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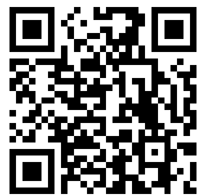

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HISTORY OF THE SECOND WORLD WAR

UNITED KINGDOM MEDICAL SERIES

Editor-in-Chief:

Sir Arthur S. MacNalty, K.C.B., M.A., M.D., F.R.C.P., F.R.C.S.

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THE ARMY MEDICAL SERVICES

BY

F. A. E. CREW, F.R.S.

Campaigns

VOLUME I

FRANCE AND BELGIUM, 1939–1940

NORWAY · BATTLE OF BRITAIN · LIBYA, 1940–1942

EAST AFRICA · GREECE, 1941 · CRETE · IRAQ · SYRIA

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PREFATORY NOTE

BY THE EDITOR-IN-CHIEF

As Macaulay wrote in his History of England: 'No man of sense has in our days, or those of our fathers, seriously maintained that our island could be safe without an army. And, even if our island were perfectly secure from attack, an army would still be indispensably necessary to us. The growth of the Empire has left us no choice.'

At the same time, the British nation has a deep-rooted, reasonable and salutary aversion to having permanent military establishments on a large scale in time of peace. The maintaining of large military forces in peace-time undoubtedly has been one of the factors responsible for the aggression of Germany on three occasions since 1870. A nation that gives up butter for guns and sees a superb military machine emerge as the result of its self-sacrifice is predisposed to use it.

The British are not an aggressive people. Disarmament always appeals to them and under the influence of this appeal they are prone to run to the opposite extreme, to reduce their armed forces to a point where their means of defence are imperilled unduly when they are forced into war. It was so at the beginning of the First World War, and history repeated itself when war broke out in 1939.

But the British have also wonderful powers of co-operation and of improvisation and planning in the face of danger. These characteristics belong not only to the soldier but are also present in the medical officer. He, too, must improvise and plan to save lives, to evacuate wounded and to augment the medical establishment in the thick of active warfare.

In Professor Crew's previous two volumes in this History dealing with military medical administration, he has described how truly and faithfully the Army Medical Services rose to their responsibilities in this matter and overcame countless difficulties in doing so.

In four succeeding volumes, of which this is the first, he describes vividly the medical resources deployed in the various campaigns of the war and shows how greatly they contributed towards victory. This first volume tells a chequered story of defeats and successes. The first chapter narrates the medical aspects of the campaign in France and Belgium and the wonderful story of Dunkirk. Chapter 2 shows how the R.A.M.C. played its part in the saga of Norway. In Chapter 3 the Army's medical arrangements during the Battle of Britain are described. Chapters 4 and 5 treat of the medical arrangements from 1940 to 1942 in the Campaign in Libya and break off immediately prior to the turn

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of the tide at the Battle of El Alamein. Chapter 6 tells of the Campaign in East Africa and the liberation of Abyssinia. In Chapters 7 and 8 the Campaigns in Greece and Crete are seen to present their own medical problems. This is true also of Chapter 9, the Campaign in Iraq; Chapter 10, the Campaign in Syria; Chapter 11, the Campaign in Persia; Chapter 12, the Campaign in Madagascar, and Chapter 13, the siege of Malta, with which the volume concludes. This last epic story is described in Volume II, *The Civilian Health and Medical Services* of this history, but Professor Crew records here the important part taken by the Army Medical Services.

Victories over foes adorn the rolls of British regiments. This is a chronicle of victories over wounds and disease.

This volume of the Official Medical History of the War has been prepared under the direction of an Editorial Board appointed by H.M. Government; but the author alone is responsible for the method of presentation of the facts and the opinions expressed.

September 1954. ARTHUR S. MACNALTY

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The Golden Book of Remembrance

The book, in Westminster Abbey, contains 2,463 names of those of the R.A.M.C. who died during the war years. These may be classified according to ranks and theatres of war as follows :

Ranks

Rank	No.	Rank	No.
Major Generals	1	Warrant Officers Class I	17
Brigadiers	2	Warrant Officers Class II	23
Colonels	16	Staff Sergeants	51
Lieutenant Colonels	30	Sergeants	158
Majors	84	Lance Sergeants	4
Captains	218	Corporals	174
Lieutenants	84	Lance Corporals	66
2/Lieutenants	2	Privates	1,533
Total Officers, 437		Total Other Ranks, 2,026	

Theatres of War

Theatre	No.	Theatre	No.
United Kingdom	436	Sicily	5
Iceland and Faroes	4	Italy	121
France and Belgium, 1939–40	197	N. Caribbean	6
Western Europe, 1944–45	313	S. Caribbean	1
Norway	1	Far East	231
Balkans and Greece, 1944–45	5	Burma	77
Middle East	303	Ceylon	4
Gibraltar	3	China	6
Malta	9	India	185
Persia-Iraq	13	Malaya	30
East Africa and Abyssinia	10	Netherlands E. Indies	5
Eritrea	2	Europe (unspecified)	7
West Africa	16	Asia	1
Madagascar	1	America	1
South Africa	12	At Sea	259
North Africa	198	Unspecified	1

The Golden Book, 1914–1918 contains the names of 743 Officers and 6,130 Other Ranks.

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ABBREVIATIONS

'A'.	Adjutant-General's Branch
A., or Afr.	African
A.A.	Anti-aircraft
A.A.M.C.	The Australian Army Medical Corps
A.A.N.S.	Australian Army Nursing Service
A.A.S.F.	Advanced Air Striking Force
A and D Book	Admission and Discharge Book
A.B.S.D.	The Army Blood Supply Depot
A.C.C.	Ambulance Car Company, R.A.S.C.
A.D.C.	Army Dental Centre
A.D. Corps	The Army Dental Corps (now the Royal Army Dental Corps)
A.D.D.S.	Assistant Director of the Army Dental Service
A.D.H.	Assistant Director of Hygiene (now Health)
A.D.M.S.	Assistant Director of Medical Services
A.D.P.	Assistant Director of Pathology
A.D.S.	Advanced Dressing Station
Adv.	Advanced
Adv. Depot Med. Stores	Advanced Depot Medical Stores
A.F.S.	The American Field Service
A.F.V.	Armoured fighting vehicle
A./G.	Anti-Gas
A.G.H.	Australian General Hospital
A.I.F.	The Australian Imperial Force
Amb.	Ambulance
Amb. Train	Ambulance train
A.M.P.C.	The Auxiliary Military Pioneer Corps
A.M.U.	Anti-malarial Unit
Armd.	Armoured
A.R.P.	Air Raid Precautions
A.S.H.	Army School of Hygiene
A. & S.H.	The Argyll and Sutherland Highlanders
A.T.	Animal Transport
A/T	Anti-tank
A.T.A.	The Air Transport Auxiliary
A.T.S.	Anti-tetanus Serum or The Auxiliary Territorial Service
A.Tr.S.	The Army Transfusion Service
Aust.	Australian
Bays	The Queen's Bays (2nd Dragoon Guards)
B.C.	Belgian Congo or Battle Casualties
Base Depot Med. Stores	Base Depot Medical Stores

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Bde.	Brigade
Bedfs. Herts.	The Bedfordshire and Hertfordshire Regiment
B.E.F.	The British Expeditionary Force (France 1939–40)
B.G.H.	British General Hospital
Black Watch	The Royal Highland Regiment
Bldgs.	Buildings
Bn.	Battalion
B.N.A.F.	The British North African Force
B.O.R.	British Other Rank
Br.	British
B.R.C.S.	The British Red Cross Society
B.S.A.	Base Sub-Area
B.S.S. / Br.S.S.	British Staging Section
B.T.	Benign Tertian Malaria
B.T.E.	British Troops in Egypt
B.T.G.	British Troops in Greece
B.T.S.R. Lab.	The Blood Transfusion and Surgical Research Laboratory (B.E.F.)
B.T.U.	Base Transfusion Unit
Bty.	Battery
Buffs	The Royal East Kent Regiment
B.W.	The Black Watch
C.	Clinical (Malaria)
Cameronians	The Cameronians (Scottish Rifles)
Camerons	The Queen's Own Cameron Highlanders
C.C.P.	Casualty Collecting Post
C.C.S.	Casualty Clearing Station
C.G.H.	Combined General Hospital (Indian)
Cheshire	The Cheshire Regiment
C.I.G.S.	Chief of the Imperial General Staff
C. in C.	Commander-in-Chief
C.M.P.	The Corps of Military Police
Coldm. Gds.	The Coldstream Guards
Con. Depot	Convalescent Depot
Coy.	Company
C.P.	Car Post or Collecting Post
C.R.S.	Camp Reception Station
C.S.F.	Cerebro-spinal Fever
C.W.	Chemical Warfare
Cyrcom.	Cyrenaica Command
D.A.D.D.S.	Deputy Assistant Director of the Army Dental Service
D.A.D.H.	Deputy Assistant Director of Hygiene
D.A.D.M.S.	Deputy Assistant Director of Medical Services
D.A.D.P.	Deputy Assistant Director of Pathology
D.A.D.S.	Director of the Army Dental Service
D.C.L.I.	The Duke of Cornwall's Light Infantry
D.D.D.S.	Deputy Director of the Army Dental Service
D.D.H.	Deputy Director of Hygiene

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D.D.M.S.	Deputy Director of Medical Services
D.D.P.	Deputy Director of Pathology
D.D.S. & T.	Deputy Director of Supply and Transport
Depot Med. Stores	Depot of Medical Stores
Detach.	Detachment
Devon	The Devonshire Regiment
D.G.	Dragoon Guards
D.G.A.M.S.	The Director General, Army Medical Services
D.I.D.	Detail Issue Depot
D.I. List	Dangerously Ill List
Div.	Division
D.L.I.	The Durham Light Infantry
D.M.S.	Director of Medical Services
D.O.	Dental Officer
Dorset	The Dorsetshire Regiment
D.R.L.S.	Despatch Rider Letter Service
D.W.R.	The Duke of Wellington's Regiment (West Riding)
E.A.	East Africa
E.A.G.H.	East African General Hospital
E.A.M.C.	East African Medical Corps
E. Lan. R.	The East Lancashire Regiment
E.M.S.	The Emergency Medical Services of the Ministry of Health and of the Department of Health for Scotland
E.P.I.P.	European Privates, Indian Pattern (tent)
E. Riding Yeo.	The East Riding Yeomanry (T.A.)
Essex	The Essex Regiment
Eur.	European
E. Yorks.	The East Yorkshire Regiment
Fd.	Field
Fd. Amb.	Field Ambulance
Fd. Hosp.	Field Hospital
Fd. Hyg. Sec.	Field Hygiene Section
Fd. Lab.	Field Laboratory
F.F. Yeo.	The Fife and Forfar Yeomanry (T.A.)
Foresters	The Sherwood Foresters (Nottingham and Derbyshire Regiment)
F.S.	Field Service
F.T.U.	Field Transfusion Unit
'G'	The General Staff branches
G.1098	Mobilisation Ordnance Equipment Scale
G.C.	Gold Coast
G.D.O.	General Duties Officer or Orderly
Gds.	Guards
Gen. Hosp.	General Hospital
G.H.Q.	General Headquarters
G.H.Q.(Tps.)	The branch of G.H.Q. concerned with logistics
Glosters.	The Gloucestershire Regiment

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G.O.C. . . .	General Officer Commanding
G. Ops. . . .	Operational Branches of the General Staff
Gordons . . .	The Gordon Highlanders
Gp. . . .	Group
Green Howards .	The Green Howards
Gren. Gds. . .	The Grenadier Guards
H. . . .	Hussars
Hallams . . .	The Territorial Battalion of the York and Lancaster Regiment, The Hallamshire Battalion
Hamps. . . .	The Hampshire Regiment
H.C. . . .	Hospital Carrier
H.L.I. . . .	The Highland Light Infantry
H.M.A.S. . .	His Majesty's Australian Ship
H.Q. . . .	Headquarters
H.S. . . .	Hospital Ship
Hy. Sec. . . .	Heavy Section of a C.C.S.
Hyg. Sec. . .	Hygiene Section
I.1248 . . .	Mobilisation Medical Equipment Scale
'I'	Infantry (tank)
I.A.T. . . .	Inflammation of the Areolar Tissue
I.G. . . .	The Irish Guards
I.G.H. . . .	Indian General Hospital
I.M.C. . . .	The Indian Medical Corps
I.M.D. . . .	The Indian Medical Department
I.M.S. . . .	The Indian Medical Service
Ind. . . .	Indian
Indep. . . .	Independent
Inf.	Infantry
Innisks. . . .	The Royal Inniskilling Fusiliers
I.O.R. . . .	Indian Other Rank
I.P.	Indian Pattern (tent)
I.S.S. . . .	Indian Staging Section
K.	Kenya
K.A.R. . . .	The King's African Rifles
K.D. . . .	Khaki Drill
Kensingtons . .	The Kensington Regiment (T.A.)
King's Own . .	The King's Own Royal Regiment (Lancaster)
Km. . . .	Kilometre
K.O.M.R. . .	The King's Own Malta Regiment
K.O.S.B. . . .	The King's Own Scottish Borderers
K.O.Y.L.I. . .	The King's Own Yorkshire Light Infantry
K.R.R.C. . . .	The King's Own Royal Rifle Corps
K.S.L.I. . . .	The King's Shropshire Light Infantry
L.	Lancers
L.A.D. . .	Light Aid Detachment
Leicesters . .	The Leicestershire Regiment
L.F. . . .	The Lancashire Fusiliers
L.G. . . .	Landing Ground

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Lincolns . . . The Lincolnshire Regiment
L.M.S. . . . The London, Midland and Scottish Railway
L. of C. . . . Lines of Communication
L.O. . . . Liaison Officer
Lothians . . . The Lothians and Border Yeomanry (T.A.)
Loyals . . . The Loyal Regiment (North Lancashire)
L.R.D.G. . . The Long Range Desert Group
L./T. . . . Line Telegraphy
Lt. . . . . Light (section of a field ambulance or of a C.C.S.)

M.A.C. . . . Motor Ambulance Convoy
Manch. . . . The Manchester Regiment
M.A.S. . . . Motor Ambulance Section (Indian Army)
M.B.S.A. . . Medical Base Sub-Area
M.B.U. . . . Mobile Bath Unit
M.C.U. . . . Malaria Control Unit
M.D.S. . . . Main Dressing Station
M.E. . . . The Middle East
M.E.C. . . . The Middle East Command
M.E.F. . . . The Middle East Force
M.F.H. . . . Mobile Field Hospital (Sudan)
M.F.U. . . . Maxillo-Facial Unit
M/G . . . Machine-Gun
Mil. Fam. Hosp. . Military Families Hospital
M.I. Room . . Medical Inspection Room
M.N. . . . The Merchant Navy
M.N.B.D.O. . . Mobile Naval Base Defence Organisation
M.N.S.U. . . Mobile Neurosurgical Unit
M.O. . . . Medical Officer
Mob. Bact. Lab. . Mobile Bacteriological Laboratory
Mob. Bath Unit . Mobile Bath Unit
Mob. Hyg. Lab. . Mobile Hygiene Laboratory
Mob. Mal. Lab. . Mobile Malaria Laboratory
Mob. Mil. Hosp. . Mobile Military Hospital
Mob. Ophthal. Unit . Mobile Ophthalmic Unit
Mob. Surg. Team . Mobile Surgical Team
M.O.R. . . . Maltese Other Rank(s)
M.R.H. . . . Medical Railhead
M.S.U. . . . Mobile Surgical Unit
M.T. . . . Mechanical Transport or Malignant Tertian Malaria
M.T.C. . . . Mechanical Transport Company
M/V . . . Motor Vessel
MX. . . . The Middlesex Regiment

N. . . . . Nigerian
N.C.O. . . . Non-Commissioned Officer
N.F. . . . The Royal Northumberland Fusiliers
Non-Eur. . . Non-European
Norfolk . . . The Royal Norfolk Regiment
Northamptons . . The Northamptonshire Regiment
N.R. . . . Northern Rhodesian
N. Staffs. . . The North Staffordshire Regiment
N.W.E.F. . . The North-Western Expeditionary Force (Norway)

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N.Y.D. . . .	Not Yet Diagnosed
N.Y.D.(N.) . .	Not Yet Diagnosed (Neuro-psychiatric ?)
N.Z. . . .	New Zealand
N.Z.A.M.C. . .	The New Zealand Army Medical Corps
N.Z.A.N.S. . .	The New Zealand Army Nursing Service
N.Z.G.H. . .	New Zealand General Hospital
O.C. . . .	Officer Commanding
O. i/c . . .	Officer in charge of
Offr. . . .	Officer(s)
O.R. . . .	Other Rank
Oxf. Bucks. . .	The Oxfordshire and Buckinghamshire Light Infantry
P.	Primary (malaria)
P.A.C. . . .	Prophylactic Ablution Centre
P.A.D. . . .	Passive Air Defence
P.A.I. Force . .	Persia and Iraq Force
P.o.W. . . .	Prisoner(s)-of-War
Pk. . . .	Park
Pte. . . .	Private
P.U.O. . . .	Pyrexia of Unknown Origin
'Q'	The Quartermaster-General's Branch
Q.A.I.M.N.S. . .	Queen Alexandra's Imperial Military Nursing Service (now Queen Alexandra's Royal Army Nursing Service)
Q.M. . . .	Quartermaster
Q.M.G. . . .	Quartermaster General
Q.M.S. . . .	Quartermaster Sergeant
Queen's . . .	The Queen's Royal Regiment (West Surrey)
Q.V.R. . . .	The Queen's Volunteer Rifles
R.A. . . .	The Royal Regiment of Artillery
R.A.A.F. . .	The Royal Australian Air Force
R.A.F. . . .	The Royal Air Force
Raj. Rif. . . .	The Rajputana Rifles
R.A.M.C. . .	The Royal Army Medical Corps
R.A.O.C. . . .	The Royal Army Ordnance Corps
R.A.P. . . .	Regimental Aid Post
R.A.S.C. . .	The Royal Army Service Corps
R.B. . . .	The Rifle Brigade
R. Berks. . . .	The Royal Berkshire Regiment
Recce. . . .	Reconnaissance
R.E. . . .	The Corps of Royal Engineers
R.E.M.E. . .	The Royal Electrical and Mechanical Engineers
R.F. . . .	The Royal Fusiliers
R.H. . . .	Railhead
R.H.A. . . .	The Royal Horse Artillery
R.H.O. . . .	Regional Hospital Officer of the Ministry of Health or of the Department of Health for Scotland
R.Ir.F. or R.I.F. .	The Royal Irish Fusiliers

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Rly. Stn.	Railway Station
R.M.O.	Regimental Medical Officer
R.N.F.	The Royal Northumberland Fusiliers
R.S.	The Royal Scots
R.S.C.	The Royal Corps of Signals
R.S.F.	The Royal Scots Fusiliers
R.S.M.	Regimental Sergeant Major
R. Sussex	The Royal Sussex Regiment
R. Tks.	The Royal Tank Regiment
R/T	Radio Telephony
R.T.O.	Railway Transport Officer
R.U.R.	The Royal Ulster Rifles
R.W.F.	The Royal Welch Fusiliers
R.W.K.	The Royal West Kent Regiment
S.A.	South African or Sub-Area
S.A.A.F.	The South African Air Force
S.A.G.H.	South African General Hospital
S.A.M.C.	The South African Medical Corps
S.A.(N.E.)G.H.	South African (Non-European) General Hospital
S.A.S.	Special Air Service
S.D.F.	The Sudan Defence Force
Seaforth	The Seaforth Highlanders
Sergt.	Sergeant
S.H.O.	Senior Hospital Officer of the Ministry of Health or of the Department of Health for Scotland
S/L	Searchlight
S. Lan. R.	The South Lancashire Regiment
S.M.O.	Senior Medical Officer
S.P.	Staging Post
Sp. Gp.	Support Group of an Armoured Division
S.S.	Steamship
S. Staffords	The South Staffordshire Regiment
Suffolk	The Suffolk Regiment
Surreys	The East Surrey Regiment
S.W.B.	The South Wales Borderers
T.	Tanganyika
T.A.	The Territorial Army
T.A.B.	Typhoid, Paratyphoid Vaccine
T.A.N.S.	The Territorial Army Nursing Service
T.J.F.F.	The Transjordan Frontier Force
Tk.	Tank
T.O.	Transfusion Officer
Tps.	Troops
Tyne Scot.	The Tyneside Scottish (T.A.)
U.	Uganda
u/c	Under command of
U.D.F.	The Union Defence Force (South Africa)
U.K.	The United Kingdom
U.S.	The United States of America

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V.A.D. . . . Voluntary Aid Detachment
V.C.O. . . . Viceroy's Commissioned Officer (Indian)
V.D. . . . Venereal Diseases
V.D.H. . . . Valvular Disease of the Heart
V.D.T.C. . . Venereal Diseases Treatment Centre

W.D. . . . War Department
W.D.F. . . . The Western Desert Force
W.E. . . . War Establishment
W.G. . . . The Welsh Guards
Wilts . . . The Wiltshire Regiment
W.O. . . . Warrant Officer
Worc. R. . . . The Worcestershire Regiment
W/T . . . Wireless Telegraphy
W.W.C.P. . . Walking Wounded Collecting Post
W. Yorks . . . The West Yorkshire Regiment

Y. & L. . . . The York and Lancaster Regiment

Z. . . . . Zanzibar

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PREFACE

THE selection of the narratives for inclusion in this volume is convenient. It yields a book of about the required size and brings together, more or less in their correct chronological order, three sets of campaigns, each of which within itself consists of enterprises bound together by a common strategy. The campaigns in France and Belgium, 1939–40, and in Norway, 1940, were fought in order to prevent the further expansion of German dominion over Europe. They ended in complete victory for the Germans.

The Battle of Britain, 1940, was fought by Germany for the purpose of eliminating her only remaining antagonist. It ended in defeat for the Germans. Then followed the indirect attack by Germany and her ally Italy upon Great Britain, having for its purpose the replacement of British by Axis influence in the Mediterranean and the Middle East and the cutting of the communications between Great Britain in the west and the Dominions and Colonies in the east. The campaigns in Libya, 1940–43, East Africa, 1940–41, Greece, Crete, Iraq, Syria and Persia, 1941, and the Battle of Malta, 1940–43 were inter-related episodes belonging to this phase of the war. With them the campaign in Madagascar, 1942, was linked for it was undertaken to keep open the sea routes of the Indian Ocean. The story of the Libyan campaign is left unfinished in this volume. For reasons of convenience it has been halted at the point when General Auchinleck relinquished the Middle East Command. The campaigns in Greece and Crete ended in complete Axis victory. In East Africa the Italians endured complete disaster. As a result of the successes achieved in Iraq, Syria, Persia and Madagascar, Britain's position was appreciably improved. Malta was not subdued.

It is not to be expected that in this volume there will be encountered any development that constitutes a significant advance of any considerable magnitude in military medicine. Of necessity there must be a time-lag between experience and the application of the wisdom that emerges therefrom. In war, before advantageous innovation in systems of evacuation, hospitalisation or treatment can come to modify current practice, quite inevitably there must be an interval. Time must pass before the administrative machinery concerned can, through exercise, attain a smooth efficiency. Since this country, when entering the war, was far from prepared for it, it was quite inevitable that its armies should, at first, endure defeat. Such circumstances do not encourage attempts at improvement or innovation. In the Libyan story alone are there to be discerned indications of developments that, being later

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pursued, led to far-reaching changes in medical administration and practice.

This volume, like those which have preceded it and those which are to follow, is addressed to those who serve in the (British) Army Medical Services and who are required to prepare themselves for the task of applying medical knowledge and skill to the best advantage to the affairs of an army in war. For such application the medical officer must know more than the content of medicine; he must know a great deal about military matters generally. The medical tactical plan has to be superimposed upon the tactical plan of the general staff and must be in harmony therewith. The tactical handling of field medical units has to be undertaken in a setting the features of which are created by the conditions and circumstances that attend the conduct of a military operation.

In these narratives, therefore, attention is attracted to the operational as contrasted with the medical aspects. The first set the problem that the medical services must tackle and, if possible, solve. The second relate to the manner in which the problem was tackled and reveal the degree of success that was achieved. Only against the background of the military operation can the work of the medical services be seen and its value assessed.

Here it is necessary to sound a warning note. The operational sections of the narratives, derived as they have been from such sources as were available at the time of writing, may be found to differ, in respect of detail, from the accounts that are presented in the volumes of the Official Military History when these appear. The collection and valuation of all the relevant material for these volumes must of necessity be a much more time consuming affair than in the case of the medical volumes. With the passing of time the operational narrative is subjected to continual and serious modification as new information is received. The operational sections of the narratives in this volume are meant to provide a background to the medical story, nothing more.

The raw material out of which these narratives were compounded was quarried from the relevant despatches (operational), and from the quarterly reports submitted to the War Office by the senior administrative medical officers concerned (medical). When reference is made to the medical affairs of a force, army, corps, division, district, area or sub-area it is to be assumed that the information presented derives from the quarterly report of the appropriate date and of the senior administrative medical officer concerned. When a particular medical unit is mentioned it is to be assumed that when considered necessary the war diary of that unit has been consulted. But it has to be stated that not uncommonly this assumption would be found to be unwarranted if put to the proof of search. Unfortunately and inevitably the

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sequence of these reports and diaries is only exceptionally unbroken. When a campaign rushes to its end in retreat and evacuation, there is much deliberate destruction and accidental loss of documents. So it was that the source material for the campaigns in France and Belgium, Norway, Greece and Crete came to be very incomplete. The records belonging to the earlier phases of the campaign in Libya became depleted through loss at sea.

Attempts have been made to repair these deficiencies. The drafts of the narratives were sent to such as had been participants in the events described for their criticism of statement and interpretation. From them much help was received. But there can be no documentary confirmation of information so gathered. Acknowledgement is made of the assistance given by Sir Alexander Hood who served as D.D.M.S., G.H.Q., B.E.F., by the late Major General Philip Mitchiner who was D.D.M.S. in the campaign in Norway, by Colonel D. T. M. Large who served as D.D.M.S., British Troops in Greece, by Colonel W. K. Morrison who was D.D.M.S. Malta during part of the time when that island was enduring its greatest tribulations, and by Captain R. P. Lawson, who served as medical officer to the Long Range Desert Group.

Help was received from another source. In Libya, East Africa, Greece, Crete, Iraq, Syria and Persia the 'British' expeditionary force was a composite one including contingents from one or more of the Dominions and from India. These had their own medical services and each is producing its own official medical history. Through the medium of the Official Medical Historians' Liaison Committee, appointed by the United Kingdom and Commonwealth Governments in 1946, there has been maintained a continuous interchange of draft narratives between the medical historians. It has been possible therefore to fill in many a gap and to check much that seemed uncertain.

In the field it was not unusual for each of these medical services to have its own evacuation chain. Thus in Libya, New Zealand casualties were evacuated along a chain of New Zealand field medical units ending in a New Zealand general hospital and convalescent depot. Such an arrangement was necessary if the New Zealand Expeditionary Force was to retain its own structure. Nevertheless these medical services were fused, administratively, into one under the command of a senior administrative medical officer. The medical branch of G.H.Q. was composed of United Kingdom personnel, representative of the Army Medical Directorate of the War Office. The instruments of its policy were the army medical services of all the contingents, United Kingdom, Australian, Indian, New Zealand, South African, and Colonial under command of this G.H.Q. Thus while each of the other medical historians is required to present an account of the activities of the medical services of one contingent, the United Kingdom medical

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historian must attempt to deal with the affairs of the 'British' medical services as a whole.

When in this volume reference is made to the medical services of Australian, Indian or New Zealand formations, it can be assumed that the statements made are either in complete agreement with the Australian, Indian or New Zealand official medical histories or are actual excerpts taken therefrom. Unfortunately the same cannot be said in the case of references to the South African Army Medical Corps. The writing of the narrative of the East African campaign was greatly eased by the receipt of the draft narrative of Colonel Anning, the South African medical historian at that time; but shortly afterwards work on the South African medical history ceased. So it is, that to the South African Army Medical Services in the campaign in Madagascar, far less consideration than they merit has been given, for concerning them little information is as yet available. That this is so is greatly to be regretted, for from the little that is known it is apparent that the work they performed there was of outstanding quality and must have yielded new knowledge of considerable value.

In this Medical History of the Second World War the policy has been to separate the more professional, the more clinical, aspects of the work of the physicians and surgeons from the more military. The former are considered in detail in two volumes of the History: (1) *Medicine and Pathology*, and (2) *Surgery*. In them much that relates to the different campaigns is presented, and they should be read in conjunction with the campaign volumes, particularly so if further information concerning the work of the specialist teams and units, e.g. maxillo-facial, orthopaedic, neurosurgical, is sought.

It is with very great pleasure that acknowledgement is made of the continuing and most valuable help that has been received from Lieut. Colonel W. R. Feasby, from Colonel Allan Walker, from Lieut. Colonel B. L. Raina and from Colonel Duncan Stout, the Canadian, Australian, Indian and New Zealand medical historians. To have been permitted to work with them on a common task has been a great privilege and withal a most enjoyable experience.

To assist in the preparation of the campaign volumes of this History Lieut. General Sir Treffry O. Thompson was appointed by Lieut. General Sir Neil Cantlie when D.G.A.M.S. It was indeed necessary that someone with his knowledge of the Army, of the Army Medical Services and of war should be associated with their production. It has been his task to ensure that what was presented was that which would be of value to those to whom it has been addressed. His are the many footnotes in which attention is drawn to matters of special importance. If these volumes can claim merit, much of it must be ascribed to his contributions.

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To the construction of these campaign volumes Mr. R. Basset Scott contributed notably. It was he who, during the war years and immediately afterwards, by the exercise of much diligence and considerable powers of discrimination, produced the first drafts of the narratives, the foundation upon which all else has been built.

To the staffs of the Historical Section of the Cabinet Office and of the Army Medical Directorate many thanks are due. To their patience, knowledge, judgment and willingly given help this volume owes much. Had it not been for them and for Lieut. Colonel C. L. Dunn, of the Editorial Committee and Mr. W. Franklin Mellor, Secretary of the Editorial Committee and also of the Commonwealth Official Medical Historians' Liaison Committee, it would have been far more imperfect than it is. For the avoidable faults it displays the author alone is blameworthy.

Edinburgh F. A. E. C.
1953

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CHAPTER 1

THE CAMPAIGN IN FRANCE AND BELGIUM 1939–1940

Précis

GERMANY invaded Poland on September 1, 1939. France and Britain promptly declared war on Germany. In accordance with arrangements previously made, a British expeditionary force was despatched to France, there to take up its assigned position along the Franco-Belgian frontier.

The tactical policy of the French General Staff was to defend France on the Maginot Line so long as the Germans respected the neutrality of the Low Countries. But should the Germans thrust against France through Holland and Belgium, as they were expected to do, then the French armies in the north (including the B.E.F.) would move into Belgium and take up positions along the line of the River Dyle (Plan D).

During the period September 4, 1939–May 10, 1940 the B.E.F., separated from the Germans by the whole width of Belgium, busily occupied itself with growth, training and the improvement of the defences of its sector. The Maginot Line ended at Montmédy and along the Franco-Belgian border there were no prepared defences.

The uneasy, unreal quiet that had lasted so long was suddenly shattered when on May 10, the Germans invaded Holland while the Luftwaffe assailed points of strategic importance in Belgium and Northern France. The Allied armies promptly moved forward to the line of the River Dyle.

Then came the main German thrust where it was least expected, through the Ardennes and against the sector of the French Ninth Army about Sedan. The front was pierced and the German armour raced towards Abbeville and the coast beyond.

Disorganisation of the French Ninth Army proceeded and that of the French First Army on its left began. In the north the Belgian Army, under mounting pressure, was obliged to withdraw. So it was that the B.E.F. was forced to pull out of the Dyle position and retire to the line of the River Escaut. At the same time it became necessary to organise a number of improvised formations to guard the right flank of the L. of C. The connexion between forward areas and base became threatened as the German columns moved westwards, for the L. of C. of the B.E.F. ran diagonally across Northern France from north-east to south-west.

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But these measures were unavailing and the B.E.F. found it necessary to withdraw still further to the line of the frontier defences from which it had started. On the 27th the Belgian government asked for an armistice and the left flank of the B.E.F. was bared. The Channel ports were occupied by German forces and only that of Dunkirk remained. The B.E.F. was now contained within a shrinking quadrilateral and it became clear that in northern France it could serve no useful military purpose. The decision to withdraw it from France was reached.

The Royal Navy snatched more than 278,000 men from the inferno that Dunkirk and its beaches had become.

There now remained in France 51st Division and a number of formations built out of L. of C. troops and reinforcement details that were south of the Somme. On June 4 the French Command attempted to reduce the bridgehead over the river at Abbeville. In this attempt 51st Division took part. It was unsuccessful and the withdrawal of 51st Division to the coast and to its final surrender at St. Valéry-en-Caux began.

But even this was not the end. 52nd Division had landed at Cherbourg during June 8–14 and its 157th Bde. had moved forward towards the Seine. 3rd Division had been re-equipped and was about to return to France. Canadian 1st Division had been sent to Brest. But the French collapse was now beyond repair and there was nothing for 52nd Division to do but to return to the coast, there to be withdrawn by the Navy. The night of June 18–19 marked the end of the campaign.

(i)
The First Phase
September 4, 1939 – May 9, 1940

THE DECLARATION OF WAR

At dawn on September 1, 1939, Germany invaded Poland. At 0930 hours a British ultimatum was delivered to the German government and orders for mobilisation were issued. At 0900 hours on September 3 a second and final ultimatum was sent to Germany. This being disregarded, war was declared on Germany at 1100 hours that day.*

At 1200 hours on September 2 the 'G' (Ops.) Staff, General Headquarters, British Expeditionary Force, mobilised at Aldershot and two military missions were flown to France. On September 3 G.H.Q., B.E.F. moved to Camberley and on the 4th the Advance Party G.H.Q., left for France, there to open temporary offices at Le Mans. The medical component included D.M.S. and D.D.M.S. G.H.Q.; D.D.M.S. L. of C.; D.D.M.S. and A.D.M.S. 1 M.B.S.A.; an officer for the

* Australia and New Zealand declared war on Germany on September 3, South Africa on the 6th and Canada on the 10th.

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A.A.S.F. area and A.Ds.M.S. and D.A.Ds.H. for Brest, Cherbourg and Nantes. The Main Party Medical (D.D.H., D.D.P., D.D.D.S., A.D.M.S., D.A.D.M.S. and Principal Matron and Matron) reached Le Mans on the 12th. On the 14th and 18th the Main and Rear Parties G.H.Q. left England for the same destination.

Lord Gort's instructions were to the effect that he was to serve under the French C. in C., North-East Theatre of Operations. The B.E.F. was to consist initially of two corps, each of two divisions, together with G.H.Q., corps and lines of communication troops. Accompanying it would go a R.A.F. element, the Advanced Air Striking Force (A.A.S.F.). The assembly area was to be St. Pol–Vimy–Biaches–Bapaume–Bray–Corbie–Villers-Bocage–Domart-en-Ponthieu–Bernaville–Sommesous; the concentration areas (*a*) St. Omer, Hazebrouck and Aire-sur-la-Lys and (*b*) Abbeville, Picquigny and Poix.

On October 2, 1st Echelon G.H.Q. opened at Habarcq, eight miles west of Arras. G.H.Q. was finally to occupy no less than thirteen villages, spread over an area of fifty square miles.

THE BRITISH EXPEDITIONARY FORCE SECTOR

The French, mobilising, had manned the Maginot Line which ran roughly parallel to the Franco-German and Franco-Luxemburg frontiers to end at Montmédy. From Montmédy to the North Sea and running along the Franco-Belgian border they at once began to strengthen a zone of field defences.

The B.E.F. was allotted a sector of this zone beginning at Maulde (north of St. Amand) on the right, running roughly northwards to Halluin, turning thence in a south-westerly direction along the river Lys as far as Armentières and then running northwest to end at Croix de Poperinghe. The B.E.F. front line, 250 miles distant from the assembly area, thus formed a salient enclosing the city of Lille.

The L. of C. ran diagonally across northern France. The vulnerability of the channel ports to attack from sea and air made it necessary to make use of the more westerly ports of Cherbourg, Brest, Nantes and St. Nazaire. The Army was responsible for the establishment and maintenance of the bases, depots, L. of C. railheads and supplies of the A.A.S.F. area with its H.Q. at Rheims.

The road routes from ports to assembly areas, some 150 miles away, were:

From Cherbourg (Personnel)	Valognes–Carentan–St. Lô–Vire–Domfront–Mayenne–Laval or Le Mans
From Brest (Stores and Vehicles)	Morlaix–St. Brieuc–Lamballe–Rennes–Laval
From Nantes and St. Nazaire (Stores and Vehicles)	Châteaubriant–Craon–Laval or Le Mans

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There were also rail routes from the ports of entry to the assembly areas, from Cherbourg–Caen–Mézidon–Alençon, to the A.A.S.F. assembly area and from Tours–Vendôme–Villeneuve–Coulommiers–Sommesous.

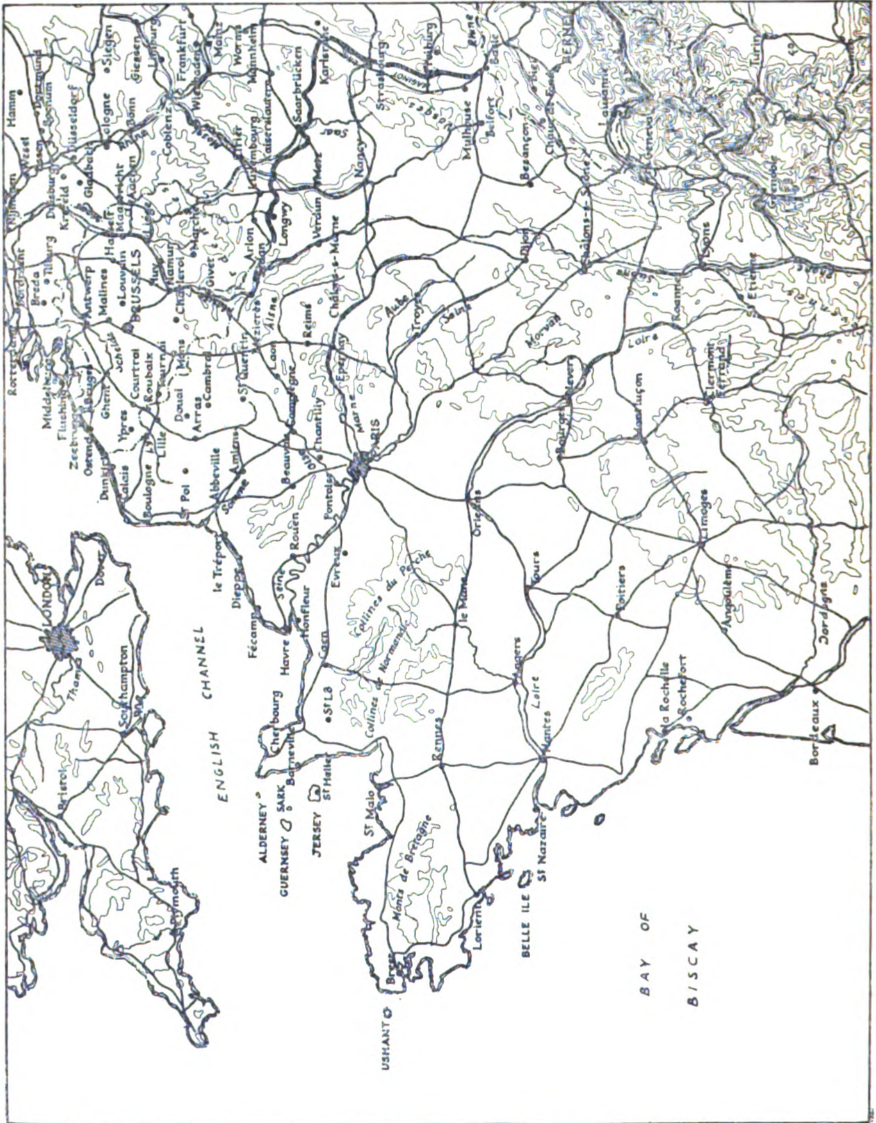

FIG. 1. Northern France.

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BASE AND L. OF C. DISTRICTS AND SUB-AREAS

At Marseilles provision was made for the reception and servicing of troops arriving from India and the Far East.

Base and L. of C. were divided for administrative purposes into two districts and nine sub-areas. Headquarters North District was at Rouen, that of South District at Vitre. H.Q. Sub-areas were at Le Mans, Rouen and Boulogne (North District); Rennes (Brest), Cherbourg, Nantes and Marseilles (South District); Dieppe Medical Base and 'X' L. of C. Avesnes. (*See* page 11.)

The L. of C., with its H.Q. at Le Mans, was administered in respect of matters medical by a D.D.M.S. as was each of the districts. Each of the nine sub-areas had its A.D.M.S., with the exception of the Dieppe Sub-area which was exclusively medical territory, being 1 Medical Base Sub-area (M.B.S.A.) and in charge of a D.D.M.S. who was at the same time the sub-area commander. Boulogne Sub-area was designated 2 M.B.S.A. and in it 2,000 beds were available early in November. It was intended that by March this number should have been increased to 12,000 but this development was not completed when the end came.

Each sub-area was provided with a pool of medical officers and a number of O.Rs. R.A.M.C. for the staffing of M.I. Rooms and the like and with a detachment of M.A.C. or A.C.C. cars. E.M.Os. and staffs were provided for the ports.

THE B.E.F. BUILD-UP*

On October 3–4 I Corps took over from the French the line between Maulde and Bouvines. On October 12, 3rd Division of II Corps extended the line as far as Hem, while 4th Division went into G.H.Q. Reserve in the Lens area. 13th, 15th and 17th Inf. Bdes. arrived during October–November and on December 29 joined H.Q. 5th Division (of II Corps) which had been completed with divisional troops. 48th Division (I Corps), 50th Division, a motorised division of two brigades, (II Corps) and 51st Division arrived during January–February 1940. In April, 42nd and 44th Divisions of III Corps arrived and it became possible for the B.E.F. to extend its sector to the west as far as Croix de Poperinghe. 15th Infantry Brigade of 5th Division was withdrawn for service in Norway and the rest of 5th Division ultimately went back into G.H.Q. Reserve around Amiens. Between April 16–27 three second-line Territorial Army divisions—12th, 23rd and 46th—were sent to France, there to continue their training and also to augment the labour force. 12th Division went to the Rouen area, 23rd Division to Miraumont and 46th to Seclin. 12th and 46th Divisions each had three brigades, 23rd, a motorised division, had but two. They were

* *See* Administration, Vol. I, Chapter 1, page 17 and Chapter 7, page 108.

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incomplete in respect of staff, armament, transport and services. The subsequent experience of these divisions gave force to the contention that when combatant units move to a theatre of war for whatever purpose they should take with them their medical units complete. They had only one field ambulance apiece in spite of strong protests from Medical G.H.Q. 12th and 23rd Divisions were eventually committed to battle with that very inadequate provision. The excuse for this was that they were only for use on the L. of C.; but they were part of G.H.Q. Reserve and were inevitably drawn into battle. This initial economy proved costly in the end.

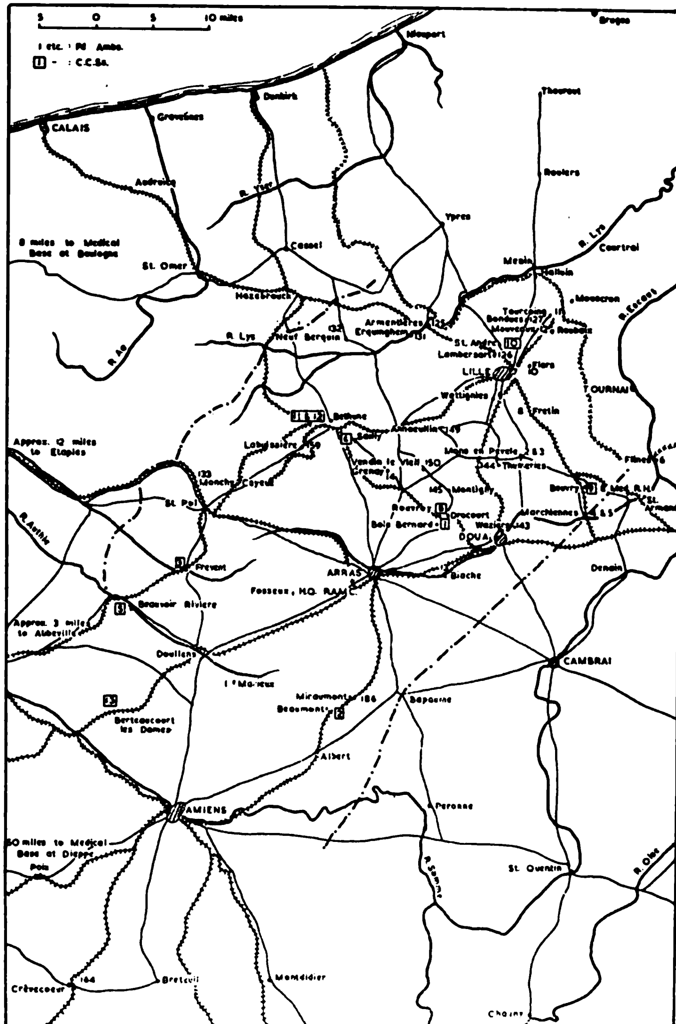

FIG. 2. The Distribution of the Forward Medical Units, May 10, 1940.

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By the end of April 1940 there was a main fighting force of nearly a quarter of a million and behind these over 150,000 in the rearward areas.

It had been decided that as soon as the strength of the B.E.F. reached that of four corps these should be grouped in two armies. This stage had not been reached before the battle began.

B.E.F. Order of Battle is shown in Appendix I.

The Medical Units Location statement as at the end of the first phase is shown in Table 1.

TABLE 1

B.E.F. Medical Units Location Statement as at the End of the First Phase

Field Ambulances, Field Hygiene Sections and Motor Convoys

Formation	Fd. Ambs.	Fd. Hyg. Secs.	M.A.Cs.
G.H.Q.	—	8 Bavincourt	4, 5, 6, 8,
I Corps	13 Biaches	6 Douai	1 Douai
II Corps	14 Grenay	7 Phalempin	2 Phalempin
III Corps	159 Labuissière	23 Gosnay	7 Fouquières
1st Division (I Corps)	1 Marieux 2 Mons-en-Pévèle 3 Mons-en-Pévèle	1 Bersée	
2nd Division (I Corps)	4 Marchienne 5 Marchienne 6 Flines	2 Orchies	
3rd Division (II Corps)	7 Lille 8 Frétin 9 Wattignies	3 Seclin	
4th Division (II Corps)	10 Flers 11 Tourcoing 12 Mouvaux	4 Lille	
5th Division (G.H.Q. Reserve)	141 Moliens Vidame (158 gone to Norway) 164 Crèvecoeur	24 Crèvecoeur	
12th Division (L. of C.)	182 Formerie	31	
23rd Division (L. of C.)	186 Miraumont	33 Miraumont	
42nd Division (III Corps)	125 Armentières 126 Lambersart 127 Bondues	20 St. Germain-le-Fouilloux (Mayenne)	
44th Division (III Corps)	131 Erquinghem 132 Neuf Berquin 133 Monchy-Cayeux	14 Estaires	
46th Division (L. of C.)	183 (passed to 50th Div.)		
48th Division (I Corps)	143 Waziers 144 Thumeries 145 Montigny-en-Gohelle	12	
50th Division (II Corps)	149 Annoeullin 150 Vendin-le-Vieil. 183 (from 46th Div.) Nantes	22	
51st Division (Saar Front)	152 Ising 153 154 Veckring	13	
1st Army Tk. Bde.	5 Lt. Pacy near Evreux		

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Table 1—continued

Formation	Fd. Ambs.	Fd. Hyg. Secs.	M.A.Cs.
L. of C.		9 Cherbourg 10 Pacy-sur-Eure 11 Nantes 15 Le Havre 16 Rennes 17 Rouvroy	
A.A.S.F.			3 Epernay
1st Armoured Div. (Cherbourg May 19)	1 Lt. 2 Lt.	1st Armd. Div.	

Casualty Clearing Stations.

G.H.Q.

1 Bois-Bernard (closed) 6 F.T.U. attached
2 Beaumont-Hamel, 1 F.T.U. attached
3 Frévent
5 Beauvoir Rivière (closed) 2 F.T.U. attached
6 (less detachment) Sailly. 7 F.T.U. attached. Detachment. Metz
8 Rouvroy. 8 F.T.U. and 1 Mob. Bact. Lab. attached
9 Beuvry. 5 F.T.U. and 2 Mob. Bact. Lab. attached
10 St. André, Lille. 4 F.T.U. attached
11 Béthune (closed)
12 Annezin, Béthune
13 Berteaucourt-les-Dames

A.A.S.F.

4 Epernay. 3 F.T.U. and 3 Mob. Bact. Lab. attached

General Hospitals

L. of C. 1,200 beds.

1 Dieppe (1 M.B.S.A.) Arrived Sept. 17. Opened Oct. 2. Indian wing. Jan. 8	Buildings
2 Offranville (1 M.B.S.A.) Arrived Sept. 17. Opened Nov. 11	Buildings
3 Offranville (1 M.B.S.A.) Arrived Sept. 17. Opened Nov. 25	Tented
4 La Baule, St. Nazaire. Arrived Sept. 14	Buildings
5 Le Tréport (1 M.B.S.A.) Arrived Oct. 12	Buildings and Tented
6 Flocques, Dieppe (1 M.B.S.A.) Arrived Oct. 12	Buildings and Tented
10 Arques-la-Bataille, Dieppe. (1 M.B.S.A.) Arrived Sept. 26. Opened Oct. 30	Buildings and Tented
13 Château Bruyere near Rouen. Arrived January	Huts
14 Etaples, Boulogne (2 M.B.S.A.) Arrived March	Tented
17 Camiers (2 M.B.S.A.) Arrived January	Buildings
18 Le Touquet (2 M.B.S.A.). 9 F.T.U. attached. Arrived Feb.	Tented

L. of C. 600 beds.

7 Cherbourg. Opened Sept. 11	Buildings
8 Lesneven, Brest and Rennes. Arrived Sept. 14. Opened Oct. 2	Buildings
9 Le Grand-Lucé, Le Mans. Detachment at Château Buisson de Mai near Pacy-sur-Eure. Opened Sept. 22	Buildings and Tented
11 Le Havre. Opened Jan. 1	Buildings
16 Boulogne (2 M.B.S.A.) Arrived January	Buildings
20 Camiers (2 M.B.S.A.) Arrived January	Tented
21 Camiers (2 M.B.S.A.) Arrived January	Tented

L. of C. 200 beds.

Section of an I.G.H. Queen Alexandra's Hospital, Marseilles
(This hospital was a branch of the Dreadnought, a seaman's hospital)

Convalescent Depots (L. of C.)

1 Château Gunsberg near Dieppe
2 Le Tréport
3 Château le Heron, near Rouen. Later at Coulaine
4 Wimereux

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Table 1—continued

Mobile Hygiene Laboratories (G.H.Q.)
1 Rouvroy
2 Beuvry
Mobile Bacteriological Laboratories (G.H.Q.)
1 Rouvroy
2 Beuvry
A.A.S.F.
3 attached 4 C.C.S., Epernay
Base Depots Medical Stores (L. of C.)
1 1 M.B.S.A. Dieppe
2 2 M.B.S.A. Boulogne
Advanced Depots of Medical Stores (G.H.Q.)
1 Rouvroy
2 Pommera
3 Sailly-Labourse
4 Annezin
Ambulance Trains (L. of C.)
1, 2, 3, 4, 5, 6, 7, 8, 13
Hospital Carriers (500 beds) (L. of C.)
1, 2, 3, 4
Blood Transfusion and Surgical Research Laboratory (L. of C.)
1 M.B.S.A. Dieppe
Depot R.A.M.C. Reinforcements (L. of C.)
1

The consultants (medicine (2), surgery (2), pathology, ophthalmology, psychiatry, dermatology) and advisers (radiology, venereal diseases) were carried by 1 M.B.S.A.

The designated centre for:

maxillo-facial cases was	1	British General Hospital (B.G.H.)
genito-urinary cases	3	,, ,, ,,
fractures . .	10	,, ,, ,,
thoracic cases .	10	,, ,, ,,

Medical Policy B.E.F. Instructions were issued to the effect that, of those admitted to medical units, only such as could not be expected to be fit to return to their units within twenty-eight days were to be sent back to the United Kingdom, where all long term therapy was to be undertaken.

THE TACTICAL PLAN—PLAN D

The tactical policy which guided the actions of the Franco-British armies during this campaign was twofold. So long as the enemy respected the neutrality of the Low Countries, France was to be defended on the Maginot Line. But should the Germans thrust through Belgium and Holland towards northern France, as they were expected to do, then at once the French armies in the north, together with the B.E.F. would move into Belgium. It was assumed that the Belgian Army would fight first of all on the defensive line of the Meuse and the Albert Canal.

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Behind this position and roughly parallel to it and to each other were three river lines—those of the Dyle, the Dendre and the Escaut—in this order from east to west. Of the several plans that were prepared the one known as Plan D can claim the greatest importance in the light of subsequent events. This involved the B.E.F. in a forward move of some 60 miles to a defensive position along the river Dyle between Wavre in the south and Louvain in the north and covering Brussels.

The instructions issued in connexion with the execution of this Plan D are outlined in Appendix II.

MEDICAL ARRANGEMENTS IN CONNEXION WITH PLAN D

Field Ambulances

Field ambulances would evacuate all patients unfit to return to their units into the C.C.Ss. and move under command of and in conformity with the movements of the formations to which they were assigned. An ambulance car from the field ambulance would accompany the forward body of the formation, taking with it a reconnaissance party which would select suitable sites for dressing stations and billets. Each column of a formation would be accompanied by one or more ambulance cars during the forward move for the transport of casualties incurred *en route*. For the provision of medical care to casualties incurred during the forward move dressing stations would be established by the field ambulances as these moved forward, at selected points along the routes of advance. The field ambulances concerned with the provision of these dressing stations would move (in part or in whole) with the forward bodies of the leading formations.

A light section of 9 Fd. Amb. (3rd Division) and two ambulance cars would move with and under command of 12th Lancers. In addition three ambulance cars would be placed under command R.M.O. 12th Lancers.

A company of 8 Fd. Amb. (3rd Division) moving with the forward body of the division, would open an A.D.S. at Leeuwergem (near Sottegem). It would rejoin its parent unit when 6 C.C.S. had opened at the site selected by II Corps.

Evacuation during the advance would be by M.A.C. from dressing stations to 8, 9, 10 and 12 C.C.Ss.

Casualty Clearing Stations

I Corps.

8 C.C.S. (Rouvroy) and 1 C.C.S. (Bois-Bernard) would entrain at Rouvroy on J.1 day* and be moved forward by G.H.Q. to open in the

* J.1 day = the day on which the forward movement to the Dyle began.

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vicinity of the new ambulance railhead (R.H.), when selected by Corps, in the area of Ninove. (In the event, 1 C.C.S. opened at Ninove and 8 remained at Rouvroy.) 2 C.C.S. (Beaumont-Hamel) would be allotted to I Corps from J.3 day.

II Corps.

9 C.C.S. (Beuvry) and 6 C.C.S. (Sailly), less light section which would move by road under orders Corps, would entrain at Beuvry on J.1 day and be moved forward by G.H.Q. to open in the vicinity of a new ambulance railhead when selected by Corps in the area of Haaltert. (In the event, 6 C.C.S. was sited at Haaltert.)

III Corps.

12 C.C.S. (Annezin) and 10 C.C.S. (St. André) would remain open and 11 C.C.S. (Béthune) closed.

G.H.Q. would detail five ten-ton lorries to report to each of 1 and 6 C.C.Ss. on J.1 day to assist entraining. G.H.Q. Tps. would also provide transport to assist the entrainment of 2 and 5 C.C.Ss. when required.

Motor Ambulance Convoys

5 M.A.C. (Lucheux) and 6 M.A.C. (Ransart) would be allotted to I and II Corps respectively on J.1 day.

Corps would provide medical personnel and equipment for troops left behind in the corps areas being vacated. Evacuation of casualties among these troops would be by M.A.C. to 3 C.C.S. at Frévent in the case of I and II Corps and to 12 C.C.S. at Annezin in the case of III Corps. The M.A.C. cars would be attached to Corps from 4 M.A.C. (at Candas) under orders D.M.S.

When the B.E.F. moved forward the area vacated by I, II and III Corps would become a new sub-area, 'X', L. of C. S.A. (H.Q. Avesnes) and Brussels an area with two sub-areas.

Advanced Depot of Medical Stores

Under command 1 C.C.S., 1 Adv. Depot Med. Stores would move with this unit to the new ambulance R.H. (Ninove).

Ambulance Trains

An ambulance train programme would be prepared by D.D.M.S. L. of C. in consultation with Q. (Movements). The timetable would provide for one train daily for the first six days. (In the event, admissions to the forward C.C.Ss. were on a small scale and consequently the number of ambulance train journeys was reduced.)

General Hospitals

All general hospitals in the two M.B.S.As. would evacuate to the United Kingdom all cases unlikely to be fit for discharge in seven days and so make available some 10,000 beds.

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D.D.M.S. L. of C. would provide a surgical team for each of 1, 6 and 10 C.C.Ss., prior to the advance to the Dyle, from the staffs of the B.G.Hs. in L. of C. Further surgical teams would be formed and held by the B.G.Hs. in the two M.B.S.As. in readiness to proceed as required at one hour's notice. (A surgical team consisted of a specialist surgeon, a specialist anaesthetist, a theatre sister and an operating-room assistant, together with complete equipment.)

THE MAIN FRONT DURING THE FIRST PHASE

Between the B.E.F. and the enemy stretched the whole width of Belgium. Only from the air could the antagonists inflict hurt upon each other. Expectation of such attacks made wide dispersal imperative. This dispersal made the general care of the troops by the different services exceedingly difficult, greatly increased the routine duties of all hospital staffs and interfered with the layout of all medical units.

The troops in the forward areas were continuously occupied in strengthening the defensive positions they held. In the rear areas were the divisions completing their training, greatly interrupted by the foul weather of November–January. Everywhere thousands of men were engaged in projects for the provision of camps, services, communications, roads and the rest of the multitude of things that the ever increasing expeditionary force needed.

The B.E.F. had been inserted into a densely populated and highly industrialised region from which the civilians, whose personal interests and activities were greatly affected and often disrupted by those of an army preparing for battle, had not been evacuated. Moreover for the time being the troops were engaged in an emotionally unsatisfying and apparently meaningless routine. The circumstances and conditions were such as to give to environmental insanitation and venereal diseases high places among the problems which beset the B.E.F. during the first seven months of the campaign in France, a period abruptly to be followed by three violent weeks filled with the chaos of swiftly moving disaster.

THE SAAR FRONT DURING THE FIRST PHASE (FORCE 'W.', B.E.F.)

On November 17 it was agreed by the French and B.E.F. Commands that British troops should be sent into the Maginot Line for training under conditions differing markedly from those along the Belgian frontier. I and II Corps were instructed to send a series of brigades in succession, each taking with it an anti-tank company, a machine gun company, a field company Royal Engineers and a field ambulance. Four Royal Artillery officers would at the same time be attached to the French artillery supporting the brigade in the Line.

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The Maginot Line consisted of:

(*a*) The Ligne de Contact, 1–2 miles beyond the French frontier.

(*b*) The Ligne de Soutien, about 2 miles back.

(*c*) The Ligne de Recueil, 2 miles behind this.

(*d*) The Fortified Zone of the Maginot Line itself, 3 miles further back.

(*e*) The Ligne d'Arrêt, 3 miles to the rear of the Fortified Zone.

On December 1–2, 3rd Brigade (1st Division) moved into the Maginot Line, taking over the Ligne de Contact about Lachholtz, Waldweistroff and L'Obersterwald. The field ambulance serving this brigade established itself and its main dressing station at Veckring. Brigade headquarters was at Kédange.

The brigade was kept busy improving the fieldworks and in training under active service conditions. Eight other brigades in turn thereafter served in this sector between December 18, 1939 and April 21, 1940. Then instead of a brigade a complete division—51st Division—went into the Maginot Line and was there when the second phase opened.

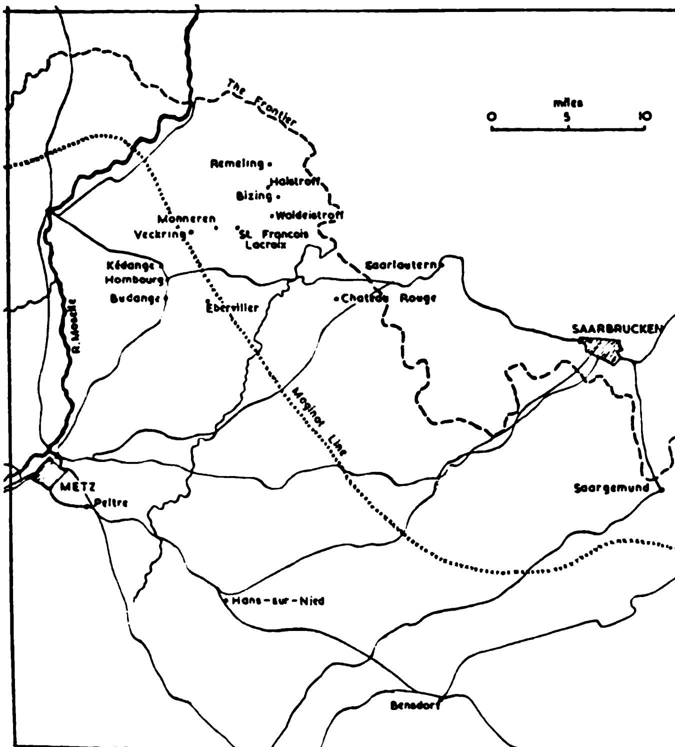

FIG. 3. The Saar Front.

Disposition of 51st Division on May 3

	H.Q. 51st Division	Hombourg-Budange
Southern sub-sector	H.Q. 152nd Bde.	Ebersviller
Northern sub-sector	H.Q. 153rd Bde.	Veckring
Centre sub-sector	H.Q. 154th Bde.	Monneren

together with attached divisional troops including:

Medical	A.D.M.S. and staff
	152 Field Ambulance
	153 Field Ambulance
	154 Field Ambulance
	13 Field Hygiene Section
	and
	8 Mobile Bath Unit

The four ambulance cars which had gone to the Saar front with 3rd Bde. of 1st Division had remained there for the use of the succeeding brigades. The division had with it Indian 22nd Animal Transport Company.

During the last week of April only ten casualties were incurred by the division, these being caused by enemy shellfire. The days were still and the nights filled with activity. For this reason the wounded were retained in the regimental aid posts during the night and brought back only by day, a practice not always to the advantage of the wounded.

Each battalion in the Ligne de Contact maintained up to twelve defended posts with garrisons of from six to forty men. Each post was isolated within its own encircling wire and the general conditions within the weapon-pits were extremely primitive. Thus it was that the immediate treatment and evacuation of casualties from these posts presented problems of unusual difficulty. In an attempt to solve them the following instructions had been issued to the divisional medical officers : to each post with thirty men or over there should be allotted a stretcher-bearer, a stretcher, a haversack, shell dressing, iodine, a Thomas splint and Gooch splinting; to each officer and warrant officer on duty in a post there should be issued a supply of morphia tablets in a match box duly sealed with adhesive plaster and with full instructions as to when they should be given. Stretcher-bearers were to be instructed concerning the dangers of the tourniquet and medical officers were reminded of the dangers that attended the too frequent and unnecessary changing of dressings.

Between May 1–10 there descended upon the divisional front an uneasy quiet. Only on the flanks and in front of the neighbouring French units was there enemy activity, for there patrols were constantly probing.

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MEDICAL ARRANGEMENTS, SAAR FRONT

There were casualty collecting posts at Halstroff, Forgeville, Bizing, Remeling, Waldweistroff and St. François-Lacroix. At Veckring, in a French barracks, was the M.D.S. of 154 Fd. Amb. 152 Fd. Amb. had its advanced dressing station at Ising. In Metz a detachment of 6 C.C.S. had 150 beds in L'Hôpital Legouest. From Metz patients to be evacuated were taken by automotrice (Diesel train) to Epernay where 4 C.C.S. was sited. Very urgent cases could be sent from M.D.S. direct to a French C.C.S. at Château Logne, to the west of Veckring. Sick and injured from the rear areas could be taken direct to 6 C.C.S. in Metz. Head and face cases could be diverted from Metz to a French hospital at Peltre. An ambulance train was sent at intervals, and when especially required, from base to Epernay.

THE WORK OF THE ARMY MEDICAL SERVICES DURING THE FIRST PHASE

For the first week of this campaign, while the earliest elements of the B.E.F. were assembling in France, the French authorities placed at the disposal of the B.E.F. 100 beds in each of the civil hospitals at Cherbourg, Brest and Nantes. At the end of this time it was intended that British general hospitals would have become available at Cherbourg, La Baule, Brest and also in the assembly areas and that evacuation would then be *via* Cherbourg to Newhaven by hospital carrier. The sick and injured who were admitted to these French civil hospitals were in danger of becoming lost to their units and it became necessary to comb them out and to transfer them to British medical units.

The French authorities also offered for the use of the B.E.F.:

1 Train couché	300 lying	by Z + 7
1 Train mixte	120 lying 240 sitting	by Z + 7
1 Train couché		by Z + 16
1 Train mixte		by Z + 20

all of these to be handed over at Rennes.

Units reaching France from the United Kingdom arrived in their assembly areas usually within thirty-six hours after embarkation. The movement of units from the assembly areas to the concentration areas was an operational move carried out under orders of corps and divisions since it was expected that the columns would be subjected to intense air attack, especially at the crossings over the rivers Seine and Somme. The medical services of corps and divisions therefore allotted field ambulances, or motor ambulance cars to each column. Such as went sick *en route* were admitted to local French civil or military hospitals. They were later collected and evacuated by motor ambulance cars which were sent along the routes to visit every hospital.

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After September 26 all troops passing west of Paris *en route* for the forward zone travelled *via* Le Mans. Rail parties did not halt there but road parties proceeding by stages had to be billeted in the Evreux and Poix districts. Rail parties were accompanied by medical officers but road parties depended for medical attention on the medical staffs of headquarters L. of C. sub-areas. Their limited medical supplies were soon exhausted and in the early days had to be replenished by local purchase out of imprest.

The work of the medical services, like that of all the rest, was made difficult by the wide dispersal of units. Medical inspection rooms had to be dotted all over the country and in order to staff them general hospitals were required to give up medical officers and material. To the many widely dispersed units of corps troops with no medical officer, or with medical officer but without transport, ambulance cars were allotted for semi-permanent attachment. These took the sick to the nearest medical unit.*

GENERAL SANITATION

Troops were billeted in every variety of building, from convents to cow-byres. Almost everywhere provision had to be made for the construction of latrines, the selection of water points and the disposal of rubbish and swill. The low standard of personal hygiene common among the poorer socio-economic groups of town dwellers and the agricultural value of human excrement to the country folk added vastly to the labours of the field hygiene sections. All drinking water, save that in a few base ports and L. of C. towns, had to be treated and continually tested. Overcrowding in billets was almost universal, largely because the policy of dispersal meant that the troops were quartered in small villages, and in a large proportion of these lighting and ventilation were grossly insufficient. There was no canteen to which the men could repair. These conditions were gradually bettered, however, for by January hutted camps were being built. At Nantes, for example, at one time there was a large influx of A.M.P.C. personnel quite without experience of active service and lacking the initiative to fend for themselves. Floor space being insufficient, bunks two or three tiers high were erected by the R.E. without reference to the medical authorities. Six men lay in pairs at three levels, the space between the tiers of bunks being only 6 feet and the cubic space per man some 60 feet. The use of braziers without flues in unventilated billets was responsible for the occurrence of a number of cases of carbon monoxide poisoning.

* This dispersal of, and within, units was one of the new features of this war. As revealed both in this campaign and those which followed, wide dispersal greatly complicated the affairs of all services and especially those of the large medical units.

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By April there had been 14 deaths, while 28 other men had been rendered unconscious before they were rescued.

D.D.M.S. II Corps reported as follows: 'The sanitary condition of billets and their surroundings varies considerably, depending as it does not merely on the care and attention paid by individual units to sanitary details but also on the neighbourhood where they happen to find themselves billeted. Thus units situated in country areas can spread themselves very much more in the provision of such items as ablution benches, urinals, soakage pits and so on, than can those troops who find themselves accommodated in the numerous mining towns in the industrial areas. These latter are frequently confined for space, their cookhouses situated in lean-to sheds in some backyard with no facilities for the removal of their kitchen refuse other than a frequently unsatisfactory civilian contractor, while their ablution arrangements are often no more than the local pump.' A.D.M.S. 44th Division records that the disposal of waste water became a serious problem since subsoil water was encountered in the Bailleul–Lille area at a depth of 18 inches. To surmount this difficulty in the case of the Otway Pit, a 'Flanders Type' was invented. It was made by raising a mound of earth and making the pit in the middle of it. This method was subsequently adopted for 'pits' and latrines in other theatres where the subsoil water was quickly reached, e.g. Egypt, Iraq and Arakan.

In the first months of this campaign the sanitary condition of units was, on the whole, bad. Many R.M.Os. had no previous field experience. The construction of defensive and protective works being the first priority, there were relatively few men who could be spared for sanitary fatigues. The R.E. were fully occupied on other and, to the General Staff, more important tasks. Local contracts were made difficult by the fact that the workmen who might have been employed were away serving with the French Army. It has to be recorded, however, that one cause, and by no means a minor one, of the low sanitary standards was the ignorance or indifference of officers commanding units.*

An officer commanding a field hygiene section records:

> 'What struck me most was the ignorance and apathy of many units in simple public health principles. This applies to medical as well as other units. It seemed to me that enough stress had not been laid on public health propaganda and teaching during the training period, mobilisa-

* In every subsequent campaign, in varying degrees, the same factors, ignorance concerning sanitation and lack of disciplinary control, made their appearance. Good standards of hygiene were not achieved until senior combatant officers had themselves received training and had come to recognise their responsibilities. In fact, in tropical and sub-tropical theatres it came to be accepted that the possibilities of success were very largely pre-determined by the realisation on the part of all commanders that they, and not the medical services, were primarily responsible for the prevention of disease in their units or formations and for the promotion of health among the men who were in their charge.

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tion, etc. I regret I was not able to alter this opinion materially, even after all the efforts others and ourselves had put in. Even where a health rule or regulation was obeyed, it was often so obeyed because it was an order and not because the unit and individuals in the unit realised the importance and value of the particular measure. In my considered opinion the weakest link in what was definitely a good Public Health structure was the apparent absence in the Army of a real system of public health education among officers, N.C.Os. and men. Among the worst offenders were medical officers from civil life, new to the Army, whose whole outlook previously had for the most part been bound up in curative, as apart from preventive, medicine.'

But as A.D.M.S. 51st Division pointed out:

'It is to be remembered that before embodiment their sanitary experience was limited to the two weeks of their annual training, usually in standing camps already provided with latrines, cookhouses, ablution benches and civil contracts for the disposal of refuse. Before the division left for France selected personnel had attended the Army School of Hygiene, but this in itself could not take the place of general practical experience.'

In assessing the value of these observations and suggestions it must be borne in mind that this was a national army in that it included within its ranks very large numbers of non-regular soldiers. It is to be accepted that the regular soldier, when trained, is a clean animal and an animal that does not foul his environment when in the field. He is the product of a special education in which the principles of personal and public hygiene loom large. The non-regular is one who has been abruptly removed from an environment in which he was not required to accept the responsibility of safeguarding his own health or that of others. His water came to him out of a tap; his excrement disappeared down a water closet and his refuse was removed by scavengers. He received no instruction either in school or afterwards which would have fitted him for a feral existence. If he is removed from the environment to which he has become adapted, he shows himself to be the most insanitary animal of all. He knows not how to cope with the conditions of his new habitat and he waits for others to provide him with the things to which he is accustomed. These amenities must be supplied, and that is why the field hygiene section in sufficient numbers is as necessary to a national army as is a sanitary service to an industrial city. Without them continued life would soon become impossible.

Thus the Deputy Director of Hygiene reported:

'The shortage of sanitary inspectors in corps and area field hygiene sections was seriously felt. The areas these sections had to cover were in many instances enormous, as much as 2,000 square miles and holding as many as 30,000 men. To add to the difficulties the units were widely scattered and many, especially in the base areas, were completely devoid of

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sanitary knowledge and discipline. Many of these units too, though several hundreds in strength, had no medical officer and, although their sick were seen each morning, the visiting medical officer had no time to inspect their lines or advise as to the sanitation, since he had to tour some 200 miles each day, travelling from one unit to another. The general consensus of opinion is that the field hygiene section should have its establishment increased by three sanitary inspectors (corporals) and that to assist them in carrying out their duties six motor cycles should replace six of the eight push-bicycles with which these units are equipped. As an alternative, each corps field hygiene section and the one at G.H.Q. should be able to draw on a pool of three sanitary inspectors held at corps and G.H.Q. H.Q. and the Assistant Director of Hygiene at H.Q., L. of C., should also have a pool of 15 sanitary inspectors (3 sergeants and 12 corporals) to supplement any field hygiene section in need; the supply of motor cycles to be as stated.'

D.D.H.'s advocacy remained unheeded in so far as sanitary inspectors were concerned, but he got his motor cycles!

It came to be recognised therefore that the number of field hygiene sections to be included within an expeditionary force is not to be determined solely by reference to the total strength of the force or to the conditions that obtain in the country to which it is to be despatched. Consideration must also be given to the general level of personal and public hygiene among the force. One that includes a large proportion of labour units needs more hygiene sections than one which consists mainly of combatant units. The function of these field hygiene sections was not understood by the Army, nor even by some medical officers. It was not recognised that their personnel are expert advisers, who require large allotments of labour if they are to discharge their functions properly. Their normal and correct rôle is inspectorial and advisory. Throughout the whole of the war this was never fully understood and far too often it seemed to be thought that the field hygiene section was composed of scavengers and unskilled labourers.

WATER

Very many units arrived in France with none, or only a portion, of their establishment of water vehicles. Moreover, practically every vehicle that did arrive was deficient of its Horrocks Box and related chemicals. Even as late as January units were still arriving without these vehicles and it was not until April that establishments were complete. For some reason or other no supply of water sterilising powder was available, and it was five weeks after the first units landed in France that news was received that supplies had been despatched from the United Kingdom. During this period the water had either to be boiled or else treated with Chlorosene (Anti-gas) or by a French preparation '*Eau de Javel*'. Without the Horrocks Box correct dosage

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remained impossible and so, to be on the safe side, it was usual to use excessive amounts and thereby make the water distinctly unpalatable. In mid-October, D.D.H. was in despair: 'In spite of the complete want of chemicals which continued up to a week ago', he reports, 'we have managed to carry on; but one always felt near the edge of a catastrophe.' By the end of November the situation was easier. Sterilisation by superchlorination followed by dechlorination had become the standardised chemical method, though some small and isolated units were still boiling their water. Shortly afterwards sterilisation outfits for water bottles became available and were generally welcomed.

War establishments had not allowed for as wide a dispersion of troops as actually occurred, and so it was that scattered throughout the countryside there were very many small units, not entitled on account of their smallness to water equipment of their own, which were unable to treat their water save by boiling. Many companies of the A.M.P.C. for whom it had been expected that a piped water system would be available, were similarly placed. It became necessary to detail two field hygiene sections to deal with this difficulty. They did so by salvaging 4-gallon petrol tins which were then issued to units together with sterilising and de-tasting solutions, the units being instructed in their use.

Another difficulty was created by the need for secrecy. D.D.H. recorded that 'very often we know nothing of troops movements until some soldier goes sick. Then we learn that, say, 200 men are billeted at "X" and that for these no sanitary or medical arrangements have been made'.

In retrospect it would seem that the medical services should have been given a greater proportion of the responsibility for the provision of water and of water vehicles than they carried, and that for the use of isolated units some form of simple portable filter and canvas tank for water storage should have been provided.

CONSERVANCY

Conservancy was made difficult by the shortage of timber, by the preoccupation of the R.E. in other projects and by the inability of inexperienced units to look after themselves. For the construction of latrines use was often made of the wooden containers of the 4-gallon petrol tins, the tins themselves sometimes taking the place of the regulation buckets. In the best type the lid of the seat was a portion cut out with an inward bevel so that it fitted exactly; it was strengthened with a batten and was self-closing. Deep trench latrines gradually gave place to bucket latrines, especially in rural areas, partly because of the heavy rains and the consequent high subsoil water level and also because the troops preferred the latter type, which

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could be placed inside a building. They were quite willing to empty the buckets themselves where no local contract could be made. The excrement was burnt in graduated-feed incinerators or else buried. In connexion with these matters the field hygiene sections rendered notable service. Large quantities of wooden and tin appliances as well as exhibition models were produced, especially in divisional areas, by sanitary squads and pioneers of units under the supervision and with the help of personnel of these sections. The difference between the trained and corporate infantry unit on the one hand and the loosely cohering labour unit on the other in this matter of conservancy was everywhere to be recognised. Because the care taken of their men by the officers, warrant officers and N.C.Os. of these ancillary units was inept and insufficient, their dependence upon the medical services was all the greater.

To begin with in most parts of the B.E.F. sector bathing facilities were lacking. In November mobile bath units began to arrive and by January, six, attached to field hygiene sections, were fully functioning, their disinfectors doing much to control the incidence of pediculosis.

One mobile hygiene laboratory arrived in September and a second at the end of January. They did useful work, but the D.D.H. found reason to express the views that 'I have to admit that these units had little work to do' and that 'It is a pity that the selection of chemists was not from among those with special knowledge of chemistry applied to Public Health'.

RATIONS

All the available evidence suggests that rations were satisfactory. An excellent feature was the abundant supply of green vegetables purchased locally and interrupted only in time of severe frost. An occasional failure in the early days of the campaign to issue the full ration and to provide bread of British rather than of French baking—the latter was much disliked by the troops—was attributed to looting from the pack trains. D.D.H. himself had criticism to offer. He called attention to the fact that it had been accepted that the Field Service Ration should be more substantial than the peace-time ration; yet the Field Service Ration then issued had a value of 3,700 Calories as compared with the 4,000 of the peace-time ration. The difference was due to the fact that the supper meal was omitted from the Field Service Ration.

CLOTHING

Reports written during the early months of the campaign are almost unanimous in describing the troops' clothing and equipment as of good quality. Few other ranks had more than one uniform, however, and this, the service dress, which was soon to become outmoded.

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Frequently they had to let their clothes dry on them. In such circumstances a spare uniform became a necessity. The trouser leg-bottom could not be kept dry. Puttees and anklets were useless and gaiters were needed. It was common opinion that the half length pull-on boots of the Germans and the Russians would have been far better than the British boot. For much of the labour gum-boots were almost a necessity; yet by the end of October only 700 pairs had been issued to the two corps. In the early days no leather was available for the repair of the ordinary footwear. The supply of socks was almost everywhere insufficient. The waterproof cape issued to working parties was most unsatisfactory. It offered no protection from the knee downward and, being without sleeves, the cover it afforded to the trunk of a man at work was most imperfect. To begin with only one blanket per man was issued. This was not nearly enough. By the end of October all men had two, although this again was not enough.

Most of these deficiencies with regard to clothing were soon rectified. In November the boot and sock shortage had almost disappeared and by January there were three blankets per man. Moreover, the troops were learning to take care of their clothing. (Plate I illustrates the variety and types of uniform seen at a C.C.S. during the first phase of this campaign.)

MEDICAL SUPPLIES

There was an initial shortage of T.A.B. and of tetanus toxoid in the B.E.F. and the inoculation state of very few units was satisfactory before January. The demands received from France for tablets of various kinds was enormous, much greater than could be met by the existing machinery of manufacture. By the end of December no less than 777,000 aspirin and 455,000 cough mixture tablets had been sent out to the B.E.F. but still the cry was for more. There was a shortage too of certain surgical requirements—for example, large syringes—at a time when the question of protective inoculation was urgent, and it was not until March that it became possible for base depots of medical stores to meet indents from medical units in full.

FIELD AMBULANCES

During this phase field ambulances had been retaining in their M.D.Ss. all uncomplicated skin and V.D. cases and all minor medical and surgical cases. A.D.M.S. 5th Division commented that 'the medical equipment of the field ambulance is well designed for its purpose in active warfare. Where a field ambulance, as was the case during the period under review, has to act in the capacity of a reception station for sick there are several deficiencies which make it difficult to provide adequate treatment for more than a few hours. The severe weather conditions of the past quarter have made the roads between field

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ambulance and C.C.S. practically impassable for as long as a week at a time. Under these conditions the field ambulances have been forced to treat such serious cases as lobar-pneumonia, broncho-pneumonia and sub-acute abdominal conditions for periods up to four to five days'.

In order that a field ambulance, when required to assume such unusual functions, could satisfactorily undertake the task, A.D.M.S. 5th Division suggested that the following articles should be added to the standard equipment: more operating towels; a range of suture needles similar to that supplied to general hospitals; a range of sizes of catgut and silk; a needle holder; a pair of medium-sized retractors and the means of sterilising swabs, dressings and towels. He remarks that such additions would not diminish the mobility of a field ambulance.* It was reported by many that, for the reason that the field ambulances met their vehicles for the first time only just before embarkation, the units had received no training in the correct method of loading. The long duration of quiescence rendered this omission of no great moment, but had events taken a different course it might easily have had most serious repercussions.

The suggestion was also made from more than one source that, in view of the vast amount of clerical work demanded of a field ambulance, a typewriter could with great advantage be included in its equipment.

CASUALTY CLEARING STATIONS

Of the three C.C.Ss. allotted to each corps, only one was open for the reception of patients during this phase. Thus it was that to each in turn was given the opportunity to train its personnel. An account of one C.C.S. serves to illustrate the affairs of all. O.C. 8 C.C.S. reports as follows:

> 'On March 16 we became attached to I Corps and relieved 2 C.C.S. at Rouvroy. From March 16 to May 10, 8 C.C.S. received all the sick from I Corps. A large church hall formed the central block, providing accommodation for 43 beds, the operating-theatre, X-ray department, kitchen, stores, etc. On an adjoining trotting-track the tentage of the heavy section was erected. This, together with 12 Nissen huts, gave accommodation for about 300 patients. During the first eight weeks admissions numbered over 3,000, none of them battle casualties. They comprised all types met with in civil life. Some 265 surgical conditions were treated under general anaesthesia and over 600 X-ray films were taken. Thirty-eight cases of cerebro-spinal fever were admitted and of these 2 died within 36 hours of admission. The others were retained for 7–10 days until the acute stage was over and then evacuated. Minor conditions,

* But it has ever to be borne in mind that the field ambulance is essentially a mobile unit and that every addition to its equipment, no matter how light, cannot but add to its weight and so reduce its mobility. If something is added then something must be taken away.

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accounting for about 20 per cent. of the total admissions, were returned direct to the divisional reinforcement camps. Attached to the C.C.S. were an ophthalmic clinic and an expanded dental department.

'When the Germans invaded Norway the C.C.Ss. (in France) were instructed to evacuate all cases save those on the D.I. list. Field ambulances were likewise ordered to evacuate theirs, and so it was that after getting rid of its own patients 8 C.C.S. received some 280 others, all suffering from minor conditions, about 50 per cent. of these being scabies. These were admitted, treated and returned to their units.'

To each C.C.S. 25 A.M.P.C. personnel were attached. D.M.S. had represented that, since C.C.Ss. were barred from the large towns, additional labour would be required for the improvement of sites, etc., in the small villages.

GENERAL HOSPITALS

Until late December the admissions were as those of the civil general hospitals in peace; then battle casualties in small numbers began to reach them from the Saar front. (Plate II illustrates a ward in the British General Hospital in the Casino, Dieppe.)

AMBULANCE TRAINS

Ambulance trains from the base came to R.Hs. of I and II Corps (Drocourt and Beuvry) alternately on every second day. In addition to the regular short journeys from R.H. to base and back these trains were sent at intervals on round trips in some part of the L. of C. Area, cases for evacuation being picked up at different towns *en route*. A sample trip of three and a half days was as follows: Dieppe to Rennes. Here the train divided, one half going north-west to the Finisterre coast, the other going south-west to the Biscay coast. Next both halves returned to Rennes and reunited, moved on to Cherbourg, unloaded directly on to a waiting carrier and thence returned home to Dieppe.

These trains, the coaches of which were converted L.M.S. stock, received their ordnance and medical equipment and stores and their staff when they reached France. A train consisted of 16 coaches with a total length of 360 yards pulled by a French engine. The staff of a train comprised 3 medical officers, 3 nursing sisters and some 45 O.Rs. In January an Ambulance Train Maintenance Company R.E. was formed and rendered most valuable service. (Plate III shows the interior of a coach for cot cases in an ambulance train.)

In connexion with these trains two difficulties were encountered—the supply of water and the provision of adequate heating. Though water and watering-points were plentiful, a hose had not been included in the ordnance equipment. Thus it was that the boiler had to be filled by men with buckets, a time-consuming task not without hazard in frosty weather. Heating was furnished by the engine driving steam throughout the whole length of the train. When the thermometer was

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low, however, the rear coaches remained extremely cold. Furthermore, as soon as the engine was uncoupled, all the pipe-couplings between the coaches frequently froze solid owing to the condensation of the steam and took some three to four hours to thaw after the return of the engine. This difficulty was obviated on the French train by the practice of blowing out the pipes by means of the compressed air of the braking-system. The difference between the French and English braking-systems prevented this being done. The few Valor stoves carried by the train were quite inadequate to replace the regular supply of heat when that had failed.

This same disharmony between French engine and British coach was responsible for another trouble. When the brakes were applied there was much jerkiness, and when the train halted it stopped so abruptly that almost everything in the coaches that was loose was thrown to the floor. This was distressing to the patients and positively dangerous on those occasions when urgent operations had to be performed *en route*.

The length of the train meant that much time was lost on curves and gradients and sometimes the whole of the train could not be accommodated by the siding. Experience suggested that it was a mistake to have these trains standing in large marshalling yards in big towns, where they commonly found themselves alongside ammunition trains or gasworks. Far better was a siding at a small village some miles away from the large town.

The following table of journeys of 3 Ambulance Train during December, January and February will serve to illustrate the working of the whole system:

TABLE 2

Date	From	To	Officers		O.Rs.		Nursing sisters		Totals		Totals
			L.	S.	L.	S.	L.	S.	L.	S.	
Dec.											
6	Drocourt	Dieppe	2	2	33	62	—	—	35	64	99
10	L. of C.	Cherbourg	1	2	40	112	—	—	41	114	155
16	Drocourt	Dieppe	3	3	30	123	—	—	33	126	159
28	L. of C.	Cherbourg	1	1	63	113	—	1	64	115	179
Jan.											
6	Drocourt	Dieppe	6	—	35	87	—	—	41	87	128
15	Beuvry	Dieppe	4	2	80	229	—	—	84	231	315
23	Beuvry	Dieppe	9	9	79	130	—	—	88	139	227
Feb.											
4	Drocourt	Dieppe	6	4	55	153	—	—	61	157	218
17	Beuvry	Dieppe	7	8	71	165	—	—	78	173	251
21	L. of C.	Cherbourg	7	4	86	122	1	—	94	126	220
Totals—10 trips			46	35	572	1,296	1	1	619	1,332	1,951

Average per trip: Lying 61·9; Sitting 133·2.

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HOSPITAL CARRIERS

Organisation of this service presented minor, but none the less important, problems. Questions to be dealt with included the capacity of the harbours, their liability to attack from the air, the provision of pilots, the movements of tides and the restrictions imposed by darkness. Decisions involved many interested parties—the Admiralty, the French Admiralty, the Ministry of Shipping, Medical Embarkation and Hospital Distribution H.Q. and the medical services of the B.E.F. In these circumstances much readjustment of plans was necessary. Nevertheless a continuous and adequate service functioned with very few hitches.

THE PRINCIPAL CAUSES OF MORBIDITY

The winter of 1939 was hard. Rain and storm gave place to a series of frosts of exceptional severity. Nevertheless the general health of the troops remained good. The number of admissions to medical units never exceeded 2·8 per cent. of the total strength of the B.E.F. despite an influenza epidemic during December–January.

The principal diseases were gastric disorders, scabies, venereal diseases, respiratory disorders, tonsillitis, pediculosis and impetigo, in this order. In the early months of the campaign D.G.A.M.S. had reason to remark that 'you are sending over an amazing number of duodenal ulcers'. It would appear that included in the B.E.F. was a large number of men, mostly elderly reservists and men of the labour units, who had brought their alimentary troubles with them into the Army. In civil life they had managed more or less to control their disability by means of careful dieting, but when with their units in the Army they could not receive the necessary individual attention. When considering the prevalence of gastric disorders in the B.E.F. it is necessary to remember that they were equally prevalent in the United Kingdom. The cause is usually not to be sought in the environment but in the individual and in his peculiar reactions to that environment. To hundreds of worried men the symptoms of an ulcer in the gastric wall doubtless seemed to offer the only way of escape from a mode of life and from a set of circumstances which they found unsatisfactory or even unbearable.

During this phase 11,005 patients were evacuated to the United Kingdom.* Of these the majority belonged to the following categories:

TABLE 3

Diseases of the digestive system	2,369
Diseases of the bones, muscles, etc.	1,183
Diseases of the respiratory system (excluding T.B. and pneumonia)	1,092

* From the A.A.S.F. some were evacuated by air. See *R.A.F. Medical Services*, vol. I, Chapter 10, page 481.

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Table 3—continued

Diseases of the nervous system	655
Psychiatric disorders	535
Diseases of the circulatory system	507
Accidental injuries	1,572

Even as early as October D.D.H. was reporting that 'this (V.D.) is the big problem'. It remained so throughout the first phase. In this war the civilian population had not withdrawn from the forward areas. Yet the economy of these areas became disrupted and unemployment was common. In such circumstances the unemployed girl is endangered, being thrust towards prostitution. The troops were engaged in work which itself offered them no emotional satisfaction. Such leisure as they had was often merely time to be spent. More often than not the ways of spending it were restricted. Boredom tended to beget drinking, and drinking to a befuddled search for solace or excitement. All the elements that make for a rising incidence of V.D. were present. During the first month ending November 10 the monthly admission rate was 3 per 1,000. It was highest in corps areas for reasons that were not far to seek. By the end of this phase the rate had fallen to 2·3 per 1,000.

The medical services, in order to combat this scourge, decided that special V.D. hospitals were not to be established and that cases were not to be sent to the United Kingdom. All uncomplicated cases were to be treated in field ambulances and C.C.Ss. and all cases in L. of C. areas were to be admitted to the general hospital. Prophylactic ablution centres were provided in such numbers, and so distributed, that there was always one nearby each camp and group of billets. Action was taken to give effect to D.D.H's. advice that 'the most effective method of control was by propaganda and counsel on the part of the officer and N.C.O.' When a woman who had infected a British soldier could be identified, the French police were always ready to take appropriate action. The system of punishment which then obtained—reduction of pay and postponement of leave—was an ineffectual deterrent and tended to encourage concealment of the disease. Such concealment was further fostered by the sale of the drug 'Dagenan' in all chemists' shops. A request by the British medical authorities that the sale of this drug to British personnel should be made illegal was refused.

Cerebro-spinal fever caused a certain alarm. By the end of the year there had been 8 cases of cerebro-spinal fever. In January there were 35. This sharp increase followed upon the arrival of a spell of exceptionally cold weather when men became prone to huddle together for warmth at night and to bunch around stove and brazier by day. During February and March the weekly admission rate was roughly 24. Case mortality for the first 98 cases was 16 per cent., a number being of the fulminating type and dead on admission to hospital. Later the case

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fatality rate dropped, becoming for the first 221 cases only 9 per cent. In April the incidence showed a marked decline, except for one week during which two fresh divisions arrived. By May 13, the last date when figures were available, the total number of cases was 341.

(ii)

The Second Phase. May 10–June 2, 1940

THE GERMAN INVASION OF HOLLAND, BELGIUM AND FRANCE

On May 10 German paratroops were dropped at strategic points in Holland, bridges over the Maas were seized and over them powerful armoured columns swiftly advanced westwards. In Belgium strategic centres were heavily bombed and paratroops and glider-borne troops were landed on the Belgian side of the bridges over the Meuse. The Belgian Foreign Minister called upon the British Ambassador in Brussels and asked for military assistance from Britain. In France H.Q. B.E.F., Doullens, Abbeville and many aerodromes were heavily attacked from the air. At 0615 hours the French Commander of the Armies of the North-East issued orders for the advance to the Dyle.

At this moment the disposition of the Franco-British armies was as follows:

From the Channel to Montmédy . .	1 Army Group
In the Maginot Line	2 ,, ,,
Along the Swiss frontier and the Maritime Alps	3 ,, ,,

1 Army Group comprised from right to left:

French Second Army
French Ninth Army
French First Army
B.E.F.
French Seventh Army

The advance to the line of the river Dyle meant that French Ninth and First Armies together with the B.E.F. would wheel to the right, pivoting on Mézières–Sedan, and take up the following positions on the right of the Belgian Army which, retreating, would occupy a line running from Louvain to Antwerp:

French Ninth Army . .	Sedan–Namur
French First Army . .	Namur–Wavre
B.E.F.	Wavre–Louvain

French Seventh Army was not to conform but was to move on Breda, there to support the Dutch Army.

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THE ADVANCE TO THE DYLE

The frontier sector occupied by the B.E.F. ran from Maulde to St. Jans-Cappel. In this defensive line there were:

On the right—I Corps with 2nd and 1st Divisions in the line and 48th Division in reserve.

In the centre—II Corps with 3rd and 4th Divisions in the line and 50th Division in reserve.

On the left—III Corps with 42nd and 44th Divisions in the line (5th Division which should have been in III Corps reserve had lost its 15th Bde., which had gone to Norway, and was training in the Amiens area).

With no interference the forward movement to the Dyle was carried out according to plan. At 1300 hours on May 10, 12th Lancers crossed the Franco-Belgian frontier, to be followed immediately by the cavalry (A.F.V.) elements of 1st and 3rd Divisions. They reached the Dyle position around 2200 hours that night. G.H.Q. Command Post opened at Wahagnies on the Carvin–Orchies road at 1300 hours on May 10. The advance of I and II Corps to the Dyle was completed by May 12, when I Corps had two divisions (2nd and 1st) in the new line on the right and II Corps had one (3rd) on the left. 4th Division had moved into corps reserve and was lying north of Brussels.

On May 11 the Germans had succeeded in gaining a footing on the left bank of the Albert Canal and at once rushed an armoured column through the gap. The Belgians were obliged to vacate the Albert Canal position and to withdraw to the line Namur–Antwerp.

On this day 5th Division began to move from the Amiens area to that of Grammont on the Dendre. On the 12th the Germans pierced the front of French Ninth Army north of Sedan at Monthermé and Houx. On the 14th they bridged the Meuse and smashed through French Ninth Army front. Considerable pressure was being exerted on French First Army front and Wavre was in flames. In the Louvain sector congestion and confusion mounted as Belgian civilians and troops thronged the roads to the rear. The final phase of Plan D was completed. 42nd and 44th Divisions of III Corps (H.Q. at Béthune) moved into the Escaut line between Bléharies and Gavere, 42nd on the right, 44th on the left. During the night of May 13–14, 48th Division (in I Corps reserve) arrived in the Brussels area.

On May 15 the Dutch capitulated under the threat of the complete destruction of Rotterdam and Utrecht. The speedy disintegration of French Ninth Army continued. 2nd and 3rd Divisions were attacked but held their ground. On the 16th, 50th Division (in II Corps reserve) moved up from the Loos area to the Dendre, east of Oudenaarde. 5th Division was moving up from the line of the Dendre to that of the Senne canals.

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Owing to the events taking place on French Ninth Army front a withdrawal of I and II Corps in stages to the line of the Escaut was ordered. The new line, Bléharies (just north of Maulde)–Oudenaarde, was to be held by six divisions, two from each corps, with three in reserve. The right flank of the B.E.F. was becoming exposed as French First Army was thrust back. To safeguard this flank 12th, 23rd and 46th Divisions were ordered to move up to the forward zone. Advanced G.H.Q. moved to Hazebrouck.

MEDICAL COVER, MAY 10–16

Though during this period there was much movement on the part of the field ambulances, they were not called upon to undertake any task out of the ordinary. Their activities therefore call for no special comment.

The medical arrangements in connexion with the advance had worked smoothly. 8 Fd. Amb. (3rd Division) went forward on the 10th to establish its A.D.S. at Leeuwergem. As the divisions moved forward their field ambulances opened dressing stations at sites selected by corps. Thus in association with the more northerly routes 150 Fd. Amb. (50th Division) opened at Berchem, just across the river Escaut, at Ename, just north of Oudenaarde, and at Ressegem, south-west of Alost. 1 Fd. Amb. (1st Division) established its M.D.S. at Froyennes, west of the Escaut, 2 Fd. Amb. at Auderghem and 3 Fd. Amb. at Denderwindeke, in front of Grammont. Further forward 12 Fd. Amb. (4th Division) had its M.D.S. at Maxenzeel and its A.D.S. at Meysse, both to the north-west of Brussels and between Alost and Vilvorde. To serve the more southerly routes of advance, 6 Fd. Amb. (2nd Division) had established its M.D.S. at Bruyelle on the river Escaut, north of Maulde, and A.D.Ss. at Leuze and Ath on the Tournai–Brussels road. Further along the Tournai road leading to the front 5 Fd. Amb. had opened a M.D.S. at Enghien with A.D.Ss. at Hal and at Groenendael, the latter being in the centre of the Forêt de Soignies to the south-east of Brussels. Still further forward 4 Fd. Amb. had opened an M.D.S. at La Hulpe, south-east of the Forêt de Soignies and north-west of Wavre. Thus there were dressing stations serving the whole length of the advance. 7 and 8 Fd. Ambs. (3rd Division) were in Saventhem unopened, while 9 had its M.D.S. in Saventhem and A.D.Ss. at Winxele and Berthem. 14 Fd. Amb. (II Corps) moved forward to Assche.

Surgical teams from the general hospitals reached the forward C.C.Ss. 8 C.C.S. received one such team and additional Q.A.I.M.N.S. personnel and nursing orderlies from 7 B.G.H.

The 'duration of stay' in the general hospitals was rapidly and successively reduced from the original twenty-eight days to fourteen, seven, three and, finally, one.

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On May 12, the advance of the division being completed, 6 Fd. Amb. from Bruyelle leap-frogged over 5 and 4 Fd. Ambs., opened its M.D.S. at Malaise, north-east of La Hulpe on the road to Otteryssche, and assumed responsibility for clearing the left sector of the divisional front.

During the actual advance the system of evacuation was, on the right of the sector, by field ambulance to the M.D.S. at Bruyelle, thence by M.A.C. to 8 C.C.S. at Rouvroy (8 F.T.U. attached thereto acting as the advanced blood bank) and therefrom by ambulance train from the medical railhead at Drocourt back to the general hospitals at the base. On the left evacuation was by field ambulance cars to the A.D.S. at Leeuwergem and thence by M.A.C. to 10 C.C.S. at Lille and therefrom by M.A.C. to R.H. at Beuvry and ambulance train to the base.

On May 14, 1 C.C.S. from Bois-Bernard, together with 6 F.T.U., 1 Adv. Depot Med. Stores and R.H., opened at Ninove, on the Renaix–Brussels road, and 6 C.C.S., with 7 F.T.U. from Sailly, at Haaltert, on the railway south-west of Alost. This choice of areas for ambulance railhead and for C.C.Ss. had been made by D.M.S. in consultation with 'Q' and 'A' staffs during the elaboration of the 'D' Plan. There was, of course, no preliminary reconnaissance of the areas; they were chosen from the map because of their tactical suitability. Both served their respective corps satisfactorily for the short time they were in use. Both found accommodation in schools. 10 C.C.S. with 4 F.T.U. at St. André (Lille) and 12 C.C.S. at Annezin, near Béthune, were serving the front, while 11 C.C.S. at Annezin remained closed and on wheels. 159 Fd. Amb. (III Corps) had its M.D.S. at Fouquereuil, near Béthune, where 4 Adv. Depot Med. Stores with sixty tons of stores and equipment was available. 7 M.A.C. with 75 ambulance cars lay at Fouquières, near Béthune. The system of evacuation was now by field ambulance car to the C.C.Ss. at Ninove and Haaltert and thence by ambulance train or M.A.C. back to the C.C.Ss. at St. André or Annezin.

D.D.M.S., G.H.Q., went to Renaix and saw the Belgian Mission, explained the medical layout in the British area and arranged for Belgian military casualties to be taken to 1 and 6 C.C.Ss. The Belgian Mission undertook to arrange prompt evacuation from these and it was made clear that, if they could not, then these casualties would go with the British to Dieppe or Boulogne.

When on May 15, 2nd Division was attacked, 4 Fd. Amb. moved back to Ferme Rouge, just north of La Hulpe, and opened its M.D.S. at Espinette in the Forêt de Soignies. 5 Fd. Amb. withdrew its A.D.S. from Groenendael to join its parent unit at Enghien. 6 Fd. Amb's. M.D.S. withdrew from Malaise to Boitsfort, a south-eastern suburb of Brussels, and its A.D.S. to Hoeilaart.

When the decision to withdraw to the line of the Escaut was reached, 1 and 6 C.C.Ss. at Ninove and Haaltert closed and began to entrain.

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1 C.C.S. entrained as much of its equipment as possible and its personnel on 7 Amb. Train, leaving its light section behind. Most of 1 Adv. Depot Med. Stores was also on this train. O.C. 1 C.C.S. telephoned Medical G.H.Q. from Hazebrouck reporting this and an attempt was made to get the train stopped *en route* to Boulogne to enable 1 C.C.S. and 1 Adv. Depot Med. Stores to detrain, but this could not be done and so these two units went right back to Boulogne. D.D.M.S. III Corps set up a series of ambulance car posts on all the roads leading from the Dendre line toward 10 and 12 C.C.Ss. at St. André and Annezin to direct and to control the ambulance traffic. Two M.A.Cs. were allotted to A.D.M.S., 2 L. of C. S.A., one M.A.C. to each corps and one to G.H.Q. Reserve. 2 C.C.S. moved from Beaumont to Lens.

Reverberations of the early events in the forward zone were felt along the L. of C. and at the base. In Cherbourg Sub-area, for example, when on the 10th all leave was stopped, the place almost at once became congested and overcrowded by those who had been proceeding on leave and by those returning therefrom. Their numbers rapidly rose to some 7,000 and it became an urgent necessity to improvise camps for their accommodation. Then reinforcements from the United Kingdom began to pour into the port. Four bivouac camps were hastily prepared and soon provided the sanitary services with a variety of problems. A.D.M.S., S.A., made the fullest possible use of returning ships, even of transport-carrying craft, to get his hospital population away.

7 B.G.H. was accommodated in a French naval hospital which stood next to an arsenal. Air raids soon made it clear that this was no place for the retention and treatment of the sick and wounded. A.D.M.S., S.A., recognising this, recommended that the hospital should assume the rôle of a C.C.S. and reduce its staff and equipment accordingly. This suggestion was not accepted at this time, but later A.D.M.S. was instructed to reduce the unit to the dimensions of an A.D.S. By intelligent anticipation of the sanction ultimately given he had been able to save about 75 per cent. of the unit's medical equipment and about 50 per cent. of its ordnance equipment, excluding tentage.

There was a similar invasion of the Le Mans Sub-area by troops in leave trains. A census of R.A.M.C. personnel was taken and officers and other ranks were either posted by A.D.M.S. so as to make the best use of their services or else were despatched to the R.A.M.C. Base Depot.

THE WITHDRAWAL TO THE LINE OF THE ESCAUT

From May 16 onwards the troops in the Dyle line began to thin out as the withdrawal to the line of the Dendre and thence to that of the

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Escaut proceeded. 23rd Division was in process of occupying the fifteen miles along the Canal du Nord between Ruyaulcourt (ten miles north of Péronne) and Arleux (six miles south of Douai) with its H.Q. at Bapaume. 'Macforce' (built round 127th Bde. of 42nd Division), with its H.Q. at Seclin, was filling the gap between the left flank of 23rd Division at Arleux and the right flank of the main body of the B.E.F. at Bleharies and covering the crossings over the river Scarpe between Raches (north-west of Douai) and St. Amand. 'Petreforce' (under G.O.C. 12th Division and built around 1st Welsh Guards (the nucleus of the improvised garrison of Arras), 23rd Division and 36th Bde. of 12th Division) was proceeding to the right bank of the Somme between Ballancourt and Epagne, there to guard the bridges and block the roads and so cover Arras. 36th Inf. Bde. was ordered to proceed to Doullens, there to serve as its garrison, while 37th Inf. Bde. (12th Division) was instructed to move to the south bank of the Somme about Le Transloy and Duncq. While entrained it was attacked from the air at Amiens and suffered heavily. All troops in 'X' L. of C. Sub-area south of the line Orchies–Lens–Frévent were ordered to move north of this line.

On the 18th the B.E.F. was in position on the line of the river Dendre from Ath to just east of Alost and was in the process of withdrawing therefrom to the Escaut. Commander, North District (Brest), formed a mobile reserve, 'Beauforce', round 2/6th Surreys of 12th Division and 4th Buffs and also 'Vicforce' round battalions built out of reinforcement details. These improvised formations were woefully short of arms and equipment. At Dieppe there were several very severe air attacks and the port was closed by magnetic mines dropped from aircraft.

On the following day the withdrawal to the line of the Escaut was completed and the B.E.F. main body was in position from Maulde to Oudenaarde with the Belgian Army on its left and the French First on its right. The Germans were now threatening Amiens. All troops not required by formations for fighting purposes were in process of being moved to Boulogne, Calais and Dunkirk. 'X' L. of C. moved north-westwards from Avesnes to Béthune. On the southern flank, 35th Bde. (12th Division) was in Abbeville, 36th Bde. was still in Doullens enduring violent pressure and 23rd Division was pulled back to occupy the line Saulty–Arras–River Scarpe–Biaches–St.-Vaast. Its 70th Bde. encountered German armour and endured severe losses. 50th Division was ordered to take up a position on the line of the canal between Douai and La Bassée on the right of 'Macforce' and all troops in 'X' L. of C. Sub-area were moved to a position along the La Bassée canal.

On May 20 Amiens, Albert and Abbeville were captured by the Germans. Doullens was encircled and its garrison forced to surrender

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12th and 23rd Divisions as divisions, had now practically ceased to exist. Arras was under heavy attack from the direction of Cambrai. The threat to the continued existence of the B.E.F. had now become very real, for its main body was virtually cut off from its base.

'Frankforce', built up of 5th and 50th Divisions, 1st Army Tk. Bde., 12th Lancers and 'Petreforce', was assigned the task of securing the bridgeheads south of the rivers Scarpe and Sensee. 'Beauforce' moved from Le Transloy to Eu, inland from Le Tréport, and H.Q. and details of 37th Inf. Bde. from the Amiens area reached Arques–la–Bataille.

On the 21st 'Frankforce' attacked in association with French 1st Light Mechanised Division. Initially the attack went well and the line of the Scarpe and the Cojeul was secured. But the opposition encountered quickly stiffened and ultimately it became necessary to break off the action. 'Frankforce' withdrew to the Seclin area.

'Polforce', built around units of 46th Division, was holding the line between Carvin and Aire. 'Macforce' was between Carvin and Millenfosse. 'Woodforce' was in Hazebrouck.

The line of the Escaut was held, from right to left, by 48th, 2nd, 42nd, 1st, 3rd, 4th and 44th Divisions. Rear G.H.Q., which had moved back to Boulogne on the 19th, now moved to Dover.

By the 22nd the severance between the main body of the B.E.F. and its base was complete. The divisions in the Escaut line were withdrawn to the original frontier line between Boughelles and Halluin. It became imperative to organise immediately a continuous defensive line from the Escaut to the sea, from Millenfosse south-west of St. Amand to Gravelines. The ports of Boulogne and Calais were now threatened and Dunkirk alone was available.

On the following day it became necessary to put the B.E.F. on half rations. 'Usherforce' was created out of details in 'X' L. of C. Sub-area around 6th Green Howards.

On May 24 the garrison of Arras was withdrawn. The B.E.F. was now within a shrinking quadrilateral, one side of which was the coast line and the opposite side the line between Biaches–St.-Vaast and Cysoing, held by French First Army. On the north-east side between the sea and Halluin were the remains of the Belgian Army and on the south side between the sea and Furnes French troops were gathering. On the right of the Belgians, mainly in the frontier defensive line, were from right to left 42nd, 1st, 3rd and 4th Divisions. From this line 44th and 2nd Divisions were moving across the quadrilateral to the southern flank, as was also 48th Division from south of Lille. In reserve were 'Frankforce' in and around Lille and elements of 23rd Division round Seclin. 'Usherforce' together with a number of French units was on the line of the Aa Canal from Gravelines to St. Momelin. 'Macforce' was in the area of Cassel: 'Woodforce' was in Hazebrouck; 'Polforce'

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was holding the section from west of Hazebrouck through the Forêt de Nieppe to Béthune and thence through La Bassée to Raches.

On May 25 enemy pressure upon the Belgian front had increased to such proportions that 5th and 50th Divisions, which were preparing to take part, with French First Army, in an attempt to close the gap in the south through which the German armour had advanced to the sea, were ordered to move into the widening gap between the B.E.F. and the Belgians in the region of Ypres. In order to strengthen the southern flank of the main body of the B.E.F. 'Rustyforce' was created, to incorporate 2nd, 23rd, 44th, 46th and 48th Divisions, the last less one brigade. At the north end of the southern flank 48th Division was now in command of all troops in this area, including 'Usherforce'. The formations on the southern flank now (from right to left) were 48th Division on the left of French troops to the south-west of Dunkirk; 'Macforce' in and around Cassel; 'Woodforce' in and in front of Hazebrouck amid 132nd and 133rd Bdes. of 44th Division and 137th Bde. of 46th Division; 2nd Division and 46th Division; 23rd Division was still in G.H.Q. Reserve south of Lille.

MEDICAL COVER, MAY 17–25

This period witnessed the disruption of the evacuation system. The field ambulances continued to serve their formations faithfully throughout. But evacuation beyond the field ambulance was attended by increasing difficulty as the days passed and the German assault grew in intensity. The forward C.C.Ss. were on the move and the control of their movement was wrenched from the hands of the medical staffs of the higher formations by the circumstances that were associated with the rapidly worsening military situation. Time came when no general hospital remained accessible to the main body of the B.E.F. Evacuation had to be direct to Dunkirk, where medical resources were limited and whence all quiet had fled. The journey to and embarkation from Dunkirk became increasingly hazardous, for the penalty of movement was aerial bombardment.

The records of the medical units during these hectic days are inevitably very incomplete. It follows therefore that any account of their affairs must remain most imperfect and must fail to do justice to those who, enduring much, continued, in most unfavourable circumstances, to discharge their functions with a truly remarkable degree of efficiency.

During the course of the movement of 37th Bde. to the south of Arras the train carrying 'A' Coy. 182 Fd. Amb. was bombed and wrecked at Amiens, but H.Q. 182 Fd. Amb. (12th Division) reached Ailly-sur-Noye *en route* for Doullens with 36th Inf. Bde. 127 Fd. Amb. with 127th Inf. Bde. of 42nd Division was absorbed into 'Macforce'. From this date

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onwards the movements of the field ambulances were numerous and involved as they conformed with those of the formations to which the units were attached. To record them in detail would serve no useful purpose. They are indicated in Figs. 4A-D, in which the number of the unit precedes the day of May. Thus 150. XVIII = the location of 150 Fd. Amb. on May 18.

About this time the D.M.S. decided to pull back the C.C.Ss. from the forward zone and to group them in (a) the Poperinghe and (b) the Calais area and to evacuate from Calais by hospital carrier to the United Kingdom. The concentration of C.C.Ss. in the former area was begun, but the plan for the grouping of C.C.Ss. in the Calais area was quickly made impossible, for the line of the Escaut was soon to be relinquished and the final withdrawal toward the coast begun. 5 C.C.S. (with 2 F.T.U.) moved from Beauvoir Rivière to Frévent and 4 (with 3 F.T.U.) from Epernay to Villeneuve-sur-Yonne. Medical G.H.Q. was ordered to move to Boulogne. 11 C.C.S. left Annezin on orders of G.H.Q. for Avelin, eight miles south of Lille. D.D.M.S. III Corps discovered it and caused it to be moved to Woumen, south of Dixmude. 159 Fd. Amb. (III Corps) was moved by D.D.M.S. Corps to Bondues, there to open in the convent.

3 Amb. Train was in Haaltert, and since 6 C.C.S. was closing, took aboard casualties straight from the field ambulances. 225 casualties were collected, and at 0400 hours on the 16th/17th the train slowly proceeded westward. On several occasions it was obliged to halt for the reason that the stations through which it was next to pass were being bombed. It ultimately arrived at Dieppe about 0100 hours on the 18th, three of the patients having died *en route*.

On the 17th, 8 Amb. Train was at Pont-à-Marcq, on the railway halfway between Seclin and Orchies. M.A.C. convoys brought thereto some 160 wounded, including French and Belgian, both military and civilian, who had been machine-gunned on the road. Being without orders, the commanding officer went into Seclin to contact Movement Control. Eventually orders were received for the train to proceed to Camiers. It proceeded at 0200 hours on the morning of the 18th. At Wavrans the train was deliberately bombed by a plane which had followed it from St. Pol. No casualties were sustained. The light section of 6 C.C.S. and 7 F.T.U. at Haaltert proceeded by road to St. André, Lille. In spite of the very short notice received the whole of the heavy equipment, nearly a hundred tons in bulk, was packed, loaded on to lorries, unloaded at the railway station in the absence of a train and then loaded on to a train. 6 C.C.S. arrived at Lille without loss of any stores or a single vehicle. It was on May 17 that for the first time casualties in substantial numbers were being admitted to the base hospitals in 1 M.B.S.A. Some 450 arrived.

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By the 18th the general hospitals in 1 M.B.S.A. were practically cut off from the forward zone. This meant that D.M.S., with Rear G.H.Q. now at Boulogne, could no longer exercise control over units of the medical services in the forward zone. It is to be noted that according to Plan D, D.M.S. with a certain skeleton staff was to go forward with the Adjutant-General and join up with the Q.M.G. and his staff to form a rear G.H.Q. The Q.M.G.'s staff went forward; the A.G.'s did not, and so got cut off in Boulogne and was out of the battle. The result was lack of 'A' Staff control, including medical control, from the very beginning of the final phase. It therefore came about that D.Ds.M.S. corps and A.Ds.M.S. divisions and areas, no longer receiving orders from rear G.H.Q., were called upon to exercise executive powers normally beyond their responsibility. In the absence of integrative control on the part of centralised authority it was inevitable that subordinate administrative medical officers, knowing the situation only as it existed in their own particular neighbourhood, should occasionally issue orders which led to confusion. Medical units and personnel were sometimes moved to locations unknown to the headquarters of the formations to which they belonged. In certain cases, equipment being unnecessarily jettisoned, units were despatched to the coast for embarkation.

FIGS. 4A-D. The Locations of the Field Ambulances during the Withdrawal to the Coast.

FIG. 4A.

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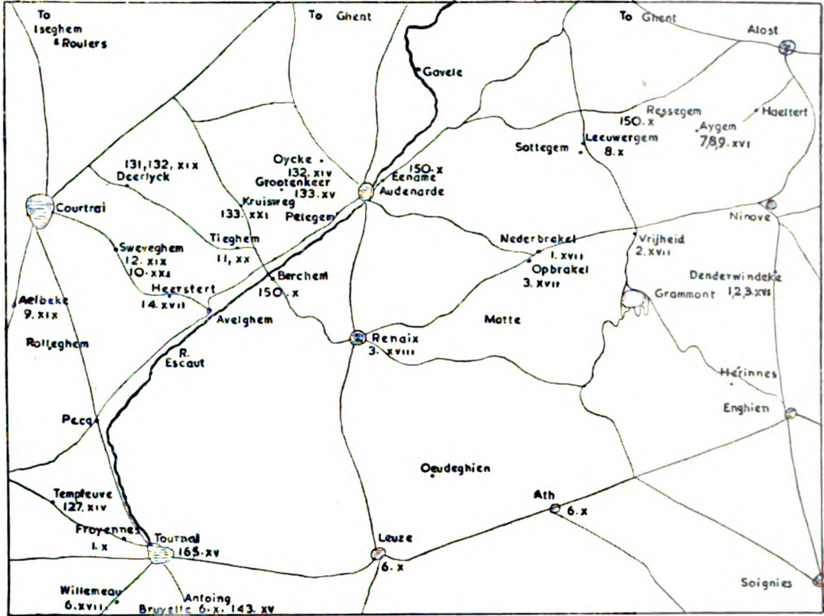

FIG. 4B.

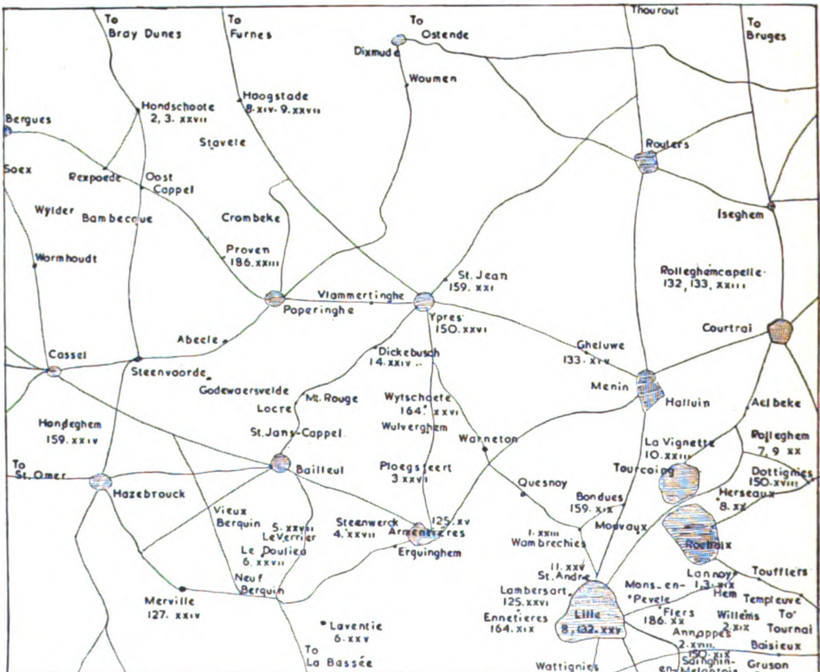

FIG. 4C.

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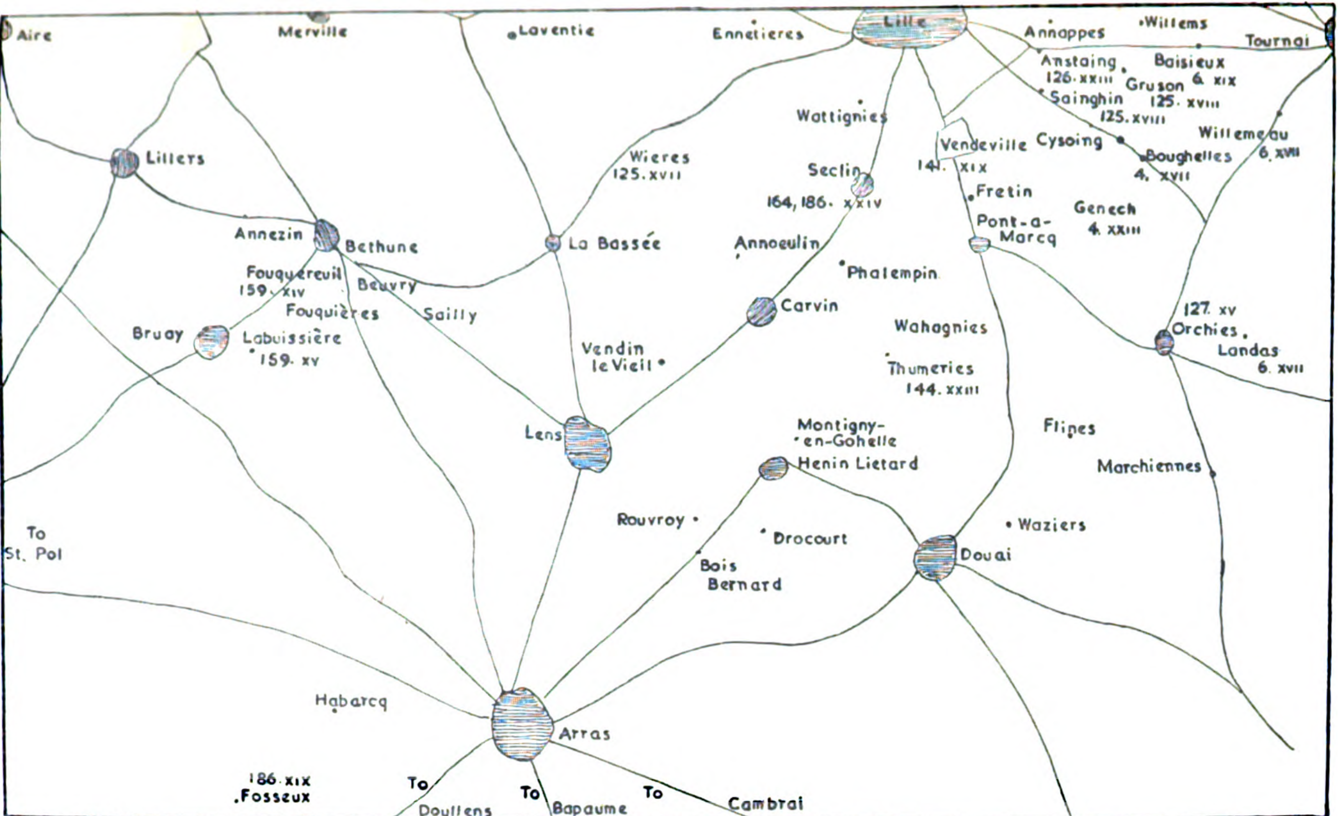

FIG. 4D.

Casualties about this time were relatively light and the evacuation of wounded, though inclined to be spasmodic, still continued. The greatest difficulties were occurring at Dunkirk, where the bombing and shelling of the quays and the non-arrival or early departure of hospital carriers resulted in wounded lying on the quayside in very distressful conditions. D.D.M.S., G.H.Q., hunted out the C.C.Ss. and gave them orders to move to the rear in the Bailleul–Poperinghe–Steenvoorde–Wormhoudt–Crombeke area. He found them at the following places:

1 C.C.S.: less light section, at Boulogne (closed);
light section at Pont-à-Marcq (closed).

2 C.C.S.: less light section, moving to Lillers (closed) under II Corps;
light section at Grandmetz.

3 C.C.S.: at Frévent (now in a French area); nursing staff moving to Le Tréport.

4 C.C.S.: at Villeneuve-sur-Yonne.

5 C.C.S.: moving to Lillers (closed) under II Corps.

6 C.C.S.: less light section, entrained at Lille (under II Corps);
light section at Haaltert but about to leave for Lille.

8 C.C.S.: at Givenchy (closed) (under 'X' L. of C.).

9 C.C.S.: at Beuvry, under 'X' L. of C.

10 C.C.S. : at St. André, Lille, under III Corps.

11 C.C.S.: at Béthune (closed).

12 C.C.S.: at Annezin, under III Corps.

13 C.C.S.: moving to Lillers (closed).

1 Adv. Depot Med. Stores: less light section at Boulogne;
light section at Pont-à-Marcq.

2 Adv. Depot Med. Stores: moving to Lillers.

3 Adv. Depot Med. Stores: at Sailly-Labourse, under II Corps.

4 Adv. Depot Med. Stores: at Annezin, under III Corps.

1 M.A.C.: with I Corps.

2 M.A.C.: with II Corps.

3 M.A.C.: less light section, at Bois-Bernard;
light section with A.A.S.F.

4 M.A.C.: at Lucheux, moving to Frévent.

5 M.A.C.: with I Corps.

6 M.A.C.: with II Corps.

7 M.A.C.: with III Corps.

8 M.A.C.: moving to west of Béthune.

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Commandant I Corps Area ordered 8 C.C.S. to move immediately to Givenchy. A.D.M.S. 'X' L. of C., Beuvry, detailed a section of 3 M.A.C. and a detachment of 4 M.A.C. to assist in this move. O.C. 8 C.C.S. decided to get his Q.A.I.M.N.S. personnel back to the base and so sent them to 9 C.C.S. at Beuvry *en route*. Casualties brought to this C.C.S. after it had closed were sent on to 3 C.C.S. at Frévent.

During the progress of these and subsequent events the control of medical units became a matter of extreme anxiety to the medical services. The lack of mobility and the great weight of equipment of a C.C.S. made the handling of this medical unit in a war of rapid movement exceedingly difficult, and this difficulty was enormously aggravated by the progressive breakdown of the ambulance train programme.* Moreover, the siting of the C.C.S. was also to become a matter of extreme difficulty. If a large village or a small town were selected it was sure to become, sooner or later, a target for air attack. A small village, on the other hand, could not provide the essential requirements of convenient buildings and a good water supply. D.D.M.S. III Corps encountered 3 M.A.C. on the road between Hazebrouck and Bailleul and advised its commanding officer to make for Steenvoorde, which he did.

7 and 9 Fd. Ambs. were moving back beyond the line of the Escaut, there to find suitable sites. These field ambulances of 3rd Division had dealt with some 80 casualties during the day. Evacuation therefrom was made exceedingly difficult as the roads had become so congested with military traffic.

On the 19th the A.A.S.F. moved from Rheims to the west and with it moved 4 C.C.S. from Epernay and the detachment of 6 C.C.S. from Metz.

D.D.M.S. III Corps discovered a loaded ambulance train and also 6 C.C.S. (II Corps) lying at St. André without instructions. He ordered the C.C.S. to make for Bailleul and to open there immediately in the mental hospital. This was done in spite of the presence therein of some 1,800 female psychotics. With the aid of the ambulance train D.D.M.S. III Corps evacuated some 300 cases from 10 C.C.S., still functioning at St. André, where a neuro-surgical team from the base had just arrived to find some 60 cases awaiting its attention. Casualties in considerable numbers were now, for the first time, being received by

* This is by no means the last occasion when reference is made to this difficulty. In every theatre in every subsequent campaign the tendency to accumulate equipment, apparatus and medical comforts is to be witnessed. It is understandable that medical and surgical staffs and welfare officers of a C.C.S. should add to the available facilities when static conditions prevail and things are quiet. But commanding officers and senior administrative medical officers must always bear in mind that the C.C.S. is essentially a mobile unit. In it there must always be a compromise between medical comfort and tactical mobility. The first function of a C.C.S. is to provide minimum hospital facilities with maximum mobility.

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12 C.C.S. at Annezin. Three operating theatres dealt with some 100 major operations. The twenty-five A.M.P.C. personnel attached to the unit were engaged in stretcher bearing. A.D.M.S. 'X' L. of C. instructed 8 C.C.S. to move from Givenchy to Merville.

On the 20th all but 50 of the Q.A.I.M.N.S. personnel of the six hospitals in Boulogne Subarea sailed for the U.K.

8 C.C.S. in La Grande Seminaire at Merville admitted over 70 casualties during the twenty-four hours. 9 C.C.S. with 5 F.T.U. moved from Beuvry to Renescure. 12 C.C.S. in Béthune received some 350 wounded and evacuation soon became an acute problem. Ambulance cars of a section of 1 M.A.C. were augmented by a considerable number of ambulance cars from various sources which, being lost and without orders, attached themselves to the C.C.S. Communications with D.D.M.S. III Corps had become uncertain. Moreover, orders were now being received from Adv. G.H.Q. direct. 159 Fd. Amb. (III Corps) at Bondues was instructed by D.D.M.S. Corps to act as an improvised C.C.S. and be prepared to receive 200 cases. Two surgical teams and a party of Q.A.I.M.N.S. personnel were sent from 11 C.C.S. at Béthune to this field ambulance in order to enable it to assume its unusual rôle. The Consulting Surgeon and the Consulting Pathologist from 1 M.B.S.A. brought to D.D.M.S. III Corps at Béthune stocks of A.T.S., blood and dressings.

On the night of the 19th, during an air raid on Dieppe, two hospital ships were sunk and the Casino, which accommodated the surgical cases of 1 B.G.H., was so badly shaken that it was condemned as unsafe. On the 20th its patients were transferred to 2, 3 and 10 B.G.Hs., and 110 Q.A.I.M.N.S. personnel were moved from the hospitals in Dieppe to Offranville.

By the 21st the situation was so fluid that the control of medical units from Rear G.H.Q. in Dover became impossible. The threatened complete severance of the main body of the B.E.F. from general hospitals in the Boulogne–Etaples area meant that the evacuation of casualties behind the C.C.Ss. had now become an improvisation and that the C.C.S. was, to some extent, assuming the functions of a general hospital. Evacuation was now from C.C.S. direct to hospital carrier at Dunkirk, but the system of evacuation was exceedingly irregular.

In the twenty-four hours ending 0900 hours May 21, 12 Fd. Amb. in Sweveghem treated and evacuated some 300 cases. Evacuation was by 2 M.A.C. to 10 C.C.S. at St. André, Lille.

8 C.C.S. moved from Merville to Wormhoudt and opened in a large preventorium. While this move was in progress and the C.C.S. therefore closed, 8 F.T.U. detached itself temporarily and served with 3 C.C.S. at Steenvoorde which was still functioning.

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1 C.C.S. was at Camiers *en route* for Boulogne for embarkation on the 22nd. 2 C.C.S. was at Arques-la-Bataille whence it moved to Steenvoorde on the 22nd. 5 C.C.S. was at Blendecques, 9 at Renescure, 11 moving from Avelin to Steenwerck and thence to Roode Berg and 13 was back in Boulogne attached to 16 B.G.H. and was to embark with this unit for the United Kingdom on the 22nd.

1 Amb. Train, loaded with wounded, being halted near Hazebrouck by the many stationary refugee trains, was machine-gunned from the air. One patient was killed and four others wounded. The train then left for Dunkirk. 2 Amb. Train and French ambulance trains at Le Tréport were ordered to evacuate patients and staff from the general hospitals in 1 M.B.S.A. On the road toward Dieppe strict precautions had to be taken to prevent refugees, stragglers and railway officials getting on board. Dieppe was reached between 1600 and 1700 hours, just in time to participate in the first large-scale daylight bombing of the docks. 4 Amb. Train reached Dieppe on the night of May 20/21, bringing back casualties collected from Ninove. During the journey back to the coast great difficulties were encountered for the reason that the Belgian drivers refused to move and signals and points were either destroyed or deserted. The train was brought out of Belgium by three R.E. drivers without previous experience. It was subjected to aerial bombardment for most of the way and was particularly fortunate to get through Tournai, which was on fire. Having unloaded, the train was ordered back to the dock siding to evacuate 11 B.G.H. and part of 3 B.G.H. While in the siding, six coaches and two baggage vans together with a large amount of equipment were lost through aerial attack. The train had over 600 patients aboard and was loading when the attack was made in broad daylight by three or four dive-bombers. Their first salvo hit H.S. *Maid of Kent* lying alongside the train. She burst into flames and, as the wind was blowing toward the train, this was soon alight. The crew and patients all this time were being repeatedly dive-bombed. Nevertheless, with the aid of the loading party from the hospital, the crew managed to get all the patients out of the burning coaches and 118 of them were sent to 3 and 10 B.G.Hs. Some were killed and others re-wounded while lying on the ground. The remainder of the train was man-handled two hundred yards down the line and, after several French trucks had been added, ultimately got away. Further damage was endured from aerial attack at Rouen. However, the patients were ultimately taken to 8 B.G.H. at Rennes and 4 B.G.H. at La Baule. From La Baule the train went to Rennes for emergency repairs and for the addition of French ambulance coaches to replace its missing portion. 5 Amb. Train moved into St. Omer hauling twenty-two trucks with the equipment of 5 C.C.S. together with its personnel. At dawn the train ultimately pulled into Hazebrouck where 5 C.C.S.

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with its equipment was left. The ambulance train itself then went on to Bailleul and the C.C.S. eventually reached Steenvoorde.

Instructions were issued by D.D.M.S., L. of C., for general hospitals in 1 M.B.S.A. to despatch all medical officers, Q.A.I.M.N.S. personnel and R.A.M.C. O.Rs. that could be spared, leaving enough behind to look after any remaining patients, *via* Le Mans into Rennes, Nantes, Brest and Cherbourg Sub-areas; 91 officers, 367 Q.A.I.M.N.S. personnel and 929 O.Rs., R.A.M.C., were sent away in spare motor ambulances and by train, taking with them as much medical equipment as could be carried. The base commandant decided to send away as many vehicles and as much valuable equipment as could be spared. Forty ambulance cars were therefore allotted to each of 1, 2 and 3 B.G.Hs. and two hundred to each of 5, 6 and 10. As related above, two ambulance trains at Le Tréport were loaded with patients from 5 and 6 B.G.Hs. Two others at Dieppe were loaded from 1, 2, 3 and 10 B.G.Hs. and from the Indian wing of 10.

In Boulogne Sub-area (2 M.B.S.A.) all movable patients in the general hospitals and the personnel of 14, 16, 17 (less a detachment), 18 and 20 B.G.Hs., leaving all stores and equipment behind and destroying all records, proceeded to Boulogne for embarkation. 21 B.G.H. in Boulogne and the detachment of 17 in Camiers, together with A.D.M.S. Sub-area and his D.A.D.H., remained behind. The Germans overran the sites of the medical installations on the 24th and were in complete possession of the whole sub-area on the following day. On the 29th they caused 21 B.G.H. to move to Camiers, there to merge with the detachment of 17 B.G.H.

D.D.M.S., G.H.Q., had been informed that evacuation was to be through Calais and that hospital ships would be sent there daily. On May 22 a reconnaissance of Calais and a message from the garrison commander showed that it was about to be encircled. D.D.M.S. therefore asked War Office to switch hospital ships to Dunkirk and this was done. He organised a road convoy from rear C.C.Ss. 6 and 8 to Dunkirk and arranged for two hospital ships to arrive at Dunkirk daily.

D.D.M.S. III Corps caused 12 C.C.S. to be moved by medical unit transport from Béthune to Proven, four miles north of Poperinghe. 10 C.C.S. was moved in similar fashion from St. André, Lille, to Crombeke and Stavele, two small villages near Proven. 4 Adv. Depot Med. Stores was moved in lorries provided by D.D.S. & T. III Corps from Béthune to Bailleul. 9 C.C.S. moved from Renescure to Mont Rouge. 2, 3 and 5 C.C.Ss. were at Steenvoorde. In Dieppe sixteen nurses of 10 B.G.H., the remaining O.Rs. R.A.M.C. of this general hospital and the Indian personnel of its Indian wing entrained for Rouen. Some 119 patients were loaded on to a French ambulance train and in this fashion all the hospitals in 1 M.B.S.A. were cleared.

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This emptying of Dieppe meant that A.Ds.M.S. of other sub-areas were called upon to find accommodation for, and if possible to make use of, large numbers of medical personnel and large quantities of equipment and stores. In the Nantes Sub-area, for example, 4 B.G.H. at La Baule was in the process of expanding to some 2,900 beds when a multitude of Q.A.I.M.N.S. and R.A.M.C. personnel presented itself from 1, 2, 5, 6, 10, 11 and 13 B.G.Hs. The officers' mess had to expand from 35 to over 200; hotels had to be requisitioned for sisters' quarters and a tented camp constructed to hold the other ranks. Then the consulting staff arrived and had to be accommodated within the hospital. As the numbers grew it became necessary to find billets for both officers and O.Rs. at Guérande, five miles away. Sites for 1 B.G.H. and 1 Con. Depot were selected at Pornichet, for 5 B.G.H. at Guérande, for 6 B.G.H. at Batz and for 2 Con. Depot on the golf links at Le Pouliguen. Thus the paradoxical situation arose in which base was evacuating into L. of C.

As communications became increasingly difficult A.D.M.S. Sub-area lost touch with the detachment of 9 B.G.H. at Château Buisson de Mai and quite unknown to him this rapidly became transformed into a modified C.C.S. and later into an A.D.S.

On the 23rd D.D.M.S. III Corps established an improvised medical R.H. post at Steenwerck, near Bailleul. The station buildings were transformed into wards and a company of the corps field ambulance (159) was placed in charge. The available C.C.Ss. now being full, M.A.C. cars were directed to this post. The only policy that could now be adopted was to get the wounded back to Dunkirk as quickly as possible. There was far too much movement to permit adequate surgery to be provided by the C.C.Ss. in the forward zone. Three ambulance trains, including an improvised one, with 1,000 wounded were got away. The journey back to Dunkirk, only some forty miles, took three days in the case of the improvised train. 7 M.A.C. was moved to Vlamertinge, west of Ypres, and a surgical team sent from 10 C.C.S. to 159 Fd. Amb. at St. Jean, near Ypres. 6 C.C.S., having been reinforced by the light sections of 1 and 2 C.C.Ss., had dealt with 1,000 cases in its first twenty-four hours at Bailleul.

10 Fd. Amb. was opened in La Vignette. At 0200 hours three medical officers with ambulance cars were sent out to patrol the three roads along which 4th Division was moving back from the Escaut line to the frontier defences. These picked up many fatigued and footsore men. By 0400 hours casualties were reaching the M.D.S. at La Vignette in considerable numbers, among them many seriously wounded. To deal with these a surgical team from 10 C.C.S. was attached to the

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field ambulance and during the day 59 cases were evacuated to 6 C.C.S. at Bailleul.

4 Amb. Train, after being repaired at Rennes, made several journeys between this place and R.H., which to begin with was at Burg le Roi and later at Le Mans. 5 Amb. Train, loading late on the 22nd at Bailleul, left for Dunkirk, there to be greeted by an air raid. The coaches were splintered and the glass broken but no one was hit. The effect of all this on the patients, however, was most painful. Severely wounded men attempted to crawl to shelter; several died and all were much the worse for their experience. It was not until late evening that a hospital carrier docked, and even then embarkation was interrupted by another air raid and the train had to be pulled away from the blazing dock into a siding. Later the evacuation was completed by carrying the remaining cases half a mile to the hospital carrier. The hospital carriers *Isle of Thanet* and *Worthing* arrived off Dunkirk in the early evening when an air raid was in progress. Under a curtain of A.A. fire they took aboard full loads of wounded and pulled out from the quay at 2300 hours. (*See* Plate IV.)

At 0200 hours on the 24th orders (later found to be intended for 6 M.A.C.) were delivered by the staff officer to the Officer Commanding 6 C.C.S. to proceed from Bailleul to Messines at 0400 hours. Since this could but mean that the enemy was drawing very near, volunteers from officers and O.Rs. were called for to remain behind with such patients as could not be moved. These being forthcoming, the remainder of the personnel, together with the equipment of the C.C.S., moved off at 0400 hours. The commanding officer and two other officers who remained behind evacuated 700 patients in a composite passenger and cattle truck train which reached Bailleul at 0700 hours. At 1100 hours contact was made with D.Ds.M.S. II and III Corps at Neuve–Eglise. The mistake in code names was then discovered and orders were issued by D.D.M.S. III Corps for the unit to return to Bailleul. In this way the work of the C.C.S. was interrupted at a most critical time for a whole twenty-four hours. The remaining patients were evacuated by 6 M.A.C. by road direct to Dunkirk during the evening while air raids were proceeding. The main operating theatre and two pavilions were wrecked, the steriliser was put out of action and the surgical treatment had to be continued in glass-strewn wards by torch and candlelight.

On this day most of the remaining stores of 4 Adv. Depot Med. Stores, still in Bailleul, were destroyed during an air raid, but 1 Adv. Depot Med. Stores, from Ninove, found its way back to Bailleul to provide a most welcome reinforcement. 7 M.A.C. was moved by D.D.M.S. III Corps to Burre on the Bailleul–Hazebrouck road. In 1 M.B.S.A. at Dieppe there were now functioning a dressing station in the Hotel Metropole staffed by personnel from 1 B.G.H., a second

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dressing station at Arques-la-Bataille staffed by personnel from 10 B.G.H. together with an improvised C.C.S. built out of the staff and equipment from 2 and 3 B.G.Hs. A second improvised C.C.S. was now formed at Offranville staffed by personnel from 2, 3 and 10 B.G.Hs., its cases being evacuated into 13 B.G.H. at Rouen.

The hospital carrier *St. Julien* was attacked in Dunkirk harbour by seventeen planes and was forced to leave without lifting any casualties. Later in the day she returned in company with the *St. Andrew* and under air cover both got away with full loads. Owing to the scarcity of the R.A.M.C. personnel in the harbour area the crew had to assist in the loading. On the return journey both carriers were shelled although they were burning the green lights and showing the red crosses obligatory under the Geneva Convention.

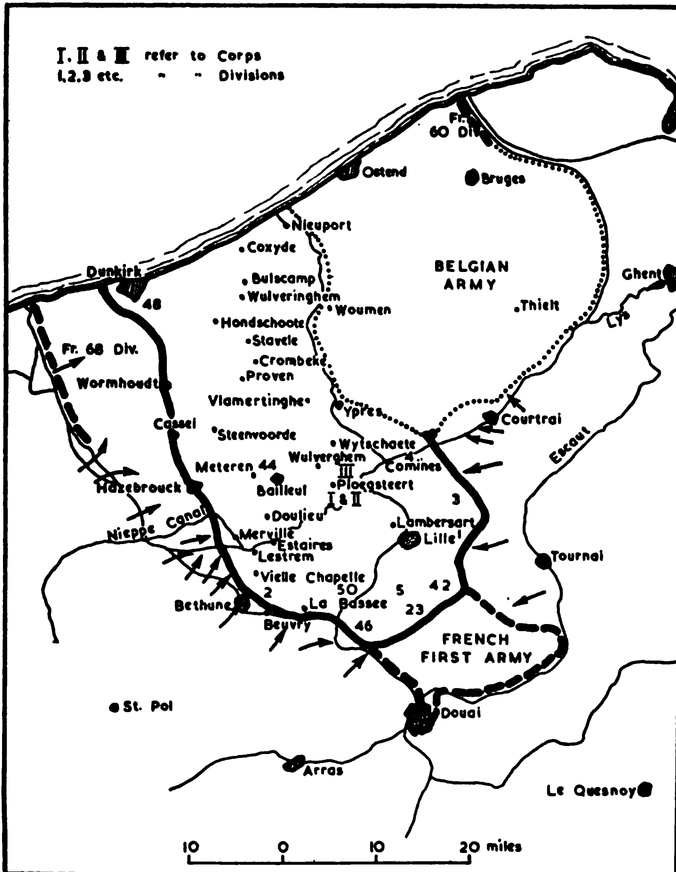

FIG. 5A. The Situation on May 25, 1940.

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On May 25 1 Fd. Amb. was at Wambrechies, 4 at Fleurbaix, 6 at Laventie, 7 at Bulscamp, 8 at Hoogstade with an A.D.S. at Neuve Eglise, 10 at Driesh, 11 at St. André, 132 at Lille, 145 at La Panne, 159 at Eecke and 164 at Petit Ennetières.

9 C.C.S. moved from Mont Rouge to Hondschoote.

Within the quadrilateral no evacuation from C.C.Ss. had occurred during the last thirty-six hours. The evacuation system had broken down and somewhere along the line there was a block. There was a chance encounter in Armentières of the D.Ds.M.S. of the three corps and it was agreed that D.D.M.S. III Corps should accept responsibility for the evacuation of casualties from all three corps. D.D.M.S. III Corps proceeded to Dunkirk to find that owing to the intense aerial bombardment and the destruction within the harbour hospital carriers were encountering very serious difficulty. With the aid of the Senior Medical Officer, Dunkirk, and the Embarkation Medical Officer, he established a medical embarkation post where casualties were congregated and whence they could be evacuated immediately a hospital carrier came in. D.D.M.S. III Corps encountered 186 Fd. Amb. of 23rd Division on the road to Dunkirk without orders. He instructed the field ambulance to move into Dunkirk, to open up in the Grande Place and be prepared to hold up to 2,000 wounded until such time as they could be evacuated. At Wormhoudt he found that 8 C.C.S. was holding some 800 cases without any prospect of evacuation. These were quickly evacuated, however, by means of empty supply lorries which were passing the hospital at this time to Dunkirk, to 10 C.C.S. at Crombeke or, if French, to a French hospital at Zuydcoote. D.D.M.S. III Corps had now collected 4, 6 and 8 M.A.Cs. at Messines.

8 C.C.S. had admitted 50 patients on the 22nd, 400 on the 23rd, 250 on the 24th and over 300 on the 25th. 'The condition of the patients on admission', the O.C. records, 'was almost without exception one of complete exhaustion. Many of them had been in the ambulances for over twenty-four hours. The majority had received adequate first-aid treatment. Fractures were satisfactorily splinted. In a few cases tourniquets had been applied with, as far as one could see, dire results. The most useful lesson we learnt from this experience was the necessity of classifying cases immediately on admission. To do this satisfactorily it is essential that one should have very large reception rooms or tents where, if necessary, as many as 100 stretchers can be accommodated on trestles. At Wormhoudt we had 48 deaths, some cases being dead on admission. During the early days all serious cases were taken into the resuscitation ward. This was found to be a mistake and special accommodation was thereafter reserved for the obviously moribund.'

During the daytime on May 25, hospital carriers were desperately trying to evacuate the casualties remaining in the base hospitals,

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together with mounting numbers of those incurred in the actual fighting and brought back to Dunkirk by the ambulances. The *St. David* arrived in the morning and lay alongside receiving wounded throughout the day while the town and the quays were subjected to continuous bombing. The *Isle of Thanet* and the *Paris* arrived in the evening and lifted 608 casualties while fires raged all round the docks throwing in high relief the white-painted carriers.

On this day D.D.M.S., G.H.Q., handed over to 'X' L. of C., having first arranged the appointment of a S.M.O., Dunkirk. The remains of Rear G.H.Q., Medical, embarked at Dunkirk by orders of the Adjutant-General to re-form at Dover.

THE WITHDRAWAL TO THE DUNKIRK PERIMETER AND THE EVACUATION THEREFORM (OPERATION 'DYNAMO')

On May 26 plans for the withdrawal of the French and British Forces to the coast were drawn up. There was a reorganisation of the main body of the B.E.F. III Corps now assumed command of 2nd, 23rd, 44th, 46th and 48th Divisions and became responsible for the defence of the southern flank, which now ran from Bergues–Wormhoudt–Cassel–Hazebrouck along the Nieppe Canal to Merville–Lestrem–Vieille Chapelle–Essars–La Bassée. The divisions of I and II Corps held the old frontier defence line from Boughelles to Comines and thence along the Comines Canal to Ypres. To the north of Menin was the right flank of the Belgian Army at Gheluwe. Between the right flank of the B.E.F. and Arras to the south was French First Army. In the line, from the right, were 42nd, 1st, 3rd, 4th and 5th Divisions. 50th Division was moving northwards to prolong the line around Ypres.

The southern flank was held, from the right, by 48th Division—Bergues to Hazebrouck; 44th Division—Haverskerque to the southern edge of the Forêt de Nieppe; 2nd Division—Hazebrouck to Béthune along the canal to La Bassée; 46th Division—on the canal line from La Bassée to Raches; 23rd Division in reserve in the area Beaucamps-Ligny, south-west of Lille.

'Adamforce' was constituted for the control of troops in the Dunkirk–Gravelines area and to make arrangements for the embarkation of the B.E.F. (Operation 'Dynamo'). (See *The War at Sea*, Vol. I, p. 217.)

On the 27th the Belgian government asked for an armistice. The immediate result of this was to leave a twenty-mile gap between Ypres and the sea, so exposing completely the left flank of the B.E.F. At Pont du Hem 25th Inf. Bde. (50th Division), with which 149 Fd. Amb. at Laventie was associated, was instructed to prepare to counter-attack toward Béthune and La Bassée and to hold the line of the Lys between Merville and Estaires. Into the Dunkirk perimeter were moving French 60th Division from Belgium in the north and elements of

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French III Corps from the south. This added greatly to the congestion, for the reason that they did not concur with the orders that had been issued to the effect that no vehicles other than those required for operational purposes were to enter the perimeter.

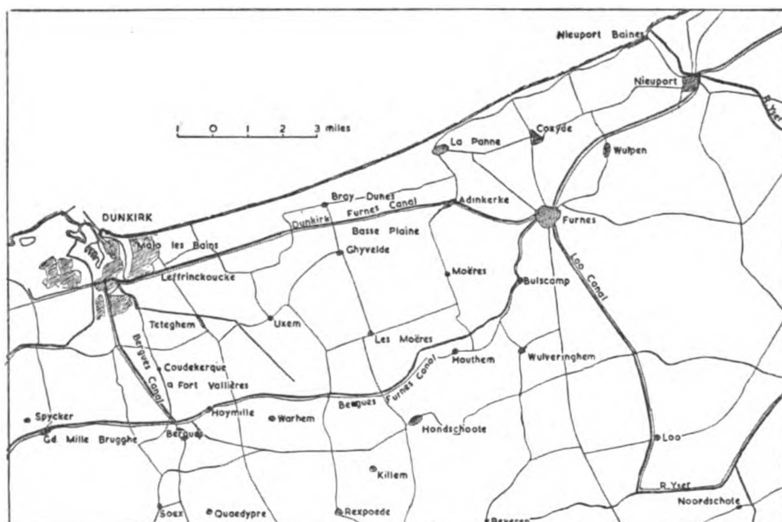

FIG. 5B. The Dunkirk Area.

By May 28 the situation had become hopelessly confused. Formations had to some extent lost their identity and large numbers of French troops were withdrawing into the British sector. The Belgian Army had capitulated. The B.E.F. was in grave danger of encirclement. Stubborn delaying actions, however, had kept the trap from closing and the B.E.F. and the bulk of French First Army got back to the coast in good order. For two days 5th Division had held Comines; then 50th Division came in to prolong the line; then 4th and 3rd Divisions and, behind and protected by them, great masses of troops and transport poured into the forming perimeter. From Dunkirk between midnight May 26/27 and midnight May 28/29 a total of 25,473 troops were evacuated; several thousands more were awaiting evacuation. On May 29, up to midnight, 47,310 troops had been embarked at Dunkirk, the majority being base and L. of C.

Arrangements were now made whereby III Corps was to be the first to embark, to be followed by II and I, in this order.

By the evening of May 28 H.Q. I and III Corps and 46th Division were within the Dunkirk perimeter. Along the southern flank of the quadrilateral the garrisons of Bergues, Soex, Vyfweg, West Cappel, Wylder, Bambecque and Cassel were holding out. 44th Division was deployed

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in front of Caestre and Strazeele. In the line running from Armentières–Warneton–Comines–Ypres–Lizerne–Noordschoote there were from the right 42nd, 4th, 5th, 50th, and 3rd Divisions. In the gap between Noordschoote and the coast beyond Nieuport were 12th Lancers and French cavalry units. 23rd Division was in the area of Poperinghe. 1st and 2nd Divisions were moving back into the Dunkirk perimeter.

By the evening of the 29th the B.E.F. was holding a series of three lines. The first of these ran from Poperinghe through Lizerne to Noordschoote, held by 50th Division on the right and 3rd Division on the left. The second ran from Wylder through Bambecque along the Yser, held by 42nd Division on the right and 5th Division on the left. The rearmost line was part of the Dunkirk perimeter from Bergues through Furnes to Nieuport–Bains, held from right to left by 46th, 1st and 4th Divisions. 48th Division was between the second and third of these lines in the area of Rexpoëde. 145th Bde. was holding out in Cassel. 23rd Division was about to pass into the perimeter. 2nd Division was at Bray-Dunes.

By the evening of the 30th the B.E.F. was within the perimeter, with which the Germans were in close contact at all points. III Corps (2nd, 44th and 48th Divisions) had embarked. I Corps was responsible for the defence of the western half of the British sector, II Corps for the eastern. Of I Corps 42nd Division had only one brigade, 126th, still capable of operations and only six battalions of 46th Division ever came under effective command. Of 2nd Division only a composite company of 5th Bde. was now left. In II Corps, 5th and 50th Divisions, as divisions, were no longer capable of fighting. The perimeter was being held from right to left by 138th and 139th Bdes. of 46th Division, 126th Bde. of 42nd Division, 1st Guards and 3rd Bdes. of 1st Division, all under I Corps and by 150th and 151st Bdes. of 50th Division, 9th, 7th Guards and 8th Bdes. of 3rd Division and 10th and 12th Bdes. of 4th Division, all of II Corps. 2nd Bde. of 1st Division and 11th Bde. of 4th Division together with the remnants of 23rd and 5th Divisions were within the perimeter.

By May 30 the port of Dunkirk had been destroyed. Two food ships had been sunk in the harbour and everywhere there was terrible congestion along the seafront. No hospital ships were arriving and it seemed as though the policy that had been adopted was to give priority to the evacuation of fit men. The C. in C. protested, pointing out that this was of the nature of a psychological blunder.

On May 31 it was the turn of II Corps, less 50th Division, to embark, I Corps (1st, 46th and 50th Divisions and 126th Bde. of 42nd Division) providing the rearguard. The C. in C. and his staff embarked on the night of the 31st/1st.

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On June 1, H.Q. I Corps embarked, 139th Bde. of 46th Division being designated as the final rearguard. On the night of June 2/3 the evacuation of the remainder of the main body of the B.E.F. was completed. The French troops remaining continued the fight throughout the 3rd. During the night of June 3/4 the British and French navies embarked some 50,921 of them, the rest, some 40,000, being compelled to surrender at 0900 hours on the 4th.

MEDICAL COVER, MAY 26–JUNE 2

On May 26, 125 Fd. Amb. (42nd Division) moved north to Lambersart, 3 was at Ploegsteert, 4 and 133 were at Blanche Maison, north of the Lys Canal, 8 was at Lille, 144 at Wulveringem, 150 at Ypres, 164 at Wytschaete and 186 at Dunkirk.

The distribution of C.C.Ss. was now as follows: 1, 2 and 6 were at Bailleul, 3 and 5 at Steenvoorde, 8 at Wormhoudt (ordered by A.D.M.S. 48th Division to move to Bray–Dunes), 10 was at Crombeke and Stavele, 11 at Woumen and 12 at Proven.

D.D.M.S. III Corps found fifty ambulances of 1 M.A.C. at Avelin and issued instructions for them to proceed to Steenvoorde. 159 Fd. Amb. moved from St. Jean, near Ypres, to Ghyvelde, near the coast. 7 M.A.C. moved to Bambecque, about twelve miles from Dunkirk. 9 C.C.S. from Beuvry reached Hondschoote and opened in a large school. 5 Lt. Fd. Amb. (1st Tk. Bde.) reached Dunkirk with its cars full of casualties. The Army Tank Brigade itself embarked but the embarkation staff instructed the field ambulance to remain behind. Extracts from the war diary of this unit for May 27 give a most graphic picture of the conditions in Dunkirk at this time:

'Departed on foot for Dunkirk docks. Two motor ambulances taken in case of casualties on road—as the result of bombing the ambulances were filled with casualties before we started to march. Two ships were provided for 1st Army Tank Bde. and other Corps troops which by then had begun to arrive at Dunkirk. The embarkation staff gave instructions for the field ambulance to remain behind in case of casualties from bombing, as there was no other Army medical unit in Dunkirk. Other units were by now assembling on the docks and enemy aircraft began to bomb the troops with salvoes about every twenty minutes. Troops were ordered to disperse on the docks and take what cover was available—bales of cotton on the quay afforded shelter from splinters. We were subjected to this bombing until about mid-day when the troops were instructed to leave the docks and seek shelter in the town—the troops dispersed and sought shelter in whatever cellars could be found. Enemy aircraft then transferred the brunt of their air bombing against the town—H.E. and incendiary bombs being used.

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Spent much time in the afternoon in locating troops of the field ambulance. Kept in touch with the embarkation officer, as the field ambulance was first in the order of priority for embarkation. There were frequent changes of the embarkation officer; the one whom I interviewed at 1800 hours said that "military control no longer existed" and that "the Mayor at 15 Rue de la Marine was in charge embarkation" and that "units were to obtain authority for embarkation from him". This embarkation officer then disappeared and no military authority appeared to exist and no boats came in during the day to take away troops. Casualties occurred from bombing and the field ambulance medical officers and orderlies dealt with these. The Mayor—as I expected— had no information or instructions regarding embarkation of troops. About this time—0800 hours—a naval officer accompanied by a seaman went round the streets and offered the following instructions to troops and into the buildings—"Go to the beach, the Navy are taking you away".

'The beaches extended northwards from Dunkirk about one mile distant. It was a dense crowd of military personnel which made for the beaches, and on arrival we were instructed that no attempt was to be made to form up into units, but to collect into groups of fifties. A fair number of the field ambulance was, however, collected together, but these were sent to carry casualties from a convoy which had arrived down the beach to the sea edge; before their work was completed darkness had set in and the dispersed unit was further prevented from collecting together. Throughout the night enemy aircraft were overhead—they lit parachute flares and also placed flares at the ends of the beaches and bombed the town Malo, which stretched along the shore, with H.E. and incendiary bombs. This town was in flames, and troops on the beaches were in danger of being seen from the air during the night. We were instructed to dig holes in the sand for cover—this we effectively did with our steel helmets. It has been stated unofficially that there were close on 10,000 troops on the beach that night. At intervals naval officers ordered groups to proceed to the sea edge where they waded out into the sea to be taken off in small boats and taken to destroyers, etc. It was found out subsequently that a large number of the personnel of the field ambulance got away under cover of darkness that night in numerous and varied boats. Before dawn we were instructed to take cover in the town of Malo. At this time I had one of my officers and three men of the field ambulance with me. At 0600 hours we were instructed to march in single file back to Dunkirk along the western bank of the canal to the Mole. There was still an immense crowd of military personnel collected on or near the beaches. Several destroyers filled with troops left this pier during the morning. In company with my one medical officer and thirty other ranks I embarked

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on a destroyer and departed from Dunkirk about 1100 hours and arrived at Dover at 1400 hours'.

The hospital carriers *Worthing* and *Isle of Guernsey* approached Calais *en route* for Dunkirk, to find themselves involved in a mutual bombardment between British destroyers and the shore batteries. At the same time they were heavily attacked by aircraft. They made for Dunkirk to find the town under a dense pall of smoke. They made fast to the quay and immediately streams of ambulances arrived making their way through long columns of walking wounded. With more than full loads the carriers pulled out at 2155 hours.

Dunkirk was now in ruins; its approaches were under shellfire and continually drenched by aerial bombardment; its loading berths were shattered. The B.E.F., short of food, was now short of water, for the supply of the town had been wrecked by the bombing. Water ships were being sent across from the United Kingdom. For the purpose of evacuating an army the port of Dunkirk was quite useless. Of its piers only two now remained, and of these the western one was so constructed that no ship could get alongside and the eastern one—the Mole—had only a 5-foot plank walk. If the troops were to be taken off, then it was from the beaches between Dunkirk and Nieuport that they must be taken.

On the 27th the distribution of the medical units was as follows:

C.C.Ss.

1. Lt. Sec. Bailleul
2. Steenvoorde moving to Hondschoote
3. Steenvoorde moving to Haringhe
5. Steenvoorde moving to Coudekerque
6. Abeele
8. Bray-Dunes
9. Hondschoote
11. Coxyde

Fd. Ambs.

1. Wambrechies moving to Hondschoote
2, 3. Hondschoote moving to Bray-Dunes
4. Steenwerck
5. Le Verrier
6. Le Doulieu
7. Poperinghe
8. Wulveringem
9. Hoogstade
10. La Vignette nr. Halluin
11. Ouderdom
12. Coppernollehoeke and Vierstraat
14. Bulscamp moving to Dunkirk
125. Le Bizet
126, 127. Ouderdom
132. Nouveau Monde
133. Godewaersvelde
143. Cassel and Oost Cappel
144. Locre
145. La Panne
150. Ypres and Vlamertinge
159. Ghyvelde
164. Locre and Wytschaete
182. Sillé
184. Bray-Dunes
186. Bray-Dunes
5. Lt. Dunkirk

The carriers, *St. Julien* and *St. Andrew*, in company with two transports, were heavily bombed on the way over to Dunkirk. On arrival the

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bombardment of the port was so intense that it was impossible to enter the harbour. Later in the day the personnel ship, *Canterbury*, went in and lifted some 400 wounded, including 140 stretcher cases.

On the 28th, D.D.M.S. III Corps received instructions that no casualties were to be evacuated north of the canal Nieuport–Furnes–Bergues. This order was found to be very difficult in execution since it meant, in fact, that no medical supplies or equipment could be taken into Dunkirk perimeter and that no more wounded could be got away. D.D.M.S. III Corps set up his office in Tétéghem, a village four miles south of Dunkirk and on the main road to the beaches. All medical personnel making their way to the port were required to report to this office. Some 300 officers and O.Rs. were quickly collected and put under the command of the officer commanding 6 C.C.S. D.D.M.S. himself returned beyond the canal and brought in an abandoned M.A.C. ambulance car, since without transport within the perimeter it was not possible to provide any kind of medical service. O.C. 159 Fd. Amb. was ordered by a staff officer to destroy his vehicles as he approached the perimeter and proceed with his unit to the Mole at Dunkirk.

1, 2, 3 and 7 Fd. Ambs. were now at Bray-Dunes, 9 at La Panne, 11 at Coxyde les Bains, 14 and 159 at Dunkirk, 4, 5 and 6 at Poperinghe, 164 at Locre, and 131, 132 and 133 were in trouble, H.Q. of 131 having been captured and 133 having been overrun at Godewaersvelde.

5 C.C.S. moved from Steenvoorde to Coudekerque, just outside Dunkirk, whence, abandoning all personal kit and destroying all office records, it moved in groups of twelve in single file to the port. On arrival a reconnaissance revealed that no ship was available and the commanding officer therefore dispersed the personnel of his unit in the cellars of the town. The persistent and continuous aerial attack was setting the town on fire, with the inevitable result that as the personnel of the C.C.S. were obliged to move from cellar to cellar they became mixed with other units. By 1800 hours on this day the condition of the town was such that the unit was moved toward the dunes. They were grouped into parties of fifty in order to facilitate embarkation when this occurred. While the commanding officer was in the dock area attempting to make arrangements for the embarkation of his unit, its personnel were embarked in a destroyer.

6 C.C.S. moved from Bailleul to a farm in the neighbourhood of Abeele, on the frontier near Steenvoorde, *en route* for Dunkirk. It was known that enemy forces were less than a quarter of a mile away, but at 1400 hours it was decided to take advantage of a very heavy thunderstorm and to make an attempt to escape. The unit's vehicles were unloaded and the personnel of the unit, together with such wounded

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as had been collected in the area, were hurriedly formed into a convoy which successfully got away to reach Dunkirk.

11 C.C.S. moved from Woumen to La Panne. On the afternoon of this day, the 28th, a sailor carrying a portable signalling lamp called upon the commanding officer with the news that he had been sent ashore from H.M.S. *Calcutta* to organise the evacuation of the casualties then held by the C.C.S. It was not discovered in what way *Calcutta* knew anything about the affairs of the C.C.S., but it was arranged that the 100 casualties then held should be carried down to the water's edge and that ship's boats should convey them on their stretchers to the ship. The night was pitch black; the unit's personnel were near exhaustion; but nevertheless every one of the casualties was carried down to the beach. Very great difficulty was experienced in getting the stretchers on to the boats, which rolled and tossed while the stretcher-bearers were standing almost up to their necks in the sea. The conditions were such that this attempt had to be abandoned, and in the opinion of the officer commanding the C.C.S. not more than about half a dozen stretcher cases got away. The rest had to be carried back to the C.C.S. at La Panne.

12 C.C.S. moved from Proven to Rosendaël, an eastern suburb of Dunkirk, some two and a half miles from the Mole which was the main point of embarkation, having reached there on the 27th. The chateau taken over by the C.C.S. was quickly filled to capacity with wounded and many had to be kept and treated in ambulances or on stretchers outside the building. During the next five days the situation became increasingly appalling, and for the last day or two took on the features of a nightmare.

Evacuation was spasmodic. It occurred when a hospital ship or carrier entered Dunkirk harbour, and such occasions were now rare. Frequently news was received that a ship was expected and a convoy of loaded ambulances would be sent to the docks or to the Mole; but no ship would arrive and the wounded would have to lie in their ambulances without attention, food or water for the best part of a day and sometimes overnight, all the time being subjected to shelling, dive-bombing or machine-gunning, while the noise of the A.A. guns was almost continuous.

In the movement back to the coast it had been possible to bring away only a limited amount of medical stores and equipment and so, although a small operating theatre functioned in the basement of the chateau, there was very soon a severe shortage both of anaesthetics and of dressings. The only rations available were tinned and hard, and by the end very little even of these was left. The water supply of the chateau was never sufficient so that water had to be brought in buckets from the nearby canal. The water sewage system soon ceased to function.

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The carriers were working without rest. The report of the *St. David's* voyage relates that 'during the night the town, quays, etc., were subjected to terrific bombardment by air and land and it became necessary, owing to lack of R.A.M.C. men ashore, for the seamen, firemen and stewards to load the wounded themselves, carrying them down the quay as required, with the medical staff on board receiving the wounded and placing them in the cots. The work was exceedingly difficult as the whole area was in bad condition and there were not even any gangways available for passing the stretcher cases on board. However, the engineers constructed a wide and useful gangway which was used during the whole time of the evacuation.'

On the 29th in Dunkirk D.D.M.S. III Corps, in order to facilitate evacuation, took a party of volunteers across the canal in an attempt to retrieve vehicles. Ten lorries and three ambulance cars were brought back and were used for the evacuation of 12 C.C.S. at Hondschoote, where casualties were still lying in the ambulance cars that had brought them. Arrangements were made by D.D.M.S. for the provision of food. In the afternoon of this day D.D.M.S. received an order from 'A' G.H.Q. to the effect that no further medical evacuation was possible and that plans were to be prepared whereby parties of casualties of 100, 200 and 500 would be tended by personnel of medical units detailed for this purpose.

O.C. 'A' Coy. 159 Fd. Amb. proceeded with D.A.D.H. III Corps to the quay south-west of the Mole at Dunkirk to find there some 200 wounded men without any organised medical care. D.A.D.H., two officers and fifteen O.Rs. of 'A' Coy. 159 Fd. Amb., together with two O.Rs. of the mobile bath unit, set to work and arranged bales of cotton that happened to be lying there into roughly parallel rows to provide some sort of shelter. The wounded were placed between the bales and thereafter their wounds were dressed. The quayside was bombed repeatedly throughout the day; ships were being set on fire and even some of the bales caught alight but were extinguished by the use of fire extinguishers taken from ambulance cars. By dusk over 400 wounded men were being looked after in this way and some 50 walking wounded had been sent to the Mole for embarkation. At 2300 hours a convoy of wounded arrived from 12 C.C.S. and were unloaded on the quayside. During the night of the 29th/30th, a hospital ship came alongside and over 350 casualties were quickly embarked and sent away.

The quartermaster of 6 C.C.S. returned to Abeele, collected a number of abandoned vehicles and, under fire, loaded up with rations and medical stores which he took to the dressing station that had now been established on the beach at Dunkirk. O.C. 6 C.C.S. made repeated journeys to collect abandoned ambulances which he manned with volunteer drivers on the beach.

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8 C.C.S. was instructed by the report centre to move to the beach for evacuation. At 0200 hours on the 29th, lights were seen flashing from the shore and these were found to be the signal for embarkation. The unit moved down to the water's edge in ten sections, each under the command of an officer. During the darkness and in a rough sea the work of getting away the wounded, and especially the stretcher cases, was extremely arduous. The only boat that completely overturned, however, was the one which was carrying the records and canteen funds of the unit. With the approach of dawn the naval officer in charge of the beach issued orders that the troops as yet unembarked should withdraw from the shore. About a quarter of the unit, together with all the 24 wounded that the unit was holding, had managed to get away. The remainder of the personnel, who had been up to their waists in water for three or four hours, returned to the Casino where it was found that the stores of the unit were being looted. The personnel of the C.C.S. were being continually increased by the accretion of M.A.C. and various field ambulance personnel, so that it was now well over the 200 mark.

The Germans were now fast advancing upon Hondschoote and 9 C.C.S. was instructed by G.H.Q. to prepare all patients for evacuation. Walking wounded were sent off to the coast while lying cases were loaded on to the many ambulance cars which had attached themselves to the C.C.S. during the past three days. When all the patients had been despatched, the unit personnel, carrying only light personal kit, began the march toward the coast. After seven hours the unit finally arrived in Rosendaël. After queueing up for most of the night along the beach at Dunkirk the main body of the unit embarked early in the morning of the 30th. The rear party, after having ensured the safe disposal of the remaining patients under its care, eventually embarked on the night of the 30th/31st.

1, 3 and 6 Fd. Ambs. had embarked on May 29, 2, 4 and 5 were in Dunkirk, 8 and 164 were at La Panne, the former opening a M.D.S. on the front, 10 and 11 were at Coxyde Les Bains, 127 at Adinkerke, 144 and 150 at Les Möeres, five miles from the coast, and 128 (42nd Division) had reached Dunkirk, having destroyed its transport *en route*.

'A' and 'B' Coys. of 10 Fd. Amb. at Coxyde took over as a M.D.S. the Grand Hotel Regina on the seafront which had been occupied by 2 and 11 C.C.Ss. These units were moving to La Panne. 11 and 12 Fd. Ambs. were billeted nearby. About 1800 hours casualties began to arrive in large numbers and throughout the night the personnel of the unit were fully occupied in dealing with them. The more serious cases were at first evacuated to 2, 3 and 11 C.C.Ss. which were functioning at La Panne, but these quickly became full and thereafter the

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M.D.S. was required to assume the rôle of a C.C.S., the staff of 10 Fd. Amb. being reinforced from 12 Fd. Amb. Throughout the night of the 29th/30th casualties continued to arrive in large numbers and the problem of feeding so many assumed enormous dimensions. The quartermaster collected a reserve of tinned milk, rice, etc., and further stocks were obtained from neighbouring units, while bully beef and biscuits were fetched from a dump on the beach at La Panne, having been brought thereto by ship from the United Kingdom.

S.M.O. Dunkirk was missing and the officer commanding 12 C.C.S. was detailed by D.D.M.S. III Corps to act in his stead. He found that the difficulties of evacuation from the Mole were enormous and still mounting. Not only did the route of approach to the Mole wind through two and a half miles of bombed and flaming streets, but by this time the whole of the Mole area was cluttered with vehicles of all descriptions so that there was only room to unload at the most two ambulances at a time. O.C. 12 C.C.S. with two other officers spent many hours in man-handling these vehicles in order to make space, and ultimately it became possible to unload ten ambulances synchronously. But from the point of unloading to the waiting ship was anything up to half a mile, and over this distance the stretchers had to be carried. Since no other personnel were available for this purpose, passing troops had to be impressed into bearing parties, men who themselves had been marching for days with little food, water or sleep. It is not to be wondered at, therefore, that no empty stretchers were ever returned from the ships. The personnel of 12 C.C.S. during these days lived anywhere they could—in cellars or in tents. Fortunately the weather was warm and dry.

The hospital carriers continued on their errands of mercy. *Dinard* loaded 271 stretcher cases and 13 R.A.M.C. personnel. On the way back she was attacked with torpedoes but managed to escape. Her report states that 'we had several narrow escapes from collisions as we were meeting dozens of ships without lights and the weather was misty'.

In 1 M.B.S.A. orders were received that ordnance and medical equipment for two general hospitals, each of 1,000 beds, should be prepared for loading and consigned to 1 Base Ordnance Depot. But it had to be explained that this order could not be obeyed since all equipment had already been sent away.

By May 30 Dunkirk was an inferno. Along the beaches galloped numbers of horses, made frantic by thirst, which had been brought into the perimeter by French units. The sky above the town was obscured by dense columns of black smoke, while long lines of troops were standing breast deep in the fortunately calm sea. All the while the docks were under constant shelling, and darting through the murk

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hurtled planes machine-gunning the defenceless troops. Into the harbour pulled the H.S. *Worthing*, to tie up under fire. D.D.M.S. III Corps' party immediately set to work and embarked every casualty, over 200, in just over twenty minutes. Being satisfied that there were no more British wounded to be embarked and having ascertained that a second hospital ship was now in sight heading for the Mole, D.D.M.S. ordered his R.A.M.C. personnel to board the *Worthing*, which cast off at 2000 hours. Over 700 casualties had been evacuated from the quay by 'A' Coy. 159 Fd. Amb. together with those who found themselves associated at this time with this unit. On the beach the dressing station was still functioning. 9 and 12 C.C.Ss. embarked. At 1200 hours on the 30th, III Corps handed over to I Corps, D.D.M.S. III Corps handed over to D.A.D.M.S. I Corps and on the following day embarked on a destroyer for Dover.

At 0830 hours on the 30th, 8 C.C.S. at Bray-Dunes was informed by the embarkation officer that the unit should proceed along the shore towards Dunkirk. The unit was without rations for the reason that its food store had been looted. During the whole of the next twenty-four hours the unit moved along the sand among tens of thousands of troops. First of all there were three parallel marching columns which were bunched up together as the tide came in. Then a single column was formed and progress became exceedingly slow. Aerial activity was continuous but was directed entirely against ships in the harbour at Dunkirk. The unit ultimately embarked.

During the morning of the 30th the transport officer of 10 Fd. Amb. at Coxyde took his R.A.S.C. drivers to the docks at Dunkirk where he collected about forty ambulance cars which had been abandoned there. From 1400 hours until 2000 hours 12 Fd. Amb. took over the M.D.S. as the personnel of 10 Fd. Amb. had by that time been continuously on duty for thirty-six hours. Meanwhile, 'B' Coy. 10 Fd. Amb. had established a car post at Oostduinkerke where two medical officers and twenty O.Rs. had been exceedingly busy and had evacuated some 170 casualties to the M.D.S. during the thirty-six hours. 12 Fd. Amb. having, as related, taken over the M.D.S. from 10, was obliged to enlarge its accommodation by requisitioning further cafés and shops. Some 200 walking wounded were thus accommodated. Later 100 of these were evacuated in lorries to La Panne, but, when 12 Fd. Amb. handed the M.D.S. back to 10 Fd. Amb., there were still some 500 or more serious cases in its charge awaiting evacuation. 145 Fd. Amb. of 48th Division was in the Kursaal at La Panne and was forced to expand into an improvised C.C.S. A M.A.C. was formed out of abandoned ambulances lying on the roads nearby and casualties were evacuated into Dunkirk for embarkation. This system broke down because the ambulances, having taken their loads to the Mole, failed to return;

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4, 5, 132, 145 and 186 Fd. Ambs. embarked; 9 and 127 reached Bray-Dunes and 150 got to Adinkerke.

The carrier, *Isle of Guernsey*, lifted 490 wounded while the ship was being shaken every few minutes by exploding bombs on the quay and in the water. The *Dinard* went in after dark. Her report states that 'during the whole of the time shells were bursting about us, enemy planes were continuously overhead and bombs were dropped all round us, but not near enough to damage us. While alongside shellfire was very intense and planes overhead were giving the range by Verey lights. Shrapnel from bursting shells was continually coming aboard. We found great difficulty in making contact with those in charge of the wounded.'

The strain was now beginning to exact its toll. The crew of the carrier, *St. David*, protested against sailing unless the ship were armed or escorted. They were not far from complete exhaustion. Though their ship was a hospital carrier and distinctly marked as such they found themselves protected neither by custom nor by international law. After one night's rest, however, the *St. David* sailed again, unarmed and unescorted, for neither escort nor arms could be provided.

On the 31st in 4th Division instructions were issued that field ambulances were to be passed into the divisional reception camps and that the car posts established by the field ambulances of 4th Division were to be withdrawn. Casualties in charge of field ambulances were to be taken to the C.C.S. in the Casino at La Panne in unit transport.

A medical instruction was issued in conjunction with the final G.H.Q. operational order by which medical units were ordered to remain *in situ* and to clear casualties as opportunity offered to the beaches, if walking, and to Rosendaël. They were instructed to remain open as long as possible and to have a sliding scale worked out whereby an adequate number of R.A.M.C. personnel remained behind to look after any casualties that had to be left. At 1630 hours on the 31st the La Panne area was almost cleared of casualties.

The field ambulances of 3rd Division were all congregated at La Panne. A.D.M.S. 3rd Division, visiting them, found that a road had been forced through the jettisoned vehicles which isolated La Panne from Dunkirk, that ambulance cars had been collected from Dunkirk and that the great majority of the wounded held by these field ambulances had been evacuated. 10 Fd. Amb. (4th Division) at Coxyde managed to evacuate every one of its casualties to Rosendaël. This move had been carried out by the ambulance cars brought back from Dunkirk on the previous day and by fifty cars belonging to 2 M.A.C. At midnight on the 30th/31st, 10 Fd. Amb. again took over the M.D.S. from 12 Fd. Amb. In this single mass move over 400 cases were evacuated and at 0800 hours 11 Fd. Amb. took over from 10. At 1200

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hours the M.D.S. was closed. 145 Fd. Amb. (48th Division) at La Panne got its last convoy away on this date. During the previous seven days this medical unit had operated upon and evacuated some 2,000 cases, the stretcher cases being sent to Dunkirk and the walking wounded in batches to the beaches, there to be removed by small boats to the destroyers. 125 Fd. Amb. (42nd Division) embarked, leaving behind eight medical officers to establish a dressing station on the beach. 2, 4, 7, 8, 9, 11, 127, 150 and 164 Fd. Ambs. also embarked. Of 131 Fd. Amb. only 3 officers and 67 O.Rs. got away, while of 133, 10 officers and 187 O.Rs. failed to reach the coast.

The carrier, *St. Julien*, her crew weary and shaken, loaded under shellfire. *St. Andrew* berthed at the Mole during a heavy air raid and later moved to another part of the harbour. She could see a number of stationary ambulances but on investigating them found that they were either empty or else loaded only with dead. Moving to still another part of the harbour she embarked a load of wounded and made her way out. *St. David*, reaching Dunkirk, could find no vacant berth and so stood off until *St. Andrew* came out. Going in she failed to get any response to her signals and so returned empty.

During the final stages of the evacuation from Dunkirk 1, 2, 3, 5, 6, 8, 11 and 12 C.C.Ss. got away, but 10 C.C.S. at Crombeke and Stavele fell into the hands of the enemy together with some 700 patients. 4 and 13 C.C.Ss. had not been involved with the main body of the B.E.F. 1 Neurosurgical Unit was captured. It was known that 6 Fd. Amb. had suffered heavily from aerial attack and that 131 Fd. Amb. had been captured. 12 C.C.S. at Rosendaël was the last medical unit functioning around Dunkirk. The final scene is best portrayed in an excerpt from this unit's diary.

'As we seemed to be the last medical unit functioning round Dunkirk it never occurred to us that we had any chance of getting away, and so it was a complete surprise to the C.O. when, on the morning of June 1, the Acting D.D.M.S. I Corps asked how many officers and men should be left per 100 casualties. The C.O. said two officers and twenty men, but shortly afterwards the D.D.M.S. returned with Comd. I Corps orders that one officer and ten men per 100 casualties should be left and that we should ballot forthwith and be prepared to leave at 2000 hours. A ballot was accordingly carried out for both officers and men at 1400 hours, on the principle first out of the hat first to go and last out of the hat last to go. There were now some 17 officers working at the C.C.S. exclusive of padres, etc., and it was as tense and dramatic a draw as any in which one could wish to partake; there were some 230 casualties remaining at the time and the last three named were those of an officer who had got separated from his field ambulance and joined us at Béthune, another who had been sent over

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for beach duties at Dunkirk and had only been in France a few days, and the surgical specialist; these three took their fate splendidly and cheerfully, as did the men theirs; all three had worked magnificently and the selection could not have been bettered from the point of view of looking after casualties.

'Just before 2000 hours the D.D.M.S. asked us to stay on until 2200 hours as there was still a chance for a hospital ship to arrive—casualties had increased to some 265 when we left at 2200 hours in lorries which were abandoned at the end of Malo-les-Bains, from where we marched along the beach to the Mole base, sad in the thought of the casualties and our three officers and thirty men left behind. The journey of three-quarters of a mile of two files of British and two of French troops along the narrow base Mole seemed never ending—a few yards and then a halt for five, ten, perhaps fifteen minutes, and so on; meanwhile occasional shells whined overhead to plop in the sea; one near miss some thirty yards from the head of our little column at first looked as if some 20 or 30 good men must have gone west, but luckily the shell, falling almost vertically, hit the Mole at sea level and only sent up a column of water, which sprayed those around. When we reached the end we found three destroyers, and were urged by the sailors to get on quick—it was everyone for himself, until the destroyers could hold no more, when they immediately left, going cautiously at first, but later it seemed all out, as all was throbbing and rushing through the still, calm, warm night; most luckily it was so, as even with a long greatcoat and equipment it felt quite cold—what the poor devils in wet clothes and without coats must have felt is not known, but then everyone fell asleep in their tracks and did not wake up till in Dover or other harbour, for the destroyers did not all go to the same place.'

The British official wireless sent out a message in clear saying 'Wounded situation acute and hospital ship to enter during day. Geneva Convention will be honourably observed and it is felt that the enemy will refrain from attacking'. Two hours after this broadcast the carrier *Worthing* left the Downs for Dunkirk and was attacked by twelve aircraft, although plainly marked and alone. *Paris* followed *Worthing* and picked up her signal that she was being attacked. *Paris* signalled to the shore asking if she was to proceed. She was ordered to make for Dunkirk. She was attacked from the air and damaged. While lying helpless she was attacked again, hit and had to be abandoned.

Medical planning in connexion with Operation 'Dynamo'* included the clearing of the hospitals, especially the E.M.S. hospitals, in the south-east of England by the transfer of patients to hospitals in other

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* *See* The Emergency Medical Services, Volume 1.

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parts of the country and the posting of R.A.M.C. officers, stretcher-bearer squads and ambulance cars to the smaller ports on the Kent and Sussex coasts to which casualties might be brought.

The casualties came back in hospital ships and carriers, in units of the Royal Navy and in 'the little ships'. Most of them were disembarked at the larger ports around the south-east coast of England but some were landed elsewhere, even as far away as Liverpool. Among them were French, Belgians and Poles. The most serious cases among them were at once taken, under E.M.S. arrangements, to the nearest hospital by ambulance car. The rest of those requiring hospitalisation were despatched by ambulance car or by ambulance train to E.M.S. hospitals inland, in London or elsewhere. During the course of the operation 47 ambulance trains distributed 28,354 Army casualties among the selected hospitals.

At certain of the smaller ports the numbers of casualties arriving far exceeded those expected and so the facilities of the local hospital, staffed and equipped to cope with local air-raid casualties in limited numbers, were overtaxed. Under E.M.S. arrangements such hospitals were cleared by the sending of ambulance trains and of mobile surgical teams, additional medical and nursing personnel and medical supplies.

The arrangements made by the E.M.S. worked smoothly and efficiently. As was but inevitable in the circumstances, very many of the casualties on admission to hospital in England were in poor condition. The optimum interval between the receipt of the wound and the exposure to expert surgical intervention had long been exceeded. A few instances of gas gangrene were encountered. The case fatality rate in those hospitals to which were admitted the most serious cases—the local hospitals in the coast towns—was high. Of 354 admissions at Dover 51 died; of 211 admitted at Brighton 53 died. But in those hospitals which did not receive an unduly high proportion of the moribund, the case fatality was not remarkable. Thus, in the hospitals of one E.M.S. sector of London, of the 1,873 admitted 33 died.

THE DEFENCE OF BOULOGNE AND OF CALAIS

When on May 20 the Germans captured Amiens and Abbeville the need to conserve the ports of Boulogne and Calais became imperative. So, on the 22nd, 20th Guards Bde. was sent to Boulogne, and on the same day the personnel of the general hospitals of 2 M.B.S.A. embarked for the United Kingdom in the two ships that had brought the Guards Brigade. With them they took the patients in an ambulance train which they found at the end of the cross channel steamer jetty. To tend such of these as were unfit for further evacuation sufficient medical personnel stayed behind, as did the A.D.M.S. and the D.A.D.H. of the sub-area. The Franco-British garrison just had time

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to take up its defensive positions before the German armour began to close in. During the latter part of the 22nd and throughout the 23rd the garrison, aided by the Royal Navy and the R.A.F., resisted stubbornly but at about 1830 hours on the 23rd orders were received from the War Office to the effect that 20th Guards Bde. was to be evacuated immediately. Most of the Boulogne garrison was withdrawn by sea. Some 6,160 officers and men, including 265 wounded (British and French) were taken off by naval units.

Those who remained behind, including several hundreds of Welsh Guardsmen, continued to fight on and it was not until the 25th, when food and ammunition were nearing exhaustion, that they were forced to capitulate.

To Calais was sent 30th Inf. Bde., its first contingent arriving on the 22nd and the remaining two battalions on the following day. Two ambulance trains, which had been three days on their journeys from the forward zone and which had vainly attempted to get their patients embarked at Boulogne and at Dunkirk, arrived, and the casualties, together with some 1,600 non-combatants of one sort or another, were put aboard the ships that had brought 30th Inf. Bde. and safely taken away.

The Calais garrison included French units also. The task assigned to the brigade was to open a new supply route for the main body of the B.E.F. It was hoped that the brigade might break through towards Dunkirk. But patrols quickly found that the roads to Dunkirk and to Boulogne were closed by enemy forces. It was quickly realised that the task set the brigade was far beyond its very limited powers. But, unlike the garrison of Boulogne, it was not withdrawn. Its new task was that of containing as much enemy strength as possible in front of Calais for as long as possible in order that time might be gained for the main body of the B.E.F.

On the 24th two ships entered the harbour, there to embark wounded, refugees and surplus non-combatants. The water mains had been cut and in the heat the troops were suffering from thirst. The enemy continued to press his attack and by the evening the outer perimeter had been breached and the garrison forced to withdraw to the inner. Small craft made their way in and out of the harbour removing the wounded. Late that night direct communication with London ceased.

By the 25th the Germans were pressing hard against the outer perimeter and Calais was enduring concentrated bombardment. On the 26th the garrison was told that it was to fight to the end and that there was to be no evacuation. Throughout the day waves of dive-bombers attacked continuously and enemy tanks penetrated the inner perimeter, while German infantry infiltrated into the dock area itself.

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On the night of May 26–27 the Navy took off some 70 wounded together with about twice this number of British, French and Belgian military personnel. Attempts to get hospital carriers into the harbour failed owing to the severity of the enemy fire. The remainder of the garrison was overwhelmed. 30th Inf. Bde. had done all that was required of it. Its four battalions had occupied the attention of at least two German divisions for four vital days.

The composition of these two brigades is given in Appendix 1.

The only medical component of the brigades consisted of the regimental medical officers.

(iii)

The Saar and the Somme

THE FIGHTING ON THE SAAR AND SOUTH OF THE SOMME

On May 13 on the Saar front a heavy artillery barrage at 0405 hours heralded a determined infantry attack on the sector held by 51st Division.

During the 14th enemy pressure on the front of 51st Division increased and it became evident that this was no localised activity but part of a serious and widespread offensive movement. The French Command decided that it had become necessary to withdraw to the Ligne de Recueil. This withdrawal was successfully accomplished during the following days.

On the 15th the M.D.S. of 154 Fd. Amb. serving the centre and left sectors of the divisional front, moved back from Veckring to Kédange where an A.D.S. was opened. On the 20th, 154 Fd. Amb. took over the A.D.S. at Ising from 152 and was now serving the whole of the divisional front in the Ligne de Recueil.

When, on the night of May 18/19, G.H.Q. had decided that the B.E.F. might be forced to retire to Dunkirk, it had been agreed that 51st Division must be extricated from the Saar. On May 20 the division received a warning from the French Command that it was to be withdrawn into reserve in the area of Etain. It was relieved by French troops on the night of May 22/23 and a few days later 154th Bde. moved to Apremont (near Varennes) by road, 154 Fd. Amb. to Saulx-en-Woëvre, and road parties of 152nd and 153rd Bdes. quickly followed. The rail parties were diverted to Rouen. Ultimately the road parties all collected at Gisors (forty miles north-west of Paris) and all the rail parties at Rouen by way of Vitry-le-François, Troyes, Orléans, Blois, Tours and Le Mans. Orders now came for the division to assemble in the Haut Forêt d'Eu, just inland from Le Tréport, there to take part in the hopeless task of reuniting the several parts of the B.E.F. By this

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time the enemy was in Amiens in strength and had established strong bridgeheads across the Somme, at Abbeville and nearer the sea at St. Valéry-sur-Somme.

On May 29, 51st Division took over the sector extending along the river Bresle from Sénarpont on the right to Eu, a line some twenty miles long. 1st Armd. Division, consisting of 2nd and 3rd Armd. Bdes. and a Support Group and with 1 and 2 Lt. Fd. Ambs. and a field hygiene section attached, had been disembarking at Cherbourg since the 20th and moving up to the line of the river Bresle. Under command of French Tenth Army, it had been taking part in the attack upon the Abbeville bridgehead and during the period May 23–27 had suffered very heavy losses in respect of armour.

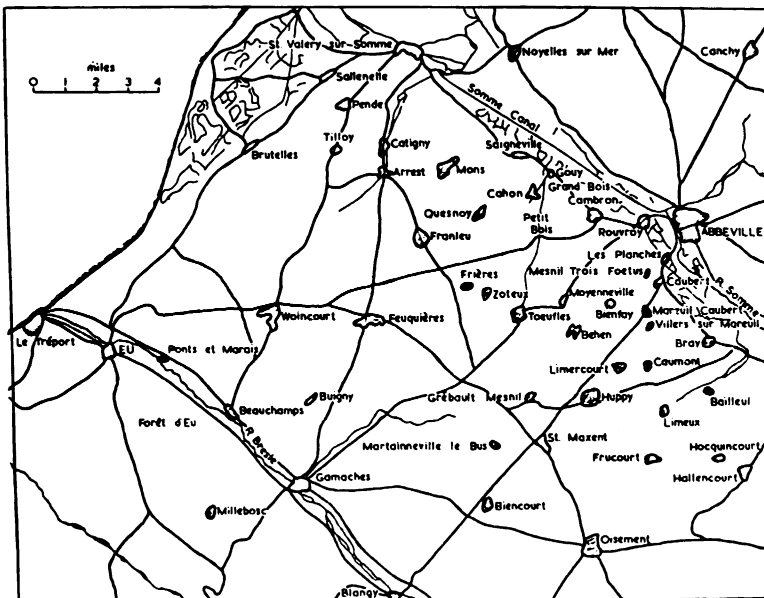

FIG. 6. From the Somme to the Bresle.

During this action 1 Lt. Fd. Amb. established A.D.Ss. in a chateau at Nesle-sur-Normandeuse, on the Bresle, and at Bazinval. Through these 6 officers and 50 O.Rs. passed, to be taken to a car post at Bord des Bois, near Formeries, and thence by M.A.C. to 13 B.G.H. at Rouen.

At the end of this action it was found necessary to form a composite regiment out of the remnants of 2nd and 3rd Bdes. and this, together with the Support Group, passed under command of 51st Division on the 29th.

On the 30th, the German bridgehead at Abbeville was again attacked, and in this assault 'B' Coy. of 1st Black Watch took part. The company

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achieved its limited objective, but since the French attack at Cambron village was unsuccessful it had to retire in conformity. 2nd Seaforth were sent forward to reinforce the French troops in Moyenneville and Bienfay, while the remainder of 152nd Bde. was disposed in Limeux and Béhen.

154 Fd. Amb. withdrew across the river Bresle and established its M.D.S. at Baromesnil, north of Melleville, and its A.D.S. at Dargnies.

For the next few days no event of any serious importance occurred in this area while the main body of the B.E.F. was rescued from Dunkirk.

The campaign did not end with the evacuation from Dunkirk. French 2 Army Group was standing along the Rhine and the Maginot Line, French 4 Army Group along the Aisne and French 3 Army Group along the Somme. There were British formations other than 51st Division and 1st Armoured Division serving with French Tenth Army of 3 Army Group.

It has been recounted how, following the final cutting of communications between the main body of the B.E.F. and the L. of C., Commander L. of C. had been occupied in the construction of improvised formations out of the available troops. Two such improvised forces—'Beauforce', consisting of nine improvised battalions and built around 2nd/6th Surreys of 12th Division and 4th Buffs, and 'Vicforce', built out of reinforcement details together with R.E. and other units—were formed. On June 1 these two formations were amalgamated to become 'Beauman' Division, a somewhat grandiose title which unfortunately misled the French Military Command as to the actual strength of this formation. There were also parts of 12th and 46th Divisions in this area.

On June 4 the French, with the assistance of 51st Division, launched a further attack upon the enemy bridgehead at Abbeville. The objective was the high ground overlooking the meadows in front of Caubert to the Cambron Woods. 4th Camerons, 152nd Bde., were on the right; in the centre were 4th Seaforth of 152nd Bde. under command of the French and 1st Gordons of 153rd Bde. under French command also, while on the left 154th Bde. was given the task of preventing enemy reinforcements entering the bridgehead. It so happened, however, that the enemy had mounted an attack for this very time, so that as the Allies advanced they encountered fierce opposition. 152nd Bde. lost 20 officers and 543 O.Rs. in the day's fighting. The attack was unsuccessful. 154 Fd. Amb. had its M.D.S. at Dargnies and A.D.Ss. at Acheux and Ochancourt during this action, serving both 153rd and 154th Bdes., and dealt with some 49 casualties. (Plate V shows battle casualties of the 51st Division being treated at a Regimental Aid Post of the 4th Camerons.)

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On the following day the Germans renewed the battle, thrusting most strongly against 154th Bde., holding the line Quesnoy–Le Hourdel and the sea, and under increasing pressure 51st Division was forced to withdraw to the line Limeux–Limercourt–Moyenneville–Valines–Escarbotin–Hautebut. Enemy pressure increased, particularly near the coast, and 8th Argylls on the left wing of 51st Division were forced to withdraw to the line Ault–Tully–Friville. 154 Fd. Amb. moved back to Frettemoule, near Maisnières, and during the day was called upon to deal with some 50 casualties.

On June 6 it became manifest that this line could not be held and 51st Division was pulled back to the line of the Bresle, from Gamaches on the right through Eu to the sea on the left. There it was reinforced by 'A' Brigade of 'Beauman' Division (4th Buffs, 1/5th Foresters, 4th Border). But this line was already pierced, as was also that of the French in front of Amiens, and 51st Division was now cut off from Rouen and its bases of supply. Its position was serious, for, though much depleted and largely unsupported, it was required to hold a line of some fourteen miles with 152nd Bde. on the right, 153rd in the centre, and 154th on the left. 154 Fd. Amb. opened its M.D.S.

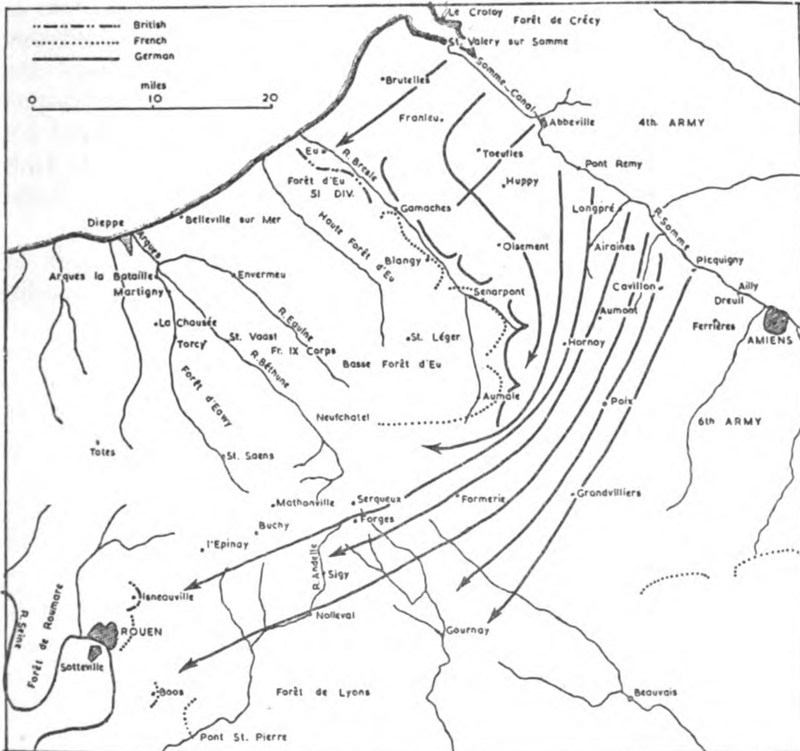

FIG. 7. The Situation on the Evening of June 8, 1940.

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at Wanchy-Capval, its centre brigade A.D.S. at Bouillancourt and its left A.D.S. at Delville. There was much bombing and machine-gunning and the ambulance admitted some 70 civilian casualties from Neufchâtel and Londinières.

On June 7 German armoured formations, driving towards Rouen, pierced the front of French Tenth Army with the result that French IX Corps and British 51st Division on the left became separated from the rest of Tenth Army. 'Beauman' Division, together with a number of tanks of 1st Armd. Division, attempted to cover Rouen.

On the 8th orders were received from the French Command for 51st Division to retire to the line of the Béthune, and on the 9th naval officers reached divisional H.Q. at La Chaussée to discuss plans for the evacuation of the division on the night of the 9th/10th.

The Germans drove 'Beauman' Division to the Seine and entered Rouen. As a consequence of this 51st Division was ordered to fall back on Le Havre. 154 Fd. Amb., leaving its civilian casualties behind, moved to Anneville, beyond the river Béthune. During the day it dealt with some 60 casualties who, since they could no longer be evacuated by M.A.C. to Rouen, were taken along with the unit. To make room for them, all stores and equipment that could be spared were destroyed.

1st Armd. Division, u/c 51st Division, was involved in these events and in this withdrawal. Thereafter it took part in a number of attempted delaying actions and stubbornly withdrew *via* Alençon to Brest and Cherbourg, arriving there on the 15th. A section of 2 Lt. Fd. Amb. withdrew with 51st Division to St. Valéry-en-Caux and there shared its fate.

'Arkforce' was created at Arques-la-Bataille around 154th Bde. of 51st Division with 154 Fd. Amb. attached, to defend the approaches to Le Havre, while the division was evacuated.

'Arkforce' Order of Battle.
- H.Q. 154th Bde. 51st Division
  - 4th Black Watch. 153rd Bde.
  - Remnants of 7/8 A. & S.H. 154th Bde.
  - 6th R.S.F.
- Medical 154 Fd. Amb.
- 'A' Bde. formed out of the remnants of:
  - 4th K.O.S.B.
  - 1/5th Foresters
  - 4th Buffs
  - 1st Kensingtons
  - with attached R.A., A.A. and R.E. units.

'Arkforce' was ordered to occupy the position Fécamps to Lillebonne to cover the withdrawal of the rest of the division and of the French IX

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Corps. Serious difficulties arose from the fact that the French with their horsed transport could not move as rapidly as could 51st Division. As 'Arkforce' moved towards its positions along roads clotted with refugees, Le Havre was afire and 'Arkforce' struggled through black confusion. Bombing and machine-gunning from the air was continuous. 154 Fd. Amb. was lying up in the woods near Le Havre, its casualties having been put on board a transport.

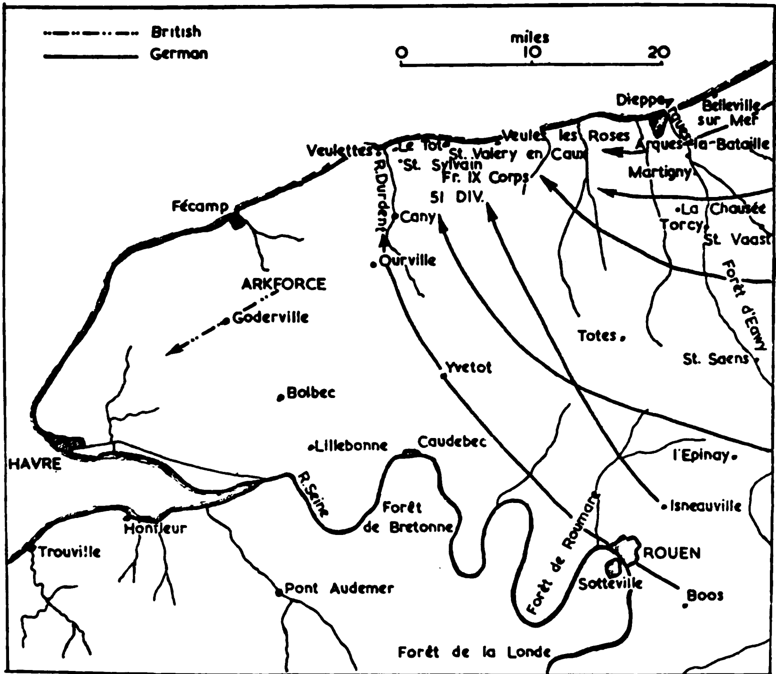

FIG. 8. The Situation on the Evening of June 10, 1940.

On June 10, 'Arkforce' was still *en route* for Le Havre when news reached it that the Germans were nearing Fécamp. 'Arkforce' thereupon took up a position on the line Lillebonne–Goderville. By this time the troops were exceedingly tired, for during the last few days they had never been out of range of the mortar, the dive-bomber and the machine-gun. German tanks were approaching Dieppe and also had penetrated to the west of the River Durdent, so that the main body of 51st Division had no hope whatsoever of getting away from Le Havre. It was decided that St. Valéry-en-Caux should be the port of departure and that a perimeter should be drawn around it. Even while this decision was being reached enemy field guns were being placed in position on the cliffs overlooking the port.

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51st Division was now fighting on two fronts: (a) on a line facing east and running from Fontaine-le-Dun to Veules-les-Roses (on the coast east of St. Valéry-en-Caux). 1st Black Watch, 5th Gordons, 4th Seaforth and a battalion of the Duke of Wellington's Regiment from 'Beauman' Division, which was then retiring from Dieppe, occupied the line in this order from the right; and (b) a defensive position along the line of the River Durdent, occupied by 2nd Seaforth, 4th Camerons and 1st Gordons, while the Lothians and Border Yeomanry were to hold the line on the south side of the box thus formed until the French IX Corps reached it.

The perimeter round St. Valéry-en-Caux was never established as a fully defended line, however, for the reason that the Germans, moving with devastating speed, were already in Cany and approaching Veulettes. 51st Division therefore was obliged to relinquish the plan of defending the line of the Durdent and withdraw its flank to Le Tot, even though enemy tanks were thrusting through this place on to St. Valéry itself. By the 11th St. Valéry was literally surrounded by tanks.

On June 11, 12 and 13, Le Havre was finally evacuated. 'Arkforce', before leaving for Cherbourg and the United Kingdom, destroyed most of the installations and its own transport. Three officers and 150 O.Rs. of 154 Fd. Amb. embarked on the 12th, while 5 officers and 35 O.Rs. remained behind to establish dressing stations in the town and later on the quays. This rear party embarked on the 13th to join the rest of the unit at Cherbourg.

The Navy made strenuous efforts to bring ships inshore off St. Valéry but losses were so severe that the attempt had to be abandoned. On the 12th French IX Corps surrendered. The remnants of 51st Division were now in dire straits; their ammunition was nearly exhausted and there was no hope of rescue. The Navy got away some 2,137 British and some 1,184 French and 34 seamen and civilians from Veules-les-Roses, but for the rest, some 8,000 altogether, surrender quickly became inevitable.

But even this was not the end of the campaign in France. The B.E.F., stripped of its equipment, had been ejected from the Continent; 51st Division had been overwhelmed; French morale was swiftly sinking into a black abyss of despondency and the French armies were disintegrating. Nevertheless, the attempt was to be made to create and hold another bridgehead around the western ports in order that British forces might retain a footing on the Continent. General Brooke assumed command of the British troops in France.

While 'Beauman' Division moved from Rouen to the Risle, 52nd Division was landed at Cherbourg and St. Malo (June 8–14). With this division came 155, 156 and 157 Fd. Ambs., 18 Fd. Hyg. Sec. and 18 M.B.U. 157th Bde. moved at once to Conches, La Bonneville and

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Favorolles, west of Evreux and south of the Seine. At the same time 1st Division of the Canadian Army was, with the full consent of the Canadian Government, directed to Brest, while the British 3rd Division, re-equipped, was warned for return to France. In addition the French troops from Narvik together with French units evacuated from Dunkirk were sent back to France. But on June 14 it was reluctantly and finally decided that the situation in France was beyond repair and that the British and Canadian troops must be withdrawn without delay. The leading elements of Canadian 1st Division returned to the ships at Brest and came away.

On June 15, 52nd Division was back in the Cherbourg area, having moved by way of Dozulé, east of Caen, there to form a rearguard through which 'Beauman' Division withdrew on June 17.

The Royal Navy brought away safely 30,630 men from Cherbourg, 21,474 from St. Malo and 32,584 from Brest.

From Dunkirk 366,162 men had been evacuated. Subsequently from ports south of the Somme a further 191,870 had been got away (144,171 British, 18,246 French, 24,352 Poles, 4,938 Czechs and 163 Belgians).

British losses in France and Belgium 1939–40 were 68,111 killed in action, died of wounds, missing, wounded and taken prisoner-of-war, plus 599 who died from disease or injury. (*The War in France and Flanders* 1939–1940, pp. 305, 326.)

MEDICAL COVER FOR THE FIGHTING SOUTH OF THE SOMME

It has been recounted that on May 24 an improvised C.C.S. was established at Offranville, staffed by personnel from 2, 3 and 10 B.G.Hs. and evacuating to 13 B.G.H. at Rouen. On May 27 D.D.M.S. North District, L. of C., made arrangements whereby the casualties of elements of 12th Division, congregating around Arques-la-Bataille and Dieppe, should be evacuated to this improvised C.C.S. He also made arrangements whereby thirty ambulance cars were to be allotted for the evacuation of 51st Division, then in the process of assembling in the Haute Forêt d'Eu.

On the 28th D.D.M.S. North District received orders from H.Q., L. of C., that every attempt must be made to salvage all ordnance, medical and surgical equipment for shipment to the United Kingdom. Lorries were sent to 5 and 6 B.G.Hs. and to the Base Depot Med. Stores at Dieppe to remove as much as possible to the ports of Cherbourg and Le Havre for shipment.

When 51st Division was in position to the east of Arques-la-Bataille and Dieppe its casualties were being evacuated to Offranville, and to facilitate the evacuation of these casualties from the M.D.Ss. of the division twenty ambulance cars were sent from 1 M.B.S.A. to Grandecourt. On June 1 some 60 or 70 casualties were admitted from this

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division. A.D.M.S. Beauman' Division requested that casualties should be accepted from his brigade on the right, which was holding a line from Dieppe to St. Vaast. An ambulance car was allotted by 1 M.B.S.A. to each of the three battalions of this brigade. On June 2 casualties continued to flow into the improvised C.C.S. at Offranville. D.D.M.S. L. of C. was now advised that casualties from 51st Division should no longer be evacuated to Dieppe but should be sent into 13 B.G.H. at Rouen.

By the following day all the hospitals in 1 M.B.S.A. were cleared of medical stores, although a large quantity of ordnance stores still remained. Some 450 trucks of stores had been moved in the previous seven days. The area commander, under orders of G.O.C., L. of C., closed 1 M.B.S.A. and proceeded to the vicinity of La Baule, near St. Nazaire in the Nantes Sub-area, there to select a site for, and to organise, a new medical base store.

Meanwhile, in the Le Mans Sub-area every available man and every stretcher that could be spared by 9 B.G.H. at Le Mans were sent to Dieppe. This 600-bedded hospital had now expanded to 800 at Le Grand-Lucé and 250 at the detachment at Pacy. A.D.M.S., L. of C., arranged for the evacuation of the medical units in 1 M.B.S.A. *via* Le Mans into Rennes, Nantes, Brest and Cherbourg Sub-areas. The personnel of the general hospitals came by road together with the medical component of rear echelon G.H.Q. D.D.M.S., L. of C., became responsible for finding accommodation for these units and for the distribution of large numbers of R.A.M.C. and nursing personnel to other sub-areas. He formed at Mulsanne a pool of medical officers who could not, on returning from leave, regain touch with their own units. This pool was held at 9 B.G.H. He also opened a small depot of medical stores in a French barracks at Le Mans and sent on all that he could not accommodate to Savenay, near Nantes. A large number of motor ambulance cars was released into the sub-area from Dieppe. The cars were despatched by D.D.M.S., L. of C., to the Evreux and Rouen areas, to Le Mans and to 9 B.G.H. Into the sub-area came the section of 6 C.C.S. from Metz. Its equipment was stored and the section despatched to the coast for embarkation.

On June 14, 9 B.G.H. provided a detachment to act as a company of a field ambulance for 157th Inf. Bde. of 52nd Division which was now operating far in advance of its own field ambulance; 6,000 doses of morphia for self-administration by casualties in isolated tanks were despatched to 1st Armd. Division, this morphia having been discovered in the medical stores depot which had been created.

On June 14 also, orders were received by Nantes and Le Mans Sub-areas to close and to move to St. Malo. A.D.M.S. Le Mans Sub-area was instructed by D.D.M.S., L. of C., to supervise the evacuation and

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embarkation of 9 B.G.H. (Le Mans) by road to Sillé-le-Guillaume, on the Mayenne road, and thence by 2 Amb. Train to St. Malo and thereafter to assist the S.M.O. St. Malo with such additional personnel and material as he might require for the rearguard medical arrangements. On arrival, however, at Sillé it was found that 2 Amb. Train had been despatched by a R.T.O. empty to Rennes owing to enemy bombing. The personnel and stores of 9 B.G.H., therefore, were sent on to St. Malo by road. 9 B.G.H. embarked all patients and personnel, besides much valuable equipment. 3 Amb. Train arrived and its patients were likewise embarked on June 16.

Medical arrangements in connexion with 'Beauman' Division were made by D.D.M.S. L. of C. The system of evacuation was from A.D.S. to 9 B.G.H. at Le Mans by road and, to some extent, by ambulance train from 9 B.G.H. to 4 (La Baule, St. Nazaire) and 8 (Lesneven, Brest) by ambulance train and, to a lesser degree, by road; from 7 B.G.H. (Cherbourg) by hospital carriers to the United Kingdom or by ambulance train to Nantes and St. Nazaire. Of the ambulance trains there were ten surviving coaches of 4; 2 and 3 were complete, as were 336 and 368 French Amb. Trains. For each French ambulance train D.D.M.S. L. of C. provided one liaison officer, two Q.A.I.M.N.S. nurses and one sergt. R.A.M.C.

13 B.G.H. at Rouen and the detachment of 9 B.G.H. at Pacy evacuated their patients, nurses and excess personnel and equipment to 9 B.G.H. at Le Mans and thereafter functioned as a C.C.S., serving the left and right sectors of 'Beauman' Division respectively, and later as left and right A.D.S. By June 12 the left A.D.S. had been withdrawn from Rouen to Beuzeville, on the Rouen–Pont-l'Evêque road, while a C.C.S. improvised by D.D.M.S. L. of C., which had been functioning at Conches, withdrew to Sées.

When H.Q. 'Beauman' Division moved back toward the coast, 13 B.G.H. at Rouen closed and moved to St. Nazaire, whence it was evacuated. Some of its staff were included in an improvised field ambulance which was attached to 'Beauman' Division. From the hospital were also obtained medical equipment, lorries and ambulance cars. The improvised A.D.Ss., each staffed by a medical officer and 7 O.Rs., of this improvised field ambulance were sited (1) at Martainville, (2) at Buchy (both in the neighbourhood of Rouen), (3) at Gonneville and (4) at Fresnay. The M.D.S. was situated at Isneauville, a few miles north-east of Rouen. The A.D.S. at Gonneville was called upon to deal with very few casualties but became isolated. Its personnel, however, managed to work their way down the coast and across the Seine by ferry, and so got away. The A.D.S. at Buchy was quickly forced to withdraw and join the M.D.S. of the improvised field ambulance at Isneauville. The third A.D.S. at Martainville, due east of

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Rouen, though given ample warning of their danger, failed to rejoin H.Q. The reason for this failure was never discovered. H.Q. and the remaining two sections of this field ambulance came back with the rest of 'Beauman' Division and were embarked at Cherbourg. An improvised M.A.C. was formed towards the end of these operations. It was composed of some fifty ambulance cars obtained from various sources and was sited in the woods some miles south of Dieppe. Shortly after its formation it became isolated and its commanding officer was captured.

On June 16 a hospital ship arrived at St. Nazaire to evacuate 4 B.G.H. All the nursing staff of this and other evacuated units were crowded on to this ship, which sailed that night with a full complement of wounded from 9 B.G.H. (Le Mans) and from La Baule. The medical units now remaining in the area were:

1 and 4 B.G.Hs.
4 C.C.S.
A number of reception stations
Base Depot of Medical Stores
2 and 11 Fd. Hyg. Secs.

By early morning on June 17 all these were on their way to St. Nazaire. Throughout the night units were on the road moving towards this port and the roads converging on it were continually filled with streams of motor transport conveying personnel and stores. The staff of 4 B.G.H. left La Baule by road for Quiberon with the remaining patients to embark on a hospital ship there.

The shipping and the docks of St. Nazaire were now under constant aerial bombardment and about 1015 hours on the 17th the S.S. *Lancastria*, carrying about 5,800 troops, was struck and sunk. Survivors picked up by ferry boats and other small craft were thickly coated with crude oil; many of them had fractures and burns and were in a most pitiful state. They were sent to a French auxiliary hospital, while most of the uninjured were transferred direct to a ship in dock, although fifty or more were sent to the reception station at St. Nazaire. There French women organised a first-aid centre, providing hot water, soap, food, sweets, cigarettes and tea. They stripped the men and rubbed them down to remove the oil, provided them with clothing from their own homes and fed them. Meanwhile, in the French hospital nearby the nursing staff of nuns was similarly employed. The death roll was in the neighbourhood of 3,000. During the night of the 17th/18th, R.A.M.C. personnel were searching the docks, under constant aerial attack, for survivors of the *Lancastria* and, so far as is known, no wounded or sick were left behind in the Nantes Sub-area. There was no possibility, however, of embarking any medical equipment or stores with which the docks and quays were piled.

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During the night of June 18/19 thirty-five ambulance cars filled with wounded from Rennes arrived. Eight of the casualties were dead on arrival. The rest, some 150, many with serious burns, were promptly embarked. Two ships, one Norwegian and the other belonging to the Holt Line, were loaded with wounded. The latter ship took 141 and these were stowed in the hold on stretchers.

FORCE 'K.6'*

In November 1939 an Indian Army contingent—Force 'K.6'—was raised for service with the B.E.F. in France. It consisted of 22 officers and 1,800 I.O.Rs. and was composed of:

H.Q. Force 'K.6'
- 22nd Animal Transport Company
- 25th Animal Transport Company
- 29th Animal Transport Company
- 32nd Animal Transport Company
- 47th Supply Depot Section R.I.A.S.C.
- an advanced remount depot
- a reïnforcement unit
- a section of an I.G.H.

together with some 2,000 horses and mules.

Its medical component consisted of:

Medical detachment with H.Q. Force	1 S.M.O. 2 Sub-assistant surgeons I.M.D. 7 I.O.Rs. 1 sweeper.
Medical detachment with each A.T. Company	1 S.A.S., I.M.D. 1 N.O. 1 ward servant.
Medical detachment with the reinforcement unit . . .	2 S.A.Ss., I.M.D. 8 I.O.Rs.
The section of the I.G.H. . .	1 M.O. 2 S.A.Ss., I.M.D. 9 I.O.Rs.

The contingent reached Marseilles on December 26, 1939 and a few days later the following moves were made:

H.Q. Force and 25th A.T. Coy. to Rouvroy
29th A.T. Coy. to Le Mans
32nd A.T. Coy. to Orchies, near Douai
22nd A.T. Coy. } remained near Marseilles
47th Supply Depot Section } remained near Marseilles
The section I.G.H. moved to Dieppe and there became attached to 1 B.G.H. to form an Indian wing.

* Should greater detail be sought the Indian Official Medical History should be consulted.

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Each A.T. Coy. established a camp hospital in which its minor sick could be held up to ten days. The medical detachment was placed under the nearest British medical unit for administrative purposes. A medical detachment was attached to the British military hospital in Marseilles. All patients requiring a prolonged stay in hospital were congregated in the Indian wing of 1 B.G.H. Evacuation therefrom was to India and not to the United Kingdom. During the course of the campaign only one batch of patients left France for India.

The companies were mainly employed during the first phase of the campaign in transporting R.E. stores for constructional work in the frontier defensive position. On May 4, 22nd A.T. Coy. was attached to 51st Division on the Saar sector. The medical detachment with this company was attached to Lt. Sec. 6 C.C.S. 25th A.T. Coy. was u/c II Corps and was near Marquette-les-Lille. 32nd A.T. Coy. was u/c I Corps and was in Orchies. 29th A.T. Coy. was still at Le Mans. 47th Supply Depot Section was at Le Havre.

At the end of May H.Q. Force 'K.6', the reinforcement unit and the advanced remount depot were concentrated in Le Mans. On June 17 they were ordered to hand over their equipment and their mules to the civilian authorities and proceed forthwith to St. Nazaire for embarkation. They sailed for the United Kingdom, and after a perilous voyage reached Plymouth on June 19.

22nd A.T. Coy., withdrawing from the Saar sector, reached Mirecourt expecting to entrain there. The line had already been cut, however, and the company was captured on June 23. 25th A.T. Coy., withdrawing from Marquette-les-Lille, reached Dunkirk on May 27 and embarked on the 29th. 32nd A.T. Coy. encountered relatively little difficulty and embarked on the 25th.

The section of the I.G.H. attached to 1 B.G.H. and its 80 patients were evacuated by 4 Amb. Train on May 21. The train was heavily bombed and machine-gunned and received several direct hits. Several coaches were burnt out and many of the patients hit. The more seriously hurt were taken back to 1 B.G.H. and the rest to 2 B.G.H. with instructions to report at Dieppe station at 0630 hours next morning for evacuation to Le Mans. This they did, to find the train already crowded with French civilian refugees. Two cattle trucks were commandeered and in them the patients, together with the accompanying British and Indian medical personnel, travelled for two whole days to Le Mans where H.Q. Force 'K.6' and 29th A.T. Coy. were located. Arrangements were made for the attachment of the section of the I.G.H. to 9 B.G.H. at Le Grand-Lucé, twelve miles from Le Mans. But on June 12 the whole of the Indian units in Le Mans were instructed to proceed at once to St. Nazaire. On the 14th the section of the I.G.H. was attached to 8 B.G.H. in St. Nazaire. On

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June 15 A.D.M.S. Nantes Sub-area informed the medical units that all patients were to be evacuated by hospital ship and all medical personnel by ordinary transport. The convoy was attacked by German bombers while in St. Nazaire harbour but reached Plymouth safely on June 18. The medical component proceeded to Falmouth and thence to 11 Depot, R.A.M.C.

H.Q. Force 'K.6', 32nd A.T. Coy., the advanced remount depot, the reinforcement unit and the section of the I.G.H. moved to Shirley in Derbyshire, 29th A.T. Coy. to Doncaster and 25th A.T. Coy. to Glasgow. In October 1940 the whole force moved to Southern Command.

On October 15, 1940, the section of the I.G.H. which had been running a small hospital at Shirley moved to Devonport, where it was accommodated in the Stoke hospital. On April 23 the Indian wing received a direct hit during a heavy air raid and was destroyed. The section thereupon moved to Dinas House, Brecon, South Wales.

In June 1941, 3rd, 7th and 42nd A.T. Coys. arrived from India and the whole force moved to Brecon in Wales where it was employed in instructing British units in mountain warfare. It embarked for India on January 14, 1944.

The Health of the Troops. (*Force 'K.6'*.) The winter of 1939–40 was particularly severe. There were two epidemics of influenza and an appreciable rise in respiratory infections. Tonsillitis, broncho-pneumonia and pneumonia were common and the sick rate was high. There were many cases of tuberculosis but none of venereal disease until the reinforcements from India arrived in June, 1941; among these there were 11 cases, the disease having been contracted in Bombay. During the fighting in France Force 'K.6' endured 12 battle casualties.

(iv)

Review of the work of the Army Medical Services

THE ARMY DENTAL SERVICE

Accompanying the B.E.F. in the first stages of the move to France went a D.D.D.S. and the dental officers attached to the various field medical units. It had been assumed that the B.E.F. would embark for service overseas dentally fit, and in point of fact nearly all men of the regular units were made dentally fit before embarkation. The dental officers embarking with the B.E.F., therefore, had a reasonable chance of maintaining dental fitness and would be available to undertake the treatment of maxillo-facial injuries, for which work they were specially

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trained. But the numbers of dental officers were much lower than one per 1,500 troops, the ratio that had been recommended for a field force serving overseas.

The D.D.D.S. embarked for France with Main Medical Headquarters party on September 10, 1939.

7 B.G.H. was established at Cherbourg, with its dental department in part of the large French naval hospital. 4 B.G.H. opened at La Baule, near St. Nazaire, and 8 B.G.H. at Lesneven with its dental department at Brest. 1 B.G.H. was located at Dieppe and 2 B.G.H. was nearby at Offranville, both in the M.B.S.A. 9 B.G.H. had embarked, and was later located near Le Mans. Also in France were 4 C.C.S., 1 Fd. Amb. of 1st Division and 4 Fd. Amb. of 2nd Division. On September 22, the dental officer serving with 3 B.G.H. was appointed A.D.D.S. at the H.Q. of the M.B.S.A. at Dieppe with the rank of lieut. colonel. The D.D.D.S. was located at Dieppe. 10 B.G.H. had arrived at the end of September and was located at Dieppe. 1 Convalescent Depot opened at Château Gunsberg, near Dieppe.

The total number of executive dental officers who reached France during September, including those who had arrived with the field medical units of II Corps, was twenty-six.

Dental departments of the general hospitals were by this time fully organised. When it is remembered that those dental officers attached to casualty clearing stations and field ambulances had little opportunity for dental work on account of the assembly and movement, the fact that there were 426 recorded attendances for treatment during the first two and a half weeks in France speaks well for the way in which they adapted themselves to the new conditions.

By the end of October, 5 B.G.H. had arrived in France; 6 B.G.H. was located at Le Tréport, together with 2 Con. Depot, all within 1 M.B.S.A.

There was an increase of only six executive dental officers during the month, bringing the total to thirty-two.

The dental officers attached to C.C.Ss. had organised their dental departments and dental laboratories and were undertaking denture work sent from the field ambulances, whose dental officers had similarly opened dental centres in their respective locations. Dental work was becoming routine as the situation became static.

There were 7,248 attendances for dental treatment during the month of October, and over 5,000 teeth were extracted, involving 4,437 local anaesthetics and 127 general administrations; nearly 1,250 teeth had been conserved. Denture work was well in hand, 164 new and remodelled dentures had been fitted and 277 dentures repaired; but the records show that there were 594 men in need of new dentures and 313 who required renewals and repairs.

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The need for the establishment of larger dental centres than could be arranged with existing dental personnel attached to field medical units in the L. of C. Area was apparent. Dental officers were therefore detached from their parent units. A dental centre was formed at Chanzy Barracks, Le Mans. A dental officer was detached from 6 B.G.H. and opened a dental centre at Nantes. The dental departments of 1 and 4 B.G.Hs. were increased by the attachment of one dental officer from a field medical unit. The dental personnel of 1 and 2 C.C.Ss. were pooled to form one large dental laboratory.

In November the dental officer of 2 Con. Depot opened a dental centre at Avesnes for the treatment of G.H.Q. troops and the dental centres established at Le Mans and at Nantes were each increased to two officer centres.

By the end of November the number of dental officers in France had increased by five.

In December a dental centre was established at Rennes. There were now two dental officers attached to 5 B.G.H. 11 B.G.H. had arrived near Le Havre, being located in the Advanced Base Area that was being formed. The close of December saw a further four dental officers in France, making a total executive strength of forty-one.

November records showed an increase in the amount of routine dental treatment carried out, but the limit of what could be undertaken by the dental officers available had been reached. This can be seen from the following figures: in November there had been 11,979 attendances for treatment; in December 10,484. The number of teeth conserved in November was 1,920, and in December 2,083; 8,266 teeth were extracted in November, 7,165 in December. The total number of new dentures, remodelled dentures and repairs fitted in November was 1,065, and in December 1,156. The figures giving the total number of men awaiting denture work caused much anxiety for they were rapidly increasing. In November 1,384 men were waiting for new dentures and 707 men for renewals and repairs, a total of 2,091 men requiring denture work of one kind or another. At the end of December these figures had risen to 1,608 men awaiting new dentures and 714 men awaiting renewals and repairs, an outstanding total of 2,322 men requiring denture work to be carried over into the following month. With the facilities available a total of just over 1,100 new dentures, remodels and repairs could be completed in one month by the dental laboratories.

A proposal was sent to the War Office from G.H.Q., B.E.F., in mid-December for the establishment of static Army dental centres at Avesnes, for the treatment of G.H.Q. troops, at Nantes in 2 B.S.A., at Brest and Rennes in 1 B.S.A. and at Le Mans, H.Q. of the L. of C. Area. In addition, it was recommended that the dental centres at

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Nantes and Le Mans should each be supplied with a mobile dental van for visiting isolated units. Dental centres had already been opened at these locations, but they were staffed by dental personnel detached from field medical units. The acceptance of this proposition would have meant the immediate increase of dental officers in France by ten, of dental mechanics by seventeen and of dental clerk-orderlies by ten, and thus would have released the detached dental personnel for duty with their field medical units.

17 B.G.H. arrived early in January and was located at Camiers. This was the first general hospital to be established in the area around Boulogne, which was later to become 2 M.B.S.A. 16 B.G.H. and 20 B.G.H. arrived in mid-January and were located in and around Boulogne. Towards the end of January 13 B.G.H. was established at Rouen in 3 B.S.A.

There was a total increase of sixteen executive dental officers during January, all attached to field medical units.

Early in February 1940, 18 B.G.H. was established at Etaples and 21 B.G.H. was at Boulogne, both within 2 M.B.S.A. 3 Con. Depot opened some miles east of Rouen, but its dental officer joined the dental personnel of 13 B.G.H. at Rouen.

There had been an increase of only three executive dental officers in the month, bringing the total in France at the end of February to sixty. The total strength of the force was now 275,144 all ranks, 4,585 men to each dental officer.

The inadequate number of dental officers with the B.E.F. and the accumulation of arrears of work was now causing grave concern to D.D.D.S. The absence of a minimum dental standard now began to have its repercussions and, although the pre-war Home Establishment had been adjusted to remedy this, no allowance for it had been made in a war establishment for the Army Dental Corps serving with a field force.

At the end of January 3,304 men were awaiting new dentures and 900 men required renewals and repairs, a total of 4,204 men in urgent need of denture work. By the end of February this total had been reduced to 3,856 men, but had again soared to the unmanageable figure of 4,861 at the end of March despite the facilities given for sending out mechanical work, under local arrangements, to French civilian dental laboratories.

At the beginning of March D.A.D.S. went to France for consultations with D.D.D.S. He visited several general hospitals, C.C.Ss. and field ambulances to gain first-hand information of the situation from dental officers in the field. Discussions with the Adjutant-General and D.M.S., B.E.F., who were both aware of the urgent necessity of effecting increases in dental personnel, gained their full support for the proposal that was then formulated.

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In view of the constant changes in the strength and location of troops it was not considered desirable to fix establishments for particular areas. It was decided, therefore, to seek approval for the increase of the number of dental officers from one to two in those field medical units to which dental officers were already allowed by war establishments, and in the case of a 1,200 bedded general hospital from one to three. A corresponding increase in other rank personnel was also recommended. Additional dental personnel were envisaged for dental centres and dental laboratories in base areas and on the L. of C.

At this time it was not generally recognised that the dental condition of those joining the army from the civilian population was most unsatisfactory and was the cause of much wastage of man-power. So it was that these requests for increases in establishments met with no success.

The immediate requirements of the force were met by despatching, on April 6, 1940, ten dental officers, seventeen dental mechanics and ten dental clerk-orderlies, in anticipation of authority being given and at the expense of the home strength. Later, an additional nine officers and twenty-one other ranks, in excess of war establishments, were despatched with the field medical units of 12th, 23rd and 46th Divisions.

In March there was a considerable influx of dental officers. Those attached to the field medical units of 42nd and 44th Divisions arrived along with 14 B.G.H. 4 Con. Depot opened at Wimereux, near Boulogne, in 2 M.B.S.A. 5 Lt. Fd. Amb. of 1st Army Tk. Bde. was in France at the end of the month.

Two dental officers had been evacuated to England for reasons of health in March and one had embarked, in April, with 158 Fd. Amb. of 15th Inf. Bde. for operations in Norway. The total number of executive dental officers in France at the end of April was ninety-five.

Each of the field ambulances of 12th, 23rd and 46th Divisions which arrived in April—182, 186 and 183—was accompanied by four dental officers, four dental mechanics and four dental clerk-orderlies—nine officers and twenty-one other ranks in excess of war establishments.

The senior dental officer of 186 Fd. Amb. of 23rd Division took over the dental centre at Miraumont from 2 C.C.S. and expanded it to a four-officer centre.

The senior dental officer of 182 Fd. Amb. of 12th Division was located in 3 B.S.A. A two-officer dental centre and a dental laboratory employing the four dental mechanics was opened at Formerie, the headquarters of the field ambulance. A single-officer centre opened at St. Saëns with 'A' Coy., and another one-officer centre with 'B' Coy. at La Manoire.

183 Fd. Amb. of 46th Division was in 2 B.S.A. The senior dental officer with this unit detached two of his officers to the dental centre

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at Nantes, while he himself remained at Redon, the divisional headquarters, and the fourth officer opened a centre with the field ambulance headquarters at Doullens.

The dental personnel of 14 B.G.H. were temporarily attached to 13 B.G.H. A three-officer dental centre was opened for the treatment of troops of 1 and 2 Infantry Base Depots at Le Madrillet, four miles outside Rouen. The dental officer of 13 B.G.H. opened his dental department on the north side of the river at Rouen; this developed into a three-officer centre with a two-officer detachment at the General Base Depot at Forges. A well-equipped central dental laboratory was being prepared, but this was destined never to function as such.

The dental officer of 1 B.G.H. was now acting as senior dental officer of 1 M.B.S.A. He had made arrangements for the concentration of all maxillo-facial injuries at Dieppe in order that appropriate treatment could be given at the earliest opportunity before evacuation to England. Dental officers arriving in France now disembarked at Dieppe, where they spent approximately one week attending lectures on maxillo-facial injuries and learning army routine. Many of these officers belonged to the T.A.R.O. and had had no opportunity for previous training. The training and trade testing of other ranks transferred from other units as dental mechanics were organised here.

The dental centre at Nantes, opened in September 1939, had expanded to a seven-officer centre with two detachments. Its connexion with 6 B.G.H. had been severed and it was now a self-accounting unit.

The dental department of 9 B.G.H. had moved to Le Grand-Lucé, near Le Mans, and was treating troops coming from Mulsanne attached to 5 Infantry Base Depot and to the Royal Artillery Central Base Depot. The dental department of 4 B.G.H. at La Baule was expanded to a three-officer centre and was responsible for the treatment of the troops attached to the base depot at Pornichet. Most of the other general hospitals had by now two attached dental officers.

Certain of the C.C.Ss. had pooled their resources in order to form larger corps dental laboratories; for example, 1 and 8 employed an additional five dental mechanics detached from field medical units in 1 M.B.S.A., and 6 and 9 had a total of ten dental mechanics working.

A further six dental officers had arrived by May 9, 1940, making the total executive strength one hundred and one at that date.

Reports show that dental equipment was in every way satisfactory and complete. On account of the static nature of the front during this period demands were made for the inclusion of dental mechanics and dental mechanics' outfits with field ambulances. Subsequent events proved that this would have been quite impracticable. General hospitals asked for continuous nitrous gas apparatus and special elevators.

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Accommodation generally was good, requisitioned buildings being used as far as possible. The dental departments of general hospitals and convalescent depots were mainly in buildings, but some of the detachments formed from them at various times often used the Nissen hut. C.C.Ss. were mostly in buildings, but some of the dental departments were established in Nissen huts divided into four rooms—waiting room, surgery, dental laboratory and office. Field ambulances used a wide variety of accommodation; some were most comfortable in cottages and houses and sometimes even in the dental surgery of a mobilised French dental surgeon; others were not so fortunate. Most of these centres had been established in one and the same place since the arrival of the field ambulance in France, and it was this lack of movement that made dentistry in the field seem so easy. The desire to accumulate extra equipment can thus be understood. (Plate VII shows a dental surgery in action in the field.)

The B.E.F. was to be divided into two armies as soon as the number of divisions in the field, excluding the armoured division which was due in France at the end of May, rose above eleven ; the staff of the medical branch of the headquarters of this second army had been nominated and certain of its members, including the D.M.S. designate, moved to France. The L. of C. Area had already been reorganised into two districts. Dental administrative appointments had been included in this reorganisation as under, although none of them were officially implemented.

At the headquarters of each army, there was an A.D.D.S. with the rank of lieut. colonel; at the headquarters of the L. of C. area, an A.D.D.S. with the rank of lieut. colonel; at the headquarters of each L. of C. district, a D.A.D.D.S. with the rank of major; at the headquarters of each medical base sub-area, a D.A.D.D.S. with the rank of major.

But these developments did not take place, for in the second phase of this campaign there was no possibility of such expansion. During this phase the affairs of the Army Dental Service cannot be disentangled from those of the Army Medical Services generally.

THE ARMY RADIOLOGICAL SERVICE*

The campaign in France, 1939–40, brief though it was, afforded the opportunity for the testing and the reshaping of the policy that had been adopted in respect of the organisation and equipment of this service. When general hospitals and C.C.Ss. began to reach their appointed places, difficulties, some of them unforeseen, were at once

* The substance of this account was provided by Brigadier D. B. McGrigor who, during the war years, served first as adviser and later as consultant radiologist in the Army Medical Directorate of the War Office.

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encountered. The French electricity distribution, mostly overhead, was found to be in a doubtful state of repair at 115 volts D.C. It was not at all certain what loads the lines would carry. Yet, since the generators and rotaries belonging to these medical units did not all arrive according to schedule, use had to be made of the local supplies. In certain instances the buildings taken over for use as general hospitals had no lighting system. In the case of the tented hospital firm pathways had still to be made. So it was that the 90/30 transportable X-ray unit could not be used. It became necessary, therefore, to call for smaller portable sets and a few 60/10 portables were sent out from the United Kingdom.

At the instigation of the Adviser in Radiology, War Office and with the encouragement of the Consulting Surgeon, B.E.F., the radiologist on the staff of 1 B.G.H. was recognised as the adviser in radiology to the Consulting Surgeon. At the same time steps were taken by the Adviser in Radiology, War Office to cause to be created an appointment of Adviser in Radiology to the B.E.F. whose functions should be:

(*a*) to inspect all medical units within the Force that were supplied with X-ray equipment;
(*b*) to advise Os.C. medical units as to the allocation of accommodation for X-ray and physiotherapy departments and the erection of such equipment;
(*c*) to correspond directly with the O.C. of any such medical unit on these matters (providing copies of such correspondence to the D.D.M.S. or A.D.M.S. concerned);
(*d*) to report to D.M.S. directly or through the appropriate senior medical administrative officer to whose H.Q. he was attached on subjects concerning X-ray and physiotherapy departments and equipment within the Force;
(*e*) to inform himself of the X-ray and physiotherapy equipment held in base and advanced depots of medical stores and to claim the co-operation of the officer-in-charge of the depot in regard to matters within the Adviser's jurisdiction;
(*f*) to establish an effective liaison with the R.E. and R.A.O.C. in each area;
(*g*) to exercise control over all radiologists and radiographers in the B.E.F., the movement of such personnel to be carried out by the appropriate authority on his recommendation.

Towards the end of the year the R.E. had provided a line supply of 200/230 A.C. to many of the base hospitals, all of which were now equipped with physiotherapy apparatus. The need was now felt for the appointment of an X-ray engineer, and application was made for the creation of this post. This was the small beginning of what ultimately grew into an army X-ray service unit. A technician, with the

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rank of lieutenant R.A.O.C. was to be attached to the Adviser in Radiology B.E.F., provided with an adequate workshop at the Base Depot Med. Stores and encouraged in all ways to co-operate with the R.E.

Even in September the flood of gastric cases sent into hospital for barium meal examination was overtaxing the radiological resources of the base. It happened that the French radiologist in Dieppe had been called up for military service, and by arrangement it became possible to rent his house and equipment. This became the extension of 1 B.G.H. and was used as the centre for these cases. At this time too the Consulting Dermatologist wished to set up an X-ray centre of his own for the treatment of skin conditions. This policy was opposed by the (acting) Adviser in Radiology, B.E.F., who offered to provide the requisite facilities for such treatment. This was the policy finally adopted.

In January 1940, an increase in the establishment was granted. This increase, in the case of a 1,200 bedded general hospital, was 1 sergeant and 2 privates for employment in the radiological department. For a 600-bedded hospital the increase was 1 sergeant and 1 private.

The scale of equipment was now stabilised, thus:

(*a*) Mobile C.C.S. .	77/15 portable X-ray set
(*b*) Stationary C.C.S.	77/15 portable X-ray set + 90/30 trolley set
(*c*) B.G.Hs. 1–12 . .	to retain mobile unit as well as trolley sets.
(*d*) B.G.Hs. 12+ . .	trolley sets only.
(*e*) 4 selected Gen. Hosps.	to be equipped with heavy duty stationary sets as supplied to military hospitals at home (these for use for gastro-intestinal and chest cases in numbers).
(*f*) Base Depot Med. Stores .	a pool of trolley sets to be maintained.

One serious difficulty presented itself about this time. It was commonly necessary, in the interests of the patient and of the Ministry of Pensions, to send X-ray films to the United Kingdom. When bundles of these were sent back by way of a convoy officer, they usually failed to reach their destination. When a film was tied on to a patient or along his limb, the patient almost invariably arrived without the film. Then the French system of *Pochettes Radiologiques* (with a specially designed envelope of standard size) was adopted. It proved to be useless and the dark cupboards of general hospitals everywhere became filled with them. This difficulty was never overcome.

While awaiting the appointment of the X-ray engineer, a civilian X-ray engineer from the firm which was supplying the bulk of the B.E.F. X-ray equipment was sent out from the United Kingdom for temporary duty. He tested all the sets and supervised the erection of the large units in the base hospitals.

It became necessary to restrict the use of diathermy machinery to certain types of head, chest and bladder surgical cases, for complaints

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were received from the Wireless Transmission Committee concerning troublesome interference.

By April the general hospitals had made considerable progress in respect of structural alterations, the provision of X-ray huts and of adequate roads, but the mains supply of electricity was even yet unsatisfactory. These X-ray huts were being provided by the R.E. to specifications drawn up by the Adviser in Radiology, War Office. The

TABLE 4

Partial Summary of Radiological Work. B.E.F. Monthly Returns consolidated to end of March 1940

General Hospitals

Name of unit	Date X-ray dept. opened	Number of cases examined						Totals	Remarks
		Oct.	Nov.	Dec.	Jan.	Feb.	March		
	1939								
1	Oct. 12	217	368	246	309	318	374	1,832	
2	Nov. 19		113	422	360	518	553	1,966	
4	Sept. 29	428	350	306	330	385	385	2,184	(Including Sept.—89)
5	Dec. 14			69	158	174	275	676	
7	Sept. 30	136	112	103	98	121	85	655	(Including Sept.—4)
8	Oct. 5	167	96	208	208	175	106	960	
9	Sept. 29	145	118	102	138	221	145	869	(Including Sept. figs.)
10	Oct. 31	3	140	147	259	212	235	996	
	1940								
11	Jan. 1				127	224	213	564	
16	Feb. 12					74	96	170	
17	Jan. 24					108	156	264	
Total general hospitals		1,096	1,297	1,603	1,987	2,530	2,623	11,136	

C.C.Ss.

Name of unit	Date X-ray dept. opened	Oct.	Nov.	Dec.	Jan.	Feb.	March	Totals	Remarks
	1939								
2	Oct. 12	17	186	163	171	165	123	825	Closed March 16, 1940
3	Oct. 18	66	203	191	117	166	312	1,055	
4	Sept. 28	82	126	113	85	115	132	653	
5	Nov. 11		63	175	239	202	107	786	Closed March 16, 1940
	1940								
8	Mar. 16						153	153	
9	Mar. 16						139	139	
Total C.C.Ss.		165	578	642	612	648	966	3,611	
Additional general hosps.		1,096	1,297	1,603	1,987	2,530	2,623	11,136	
Grand totals		1,261	1,875	2,245	2,599	3,178	3,589	14,747	

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appointment of the X-ray Service Officer was now sanctioned, but it was not until June that the technician nominated for the post took up his duties.

On May 10 the position in so far as the radiological service was concerned was as follows:

The general hospitals on the whole were satisfactorily staffed and equipped and an X-ray department was in process of being provided at the Military Hospital, Marseilles; 1, 2 and 5 C.C.Ss. were in reserve and unopened and 3 was moving from Mondicourt to Frévent; 4, 6, 8, 9, 10 and 12 had X-ray departments in buildings.

On May 15 the Adviser in Radiology, B.E.F., recommended that all Rapidex X-ray units surplus to requirements in the general hospitals should be sent to the Base Depot Med. Stores at Dieppe. When on the 19th Dieppe was heavily raided and bombed, all the X-ray stores in the Base Depot Med. Stores were distributed among 2, 3 and 10 B.G.Hs. When the medical units were evacuated from Dieppe a certain amount of the more portable X-ray equipment was salvaged and taken to 4 B.G.H. at La Baule. The Adviser in Radiology, B.E.F., with a C.C.S. lorry loaded with portable X-ray equipment, joined and served with 'Beauforce'. In the final evacuation of the medical personnel on June 18 no equipment was permitted to be taken on board so that all X-ray material was lost.

THE ARMY TRANSFUSION SERVICE*

GENERAL ORGANISATION

The B.E.F. was the first testing ground for the theoretical ideas concerning the Army Transfusion Service in the field. The experience of the field transfusion unit officers in particular during the second phase of this campaign enabled conclusions to be reached, which were shown in subsequent more favourable campaigns to have been correct. The transfusion service in B.E.F. was provided by one unit, the Blood Transfusion and Surgical Research Laboratory (B.T.S.R.Lab.), the first and last unit of this name, which was divided into a headquarters, and a number of mobile refrigerator units (in subsequent campaigns called F.T.Us.) each of which was attached to a C.C.S. or other medical unit or centre receiving casualties, where it undertook all resuscitation work. The war establishment of the B.T.S.R. Lab. differed in two

* (1) The substance of this account was provided by Sir Lionel Whitby, now Regius Professor of Physic in the University of Cambridge, then Brigadier and in charge of the Army Transfusion Service—an organisation which was very much his own creation.

(2) Under the impact of war there was an acceleration of scientific enquiry and an eager application of scientific knowledge to human and social affairs. No branch of scientific knowledge and no form of application of scientific knowledge received greater stimulus and enjoyed greater opportunity than did that which pertains to blood transfusion. For this reason this section which deals with the Army Blood Transfusion Service claims a somewhat unusually detailed treatment in this volume.

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important principles from the final establishment of its successor, the base transfusion unit:

(1) The F.T.Us. were borne upon its strength.

(2) No provision was made for forward distributing units or advanced blood banks.

H.Q., B.T.S.R. Lab. was sited until May 21, 1940, at 1 M.B.S.A. at Dieppe, which was within easy flying distance of the Army Blood Supply Depot, Bristol, was adequately connected by good roads with the British sector along the Franco-Belgian frontier, and was used as a port of entry for medical supplies. From May 23 to June 16, 1940, it operated at La Baule.

Requisitioned houses, in addition to providing living accommodation for officers and other ranks, were equipped with rooms for the assembly of apparatus, laboratories for the preparation of crystalloid solutions, a still room, a sterilising room, refrigerator repair shop, stores for transfusion equipment, and laboratories for research furnished by the Royal College of Surgeons in England.

The preparatory months (October 1939–April 1940) were largely spent in setting up the headquarters unit, and in forming and detaching field transfusion units. The transfusion service was cautiously feeling its way and planning for the active campaign.

The B.T.S.R. Lab. was held responsible for:

(i) The technical supervision, under the direction of D.D.P., of all transfusion units and transfusion arrangements in the B.E.F.

(ii) The reception of stored blood, plasma and transfusion equipment from A.B.S.D., and the distribution of these stores to medical units, preference being given to field medical units.

An air link, first established with A.B.S.D. on October 6, 1939, provided the means of transport for most of the fluids and less heavy bulky equipment which were received and distributed by B.T.S.R.Lab. and was maintained except for a few weeks in the winter of 1939–40, until June 11, 1940. Until the actual fighting started in May, the amount of blood received was gauged to maintain a level of 10 bottles in each functioning F.T.U. and to meet the needs of hospitals opening in the medical bases at Dieppe and Boulogne.

(iii) Training of medical officers and other ranks.

The interest shown in the service, which was destined to take such an eminent part in later campaigns, was disappointing. The service had yet to show its worth, and until May was really unnecessary. Although some lecture-demonstrations were given to clinical personnel, the number of officers and other ranks trained was small.

(iv) Preparation of crystalloid solutions. The preparation of the following crystalloid solutions was begun shortly after Christmas 1939:

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Isotonic glucose-saline (2·5 per cent. glucose, 0·425 per cent. saline): 540 c.cm. bottles.

Sodium citrate 3 per cent.: 100 c.cm. bottles.

Bulk supplies were issued to the Base Depot of Medical Stores and thence distributed through normal channels. The productive capacity of B.T.S.R. Lab. when fully developed was 1,000 540 c.cm. bottles per week.

(v) Assembly of apparatus: salvage and re-assembly of used apparatus:

This function of B.T.S.R. Lab. was never fully exercised. The issue of crystalloid solutions in the standard blood transfusion bottle revealed the fact that suitable apparatus for their administration was not included in the I.1248 equipment of medical units. At the same time it became obvious that B.T.S.R. Lab. could not undertake the supply of blood to isolated medical units along the L. of C. stretching from St. Nazaire, Brest and Cherbourg, to the Pas-de-Calais area, since the distances involved were too large for road delivery and the amounts required too small to justify air transport. Such units had to be self-supporting.

A survey of I.1248 equipment made in conjunction with the consulting surgeons, B.E.F., showed that no simple, easily cleaned apparatus for taking and giving blood was available in medical units, which were provided only with rather complex old-fashioned apparatus surviving from the War of 1914–18.

It was therefore decided to introduce a set for the collection of blood from local donors, and a giving set which could be used for giving blood or crystalloid solutions contained in the standard blood transfusion bottle. The taking set used at A.B.S.D. Bristol was adopted (known as Taking Set (Universal Pattern)) and a giving set was designed which was the forerunner of the later standard Hospital Pattern Giving Set, from which it differed only in minor points of detail. The manufacture of this equipment was delayed until May 1940 by slow delivery of components, but some general hospitals were equipped during June 1940. A medical administrative instruction was issued ordering all medical units to empanel at least 25 Group O donors from their own personnel.

(vi) Refrigerator maintenance. The war establishment of B.T.S.R. Lab. included a R.E. officer, and N.C.Os. for the repair and maintenance of all mobile refrigerators within the force. A workshop was established for this purpose which serviced the refrigerators of all F.T.Us.

(vii) Depot for field transfusion units: H.Q. B.T.S.R. Lab. acted as the base for the personnel of F.T.Us. working with forward medical units, supplying reliefs for officers and men during leave or sickness, providing stores of all kinds, etc.

(viii) Research, in particular into the effects of injury, treatment of battle casualties, wound infection and chemotherapy. This side of the B.T.S.R. Lab. was never developed. Although it was one of the purposes for which the unit was designed, the difficulties of such

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work were not foreseen. The B.E.F. was engaged throughout the waiting months in training, planning, organisation and construction; little attention could be given to the needs of what, in the absence of casualties, appeared to be an academic pursuit. While the lack of raw material prevented any clinical research, little academic work could be profitably undertaken in an incompletely equipped laboratory. Such work as might have been done was already in hand in England in ideal circumstances. Apart from these technical difficulties, all of which, save the lack of casualties, it might be argued, could have been overcome, there was a conspicuous lack of any considered policy and direction of research. It was never made clear whether the medical officer personnel of B.T.S.R. Lab. were to carry out research on problems (which were never specified), should the opportunity have arisen, and at the same time perform their military duties as F.T.U. officers, etc., or whether visiting teams of special investigators working on specific problems would be attached to B.T.S.R. Lab. as a parent unit. It also gradually became clear, that any research worker interested in the above problems must go to the casualties, and that a laboratory firmly sited at medical base would be of little use, other than as a base. B.T.S.R. Lab. accommodated for a few months the Consulting Biochemist to B.E.F. He found himself severely handicapped by the great distance by which he was separated from most of the force.

MOBILE REFRIGERATOR UNITS (FIELD TRANSFUSION UNITS)

Each unit consisted of:
- 1 Medical Officer (Transfusion Officer).
- 2 Nursing Orderlies (Ptes.).
- 1 Driver R.A.S.C.
- 1 Type A refrigerator mounted upon 15 cwt. 4 × 2 truck. (*See* Plate VI.)

The officer and other rank personnel of these units were drawn from the B.T.S.R. Lab. Between October 1939 and May 1940, units were formed and detached to C.C.Ss. as these opened, and to 2 M.B.S.A., Boulogne, in the British sector, and to the C.C.S. attached to the A.A.S.F. operating from bases in the French zone in the neighbourhood of Rheims. By the time the B.E.F. was withdrawn from the Continent nine such daughter units had been formed and attached for all purposes to 1, 2, 3, 4, 5, 6, 8, 9 C.C.Ss. and 17 B.G.H., Boulogne Medical Base.

The duties of the F.T.U. could not be clearly defined until they had been in action. Consequently there was some haziness as to what part they would play in the organisation of the units with which they worked, the commanding officers of some of which tended at first to regard them as a convenient source of additional man-power. Since their duties

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were ill-defined, their medical equipment, which was negligible, likewise necessarily showed lack of planning, which was also evident in the nomenclature of the other ranks who were called 'refrigerator orderlies', whose main duty was to be the care of the type 'A' refrigerator. The training given to these men emphasised their mechanical duties to the almost total exclusion of their medical duties, the vital importance of which was not at first realised. A unit, thus equipped and trained, could expect to do little more than keep a stock of stored blood, and give transfusions; it could not easily undertake the running of a resuscitation ward and all that that term implies.

During the months before May 1940, it became clear that considerable training and additional medical equipment were necessary to produce a really useful unit, the attachment of which would bring relief and valuable help to a busy medical unit receiving battle casualties. Consequently further training was given by the F.T.U. officers to the medical orderlies, who were drilled in the duties they would perform in the resuscitation ward, while the drivers of the refrigerators were trained in their care, not without stiff opposition from some who interpreted their calling in the Army in a too narrow but officially correct sense. At the same time an unofficial I.1248 scale of equipment was drawn up and issued. By May 1940 all the transfusion units had been well trained and were ready to operate resuscitation wards.

In addition to intensive unit training, all F.T.U. officers while attached to C.C.Ss. gave lecture-demonstrations in divisional and corps medical units and devoted much time to developing a close liaison with such units, particularly field ambulances, and to planning the possible means of supplying transfusion fluids to units in front of the C.C.Ss.

STATISTICS OF WORK AND MATERIAL PREPARED

Receipts of Blood and Plasma. No records of the amounts of crystalloid solutions or apparatus prepared by B.T.S.R. Lab. were brought back to England.

Transport and Communications: During the preparatory months of the campaign, the following scheme had been worked out; part was in operation during these months, part came into operation when the fighting began.

(*a*) *Transport*

(i) A.B.S.D.-B.T.S.R. Lab. Air transport was used for the carriage of blood and plasma and less bulky stores. Four twin-engined D.H.80's operated by A.T.A. were at the disposal of the Transfusion Service each of which carried 100 bottles of blood, packed in insulated boxes, holding 20 bottles and 20 giving sets. Time for journey: 2½–3 hours.

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TABLE 5

Receipts of Blood and Fluid Plasma from A.B.S.D. Bristol

	Blood	Plasma	Overseas giving sets
October 1939	120	—	120
November ,,	70	—	70
December ,,	110	7	117
January 1940	110	—	110
February ,,	121	15	136
March ,,	120	14	134
April ,,	216	40	256
May ,,	1,040	116	1,156
June ,,	100	—	100
Totals	2,007 bottles	192 bottles	2,199 sets

(ii) B.T.S.R. Lab.–F.T.Us. Road transport was used for distribution forward from Dieppe, except to the F.T.U. attached to A.A.S.F. at Epernay, which was supplied by an air link provided by A.T.A. aircraft. The use of air for forward distribution to the British sector had been seriously considered but was rejected because of the lack of conveniently sited airfields close to C.C.Ss. with which F.T.Us. would be operating, and the inability, owing to lack of personnel and transport, to site permanently on one or more landing fields, F.T.Us. which would act as advanced blood banks.

The transport available for distribution of blood (packed in insulated boxes) and other transfusion supplies was meagre, and was supplemented by the loan of ambulances from M.A.C. A utility van was attached from B.T.S.R. Lab. to 8 F.T.U., which assumed the rôle of advanced blood bank, receiving bulk supplies from B.T.S.R. Lab. for distribution to all F.T.Us. in British sector.

(*b*) *Communications*

The system of communications depended in large measure upon the Deputy Director of Pathology, G.H.Q., who undertook, if necessary, to receive and re-transmit messages concerning transfusion supplies, and involved the attachment of dispatch riders to all F.T.Us. Provisioning of F.T.Us. prior to battle was to be performed on the advice of D.D.P.; in the event no such warning was possible.

(i) *F.T.U.—Advanced Blood Bank.* Demands could be sent by dispatch rider, teleprinter or telephone from F.T.Us. to Advanced Blood Bank.

(ii) *Advanced Blood Bank—B.T.S.R. Lab.* Demands could be sent by dispatch rider, teleprinter or telephone direct, or alternatively *via* D.D.P., G.H.Q. to B.T.S.R. Lab.

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PLATE I. France, 1939–40. At a Casualty Clearing Station. Types of Uniforms then worn.

[*Imperial War Museum*

PLATE II. France, 1939–40. A Ward in a British General Hospital in the Casino, Dieppe.

[*Imperial War Museum*

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PLATE III. France, 1939–40. An Ambulance Train. Interior of a coach.

[*Imperial War Museum*

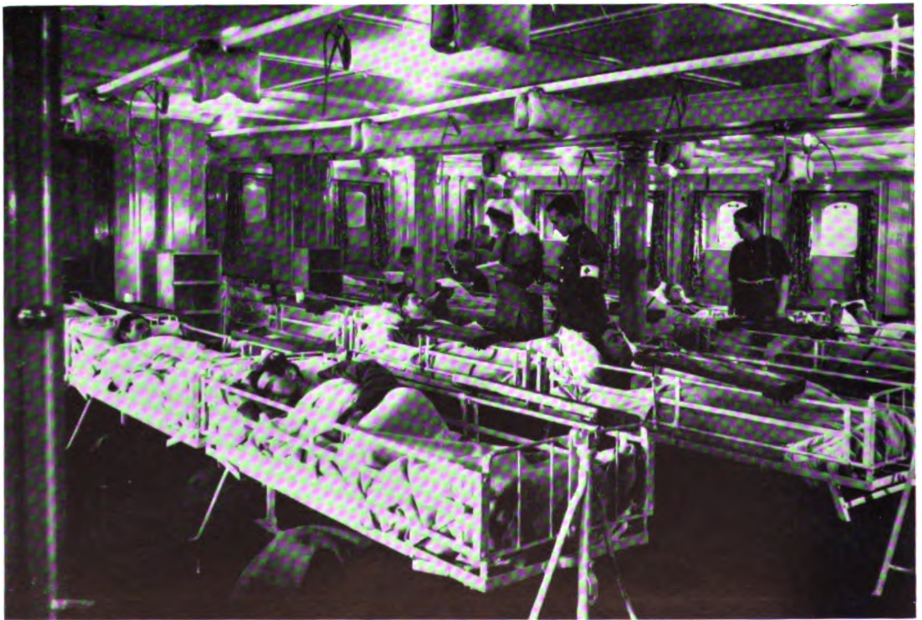

PLATE IV. France, 1939–40. A Ward in the hospital carrier, *Isle of Thanet*.

[*Imperial War Museum*

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PLATE V. France, 1939–40. Battle Casualties of 51st Division reach the R.A.P. of 4th Camerons near Hughenville, Somme.

[*Imperial War Museum*

PLATE VI. France, 1939–40. An Army Transfusion Service Refrigerator Van.

[*Imperial War Museum*

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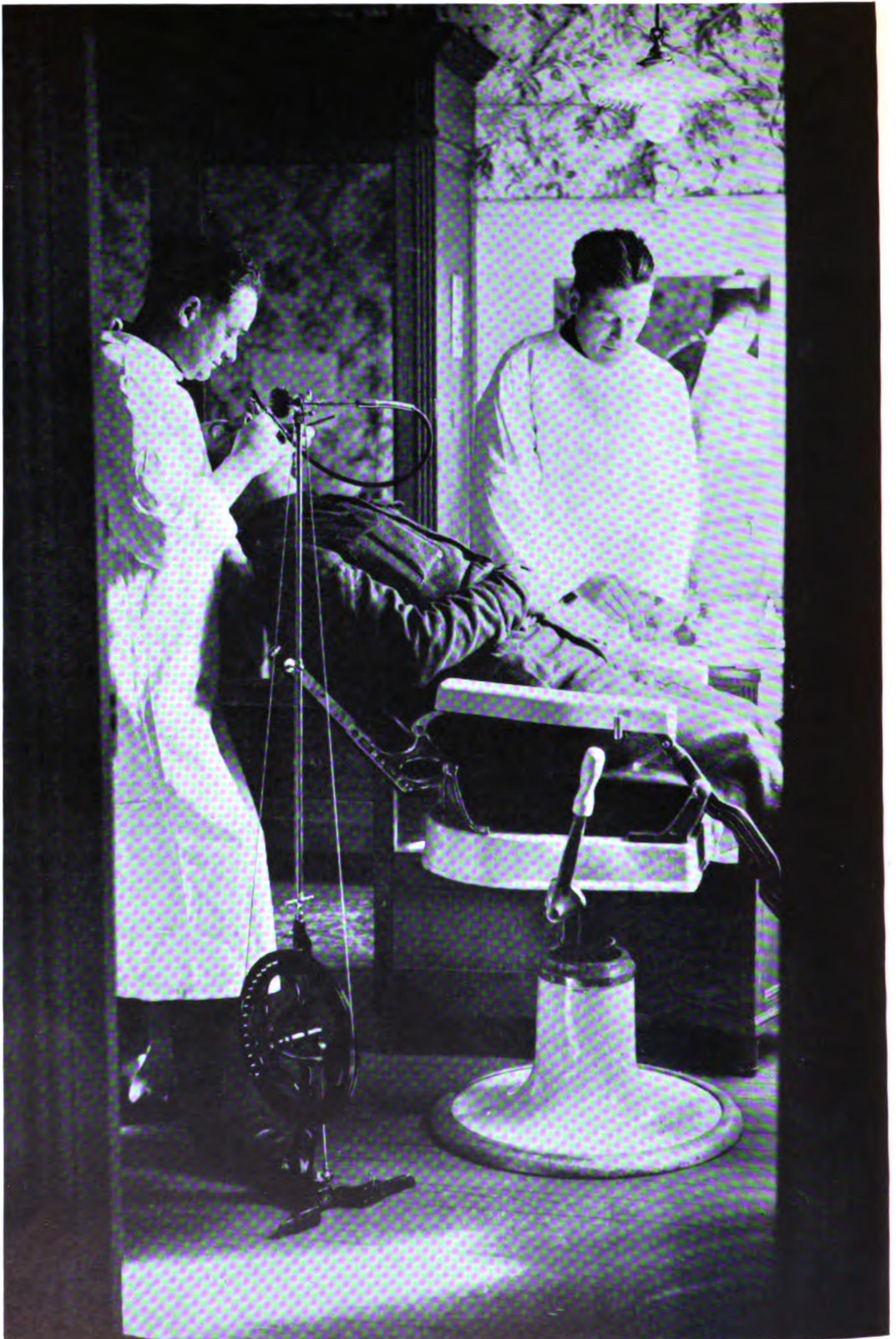

PLATE VII. France, 1939–40. Dental Surgery in the Field.

[*Imperial War Museum*

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(iii) *B.T.S.R. Lab.–A.B.S.D., Bristol.* The normal means of communications was by teleprinter. In exceptional circumstances Officer Commanding, B.T.S.R. Lab. or D.D.P., G.H.Q., was to telephone the Army Medical Directorate, War Office, which would relay demands to A.B.S.D., Bristol, by telephone.

EXPERIENCES OF BATTLE

Work of B.T.S.R. Lab. Supplies of Transfusion Fluid and Equipment. The events of May 10 were unheralded by any warning order from G.H.Q. to B.T.S.R. Lab., which was not officially ordered until 1100 hours that day to increase stocks of stored blood to capacity in each F.T.U. A sudden and unexpected load had to be shouldered by A.B.S.D., Bristol, in the provision of all the stored blood it could produce. The need for rapid delivery was urgent, since until May 10 only four F.T.Us. had been open, and these had been stocked only with small quantities of blood for routine work. On May 10, all resting units prepared for operation and the rapid movement of I and II Corps across the Belgian frontier to the pre-arranged line beyond Brussels began. It was thus imperative to supply immediately those F.T.Us. which were to advance, and to establish 8 F.T.U. as an advanced blood bank, in accordance with the plan previously agreed with D.D.P.

The rapid response made by A.B.S.D., Bristol, is shown in the following table. It must be remembered that the supply operation to the B.E.F. was the first of its kind, that it was unbacked by the large body of experience which was of such value in later campaigns, that the force involved in the battle was very much smaller, and that A.B.S.D., Bristol, was then a small unit, with a corresponding capacity of production. Fluid plasma production was still in the earliest experimental stage; consequently no stocks had been accumulated, and only small quantities could be sent.

TABLE 6

Blood and Fluid Plasma received in B.E.F. May 10–31, 1940

	Blood	Plasma
May 10 . .	60	16
May 11 . .	200	40
May 12 . .	200	—
May 14 . .	100	10
May 16 . .	50	50
May 19 . .	380	—
	990 bottles	116 bottles

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6 and 7 F.T.Us., which moved with the C.C.Ss., to Ninove and Haeltert, were first supplied each with 50 to 80 bottles of blood. The stocks in other F.T.Us. were then built up; O.C. 8 F.T.U. in his capacity as officer commanding the advanced blood bank deciding upon the best and most economical distribution. No blood was sent from B.T.S.R. Lab. after May 18 to the advanced blood bank, or to the Boulogne medical base. It may be estimated, however, that by the time communications between B.T.S.R. Lab. and the forward area were cut, each F.T.U. had received some 60–80 bottles of blood, a variable number of bottles of glucose-saline and a small quantity of plasma. No units had been provided with sets for the administration of glucose-saline, which was given with improvised apparatus, owing to the slow delivery of component parts to B.T.S.R. Lab., nor had it been possible to complete stocks of crystalloids at advanced depots of medical stores to the desired levels. It may be said that, while roads remained passable and until the situation in the forward area became confused, the system of distribution from B.T.S.R. Lab. to F.T.Us. *via* an advanced blood bank worked smoothly and successfully, and that the means of transmitting demands operated satisfactorily. No measures, however, could overcome the confusion caused by refugees, the destruction of telephone and signal cables by fifth columnists, and the destruction and blocking of roads by a superior air force.

In the last weeks of the campaign after the evacuation of the greater part of B.E.F. from Dunkirk, B.T.S.R. Lab. and 3 F.T.U. furnished a transfusion service to the improvised medical base at La Baule and 8 B.G.H. at Rennes. A shortage of medical officers precluded the formation of further F.T.Us., although other ranks were available and further refrigerator vehicles were received while at La Baule. During this closing phase of the battle, communications between B.T.S.R. Lab. and A.B.S.D., Bristol, and medical units remaining in the B.E.F. were difficult. Two shipments of blood from A.B.S.D. were arranged, however, and between June 1–16, 100 bottles were received at La Baule; in addition a small quantity of blood was collected locally. It was not possible to ensure the production of crystalloid solutions because of technical difficulties, but a number of medical units were equipped with the taking and giving sets.

Work of Field Transfusion Units. In considering the work of the F.T.Us. in the B.E.F., the highly mobile type of warfare in which they found themselves involved must be remembered. Each F.T.U. was attached more or less permanently to a C.C.S., which was in 1940 a cumbersome unit to move. Consequently at any one time the number of C.C.Ss. open and functioning was always less than the total number available. The result of this was that some T.Os. were always unable

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to function, while others were overworked, since the functioning C.C.Ss. had to admit an excessive number of patients.

It may be confidently stated that all F.T.Us. engaged fulfilled their prime rôle of organising and performing pre-operative and post-operative resuscitation, in most instances at C.C.Ss. and occasionally at field ambulances, in the most trying circumstances in which a campaign can be fought; they were graphically described by one T.O., who wrote: 'Transfusions were given to patients in beds, on stretchers, in clean rooms and in hovels. They were given to every type of case of shock and haemorrhage, to conscious and unconscious, restless and quiet patients. Asepsis did not exist, antisepsis on most occasions was almost impossible to achieve.' In nearly every case the T.O. was put in full charge of resuscitation, allotted a resuscitation ward, and given complete independence and freedom of judgment. This demonstration of a rapidly-developed confidence in the ability and value of the F.T.U. greatly increased the efficiency with which the casualties were treated. The careful and detailed training given to the R.A.M.C. and R.A.S.C. personnel of the transfusion units during the waiting months was well repaid. The medical orderlies were able immediately to take up their duties in a busy resuscitation ward, performing not only those tasks connected with blood transfusion, but also the general nursing duties; their rôle as refrigerator orderlies was shown to be comparatively unimportant, since this duty was in most instances well performed by the R.A.S.C. driver.

Statistics of Transfusions and Materials Used. With two exceptions no records of the work performed by the F.T.Us. were salvaged, and it is thus impossible to present any statistics showing the consumption of blood, plasma and crystalloid solutions, or the percentage of 600 bottles of blood and about 100 bottles of plasma that was used. The number of patients treated is not accurately known; approximately 350–400 were transfused. All T.Os. remark that they transfused fewer casualties than they expected and that the volume transfused was on the average 1½ to 2 bottles of protein fluid. From the casualty figures it might have been expected that some 1,400 casualties would have been transfused and some 4,500 bottles of protein fluid consumed.

The small number transfused and the small amount of fluid used are partly accounted for by the conservatism engendered through the knowledge that the rapid advance of the enemy through the lines of communication precluded the receipt of further supplies. Existing stocks were therefore husbanded with rigorous care. Another factor was the long time taken for the evacuation of casualties to the C.C.S. where surgical treatment was first available. Consequently many casualties, who would have survived and been successfully treated if admitted earlier, died before they could reach a surgically equipped

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unit. Again many arrived in a hopeless condition after a long and arduous journey, and were deliberately not treated, since it was not felt justifiable to use the dwindling stocks of blood and plasma on such poor risks. It was not unusual for casualties to travel in ambulances for 36 hours before reaching the C.C.S. It is possible that many of these would have arrived in a fit condition for surgical intervention to be successfully undertaken, had supplies of transfusion fluids been available in field ambulances and the means of giving transfusion in ambulances provided. All T.Os. expressed this opinion, with an emphasis which subsequent experience showed to be well-founded.

The results of transfusion therapy were in general gratifying. All T.Os. reported that speedy evacuation and early surgical treatment combined with resuscitation were essential for the best results. Transfusion delayed beyond a few hours after injury was less successful, and thus the most favourable casualties were those brought in from the immediate vicinity of the C.C.Ss. It was also stressed that blood volume replacement must be adequate, and rapid. Slow transfusion or inadequate volume replacement, or both, gave disappointing results. In spite of the general expectation that cannulation would be needed in many transfusions, it was found that the needle could be used in all but about some 5 per cent. of cases; the cannula was useful specially at night during aerial bombardment when restlessness and anxiety among the casualties increased, and under overcrowded conditions, when adequate fixation of the arm could not be easily achieved.

Little can be said of the fluid plasma, save that it was used with apparent success. No serious reactions were encountered after the use of plasma, or stored blood, the oldest of which was probably about three weeks, with one exception in which blood seven weeks old was successfully used.

Refrigerators: the type 'A' refrigerator worked well under battle conditions. Once the campaign had started no further R.E. maintenance was available in the forward areas; any minor running repairs needed were performed successfully by the R.A.M.C. orderlies. The 15 cwt. chassis, carrying the refrigerator, was however, not large enough; it was difficult to carry in the vehicle the blood and other medical stores together with personal equipment and the members of the unit. Even with these disadvantages, the F.T.U. was self-contained and mobile.

LESSONS OF THE CAMPAIGN

Tactical and Administrative

It is difficult to draw definite tactical and administrative conclusions from the brief and adverse campaign in France, but some points of value emerged.

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(*a*) *Tactical*

(i) *Distribution of Blood.* The method used was shown to be practicable. The need for an advanced blood bank became obvious, and the use of a F.T.U. for this purpose was well justified; it was also clear that the need for such a unit or units would have been greater had the campaign been successful, and that an amended war establishment providing the necessary men, including R.E. refrigerator maintenance personnel and transport, would have been required. The value of dispatch riders was clearly demonstrated in the B.E.F.

(ii) *Siting and Control of B.T.S.R. Lab.* This unit was regarded as playing only a static part. Allowance was not made for the possible need to move the unit. In the event of an advance, transport would have been totally inadequate. The control of the unit by D.D.P., G.H.Q., served as a pattern for subsequent campaigns.

(iii) *Siting and Control of F.T.Us.* The potentialities of this new unit were not at first fully recognised, and there was a tendency to take too little advantage of its mobility, once it had been attached to a C.C.S., so that the unit was wasted while the C.C.S. packed, moved and unpacked. 8 F.T.U. showed that these ineffective periods could be profitably spent, by attaching itself to an open C.C.S. until its parent unit was again functioning. Attachment of F.T.Us. to field medical units other than the C.C.S. was precluded since surgical treatment was, generally speaking, only available at C.C.Ss., and it was realised that resuscitation divorced from surgical treatment would be largely wasted.

The control of the F.T.U. invested in D.D.P., G.H.Q., who delegated it to the senior administrative officer of the formation in which the unit was working, operated well so long as communications remained intact.

(*b*) *Administrative*

(i) *War Establishment.* The inclusion of the F.T.Us. within the war establishment of B.T.S.R. Lab. was of doubtful value, for once they were detached from their parent unit for duty in the forward area, they passed from all, save technical, control of the Laboratory. Their inclusion, however, prevented their 'cannibalisation' by units to which they were attached. The ideal status was obviously that of independent units provided with their own scales of medical and ordnance equipment, under the technical direction of the B.T.U. acting as parent unit and depot. The ranks and numbers provided in the war establishment were in general satisfactory. In the F.T.U., however, two increases in rank would have been of great value in assisting the unit to perform its work. Both were recommended by most officers in their reports made after the campaign.

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(1) One R.A.M.C. orderly should have been given rank of corporal or lance-corporal so that authority could be clearly delegated by the T.Os.

(2) The T.O. should have been recognised as a specialist and granted appropriate rank. Officers of the rank of lieutenant found great difficulty on occasion in seeing that their recommendations were followed, and lacked the authority which would have attended a higher rank or designation as a specialist.

In general it may be said that the attachment of F.T.Us. to C.C.Ss. raised few administrative problems; mutual co-operation and respect were soon established and a harmonious relationship of value to both units rapidly developed.

Technical and Medical

(*a*) *Technical*

(i) *Transfusion Apparatus*. The standard overseas set was shown to be excellent for use in the field, with the exception of the cannula provided with each set, the bulb of which was too large.

The need for simple taking and giving sets, which could be maintained and sterilised in medical units and used for fresh blood or crystalloid solutions, early became apparent and was met by the design of suitable apparatus. While no official action regarding a scale of issue could be taken under the circumstances, it was obviously desirable that the I.1248 equipment of all medical units should include this type of set.

(ii) *Medical and Ordnance Equipment, F.T.Us.* The complete lack of any official scale of equipment was soon seen to be a tremendous handicap to the usefulness of the unit which would have to depend upon what it could borrow from the unit with which it was working. Much unofficial equipment was issued to each unit before detachment from B.T.S.R. Lab. A telescopic transfusion stand was designed and produced to fill the need of some simple apparatus to suspend bottles, which was foreseen during the preparatory months, and was successfully used under the trying conditions of the campaign. During the fighting it became obvious that a simple stand, attachable to the standard stretcher, would be of great value. The forerunner of the F.T.U. Box later to become standard was designed, and its great usefulness made it certain that its official provision would have to be sanctioned if the F.T.U. was to fulfil the promise displayed in the B.E.F.

(iii) *Refrigerator Vehicles*. While the type 'A' refrigerators gave no cause for complaint throughout the brief campaign, it became evident that they were unnecessarily large. A smaller capacity, say 150 bottles, would have sufficed. It was also evident that a larger vehicle than the 15 cwt. chassis provided would have permitted the carriage of the

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essential medical and other technical equipment without the difficulty which attended its packing into the type 'A' refrigerator, and at the same time permitted the personnel of the unit and their kit to be carried without the extreme discomfort of lying upon the refrigerator roof.

The 20-bottles insulated box with ice insert was shown to be an adequate container for blood over journeys lasting 6–10 hours in this theatre. Its only disadvantage was its unwieldy size and heavy laden-weight. The lack of an ice-insert freezer at B.T.S.R. Lab. would probably have been a handicap, if the campaign had lasted well into the summer of 1940 and it had been necessary to continue the forward distribution of blood in these boxes instead of by Type 'A' refrigerator.

(iv) *Training in Resuscitation.* Within the Army Transfusion Service the detailed and exact training in all aspects of resuscitation given to R.A.M.C. personnel of F.T.Us. proved of inestimable worth, but it became evident that a high degree of skill in general nursing was also essential. The transfusion unit orderly must be an efficient nursing orderly as well. Mechanical training, while necessary for the care of the refrigerator, was found not to be as important as his professional training.

In medical units the importance and potentialities of the A.Tr.S. were not realised, because such a service had not been provided before. In retrospect, it is obvious that very much more training of medical and nursing officers and other ranks should have been officially arranged at a high level.

(v) *Medical Equipment of Field Medical Units.* All T.Os. in the preparatory months realised the need for the provision of transfusion fluids and apparatus in front of the C.C.S., and events proved that such equipment, if provided, could have been used. In the brief campaign the practicability of this was demonstrated on isolated occasions, in spite of the widespread belief that field ambulance medical officers would be unable to spare the time to perform transfusions. It was clear that such provision would be necessary in future campaigns. The possibility of travelling transfusion was also foreseen, and certain field ambulances in conjunction with their M.A.Cs. made provision for this by the installation of suitable hooks, brackets, etc., to hold the transfusion bottles. The fury of the battle and the consequent disorganisation and the lack of transfusion material at field ambulance level made the trial impossible, but the correctness of this opinion was shown in subsequent campaigns fought under more favourable conditions.

(vi) *Medical Equipment, Other Medical Units.* In retrospect it is clear that the inclusion of transfusion fluids and apparatus in such units as ambulance trains and general hospitals would have been of great value,

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especially when the B.E.F. was transected by the German advance to the channel coast. These units found themselves rapidly called upon to fill unintended rôles, in which the possession of the means of giving transfusion would probably have been instrumental in saving many lives.

(*b*) *Medical*

(i) *Blood and Plasma*. The use of stored blood under active service conditions was shown to be a practical venture. The fluid kept well if properly stored at a suitable temperature, in spite of rough handling and transport over many miles by air and by road, and could be used with safety up to an age of at least three weeks. The exclusive use of Group O blood was unattended by any serious reactions. The little experience with fluid plasma strengthened the belief, which was confirmed in the air raids on England in 1940 and 1941, that this substance would become a valuable weapon in combating shock in the field, since it did not require refrigeration and had a life which was considerably longer than that of stored blood. Its full value could obviously not be assessed under the conditions obtaining in B.E.F. During the campaign it became clear that blood could not be collected in the forward area from local donors, except in quiet times when the demand was negligible.

(ii) *Resuscitation of the Wounded*. From the reports made after the campaign, it may be concluded that all the principles of treatment of the wounded, later well established in the light of more extensive experience in favourable circumstances, were recognised and practised.

Resuscitation Ward. The necessity of the self-contained resuscitation ward, with its own equipment and staff, to which only those in need of this specialised form of treatment were admitted, became apparent very soon after the opening of the second phase, and with few exceptions the T.Os. were immediately placed in sole charge of all resuscitation arrangements in the units to which they were attached. The surgeons rapidly grasped the advantages of this principle and developed great confidence in the ability of the T.Os. For this principle to succeed, the officer in charge of resuscitation must be a responsible and able doctor with a sound clinical judgment.

Blood Volume Restoration. The accepted principles of early, rapid, and adequate transfusion gradually emerged and are clearly evident from the transfusion unit reports. The value of the initially rapid transfusion (first 500 c.cm. in 10–15 minutes and continued at a gradually decreasing rate and maintained during operation), the importance of early restoration of blood volume after injury, and the need for early surgical interference completed with the minimum delay, were all

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recognised, although not always achieved because of the conditions of the campaign. The latter, especially, served to confirm the belief in the value of early transfusion, and many who died before or soon after reaching the C.C.Ss. might have been saved had small transfusions been given further forward and continued in the ambulances or ambulance trains on the way to the surgical centres.

Routine Treatment of Shock. The importance of the more simple forms of resuscitative treatment was recognised, and it became apparent that transfusion therapy alone, divorced from such first-aid measures, was not completely successful.

Special Cases and Other Forms of Treatment. In the few weeks of intense and arduous activity in May and June 1940, little data of value could be recorded about resuscitation of special types of wound—e.g. head, chest and abdominal wounds—and no special mention is made of these in the transfusion unit reports. The lack of a definite policy regarding chemotherapy and especially the dosages to be employed was remarked by most T.Os., who realised that the successful combination of resuscitation, control of infection and speedy well-timed surgery made the difference between success and failure in many cases.

(iii) *Research.* For research in the field to be satisfactorily undertaken, it became evident that full-time investigators working along clearly specified lines and supplied with the appropriate equipment, must be provided, and that such investigations, in so far as they concerned shock, chemotherapy and wound infection, must be carried out in the forward areas. Likewise it was plain that the purely academic type of investigation should be undertaken in the United Kingdom, where suitable laboratory accommodation could alone be provided in time of war. Such a unit as the B.T.S.R. Lab. could hope to do little more than act as a base for teams of investigators.

GENERAL CONCLUSIONS

The experiences of the A.Tr.S. in the B.E.F. showed that the organisation in an overseas theatre of a supply of stored blood and durable blood substitutes and the provision of specially trained units and personnel for their administration and for technical advice, were practicable undertakings of immense value to an army in the field. It was also apparent from the brief campaigning experience and the observed clinical results, that the attachment of F.T.Us. to medical units undertaking forward surgery would play an important and beneficial rôle in subsequent campaigns; and that the provision of suitable standard transfusion fluids and equipment should be extended to all medical units in greater or lesser degree, so that units could if

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necessary practise this form of therapy independent of the specialised F.T.Us.

At the same time it was clear that the knowledge of transfusion therapy and its uses must be increased by intensive training of medical officers, nurses and O.Rs. throughout the Army, if the fullest benefits were to be derived from it. The specialised training of orderlies of F.T.Us. in resuscitation methods and practical nursing was found to be of vital importance. Likewise it became clear that the T.O. was more than a G.D.O., and that he should be recognised as a specialist.

The general principles governing the resuscitation of the wounded became evident:

(*a*) A resuscitation ward with its own equipment and staff, must be provided.

(*b*) Adequate, early and rapid transfusion must be allied with efficient chemotherapy and early surgical intervention to obtain the maximum recovery of wounded.

The general plan and administration of the transfusion service in the B.E.F. stood the test of an adverse campaign against an overwhelmingly superior adversary sufficiently well to be accepted as the pattern for future campaigns in other theatres of war.

The technical equipment, with adjustments and additions found necessary in the light of practical experience, served well and left little to be desired, save in respect of the F.T.U. refrigerator vehicles.

The provision of a transfusion service in the B.E.F. was an experiment, the results of which not only fully justified the expenditure of money and materials involved, but proved valuable guides to future development.

THE ARMY PSYCHIATRIC SERVICE

Since during the war this service pursued so great an enlargement it is of interest to note its small beginning.

A Consulting Psychiatrist proceeded to France with the B.E.F. He was followed by a small number of psychiatrists who had been enlisted as general duty officers and were posted to general hospitals in France.

As no special units for psychiatric cases were authorised, a psychiatric section of 50 beds was organised in 1 B.G.H. Dieppe, and one medical officer with psychiatric experience and three mental nursing orderlies were added to the establishment of 4 C.C.S. In general, however, each medical unit dealt with its own psychiatric cases, the most suitable medical officer being employed for this work.

In the early part of the war there was no efficient system of personnel selection and thus it was that cases of psychoneurosis were more numerous than expected. These included many inadequate, unstable

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young men who had been recently called up, and a fair number of chronic neurotics among the reservists.

41 B.G.H. mobilised in January 1940, at Hellingly, Sussex, for service as a psychiatric hospital with the B.E.F. It did not have an opportunity of proceeding to France before Dunkirk. Owing to the evacuation in June 1940, no further development of any psychiatrist organisation could take place and the psychiatric casualties at Dunkirk and elsewhere were largely dealt with in the United Kingdom. No accurate statistics are available on the incidence of psychiatric battle casualties during the fighting in May and June 1940. The numbers, however, were not negligible, and batches of shaken, demoralised men were evacuated and admitted to psychiatric units in the United Kingdom.

REFLECTIONS UPON THIS CAMPAIGN

From the experiences of this disastrous campaign there were lessons to be learnt, but none of them were of any outstanding importance to the medical services. From the second phase came a refreshed recognition of the over-riding importance of physical fitness to the personnel of the forward medical services, of the need for ceaseless reconnaissance by D.D.M.S., A.D.M.S. and officers commanding medical units when conditions are fluid and intercommunication uncertain, of the great value of the ability to improvise and of the need for the exercise of this ability in training.

Time and time again during the course of this campaign there was demanded from officers and other ranks, R.A.M.C., the ability to assume responsibility, an ability based on initiative and made possible by a comprehensive knowledge of the organisation, functions, duties and scope of the Army Medical Services. Without such knowledge, comprehensive and thorough, such initiative can easily be misdirected.

When the second phase opened it at once became apparent that the equipment of the C.C.S. was too heavy and bulky for a war of movement with the transport provided for corps and army on the 1939–40 scale. When a C.C.S. requires transport to move, it generally needs it in a hurry and at a time when the demand for transport is at its peak. Practically every C.C.S. in this campaign had to jettison a greater or lesser part of its equipment on its first move, except 1 and 6 when they made their initial planned move forward.

It became increasingly evident that transport that is maintained by, or for, each unit and which is always available when required, is an essential in modern warfare. The 'pooling' of transport was never satisfactory and because of it medical units often found themselves stranded.

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For many reasons the training of the medical services for war had been extremely sketchy; medical units used in war did not exist in peace, they came into being for the first time on mobilisation. A few officers and men had done the odd week's training at home and abroad with a field ambulance, which was seldom up to strength in personnel and practically never in vehicles, and had seen the equipment for a few hours only. None had done any training with a C.C.S. or had seen its equipment except perhaps in store. The Territorials were better trained, since many of them had regularly spent every summer in camp with the field ambulance with which they were to mobilise in war.

Out of the experiences of this campaign there emerged a renewed demand for a system of training for the Army Medical Services whereby units to be used in war are assembled and trained at regular intervals in peace. Until this is done there will remain a very serious risk of a complete breakdown in the medical services in the early days of any campaign.

One of the major responsibilities of the military medical administration is that of assessing the value of recommendations submitted by the consultant group and, being persuaded of their value, of devising the means whereby these recommendations can be translated into policy and action. Indeed the efficiency of an administration is to be judged by its reactions to such recommendations, especially to those that relate to the surgical treatment of the wounded in battle.

Methods of treatment undergo modification as the result of lessons learnt from experience as this accumulates, of scientific discovery and of the exploitation of discovery which enlarges the surgical armamentarium.

Changes in the methods of the treatment of wounds can lead to marked changes in the organisation and in the utilisation of the components of the evacuation chain.

During this campaign surgical practice underwent no significant modification and so administrative policy concerning the care of the wounded remained unaltered. From it nothing new in the field of military surgery emerged. In the first phase the permanently static base hospital and the ponderous C.C.S., dependent for its movement upon sources other than its own, did all that was required of them. In so far as these medical units were concerned and in so far as they were reflections of policy, 1939 was but a continuance of 1918. In the second phase events moved too swiftly to yield modification of treatment and thus modification of policy.

The surgical teams provided by D.D.M.S. L. of C. for the reinforcement of the forward C.C.Ss. in connexion with the advance to the Dyle and those which later were attached to the M.D.Ss. of field

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ambulances functioning as improvised C.C.Ss. were in every way similar to those which had made their appearance in the War of 1914–18. They were the products of emergency and used in exceptional circumstances. In 1939, as also in 1918, the limitations of surgery imposed upon the medical administration the policy of providing surgical facilities at the level of the C.C.S. and of bringing back thereto with all possible celerity the wounded from the front line. The problem was tackled by providing a machinery of rapid evacuation from the R.A.P. to the remote C.C.S. It was not always successful for the reason that a wide variety of conditions and circumstances could remove the essential element of rapidity from the mechanism. Nevertheless surgical experience had amply demonstrated that serious intervention ought not to be undertaken ordinarily forward of the C.C.S.

Had the campaign in France and Belgium lasted longer and had the outcome been less disastrous, this narrative would surely have included an account of the beginnings of the replacement of this policy by its exact opposite. The sulphonamides were becoming available both in quantity and variety, the undesirability of treating wounds by the method of primary suture was about to be recognised and as a consequence a new policy and a new organisation of the evacuation chain were already stirring in the womb of time. They made their appearance in the campaign in Libya.

'War diaries and personal accounts of fighting, too detailed for quotation in this history, are liberally sprinkled with praise for the courage and devotion of the medical officers of units at the front, but have less occasion to notice the constructive work of the Royal Army Medical Corps in maintaining the health and hygiene of the troops and all that was involved in the care of the sick and wounded. In fact the Corps provided a complete medical service for half a million men, which included medical officers and trained personnel for units, field ambulances, casualty clearing stations, base hospitals, convalescent depots, ambulances, ambulance trains and hospital ships. It was typical of their spirit and tradition that when the British Expeditionary Force was evacuated and hospitals which could not be cleared in time fell into enemy hands, medical officers and staffs who could have saved themselves, remained voluntarily to serve their patients in captivity.' (Major L. F. Ellis, *The War in France and Flanders* 1939–1940, p. 358.)

Appendix III contains an early and tentative statement of the total casualties sustained by the B.E.F. in France from all causes during the period 1939–1940. Appendix IV contains a brief reference to the services rendered by the American Field Service, which was instituted in the War of 1914–18 and revived in 1939. The A.F.S. served with distinction in France and Belgium in 1939–40 and subsequently in the Middle East and in the North African and Italian campaigns.

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APPENDIX I

B.E.F. Order of Battle. (Abbreviated)

G.H.Q. Tps.
- R.A.C.
  - 1st Lt. Armd. Recce. Bde.
    - 1st F. F. Yeo.
    - 1st E. Riding Yeo.
  - 2nd Lt. Armd. Recce. Bde.
    - 5th D.G.
    - 15/19th H.
  - 1st Army Tank Bde.
    - 4th and 7th R.Tks.
  - not brigaded :
    - 4/7th D.G.
    - 12th L.
    - 13/18th H.
    - 1st Lothians
- R.A.
  - Twenty regts., three A.A. bdes., one S.L. bde.
- R.E.
  - Three army field coys.; two fd. coys.; one fd. pk. coy.; one army fd. survey coy.; three C.W. coys., thirty-eight general construction, two road construction, one excavation, four tunnelling and one workshop and park companies, one fd. survey depot and two water-boring sections.
- Infantry
  - 1st W.G.
  - 7th Cheshire (M.G.)
  - 1/8th M.X. ,,
  - 4th Gordons ,,
  - 6th A. & S.H. ,,
  - 6th, 7th, 8th, 9th King's Own (Pioneer)
  - 7th Norfolk
  - 6th R.S.F.
  - 1/6th S. Staffords
  - 9th W. Yorks (Garrison)

I Corps (1st, 2nd and 48th Divisions)
- Corps Tps. including
  - 2nd and 4th Cheshire (M.G.)
  - 2nd Manch. ,,
- 1st Division
  - 1st Guards Bde.
    - 3rd Gren. Gds.
    - 2nd Coldm. Gds.
    - 2nd Hamps.
  - 2nd Bde.
    - 1st Loyals
    - 2nd N. Staffs.
    - 6th Gordons
  - 3rd Bde.
    - 1st D.W.R.
    - 2nd Foresters
    - 1st K.S.L.I.
  - and Divisional Tps.
- 2nd Division
  - 4th Bde.
    - 1st R.S.
    - 2nd Norfolk
    - 1/8th L.F.
  - 5th Bde.
    - 2nd Dorset
    - 1st Camerons
    - 7th Worc. R.
  - 6th Bde.
    - 1st R.W.F.
    - 1st Berks.
    - 2nd D.L.I.
  - and Divisional Tps.
- 48th Division (South Midland)
  - 143rd Bde.
    - 1st Oxf. Bucks.
    - 1/7th Warwick
    - 8th Warwick
  - 144th Bde.
    - 2nd Warwick
    - 5th Glosters.
    - 8th Worc. R.
  - 145th Bde.
    - 2nd Glosters.

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4th Oxf. Bucks.
1st Oxf. Bucks.
and Divisional Tps.

II Corps (3rd, 4th, 5th and 50th Divisions)
Corps Tps. including
2nd R.N.F. (M.G.)
2nd M.X. ,,
1/7th M.X. ,,
3rd Division
7th Guards Bde.
1st Gren. Gds.
2nd Gren. Gds.
1st Coldm. Gds.
8th Bde.
1st Suffolk
2nd S. Yorks.
4th R. Berks.
9th Bde.
2nd Lincolns
1st K.O.S.B.
2nd R.U.R.
and Divisional Tps.
4th Division
10th Bde.
2nd Bedfs, Herts.
2nd D.C.L.I.
1/6th Surreys
11th Bde.
2nd L.F.
1st Surreys
5th Northamptons
12th Bde.
2nd R.F.
1st S. Lan. R.
6th B.W.
and Divisional Tps.
5th Division (in G.H.Q. reserve on May 10)
13th Bde.
2nd Cameronians
2nd Innisks.
2nd Wilts.
17th Bde.
2nd R.S.F.
2nd Northamptons
6th Seaforth
and Divisional Tps.
(15th Bde. in Norway)
50th Division (Northumbrian)
150th Bde.
4th E. Yorks
4th Green Howards
5th Green Howards
151st Bde.
6th D.L.I.
8th D.L.I.
9th D.L.I.
25th Bde.
2nd Essex
1st R. Ir. F.
1/7th Queens
and Divisional Tps. including
4th N.F. (motor cycle)

III Corps (42nd and 44th Divisions)
Corps Tps. including
7th R.N.F. (M.G.)
1/9th Manch. ,,
1st Kensingtons ,,
42nd Division (East Lancashire)
125th Bde.
1st Border
1/5th L.F.
1/6th L.F.
126th Bde.
1st E. Lan. R.
5th King's Own
5th Border
127th Bde.
1st H.L.I.
4th E. Lan. R.
5th Manch.
and Divisional Tps.
44th Division (Home Counties)
131st Bde.
2nd Buffs
1/5th Queens
1/6th Queens
132nd Bde.
1st R.W.K.
4th R.W.K.
5th R.W.K.

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133rd Bde.
2nd R. Sussex
4th R. Sussex
5th R. Sussex
and Divisional Tps.

12th Division (Eastern)
35th Bde.
2/5th Queens
2/6th Queens
2/7th Queens
36th Bde.
5th Buffs
6th R.W.K.
7th R.W.K.
37th Bde.
2/6th Surreys
6th R. Sussex
7th R. Sussex
and Divisional Tps.

23rd Division (Northumbrian)
69th Bde.
5th E. Yorks
6th Green Howards
7th Green Howards
70th Bde.
10th D.L.I.
11th D.L.I.
1st Tyne Scot.
and Divisional Tps. including
8th N.F. (motor cycle)
9th N.F. (M.G.)

46th Division (North Midland and West Riding)
137th Bde.
2/5th W. Yorks.
2/6th D.W.R.
2/7th D.W.R.
138th Bde.
6th Lincolns
2/4th K.O.Y.L.I.
6th Y. and L.
139th Bde.
2/5th Leicesters
2/5th Foresters
9th Foresters
and Divisional Tps.

51st Division (Highland)
152nd Bde.
2nd Seaforth
4th Seaforth
4th Camerons

153rd Bde.
4th B.W.
1st Gordons
5th Gordons

154th Bde.
1st B.W.
7th A. & S.H.
8th A. & S.H.

and Divisional Tps.

When the division moved to the Saar front to it were attached 1st Lothians, R.A. and R.E. units, 7th N.F. and 1st Kensingtons from III Corps and 7th Norfolks and 6th R.S.F. from G.H.Q. Tps.

L. of C. Tps.
A.A. and R.E. units and
4th Buffs
14th R.F.
12th Warwick
4th Border
1/5th Foresters

With A.A.S.F.

Two A.A. Regts.

The following arrived during May and June :

1st Armoured Division

2nd Armd. Bde.
Bays
9th L.
10th H.

3rd Armd. Bde.
2nd R. Tks.
5th R. Tks.
(3rd R. Tks. was detached and sent to Calais)

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1st Support Group
101st Lt. A.A. and A.Tk. Regt. (the infantry battalions were detached and sent to Calais)
and Divisional Tps.

52nd Division (Lowland)
155th Bde.
7/9th R.S.
4th K.O.S.B.
5th K.O.S.B.
156th Bde.
4/5th R.S.F.
6th Cameronians
7th Cameronians
157th Bde.
5th H.L.I.
6th H.L.I.
1st H.L.I.
and Divisional Tps.

Defence of Boulogne
20th Guards Bde.
2nd I. G.
2nd W.G.
275th A. Tk. Bty. less one troop 69th A. Tk. Regt.

Defence of Calais
30th Bde.
2nd K.R.R.C.
1st R.B.
3rd R. Tks.
1st Q.V.R. K.R.R.C. (motor cycle)
229th A. Tk. Bty. less one troop 58th A. Tk. Regt.

APPENDIX II

PLAN D

Phase I

(1) G.H.Q. would move 12th Lancers (armoured cars) to the River Dyle and zero hour (J.1) would be the time when this unit crossed the frontier. At the same time the French Seventh Army would move to the area Antwerp–Ghent.

(2) I Corps would take up a position in the Dyle line on the right of the B.E.F. sector on a frontage of two divisions.

(3) II Corps would take up a position on the left on a frontage of one division.

(4) III Corps would move 44th Division to an area north-west of Oudenaarde. The infantry would be moved by mechanical transport and the movement would be completed in 90 hours.

Phase II

(1) G.H.Q. would move 48th Division (I Corps) and 4th Division (II Corps) into Corps Reserve south and north of Brussels respectively and

(2) II Corps would move 4th Division up to the Dyle Line so that it would then have two divisions in the line.

Phase III

G.H.Q. would move 50th Division to the east of Renaix and Oudenaarde into G.H.Q. Reserve.

Phase IV

(1) III Corps would move 5th Division to Grammont.

(2) 42nd Division would occupy the line of the Escaut on the right around Tournai. 44th Division would occupy the line of the Escaut on the left of Oudenaarde.

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The Routes of Advance from the Frontier to the Dyle

Route	Corps	
A	I	Pont Caillon, through Ath, Hal, La Hulpe and Malaise to Wavre.
B	I	Bercu through Tournai, Grammont, and Hal, Groenendaal, to Ottenbourg.
C	I	Cysoing through Renaix, and Ninove, to Neeryssche.
D	II	Toufflers through Berchem, and Sottegem, to Woluwe-St.-Etienne.
E	II	Quevaucamp through Alost, and Vilvorde, to Louvain.
F	alternative routes	Orchies, Tournai, Leuze and then route A.
G	alternative routes	Ascq, Tournai, Renaix and then route C.
H	alternative routes	Roubaix, Espierres and then route E.

APPENDIX III

CASUALTIES B.E.F. 1939–40

Strength, B.E.F. (A.G. Stats. 3/944/40, of Aug. 2, 1940)

	Officers	*Other Ranks*	*All Ranks*
1. British (U.K.) Army (Male)	17,518	414,871	432,389
2. British Nurses	1,191	—	1,191
3. A.T.S.	19	667	686
4. Totals	18,728	415,538	434,266
5. Canadian Army	165	4,205	4,370
6. Totals	18,893	419,743	438,636

Battle Casualties, B.E.F. (as reported and corrected to August 15, 1945)

	Officers	*Other Ranks*	*All Ranks*
1. Killed and died of wounds	670	10,344	11,014*
2. Wounded	743	13,331	14,074
3. Missing and Prisoner-of-War	1,552	39,786	41,338
4. Totals	2,965	63,461	66,426
5. Died of disease (other than Prisoner-of-War)	13	244	257*
6. Died of injury (other than Prisoner-of-War)	25	293	318*
7. Total Battle Casualties (including deaths from all causes)	3,003	63,998	67,001

* In the Statistical Report on the Health of the Army 1943–1945, H.M.S.O. 1948, these totals are given as 11,199, 1,043, and 378, and the Relative Mortality Rates as Killed or Died of Wounds, 88·7; Died of Disease, 8·3; Died of Injury, 3·0.
The final corrected figures are those given on page 73.

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APPENDIX IV

THE AMERICAN FIELD SERVICE

The American Field Service was instituted early in the War of 1914–18 and was revived in September 1939. It was a voluntary organisation concerned with the transport of battle casualties. It consisted of United States citizens who for various reasons wished to make their contribution to the war effort. After the United States had entered the war its recruits consisted of such as were ineligible for service in the American forces by reason of some minor defect or on account of age, or of such as were unwilling to bear arms. The age scale ranged from 17–60.

They served as unpaid volunteers and received rations or allowance in lieu, accommodation, medical and dental treatment, uniform, equipment, cover for liability for third party risk when driving vehicles, a return passage to America and free railway travel. Monthly stores, purchased from the U.S. Army stocks out of A.F.S. H.Q. funds collected by subscription, were distributed under A.F.S. arrangements. The only payment made to members was of the nature of an expense allowance. After two years service they were entitled to thirty days home leave. The minimum service was eighteen months and they were liable for service in any theatre of war. After completing two years service with the British Army they could re-engage for a further period of twelve months.

A.F.S. personnel were subject to military law under Section 176 of the Army Act, but as their terms and conditions of employment were not governed by the Army Act they could not be tried for certain offences—for example, desertion or absence without leave. No liability for injury or other disability, whether fatal or otherwise, incurred by A.F.S. was accepted by the War Office.

A.F.S. companies served in France in 1939–40 both with the British and the French Forces. A.F.S. ambulances and their volunteer drivers next took part in the Syrian campaign, at the close of which General Wavell asked that they should be attached to the Western Desert Force. A company 350 strong served in the Middle East. Later they served with the British North African Force and in the Italian campaign. Later still the A.F.S. offered to provide an ambulance company 300 strong for service in Burma.

The devotion to duty and the gallantry of A.F.S. personnel were everywhere outstanding and the high quality of the service they rendered was everywhere recorded.

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CHAPTER 2

THE CAMPAIGN IN NORWAY

April 15–June 8, 1940

Précis

BETWEEN dawn and dusk on April 9, German troops occupied the capital and the chief ports and airfields of Norway. On the 10th and 13th the Royal Navy destroyed the German naval units that had transported the German troops to Narvik. On the 15th a small Allied force (British, French and Polish) began to land in the Narvik area. On the 16th another Allied force was landed at Namsos and on the 18th a third disembarked at Aandalsnes. The object of the first was to capture Narvik, that of the other two was to facilitate a direct attack on Trondheim.

At Narvik, supported by the Royal Navy, the Allies drove the Germans out of the port and back to the Swedish frontier.

The forces at Namsos and Aandalsnes moved inland, to meet increasing opposition and to endure merciless bombardment from the air. It became clear that a landing in force in the Trondheim area could not be undertaken in the face of the overwhelming numerical superiority of the Luftwaffe in the area. The Namsos and Aandalsnes forces were withdrawn, as was also that at Narvik. This most difficult operation was successfully carried out, but not without heavy shipping losses.

STRATEGIC AND OTHER CONSIDERATIONS

Following the outbreak of war, neutral Norway came to occupy a most uncomfortable and difficult position. The Germans depended largely upon the iron-ore from Gällivare in Northern Sweden. During the winter months, when the Swedish port of Lulea in the Gulf of Bothnia was ice-bound, this ore was moved by rail from Gällivare to the Norwegian ice-free port of Narvik and thence by sea. The ships transporting it made full use of Norwegian territorial waters in order to escape the attention of the British fleet. The passage between Southern Norway and Denmark leading from the Baltic and that between the Norwegian and North British coasts leading from the North Sea to the open Atlantic could not readily be dominated by the Allies so long as the Norwegian ports and airfields were not theirs to use.

From the earliest days of the war the Allied Supreme War Council had under consideration the possibility of cutting off this iron ore

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supply by laying an extensive minefield south of Narvik and in Norwegian territorial waters. But since such action would necessarily cause serious embarrassment to a friendly and neutral nation it was not taken.

On November 30, 1939, Russia declared war on Finland. The Allied Supreme War Council at once decided to give all possible help to Finland. Plans were made to provide an Anglo-French expeditionary force of 100,000 men and the consent of the Norwegian and Swedish governments for the passage of this force through their territories to Finland was sought. These plans involved the occupation of Narvik.

During these months the Germans were likewise preparing plans for the seizure of the Norwegian ports and airfields in order to control the material resources and military facilities of the country and to deny these to the Allies. In Norway there was a small ultra-nationalist political party. Its leader, Quisling, made contact with the leading German Nazis, seeking support for his plan for a *coup d'état* and promising in return the placing of the Norwegian ports and airfields at the disposal of the Germans.

Then in mid-February came the episode of the *Altmark*. This German auxiliary vessel, carrying 299 British merchant seamen removed from ships sunk by the German raider *Graf Spee*, was proceeding homewards down the Norwegian coast when she was discovered by R.A.F. Coastal Command. H.M.S. *Cossack* pounced on her, followed her into Jössingfiord and, in spite of Norwegian remonstrances, boarded her and released her captives.

On March 13 the war between Russia and Finland ended. The withholding on the part of the Norwegian and Swedish governments of their consent for the use of their territories for direct aid to Finland undoubtedly greatly influenced the decision of the Finns to seek for peace. The Allied expeditionary force was therefore dispersed.

On March 28 the Allied Supreme War Council decided that minefields should be laid in Norwegian territorial waters forthwith. Should the Germans react by invading the Scandinavian countries the Allies would promptly send forces to Narvik, Trondheim, Bergen and Stavanger. On April 5 the Norwegian and Swedish governments were informed of these intentions.

THE TERRAIN

The coast of Norway, nearly 1,000 miles long, is fringed with a multitude of large and small islands separated from each other by narrow and intricate waterways. They, like the mainland itself, are harsh and rugged, rising to heights exceeding 1,500 metres. The coast itself is deeply fissured by the fiords. For the most part Norway is sparsely populated and road communications are scanty, difficult, often

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non-existent. On the other hand, communication by water between town and town is relatively easy since the majority of places of any size are on the coast. There is one good motor road from Oslo to the north, but even this goes no further than Bodö. Sixty miles to the north of Bodö lies Narvik, near the head of the Ofotfiord, with a population of 10,000 dependent almost entirely upon the export trade of Swedish iron ore and lying well within the Arctic Circle. From Gällivare in Sweden to Narvik runs a single-track railway. Some twenty miles to the east of Narvik is the Swedish frontier. Tromsö lies about seventy miles due north of Narvik, while three hundred miles to the south-west is Trondheim.

In April Norway is usually under several feet of snow, and in the Narvik area the thaw can be expected at the beginning of May. By the middle of April the sun is below the horizon for only eight and a half hours in the twenty-four while by early June it never sets.

THE GERMAN OCCUPATION OF NORWAY

On April 6 detachments of the German fleet put to sea, their sailings being so regulated that they would make synchronised arrivals at Oslo, Kristiansund, Stavanger, Bergen, Trondheim and Narvik. The British Home Fleet put out to sea from Scapa on the night of April 7/8 in a blinding snowstorm. The minefields were laid on the 8th.

The tactical plan adopted by the Germans to achieve their purposes was, if judged purely as a military enterprise, brilliant both in conception and in execution. Suddenly and synchronously the Norwegian seat of government, the main ports and airfields would be seized. At the appointed time and by pre-arrangement with, and with the co-operation of Norwegian adherents of the Quisling political party, German troops, landing from naval or merchant vessels lying in the Norwegian ports, would occupy these ports and airfields. At the same time German naval units together with transports would force the harbour defences at Oslo and occupy the capital and at once German troops would begin to move northwards by road and rail to link up with the others at the ports, while airborne troops would be thrown in and the Luftwaffe would immediately take over the airfields.

On April 9 the Germans overran Denmark and the Luftwaffe at once began to operate from the Danish airfields commanding the sea passage between Denmark and Norway. Simultaneously, the signal being given, the Norwegian ports and airfields were seized according to plan. German naval units moved into the harbours. By nightfall the capital itself, Bergen, Kristiansund, Trondheim and Narvik were in German hands and German troops were on the move. Norwegian Army units, though quite unprepared, offered stubborn resistance wherever possible.

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Ten of the newest and largest German destroyers reached Narvik, there to land troops who quickly secured control. The British Second Destroyer Flotilla, then in the vicinity of the Lofoten Islands, being informed of this event, made its way to the Narvik channel and, though outnumbered, attacked on April 10. Two of the German destroyers and half a dozen supply ships were sunk and five other destroyers were seriously damaged. Two British destroyers—*Hunter* and *Hardy*—were lost and another badly damaged. After the battle the British flotilla returned to the United Kingdom and a naval force proceeded to Narvik to deal with the remaining German destroyers. All eight of them, together with a submarine, were eliminated. The German troops in Narvik withdrew from the town but, since there was no British landing, soon returned.

The Allied reaction to these events was immediate. Troops were landed near Narvik (April 15) and on either side of Trondheim, at Namsos (April 16), eighty miles to the north, and at Aandalsnes (April 18), one hundred and eighty miles to the south. The first of these landings had for its object the recapture of Narvik. The other two were intended to be diversionary operations of a direct attack upon Trondheim which, being held by the Allies, could then provide a port of entry into middle and southern Norway. This direct attack did not materialise, however, for in 1940 the Royal Air Force, operating from airfields in Britain, could not hope to provide adequate cover for a sustained seaborne attack upon the Norwegian coast. The troops at Namsos and Aandalsnes were not immediately withdrawn, but since they could not be given adequate air protection and were therefore exposed to the mounting fury of the Luftwaffe, and since German ground forces were, in relation to the terrain and to the existing conditions, better equipped and better armed and, moreover, were being more swiftly reinforced than were their opponents, it became inevitable that the withdrawal of the Allied troops at Namsos and Aandalsnes could not be long delayed. The attack upon Narvik in the remote north was successful. The Germans, opposed by superior numbers supported by the guns of the Royal Navy, were ultimately driven from the town towards the Swedish frontier. This success could not be exploited, however, for disaster in France compelled the Allies to abandon Norway for the time being.

The forces which landed at Narvik, Namsos and Aandalsnes were named respectively 'Avonmouth Force' or 'Avonforce', 'Mauriceforce' and 'Sickleforce':

'AVONFORCE'

The order of battle of 'Avonforce' is given in the Appendix V. The medical component of 'Avonforce' consisted of:

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A.D.M.S. 'Avonforce'
137 Fd. Amb.
147 Fd. Amb.
21 Fd. Hyg. Sec.
25 Fd. Hyg. Sec.
7 C.C.S.
22 B.G.H.
9 Amb. Train (personnel only)
a Mobile Refrigerator Unit (F.T.U.)
a detachment of an advanced depot of medical stores (no transport)
21 M.B.U. was also included.

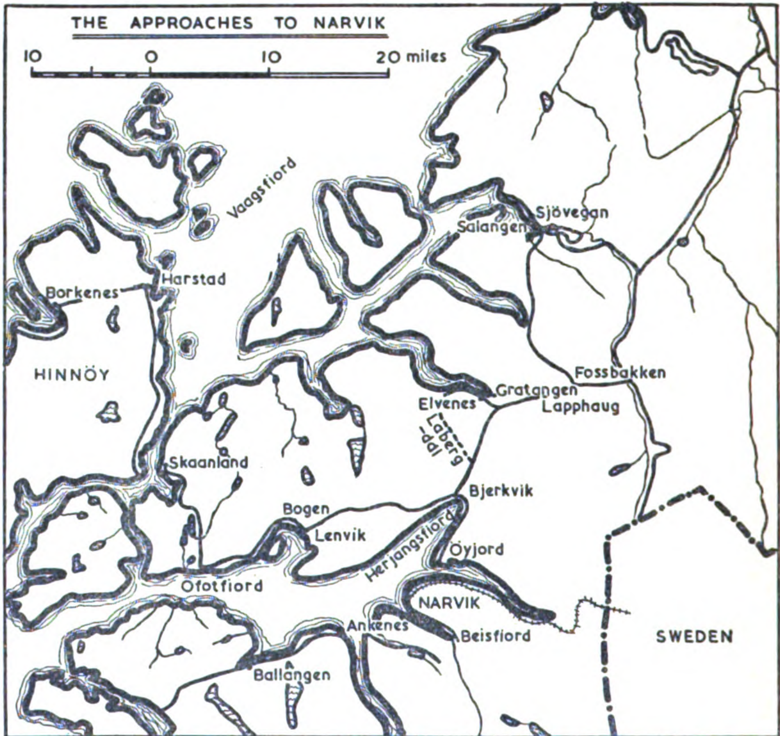

FIG. 9. Norway. The Approaches to Narvik.

The instructions issued to 'Avonforce' were to establish itself ashore in the Narvik area and to co-operate with such Norwegian forces as might be found there. It was understood that at this time there were about 3,000 Germans in Narvik and that the Norwegian 6th Division was in being thereabouts.

'Avonforce' sailed from Gourock on April 12. In the convoy, in addition to 24th (Guards) Brigade, were 1/4th Lincolns and 1st Hallams of 146th Infantry Brigade. These, while *en route*, were diverted by

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Admiralty order to Namsos. The original plan had been to throw into Narvik after 24th (Guards) Brigade, 146th and 144th Infantry Brigades, these to be followed by the remainder of 49th Division. But on April 13 the Royal Navy had attacked and annihilated the German destroyers which had brought the German troops to this port. It was assumed that as a result of the action enemy resistance at Narvik had become greatly weakened so that 'Avonforce' could be reduced and part of it sent elsewhere. Moreover, it had been decided that it was imperative that Trondheim should be taken.

On April 14 Harstad, on the island of Hinnöy and some hundred and twenty miles away from Narvik, was selected as the base, and next day H.Q. 'Avonforce' was established there. On April 17, 24th (Guards) Bde. began to move to Skaanland, on the mainland, by 'puffers'—small local fishing craft of six to eight knots and averaging about fifty tons.

THE GERMAN DISPOSITIONS AROUND NARVIK

The German dispositions at this time were as follows. The main body was in Narvik itself and L. of C. troops guarded the railway to the Swedish frontier. South of Narvik they had posts at Fagernes, Ankenes and round the coast as far as Haakvik. They had occupied the high ground forming the backbone of the Ankenes peninsula and their ski-troops patrolled as far as the west of Skjomen Fjord, thus guarding the electric power station on Lake Storvand and the cable running to Narvik. North of Narvik there were concentrations at Öyjord and Bjerkvik with machine-gun posts covering the intervening road. Other posts along the northern shore of Rombaks Fjord guarded the power station near Lilleberget and the cable thence to Narvik. From Bjerkvik the Germans had pushed outposts along the north shore of Herjangsfjord as far as Herjangl and Troldviken and also northwards along the Bjerkvik–Elvenes road. In Elvenes itself they had a fairly strong force with outposts pushed westwards along the road on the south shore of Gratangen Fjord as far as Foldvik and southwards to link up with those from Bjerkvik.

This defensive position, running roughly north and south and pivoted on Narvik, was extremely strong. Its one weakness was that the same almost impassable terrain that covered its rear also limited its lines of retreat to a mountain track. The aerodrome the Germans used was the frozen Lake Hartvigvand, but they had also the assistance of air sorties from Trondheim and appeared to be receiving reinforcements by seaplanes alighting on Rombaks Fjord.

'RUPERTFORCE'

On April 19 'Avonforce' changed its name to 'Rupertforce'. The movement of 24th (Guards) Bde. from Harstad to the mainland

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continued. On April 21, the Senior Naval Officer was placed in supreme command of the expedition and preparations were at once made for a naval bombardment of Narvik to be followed by a direct assault on April 24. But three days of heavy snowfall disrupted the arrangements for the attack. On the 24th, however, military targets round Narvik, Vassvik and Ankenes were bombarded and 2nd S.W.B. crossed from Skaanland to Ballangen on the south shore of Ofotfiord. The snow was now four feet deep. On April 27, a demi-brigade of Chasseurs Alpins reached Harstad and at once moved on to Foldvik and Gratangen, on the south shore of Gratangen Fjord, and to Bogen on the north shore of Ofotfiord. On April 29, the War Office ordered one company of 1st Scots Guards to Bodö to forestall possible air landings there.

At the end of April the distribution of Allied troops in the Narvik area was as follows:

1st Scots Guards . . .	Fossbakken
6th and 14th Chasseurs Alpins .	Gratangen Fjord
1st Irish Guards . . .	Liland
12th Chasseurs Alpins . .	Bogen
2nd S.W.B.	Haakvik

On May 1 the thaw set in and the roads began to clear of snow. 2nd S.W.B. were in action against ski-troops on the Ankenes peninsula while the French and Norwegians were moving south from Gratangen on Bjerkvik. On May 6, 13th Demi-brigade of the French Foreign Legion reached Harstad and General Auchinleck was appointed commander of all Anglo-French troops in northern Norway. On May 9 a Polish brigade of four battalions landed at Harstad. On May 13 the strength of the force in the Narvik area was:

Army (British) .	13,100
(others) .	11,700
R.A.F. . .	1,000
	25,800

'SCISSORSFORCE'

It was known that the Germans were moving north by road and rail and were already in Mosjöen and in contact with 'Scissorsforce' consisting of Independent Companies which had been formed in and sent direct from Great Britain and had landed at Mosjöen and Bodö. Each company consisted of 20 officers and 270 O.Rs., all volunteers and Territorials. Altogether ten such companies were formed, recruited from 52nd, 9th, 54th, 55th and 1st London Divisions, but only five were sent to Norway. With each company were a medical officer and eight medical orderlies.

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The order of battle of 'Scissorsforce' is given in Appendix V. Its medical component consisted of:

A C.R.S. of 50 beds with the following staff:

Three R.A.M.C. officers, one of whom was S.M.O. 'Scissorsforce', one a specialist surgeon and one a G.D.O., together with 37 O.Rs., R.A.M.C.

One A.D. Corps officer and one dental clerk orderly.

The main road running north from Namsos and Grong through Mosjöen ended at Elsfiord. From here a ferry ran to Hemnesberget where the road picked up again to run through Finneid on to Mo. From Mo it followed the Lons and Salt valleys to Saltdalen (Rognan) at the head of the Salt Fjord, at the northern tip of which lies Bodö. A ferry from Saltdalen joined this place with the northern shore of the Salt Fjord whence the main road continued to Bodö. On May 11 1st Scots Guards with R.A. and A.A. units and 'B' Coy. of 137 Fd. Amb. left Harstad for Bodö to reinforce 'Scissorsforce'. On May 12 the distribution of 'Scissorsforce' was as follows:

1st Indep. Coy. and one platoon 3rd Indep. Coy.	Finneid
1st Scots Guards (less one company) and 'B' Coy. 137 Fd. Amb.	Mo
3rd Indep. Coy., one platoon	Pothus-Rognan
H.Q. 'Scissorsforce' and 4th Indep. Coy.	Hopen
5th Indep. Coy., 3rd Indep. Coy., one platoon and the C.R.S.	Bodö

(2nd Indep. Coy. did not reach Bodö from the United Kingdom until May 13/14.)

On May 13, 5th Indep. Coy. moved from Bodö to Fauske and 4th Indep. Coy. on the following day from Hopen to Oddan. On the 17th the Germans drove 1st Scots Guards out of Mo. On the 19th 2nd Indep. Coy. was moved by M.T. to Rognan (Saltdalen) and on the following day H.Q. 24th (Guards) Bde. and 2nd S.W.B., less two companies, reached Bodö from Bogen and Skaanland. On the 21st, 1st Irish Guards arrived and on the 22nd 'Bodöforce' was created out of 'Scissorsforce' + 24th (Guards) Bde.

It had been decided that 'Scissorsforce' must be strongly reinforced if Bodö and the road to the north were to be safeguarded, and to this end the bulk of the British troops in the Narvik area were to be moved south to Bodö. The local command at Narvik itself passed into French hands.

On May 14 the Polish liner *Chrobry*, *en route* for Bodö with 1st Irish Guards aboard was bombed, set on fire and ultimately abandoned. Destroyers returned the troops to Harstad. On May 17 H.M.S. *Effingham* with H.Q. 24th (Guards) Bde., 2nd S.W.B. and 137 Fd. Amb.

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ran aground off Bodö and once again the troops were returned to Harstad. The third attempt to reach Bodö was successful.

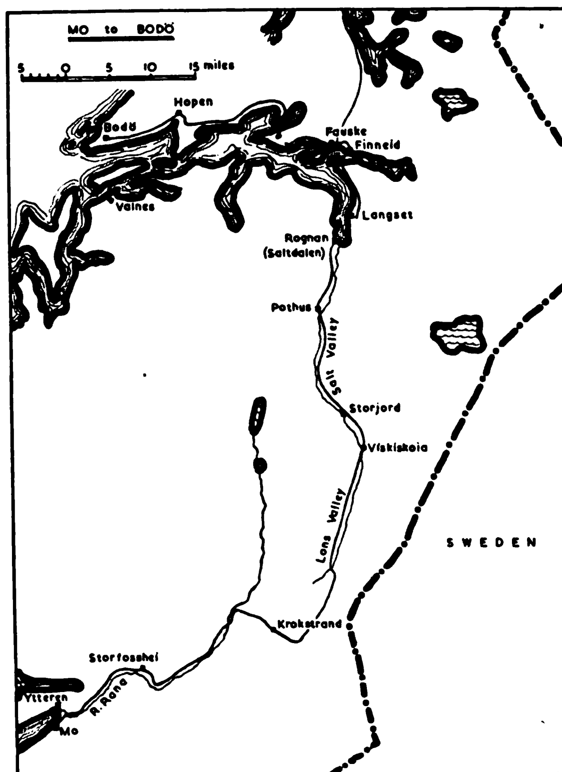

FIG. 10. Mo—Bodö.

The German attack was continuous and heavy and from the air there was unending bombardment. The resistance of the Norwegian and British troops was slowly worn down and step by step they withdrew along the Mo–Bodö road, so that by May 24 the distribution of the British units was as follows:

H.Q. 'Bodöforce'	Hopen
2nd S.W.B. and the C.R.S. (less Lt. Sec.)	Bodö and Hopen
1st Irish Guards	Pothus (8 miles south of Rognan on the Rognan–Mo road)
1st Scots Guards and 3rd Indep. Coy.	Storjord
1st Indep. Coy. and Lt. Sec. C.R.S. .	Rognan
4th Indep. Coy.	Valnesfiord
5th Indep. Coy.	Fauske.

Evacuation of casualties was along the road to the light section of the C.R.S. at Rognan by means of any kind of borrowed vehicle. From

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Rognan further evacuation was by puffer to the C.R.S. at Hopen or to the civil hospital at Bodö.

The decision had now been reached that the Allied forces must be withdrawn from Norway. On May 26, 1st Indep. Coy. withdrew from Rognan across the Salt Fjord in local boats, but part of this company, finding the bridges had been blown along the Viskiskoya–Rognan road, had to march across the mountains. On May 27 Bodö was almost completely destroyed from the air, and between May 29 and June 1 'Bodöforce' was taken off by naval units for Harstad and Scapa.

THE ATTACK ON NARVIK

On May 25, C.I.G.S. had finally decided that northern Norway must be evacuated as quickly as possible. G.O.C. Force nevertheless decided that before leaving, Narvik should be taken and the facilities for shipping iron ore destroyed.

The attack was three-pronged. British troops were landed on the south shore of Gratangen Fjord and advanced on Foldvik, Gratangen and Elvenes. Others, landing on the north shore of Ofotfiord, moved on Bogen and thence along the north shore of Herjangs Fjord towards Bjerkvik. Still others landed on the south shore of Ofotfiord at Ballangen and Skjomnes and advanced towards Haakvik and Ankenes. Later these troops were replaced by French and Polish units. When the Germans had been pushed out of Elvenes and Haakvik the attack on Bjerkvik was launched. Polish troops from Bogen thrust forward towards Bjerkvik through Troedviken and Herjangl, while under cover of a naval bombardment two battalions of the Foreign Legion were landed at Bjerkvik itself on May 13. By May 18 the Germans had withdrawn to the neighbourhood of Lillebalak, seven miles east of Bjerkvik. Lake Hartvigvand was in Allied hands. The Foreign Legion continued its advance, reaching Öyjord and turning eastwards toward Lilleberget. All the original positions of the Germans, save Narvik itself, Ankenes and the railway, were now in Allied hands. Then followed on May 26/27 the assault on Narvik itself. The two battalions of the Foreign Legion together with two battalions of Norwegian Infantry were transported under heavy fire across Rombaks Fjord from Öyjord to land at Vassvik and Teraldsvik, two small fishing villages just north-east of Narvik. At the same time one Polish battalion thrust along the coast road from Haakvik to Ankenes and another moved over mountain tracks to positions east of Ankenes in order to cut off the Germans as they retired along the southern shore of Beisfjord. Narvik was taken, a Norwegian battalion being the first to enter the town ; 300–400 Germans were captured. By the 29th the Germans had been thrust back along the railway line to the Swedish frontier and on the 30th the French and Poles met along the shore of Beisfjord.

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Victory was complete, but its fruits were not to be plucked. On June 3, 2nd S.W.B. and 12th Chasseurs Alpins were pulled out to form a defence force for the base at Harstad. On June 4 German aircraft

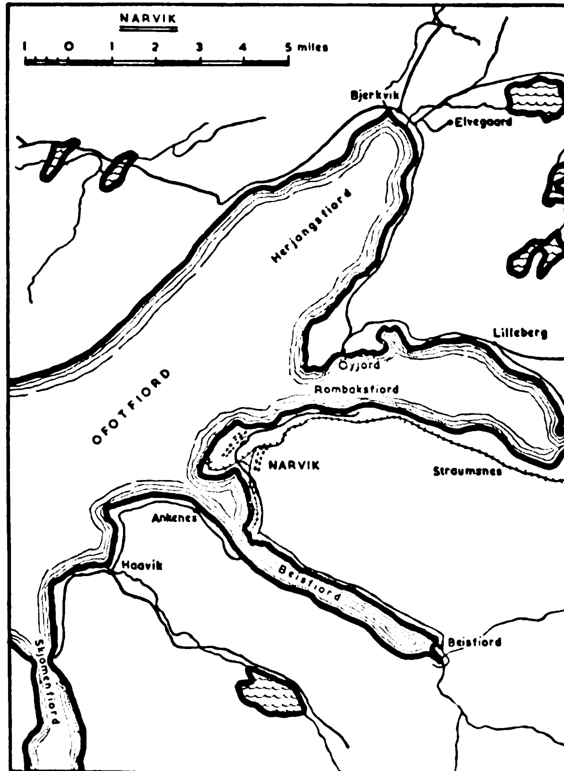

FIG. 11. The Narvik Area.

destroyed two-thirds of Narvik. The Allied troops were withdrawn during the period June 2–8. The Norwegian forces were demobilised and an armistice came into effect at midnight on June 9/10

TABLE 7

Casualties: North Norway Land Operations

	Officers	O.Rs.
Battle casualties . .	40	444
Other casualties . .	5	17
	45	461

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MEDICAL ARRANGEMENTS

The medical services in this campaign could not hope to find profit from perusal of the simple and symmetrical designs of evacuation presented by the orthodox textbook. This was amphibious warfare in which the antagonists were as much occupied in combating the malignancy of nature as in fighting each other. The terrain was such that most of the fighting was an affair of relatively small groups of infantry isolated from each other and far removed in time, if not in actual distance, from the static medical units which served them.

Under such conditions and circumstances, the successful accomplishment of the various tasks set the medical services was made possible only by the exhibition of personal initiative and of the ability to improvise and to organise such local resources as happened to be available. The general hospital had to be sited on an island and the C.C.S. on the coast of the mainland on which there was but little scope for ambulance cars. The conditions dictated that the system of evacuation should be:

From R.A.P. to A.D.S. (on the coast) by stretcher-bearers using man or horse-drawn sledges, wheeled stretchers or horse and cart, exceptionally M.T. ambulance cars.

From A.D.S. to M.D.S. by puffer. (The M.D.S. was established on one or other of two coastal steamers—the *Trondenes* and the *Salton*—which were converted into hospital carriers.)

From M.D.S. to C.C.S. by puffer.

From C.C.S. to general hospital by hospital carrier (either the *Trondenes* or the *Salton*).

Variations:

When possible, urgent cases from any point in the system direct to C.C.S. or general hospital by destroyer.

From A.D.S. to C.C.S. or general hospital by puffer.

From M.D.S. to C.C.S. or general hospital by hospital carrier.

In the initial stages of the campaign evacuation from R.A.P. to A.D.S. was exceedingly difficult. Seriously wounded men had to be carried down precipitous slopes covered with snow and ice. It was imperative that the stretcher-bearers should be unusually strong and fit men. It commonly took 12 to 24 hours to bring in casualties from the front line R.A.P. to the A.D.S. and another 6 to 12 hours to get them back to the C.C.S. Even in the case of rearward troops wounded during aerial attack it often took up to 12 hours to get them back to the C.C.S. or general hospital.

The place of the D.U.K.W. in the later campaigns was claimed by the puffer in this. But the supply of puffers was limited, and in time of

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emergency they were liable to be taken away for ration, military transport and other purposes. In this campaign, as in others, it was shown that shared or pooled transport was not a satisfactory provision for the medical services. Moreover, the low speed of the puffer made evacuation a lengthy process. A further difficulty was that these small craft were apt either to break down or to disappear. During air raids they were particularly unreliable despite the presence of a resident N.C.O. and four men of the R.A.M.C. on each. But, when allowance for these drawbacks is made, it is clear that the puffers provided the solution of an exceedingly difficult problem. Evacuation by water was at all times liable to interference by bombing. The Germans took no notice whatsoever of the Red Cross signs with which the H.C. *Trondenes* and *Salton* were marked and ultimately it was found necessary to substitute trained naval crews for the Norwegian civilians who, quite understandably, deserted rather than face the fierce and frequent air attacks to which all the craft were subjected.

The field ambulances were subdivided in this campaign and their several parts were used in different ways.

137 *Field Ambulance*. The experience of headquarters was decidedly unfortunate and its achievements inconsiderable. After about a week in billets in Harstad the unit was detailed to fit out the small coastal steamer *Trondenes*, for the transport of casualties. This sailed a week later, when the work was partly done, for Liland on the north side of the Ofotfiord, there to lie off and pick up casualties from the shore. The next day it was reported that there were some survivors from H.M.S. *Hardy* at Ballangen. These were picked up, the patients being conveyed from the civil hospital, two miles inland, by horse sledges borrowed on the spot. On returning to Liland the unit was ordered to Harstad and the patients were there transferred by ambulance cars to 22 B.G.H. It was then replaced on the *Trondenes* by H.Q. 147 Fd. Amb.

On May 17 H.Q. 137 Fd. Amb. embarked on H.M.S. *Effingham* and sailed for Bodö. As has been related, when nearing Bodö, *Effingham* ran aground and had to be abandoned. The unit was transferred to a destroyer and returned to Harstad, having lost its personal and unit equipment. Some of this was immediately replaced from store. On May 20 this unit was ordered to embark on a destroyer, and again for Bodö. The officer commanding entered a personal protest against the suggestion of sailing with incomplete equipment. Eventually the order was cancelled and the unit retired to billets near Harstad where it remained for the rest of the campaign. The total number of casualties evacuated by H.Q. 137 Fd. Amb. in the course of the campaign is represented by the survivors from H.M.S. *Hardy*.

For the assault of Bjerkvik and subsequent operations 'A' Coy. 137 Fd. Amb. was under the command of the officer commanding 147 Fd.

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Amb. Previously 'A' Coy. had operated independently along the north side of Ofotfiord, first with 24th (Guards) Bde. and later with the Foreign Legion. The company evacuated a total of about 500 casualties —most in one day, 86.

Soon after disembarkation 'B' Coy. was sent with 2nd S.W.B. to Skaanland, but after a week there returned to Harstad. When 24th (Guards) Bde. was sent by sea to Bodö and thence by road to Mo, 'B' Coy. 137 Fd. Amb., went with it and formed an A.D.S. in a small local hospital about two miles north of Mo. During the first week eight casualties, including a German flying officer shot down into the fjord, were held at this A.D.S., there being no further means of evacuation. These were later evacuated by road to the modern and well equipped civil hospital of 200 beds at Bodö.

A few days later intermittent fire was heard from the south and it became evident that a British withdrawal was taking place. News was brought that the R.E. were preparing to demolish the bridges on the road from Mo to Rognan. It became necessary to evacuate the A.D.S. and the company commandeered two 30-cwt. lorries from a R.A.S.C. section. These were used to evacuate 14 patients, including 4 stretcher cases. All heavy stores were left behind. Two officers and most of the unit's personnel marched 28 miles in the first two days. One officer with two O.Rs. and 14 patients reached the civilian hospital at Bodö after a journey by lorry of 56 hours. The remainder of the company travelled by puffer down the fjord from Rognan and established themselves in the hospital at Bodö. Afterwards several trips to Rognan were made and twelve patients evacuated before the enemy took possession of the place.

A week later Bodö was heavily raided and the civil hospital was demolished. In response to urgent appeals H.C. *Salton* was despatched to Bodö from Harstad. She managed to get alongside the burning quay and to take off 'B' Coy. 137 Fd. Amb. together with 105 casualties. These were taken back to Harstad where the field ambulance personnel remained in billets until the final evacuation.

No British troops, except the personnel of the field ambulances engaged, took part in the assault upon Bjerkvik. The medical arrangements were that 'A' Coy. 137 Fd. Amb. should follow the Foreign Legion in at Bjerkvik. Two bearer squads from 137 Fd. Amb. were attached to the Poles. H.Q. 147 Fd. Amb. was to lie off in the hospital carrier *Trondenes* with two puffers to evacuate from the A.D.Ss. The plan worked well. The Poles encountered little opposition until they reached the outskirts of Bjerkvik. After the capture of the town Polish casualties were evacuated from there. Most fortunately the Germans, though they had mined the wooden jetty at Bjerkvik, had not blown it, and it was available for Allied use. The Royal Navy had damaged it

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by shelling but it was soon repaired and working efficiently. All casualties were evacuated to H.C. *Trondenes* before 2000 hours, by which time the Foreign Legion and the Chasseurs Alpins had met on the Elvenes–Bjerkvik road.

The medical cover for the attack from Öyjord on Vassvik, Teraldsvik and Narvik was as follows:

The French had a *poste de secours** on the reverse side of a hill just north of Öyjord. 'A' Coy. 137 Fd. Amb. came down from Bjerkvik and evacuated from Öyjord to Bjerkvik. Part of H.Q. 147 Fd. Amb. cleared the A.D.S. at Bjerkvik into puffers some of which went direct to the C.C.S. at Taarstad and some to the M.D.S. on H.C. *Trondenes* staffed by the remainder of the H.Q. in Bogen Bay. Wounded began to arrive in the *poste de secours* and the A.D.S. in the early morning and continued in a steady stream. Air attack was almost continuous on both the puffers and the ships of the Navy giving supporting fire.

On the following day evacuation was from Narvik itself, the French taking their casualties to the Norwegian civil hospital and the Norwegians, many of whom during the assault had been evacuated by the British units, resuming responsibility for their own.

Narvik itself now began to undergo air attack, and the evacuation of women and children was organised by the Navy. Assistance in this was given by the puffers attached to the field ambulances. In Narvik hospital three British sailors, survivors of H.M.S. *Hardy*, were found and evacuated.

147 *Field Ambulance*. This unit landed at Harstad on April 16. It was allotted a billet area a mile outside the town and reached by a steep road almost knee-deep in soft snow; up this road its twenty-two tons of stores had to be man-handled. The unit remained for a short period in billets, time profitably spent in checking and arranging stores, putting men through up-grading tests and making contact with other units with which it would be working in the near future.

On April 30 H.Q. was established in H.C. *Trondenes*. One of the puffers attached to the unit was allotted to 'A' Coy. and the other to 'B' Coy.

Much time and trouble were given to the fitting out of the S.S. *Trondenes* as a hospital carrier. The work was begun by H.Q. 137 Fd. Amb. by whom she was first staffed, and completed by H.Q. 147 Fd. Amb. Canvas awnings and screens were fixed to enclose decks and Brechot gear mounted to carry ordinary stretchers. Neil-Robertson stretchers, borrowed from the Navy, were used for lowering casualties on board by means of the donkey engine or for lifting them through

* The *poste de secours* normally correspond roughly with a R.A.P. but as further equipped and enlarged by the R.A.M.C. it approached more nearly to the design and functions of an A.D.S.

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the doors in the side of the vessel. The original passenger saloon was fitted up as a treatment room and bunks were arranged for patients. The Norwegian crew consisted of 3 officers and about 20 men. These with the personnel of H.Q. Coy. made the ship very crowded, yet when the transformation was complete 150 stretcher cases and about 100 sitting cases could be accommodated.

As the battle for Narvik gained in intensity and as casualties became more numerous, a second ship, S.S. *Salton*, very similar to S.S. *Trondenes*, was staffed and equipped to serve as a hospital carrier or floating M.D.S. Its British personnel were provided by the staff of 9 Ambulance Train.

The Geneva Cross was displayed on these hospital carriers, but a more substantial source of confidence to the crews and human cargoes was probably found in a gift of lifebelts from the Navy.

Maintenance of the ships was not always an easy matter. The hospital carriers were coal-burning ships and could bunker only in Harstad. The puffers burned Diesel oil which could be obtained in Harstad or Liland. The *Trondenes* was due for boiler scaling and bottom scraping and the engines of the puffers needed overhauling. In meeting these difficulties the Norwegian crews were particularly helpful.

During the preliminary advance on Ankenes H.Q. 147 Fd. Amb. was chiefly engaged in evacuating the A.D.S. of 'A' Coy. at Skjomnes and later at Haakvik, though a few trips were made to clear the A.D.S. of 'B' Coy. at Sandenes during the advance on Elvenes.

'A' Company. The A.D.S. was first at Skjomnes, later at Haakvik and later still at Emmenes, round the point near Ankenes. Carries were generally long but conditions were not so severe as with 'B' Coy. Being nearer to Narvik, however, the A.D.S. was subject to more frequent and more intense air attack. In addition there was a constant threat from enemy ski-patrols who crossed the mountains from inland. Evacuation was by puffer to H.C. *Trondenes* in Bogen Bay and thence to the C.C.S. at Taarstad.

'B' Company. The A.D.S. at Sandenes evacuated the wounded of the Chasseurs Alpins. It was dispersed in unoccupied houses with the bearers working eastwards towards the Elvenes–Bjerkvik road. Relay posts had been established along each route, but even so conditions made the carries very laborious and the work became even more difficult later as the snow melted. On one occasion a carry in the Labergdalen district took four hours; this in three to four feet of snow and under repeated air attack. Fortunately battle casualties were not very heavy although there was a considerable number of frostbite cases.

When Elvenes was occupied and the enemy had withdrawn to Lillebalak, since all casualties could not be evacuated through Bjerkvik, 'B' Coy. 147 Fd. Amb. was left at Elvenes for a few days of well-earned

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rest. Later it returned to Harstad, being bombed on the way and only just managing to beach its craft in time.

The medical arrangements for the final evacuation from Harstad were made by A.D.M.S. Base. 147 Fd. Amb. was detailed to give effect to them. Casualties too ill to be placed on board a ship were to be conveyed either to 22 B.G.H. or to the civil hospital at Harstad. Officers commanding troops were instructed to arrange for R.A.Ps. to be in operation at all places of embarkation and R.M.Os. to evacuate the badly wounded to Harstad by such means as might be available.

Excerpts from the reports of these field ambulances give a clear picture of the conditions under which their work was done:

> 'Before May 10 there was no road open because of snow, and even when the roads were open they were very tortuous and very rough. This made the main channel of evacuation by boat down the Ofotfiord. . . . The land evacuation was very difficult. Before May 10 hand carriage through thick snow, hand-drawn stretcher sledges being used to the roads and horse-drawn sledges on the roads. The hand carriage was often long (3 miles) and over mountainous country. Between May 10 and May 20 it was possible to use wheeled stretchers on tracks and horse-carts on the roads. After May 20 mechanical transport was available, three 2-stretcher ambulances (British) and one 4-stretcher ambulance (French) being used. It was found that sledge-bearers became very exhausted.
>
> 'The M.T. solved one great difficulty, that of conveying stores. Before May 20 each advance entailed moving stores by hand, often requiring three journeys, one for kit, one for stores and one for rations, of which a week's supply for personnel and patients was held.
>
> 'The evacuation by water after some practice became very easy. Stretchers were shortened by four inches to make loading easier and to enable them to be used in French transport. Slings were used to lower the stretchers into the hold of the puffers and patients were slung from the jetty to the boat deck by means of a ship's donkey-engine. The holds were levelled off with loose boards, and with careful loading 10–16 lying cases could be accommodated in the hold and the same number of walking wounded in the cabin. The ship's crew and the field ambulance crew usually lived on the boat and did the loading and unloading. The journey by sea was usually from 6–10 hours and hot drinks, etc. had to be served to patients. The patients were always comfortable and usually slept even when the sea was rough.'

7 *Casualty Clearing Station.* After landing at Harstad on April 15 the C.C.S. opened in Trondenes in a school house. When its equipment was checked it was found that the steriliser was missing and it was necessary to have an improvised one made in Harstad. Its first patients were Norwegian civilians with head wounds caused by aerial bombing and Royal Navy personnel wounded in the actions of April 10–13 when British destroyers sank the German destroyers that had brought the German troops to Narvik.

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At the beginning of May the C.C.S. moved to Taarstad, a small fishing village on the north shore of Ofotfiord, taking over the school and nearby houses close to the small pier. Snow fell during the following ten days. The ground was frozen hard so that slit trenches could not be dug and the dead could not be buried. The X-ray lorry could not reach the C.C.S. for the reason that it was too wide to pass across a nearby bridge. In this campaign the desirability of having a special lorry built and equipped as an X-ray vehicle, came to be questioned. Because of its size and weight it was commonly immobilised and had to be regarded and used as a stationary plant. The need was felt for a portable plant that could be used anywhere and be transported on a modified standard lorry. In the schoolhouse there was no running water, but since it was light all night long no artificial lighting was required.

The C.C.S. dealt with some 150 casualties altogether. Its first patient was a Laplander sent in with acute appendicitis. Other civilians came in following the shelling of Bjerkvik by H.M.S. *Warspite*. The wounds of the Chasseurs Alpins gave trouble for the reason that bits of their sheep-skin coats were commonly driven into them. There could have been considerable difficulty in the matter of inter-communication between Norwegian, French, Polish and British medical officers concerning the description of a wound, had not the international code used by the French Foreign Legion been adopted. This was a tie-on label taking the following form:

Code		Example	
Region		A	
Tissue	Missile	2 4	II

Region	*Tissue*	*Missile*
A. Skull	1. Soft tissues	I. Bullet
B. Face	2. Bones	II. Shell
C. Chest	3. Joints	III. Bayonet
D. Abdomen	4. Vessels	IV. Gas
E. Limb	5. Viscera	V. Other physical object

Most of the casualties received by the C.C.S. arrived by puffer. At the end of the pier was a hut in which a medical officer practised triage, sorting the casualties into categories according to the urgency of their need for surgical treatment.

The C.C.S., like all the other medical units, was somewhat isolated owing to the terrain. It was bombed on one occasion but no damage was done. It returned to Harstad for the final evacuation.

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22 *British General Hospital.* The hospital sailed from Glasgow in two parties, a small advance party on April 6 and the main body, including 40 personnel of the Territorial Army Nursing Service, on April 11. The advance party disembarked by puffers at Harstad on April 15 and the main body, somewhat hurriedly owing to a bombing attack on their transport, by destroyer on April 16.

The setting up of tents was out of the question but a rapid reconnaissance succeeded in finding accommodation in schools, other buildings and billets for hospital beds, stores and personnel. These buildings were situated in the town itself and along the shore of the bay. The locations were as follows:

(1) Seljestad School, three kilometres south of the town. Equipped as a Norwegian A.R.P. emergency hospital—this supplied 76 beds. It was later expanded by the utilisation of billets for light cases to 150 beds, the greatest number occupying it at any one time being 120. An operating theatre was equipped here.

(2) Military School in Harstad. This was furnished with unit equipment to accommodate 80 beds. An operating theatre was equipped here also.

(3) Gymnasium at Military School. This was at first used as G.1098 stores, but after evacuation of the High School was equipped to accommodate 70 beds.

(4) Civil Hospital, a well-equipped, modern building occupied by Norwegian civil and military patients and offering facilities for X-ray, theatre and laboratory work immediately on arrival until the unit equipment became available. The theatre was used throughout for serious cases from the Military School, some of whom were retained after operation in the civil hospital. The laboratory accommodated an improvised blood transfusion unit and the X-ray equipment was at the disposal of the unit radiologist who also undertook some of the civilian work. The civil hospital at times was able to provide accommodation for 32 Allied wounded.

(5) High School. This large stone building in the town was equipped with beds but was evacuated on May 20 after an aerial bombardment which damaged the structure.

(6) Gymnasium, near the High School. This wooden building was used as a store for I.1248 equipment and also as a central dispensary.

(7) Barnkjemmet (Children's Home). This wooden building outside the town boundary was equipped to provide a medical and isolation section of 30 beds.

(8) Trondenes Folkenhogskule, two miles north of the town. This school accommodated for a few days after arrival the personnel of 22 B.G.H., of 7 C.C.S. and of 9 Ambulance Train. It was later equipped to form a hospital of 100 beds with an operating theatre with two tables. The X-ray equipment and steriliser were installed there.

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Transport by road was at times difficult but a jetty nearby provided an alternative means of transport by the use of puffers for patients and equipment.

(9) Dental Centre. This was established in the rooms of a local dentist away on active service with the Norwegian Army.

(10) Medical Inspection Room. This was established in an arms store of the Norwegian Army and was used for all base troops of units without medical officers. It was equipped and staffed by the hospital.

In few of these buildings was there any water-borne sewage. The disposal of sewage was by boat into the fjord, by burning in improvised incinerators and by collection by civilian labourers.

(11) Tromsö. After a reconnaissance made by the A.D.M.S. Force in which the potentialities of this town (situated some 70 miles north of Harstad) as a hospital base were explored, it was decided by Force H.Q. to carry out the equipping of existing buildings there as a hospital pending the erection of a 1,200 bed hospital in huts outside the town. On May 23, 3 officers and 15 O.Rs. of 22 B.G.H. proceeded there and equipped 200 beds in the High School, a few of which were occupied by local casualties. No further personnel or patients had been sent there before the evacuation of the entire force.

A grave initial handicap was imposed by the absence of equipment. Almost alone among the British medical units in Norway, 22 B.G.H. ultimately was able to assemble the whole of its equipment, but this could not be done for more than a week after the arrival of its personnel on April 16. When the transport bringing the equipment did arrive on April 24 it was obliged to discharge the greater part of its cargo by means of puffers at many points in the harbour as the threat of enemy aircraft and the dropping of bombs prevented a systematic unloading at one quay. The unloading was carried out by the personnel of the unit, many of whom worked night and day.

Within five days of arrival in Norway the hospital, in spite of its lack of equipment, was receiving sick and wounded and operating at Seljestad and at the civil hospital. An improvised blood transfusion service had been established at the civil hospital, soda water bottles purchased locally being used as containers pending the arrival of the proper equipment. A supply of donors from base troops was arranged and the personnel of 22 B.G.H. also contributed a considerable amount of blood. In connexion with this expedition two F.T.Us. had been mobilised and despatched with stocks of stored blood, fluid plasma, glucose-saline and equipment for the local collection and giving of blood. One of these units never reached Norway; the other arrived incomplete, only the type A refrigerator and the driver being landed. This refrigerator and its contents were placed at the disposal of the

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pathologist of 22 B.G.H. He assumed the responsibility of establishing a local blood bank supported by local bleedings from military personnel and for supplying plasma (much of which was made from time-expired blood), crystalloid solutions and transfusion equipment to 7 C.C.S., 137 Fd. Amb. and to the personnel of 9 Ambulance Train. An unknown number of transfusions were given. Records were made of twelve at 22 B.G.H., two at the floating M.D.Ss. and four at 7 C.C.S. It is noteworthy that under the disorganised conditions of this ill-fated expedition it was found possible to organise and maintain a blood bank from local military personnel.

The various sections of the hospital could not be grouped into surgical and medical divisions. It became apparent very early that the divisions could be regarded only as a convenient method of differentiating between the surgical and medical aspects of the treatment of sick and wounded and not in any sense as administrative sub-units.

The division of the hospital into so many sections, widely spread and with considerable difficulties of communication and transport, necessitated the formation of no less than seven surgical teams, one at Seljestad, one at the military school, one at the civil hospital and two at Trondenes. In addition two surgical teams were sent to the C.C.S. where the surgeon had contracted a septic hand during his first day's operating. The quartermaster's personnel—pack-stewards, storekeepers, cooks, dispensers, sanitary personnel, etc.—had likewise to be increased and split up.

It became increasingly clear that the organisation of a 1,200 bed hospital was quite unsuited for division, as was necessary here, into several sections which, owing to the distances between them, would have perforce to be more or less self-contained. The effect of this uneconomic dispersion was further exaggerated by frost and thaw and constantly by enemy action. The administrative difficulties arising from this situation were aggravated by the difficulties of communication by telephone. Here at least visual signalling or the use of Morse 'tapper' would have been invaluable and the report of the officer commanding suggests that a signal section might be attached to a general hospital or alternatively that hospital personnel might be trained in signal duties.

D.D.M.S. Force, reviewing the campaign, concluded that in a campaign of this sort the 1,200 bedded hospital was not nearly so useful as an equivalent number of 200 bedded hospitals would have been.*

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* In later campaigns this inflexibility of the large general hospital was also noted. Opinion rapidly swung towards the desirability of breaking this unit up into a headquarters portion and a number of self-contained sections of 200 beds up to the desired total, each of these sections to include a headquarters moiety and certain specialist equipment which could be added to the main headquarters; but each section would be so organised that it could function, if need arose, very nearly as a separate entity.

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The personnel of the general hospital were made responsible for meeting all convoys at the quays and transporting the patients in ambulance cars detached from mobile medical units to the various sections of the hospital. The evacuation to hospital ships was also carried out by the hospital personnel. The hospital in this way acted as its own M.A.C.

A convalescent depot was equipped and staffed by the hospital at Karsfjord, eight miles away, but this had to be abandoned owing to a threat of parachute landings.

The officer commanding 22 B.G.H. was appointed A.D.M.S. Base Sub-Area until the arrival of a D.D.M.S., when A.D.M.S. Force took over these duties.

On five occasions, before the projected actions at Gratangen, Narvik (when 1,000 casualties were expected), Bjerkvik, the evacuation of Bodö and, finally the capture of Narvik, the hospital was ordered to evacuate: (1) all cases who would not be fit in 14 days, and (2) all cases which were movable.

Only about one-sixth of the total wounded came through the C.C.S., the 'buffer' action of which was consequently lost. Many cases were thus evacuated prematurely from a clinical standpoint. The necessity for rapid evacuation prevented the undertaking of the treatment of many chronic cases—herniae, varicose veins and haemorrhoids—many of whom should never have been sent overseas.

Many casualties were admitted to hospital who had had no further treatment since leaving the R.A.P. Many had endured extreme hardship and exposure, waiting in deep snow and being carried over rough ground before reaching water transport or being immersed in icy fjord water when puffers were sunk by enemy action. In order that the hospital might cope with any sudden large influx of casualties, every opportunity of evacuating its patients by hospital ship was taken. As a result many cases were evacuated earlier than they should normally have been and before even the immediate consequences of treatment could be observed.

During the period 22 B.G.H. was in action—April 21 to June 5—admissions numbered 1,303, classified in Table 8.

Attendances at the out-patient clinics numbered 3,570, including 873 at the dental department.

The work of the dental centre proceeded smoothly and expeditiously from beginning to end of the campaign, being greatly facilitated by the wealth of equipment found in the rooms taken over. Patients numbered 873—drawn from units of H.M. Navy, Army and Air Force, from the French Army and French Foreign Legion, from the Polish Army, from the Norwegian Army and from the Mercantile Marine. There were 759 extractions made under local anaesthesia. The dental

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TABLE 8

	Wounded	Frostbite	Accidentally injured	Sick	Totals
Army . .	173	—	50	228	451
R.N. . .	100	—	10	43	153
R.A.F. . .	8	—	3	5	16
Total British .	281	—	63	276	620
Allies . .	368	85	28	92	573
P. of W. .	108	—	2	—	110
	757	85	93	368	1,303

Discharges are classified as follows:

	Duty	Sick convoy	Deaths	Other hospitals
Army . .	196	249	6	—
R.N. . .	37	113	3	—
R.A.F. . .	1	15	—	—
	234	377	9	—
Allies . .	79	485	8	1
P. of W. . .	17	64	3	26
	330	926	20	27

officer reports: 'Attention must be drawn to the large number of extractions necessary. No attempt appears to have been made in a great proportion of units to render the men dentally fit during the training period. In 22 B.G.H. where such an effort was made, only 3 minor casualties have occurred on active service, thus conserving the time of the dental officer abroad.'

The very large demand for dentures (252 separate items) was occasioned by the losses on M/V. *Chrobry* and H.M.S. *Effingham*, the former sinking at a moment when, as the dental officer plaintively remarks, 'Dentures appeared to be reposing anywhere but in the mouths of their owners'.

Aerial bombardment, which began even before disembarkation of the hospital, continued almost unhindered by military opposition, and with little intermission save during a period of snowfall, until the expedition was well on its way home. The following quotation is taken from the unit's war diary under date May 20:

'At 1830 hours A.A. fire opened on an enemy plane which appeared to be making a reconnaissance flight. A short time later the naval vessels in the harbour and all land A.A. guns opened very heavy fire upon a

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number of planes which appeared suddenly. A very heavy bombardment lasting about three hours followed, causing much damage in the town. High explosive bombs were dropped, one within a few yards of the branch of the unit at the High School, Harstad, resulting in the death of one O.R., R.A.M.C. Every window at the rear of the building was shattered. The O.R. was killed in a ward on the first floor of the building while in the course of his duties and the twelve patients in the room miraculously escaped with minor scratches. The whole building was badly shaken and it was decided to evacuate all patients. The evacuation was carried out swiftly and without any further incident. Several incendiary bombs were dropped in the grounds of Trondenes Hospital but were extinguished before they caused any damage. One of the oil tanks, which are situated perhaps a mile away, burst into flames and, on account of the danger of the fire spreading nearer the hospital by way of the trees, a number of cases were evacuated by means of puffers and the remainder were moved to the basement ward. There were also a number of deaths among the civilian population. No further damage was done to any of the hospital buildings and the manner in which the personnel behaved under their first heavy bombardment was very praiseworthy.'

22 B.G.H. re-embarked at Harstad in three parties on June 4, 5 and 6, in destroyers which conveyed the parties to transports waiting at sea. The T.A.N.S. sisters embarked on H.S. *Aba* on June 1.

Hospital Ships. Evacuation to England was carried out by H.S. *Atlantis* and, after the battle of Narvik, also by H.S. *Aba*. H.S. *Atlantis* anchored in the vicinity of Harstad on April 29. During the whole of her stay in the neighbourhood she was repeatedly bombed, with several near hits, but damage was trivial and casualties nil. No other ship was within a mile of her on any of these occasions. The despatch of H.S. *Atlantis* had not been notified—possibly for the sake of secrecy—to Force H.Q. at Harstad and the D.A.D.M.S. did not get into touch with her till May 5. Difficulties of communication were very great. Nevertheless the coming of H.S. *Atlantis* eased the situation considerably, as she could take 600 cases.

The ship's first patients were 22 casualties (20 lying) from a Polish destroyer sunk off Narvik. By May 12 she had 126 patients on board including a number of wounded P.o.W. In view of the continuance of air raids and the difficulty of obtaining adequate supplies of oil and water it was decided to move to Tromsö, but the ship's master would not go without a pilot and no pilot was available. Casualties were now coming in at the rate of 50 every two or three days. On May 21, H.S. *Atlantis* sailed for England carrying a total of 432 patients including British, French, Polish and P.o.W. She returned to Harstad in time to assist, with H.S. *Aba*, in the general evacuation of Norway by the Allies. On this occasion she carried back to Britain 194 patients plus 52 unwounded. H.S. *Aba* carried 369 patients. A quotation from

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H.S. *Aba's* voyage report is worth recording as evidence of good organisation:

> 'While the ship was making her way to her anchorage at Harstad two hospital carriers were circling round her, and as soon as the anchor was dropped they came alongside, one to port and one to starboard. Within 25 minutes of anchoring the first patient was being hoisted on board by "mammy chair" for walking cases and stretcher carrier for lying cases. Two derricks did the hoisting, one working to each carrier. Loading was started at 2200 hours on May 31 and proceeded throughout the night, there being no darkness at all. When the two carriers were unloaded they returned to the jetty and filled up again and on their return to the ship loading recommenced. In addition a tender came alongside with several tons of medical stores for shipment to home ports. Loading of both patients and gear was completed by 0720 hours on June 1.*
>
> 'Permission to proceed to home port was immediately asked for by signal and written route orders arrived at 1000 hours by launch.The anchor was weighed and the ship sailed at 1015 hours.
>
> 'The patients, who numbered 369 including 18 officers, were composed of British, French and Polish soldiers, and of personnel of the Royal Navy, the Royal Marines and the Merchant Navy.'

Advanced Depot of Medical Stores. At Harstad a detachment of an advanced depot of medical stores functioned under a Q.M.S. It was established in a wooden building near the quay and did excellent work, but its administration was not altogether satisfactory, primarily for the reason that there was no officer (Q.M., R.A.M.C.) in charge of the detachment. It was found that many items among the stores landed were superfluous and totally unsuited to the needs of the campaign. The stores were mostly got away and sent home in H.S. *Aba.* A large quantity of medical equipment was lost when the transport *Cedarbank* was sunk by enemy action *en route* to Norway.

9 *Ambulance Train.* Since the railway was in German hands wholly or in part throughout the campaign this particular unit was never in a position to exercise its functions. The personnel, as has been related, fitted out and staffed the coastal steamer *Salton* as a hospital carrier. During the month May 7–June 7, they evacuated 871 casualties, 193 to 22 B.G.H., Harstad, 463 to H.S. *Atlantis* and 215 to H.S. *Aba.*

21 *and* 25 *Field Hygiene Sections.* These units were located at Harstad but sent detachments to out-stations and made special inspections and reconnaissances. 21 Fd. Hyg. Sec. assumed responsibility for the sanitary organisation of Harstad and steady improvement in conditions resulted from the work of this unit. 25 Fd. Hyg. Sec. dealt with outlying stations and A.A. posts and was prepared to move forward when

*Plate VIII illustrates a casualty being hoisted on board a Hospital Ship.

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required, the scope of its operations being limited only by scarcity of labour and of materials for sanitary structures.

A general picture of the work of a field hygiene section is given in the following summary of the activities of 21 Fd. Hyg. Sec. in Harstad during the month of May:

> 'During the whole of the month the main work of the unit has been to augment the previously existing civilian sanitary organisation of the town. For this purpose a number of Norwegian labourers were employed, under the supervision of unit personnel, in street sweeping and systematic collection and dispersal of soil and general refuse. At the same time regular daily inspections of billets and their surroundings have been carried out. The area covered has been extended beyond the town boundary, particularly where it was essential to meet the special needs of certain units. Inspecting N.C.Os. and men have tried to give helpful advice and to stress the importance of using for improvisation of sanitary structures much material which might otherwise be discarded.
>
> 'Several short courses of instruction in sanitary duties have been held.
>
> 'Since May 6, 3 O.Rs., have been detached for duty in the Skaanland area where a landing ground for aeroplanes is being prepared. The troops billeted in this district, mainly R.E. or A.A. units, were faced with the most primitive sanitary arrangements. Much has been done to improve the conditions, but very much still remains to be done.'

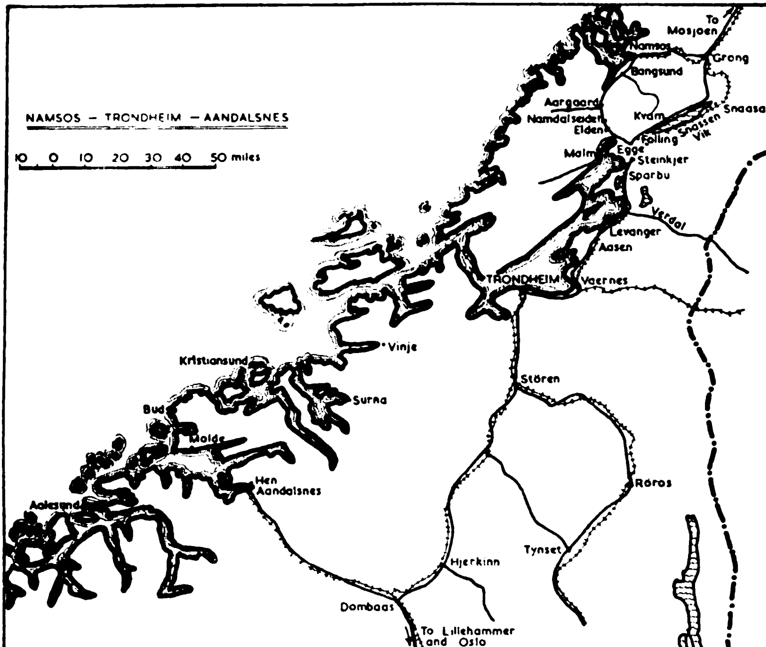

FIG. 12. Namsos—Trondheim—Aandalsnes.

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'MAURICEFORCE'

Namsos is a small port of some 3,600 inhabitants situated at the head of Namsos Fjord. It had an excellent small hospital of 250 beds.

At the time of the landing of 'Mauriceforce' on April 16 the snow was four feet deep. The enemy enjoyed almost complete superiority in the air.

The order of battle of 'Mauriceforce' is given in Appendix V. The only medical component of 'Mauriceforce' at the beginning consisted of the R.M.Os.

The purpose assigned to 'Mauriceforce' under General Carton de Wiart was, together with 'Sickleforce' under General Paget, to gain control of the Trondheim area. These two forces together constituted the North Western Expeditionary Force operating in central Norway under General Massy. H.Q., N.W.E.F. remained in the United Kingdom throughout the campaign.

Prior to the arrival of 'Mauriceforce' a small naval contingent had landed at Namsos together with the advance party of 'Mauriceforce' itself.

After disembarkation at Lillesjona and Namsos the force was deployed on April 21 as shown below:

Force H.Q.	Namsos
5th Demi-brigade Chasseurs Alpins	Namsos
H.Q. 146th Bde.	Egge
1/4th K.O.Y.L.I. . . .	Sparbu with detached companies at Stiklestad and Röra
1/4th Lincolns	Steinkjer with detached companies at Egge and Vist
1st Hallams	Beitstad, guarding roads, Follafoss–Malm and Mejeri–Namdalseid

'Mauriceforce' was promptly attacked and by mid-day of April 25 had been forced to withdraw to positions north of Namdalseid, the Hallams serving as a rearguard in the Sprora area. Touch with the Germans was lost and no further ground fighting occurred.

On the 20th Namsos was destroyed by the Luftwaffe and Rear H.Q. moved out to Egge, near Steinkjer.

On April 26 M/V. *Chrobry* arrived at Namsos with H.Q. staff of 61st Division together with A.D.M.S. 'Mauriceforce', four medical officers detailed for duties in the Namsos B.S.A., H.Q. 158 Fd. Amb. and 'B' Coy. 146 Fd. Amb. H.Q. 158 Fd. Amb. alone disembarked.

The decision had already been reached that the evacuation of 'Mauriceforce' was necessary. On May 3 the troops were embarked. The convoy sailed for Scapa and the Clyde. *En route* it was heavily attacked from the air. H.M.S. *Afridi* was sunk and 14 B.O.Rs. killed.

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TABLE 9

'Mauriceforce' Casualties

Unit	Killed		Wounded		Missing		Totals	
	Officers	O.Rs.	Officers	O.Rs.	Officers	O.Rs.	Officers	O.Rs.
1st Hallams		13	1	17			1	30
4th Lincolns		2	1	17		52	1	71
1/4th K.O.Y.L.I.		3		1	1	43	1	47
H.Q. Staff	1	1					1	1
R.A.O.C.				1				1
A.M.P.C.				4				4
Grand total	1	19	2	40	1	95	4	154*

* Dr. Derry in *The Campaign in Norway* gives 157 all told.

MEDICAL ARRANGEMENTS

A.D.M.S. had been instructed by War Office to make such local arrangements as he could with the Norwegian military and civil medical authorities for the accommodation and treatment of British casualties until the main force with its medical component arrived. The equipment of the R.M.Os. involved was increased to nearly double the standard issue.

The civil hospital at Namsos was situated on the outskirts of the town and was constructed partly of wood, partly of brick. It was very well equipped with electric light, good operating theatre and X-ray plant. A preliminary inspection had been carried out by a Naval medical officer who left an excellent report. The Norwegian medical officer in charge was at first inclined to be obstructive but later gave every assistance possible. Able-bodied Norwegian civilians were engaged as stretcher-bearers. Arrangements were made for this hospital to receive and treat British sick and wounded for a payment of 8 krone—10s. 5d. —per day. (*See* Plate IX.) It was bombed and completely evacuated and re-staffed again but it never really ceased to function as a hospital. (Plate X shows a stretcher-bearer squad searching for casualties after the raid.)

On arrival, H.Q. 158 Fd. Amb. (6 officers and 50 O.Rs.) went ashore and were sent to Spillum, about six miles away, there to open a small M.D.S. When it was learnt that Namsos was to be evacuated by the combined French and British troops, the unit returned to Namsos and its officers took over the care of British casualties in the civil hospital there up to the time of the general evacuation by sea on May 3. Eleven walking wounded were put aboard a destroyer, six others on a flying-boat and on May 3 seventeen lying cases were taken aboard H.M.S. *York*.

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At Steinkjer there was no civil hospital, but a series of small houses and halls was equipped—except for operating—as hospitals, each of some 20 to 40 beds. The A.D.M.S. reports: 'Eventually we acquired two of these houses as hospitals, one of 20 beds and one of 24 beds, close to one another and situated about 2½ kilometres outside the town. They were within easy reach of each other and the intention was to use one for sick and one for wounded. To staff them I took the medical officer of the Lincolns and his stretcher-bearers and obtained the assistance of a Norwegian woman doctor. There were sufficient hospital fittings and dressings in each to cope with an emergency. There was a qualified Norwegian nurse with each and a staff of women helpers similar to our V.A.Ds.' Later, when Steinkjer was heavily bombed and partly evacuated, 'these Norwegian doctors, myself and some nurses, together with hospital utensils and dressings, went to Kvam and there took over the village hall, which was quickly cleaned and adapted for accommodation for 40 casualties'.

In Namsos two single-stretcher ambulances were available, but the locally made stretchers were too bulky for use. From the S.M.O. of the Norwegian Force two 'ambulances' were obtained but these proved to be merely omnibuses, stripped and with mattresses on the floor. They served as little more than a means of transport. The Norwegian military medical service did not include a unit corresponding to the British field ambulance. A note from a report illustrates some of the difficulties involved in road transport in this area: 'Seven casualties were taken by one motor ambulance to Snaasen, a terrible journey as the road was in a shocking condition due to combined effects of thaw and military traffic. It was more like a farm track than a main road. The 40 kilometres took 3½ hours.' Again: 'The Quaker Ambulance Unit was reported in the mountain pass north of Grong with little prospect of getting through; also an American Ambulance Unit of 20 cars was held up by snow. Our most pressing need was ambulance cars.'

'SICKLEFORCE'

Aandalsnes is a small port of some 2,000 inhabitants situated at the head of the Romsdals Fjord and lying about sixty miles south-west of Trondheim. The region round about is very mountainous and thickly wooded. From Aandalsnes the railway runs east-south-east to join that running south from Trondheim at Dombaas and thereafter continues through Otta and Kvam to Lillehammer and Oslo. The one main road from Aandalsnes follows the line of this railway.

On April 17, some 600 Royal Marines landed at Aandalsnes, some 100 more at Aalesund and some 30 at Molde, and at Aandalsnes there was established a small Royal Naval Hospital. On the 18th, 'Sickleforce' began to disembark at Aandalsnes.

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The order of battle of 'Sickleforce' is given in Appendix V. The medical component consisted of:

A.D.M.S. 'Sickleforce'.
146 Fd. Amb. 'A' Coy. (without equipment or transport).
158 Fd. Amb. part of 'A' Coy. (without transport).

The purpose assigned to 'Sickleforce' was to secure the important railway junction of Dombaas and thence to operate northwards towards Trondheim. On April 19, 1/8th Foresters went by rail to Dombaas and another convoy arrived at Aandalsnes which included H.Q. 189 Fd. Amb. (without transport). The *Cedarbank* carrying the brigade's vehicles, guns and mortars had been sunk *en route*.

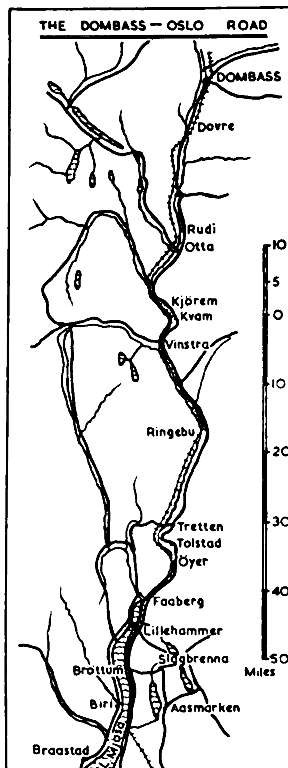

FIG. 13. Dombaas—Oslo.

Despite the instruction that 'Sickleforce', having occupied Dombaas, should move northwards towards Trondheim, when the force arrived the local Norwegian military commander made desperate appeals for the help of 'Sickleforce' in preventing the further advance of the Germans through Lillehammer to the north. The Commander of 'Sickleforce' found it impossible to withstand this importunity and so

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it was that instead of moving on to Trondheim from Dombaas, 'Sickleforce' moved south to aid the Norwegians in the Lillehammer area.

On April 20 the distribution of 'Sickleforce' was as follows:

H.Q. 'Sickleforce' with part of 'A' Coy. 146 Fd. Amb.	Aandalsnes
H.Q. 148th Bde.	Lillehammer
Half H.Q., 'B' and 'C' Coys. 1/8th Foresters . .	Bröttum
H.Q., 'A' and 'D' Coys. 1/5th Leicesters . . .	Aasmaken
Half H.Q., 'A' and 'D' Coys. 1/8th Foresters . .	Biri

On this date General Paget assumed command of 'Sickleforce'. He was allowed to understand that he might expect as reinforcements 147th Inf. Bde. and 15th Inf. Bde. of 5th Division together with attached troops including the remainder of 146, 158 and 189 Fd. Ambs., 36 Fd. Hyg. Sec. and as L. of C. units, 15 B.G.H., 34 Fd. Hyg. Sec. and a F.T.U. 5th Division was in France. Its 15th Bde. was despatched therefrom to Norway.

On the 22nd the most southerly British positions were heavily attacked. 1/5th Leicesters and 1/8th Foresters suffered heavy losses and the withdrawal from Sveen, Biri, Aasmaken and Bröttum, through Lillehammer, began. The troops were without sleep or food for some 36 hours, were moving in deep snow and were constantly attacked by mortar fire and from the air. At the end of this withdrawal the strength of these two battalions had been reduced to 9 officers and about 300 men.

On April 23 the convoy bringing 15th Inf. Bde. (5th Division) from France arrived at Molde and Aandalsnes and at once opened Adv. Bde. H.Q. at Otta. The battalions went into action as soon as they reached the crumbling front. On the 25th the Germans attacked Kvam. By the 26th the British troops were back at Dombaas and 1st Green Howards left Aandalsnes for this place, which was under continuous bombardment from the air, being surrounded by blazing woods. On the 27th it was decided in principle that 'Sickleforce' must be evacuated.

By this time troops were on half rations and the withdrawal continued, so that on the 30th 'Sickleforce' was concentrated in and around

TABLE 10

'Sickleforce' Casualties

Killed		Wounded		Missing		Totals	
Officers	O.Rs.	Officers	O.Rs.	Officers	O.Rs.	Officers	O.Rs.
4	17	21	128	76	1,156	101	1,301*

R.A.M.C. 3 officers missing, 2 O.Rs. wounded.

* Dr. Derry gives 1,402 and is more likely to be right.

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Aandalsnes itself, whence it was evacuated on May 1 by ships of the Royal Navy.

MEDICAL ARRANGEMENTS

H.Q. 189 Fd. Amb., landing on April 19, opened a M.D.S. in a school in Aandalsnes. After the destruction of the town (there were no less than 68 raids during the eight days of this unit's sojourn in Norway) this M.D.S. was transferred to Hen, a small village about four miles away to the north-east. From Aandalsnes casualties were evacuated to Britain by warship as opportunity arose.

When 'Sickleforce' moved inland, south to Dombaas, 'A' Coy. 158 Fd. Amb. together with a small detachment of 'A' Coy. 146 Fd. Amb., moved also and opened an A.D.S. in a church in Dombaas. All medical arrangements were made by the chief of the Norwegian medical services who had at his disposal a large number of ambulance cars. According to his instructions casualties were collected in the local small hospitals whence they were evacuated by ambulance car to the larger hospitals at Aalesund and Molde on the coast nearby Aandalsnes.

'A' Coy. 146 Fd. Amb. was sent to a ski-camp near Aandalsnes where a detachment of Royal Marines was training. There this unit gave assistance to the Royal Naval medical officer who was in charge of a small dressing station. In Aandalsnes itself the R.A.M.C. units received many kindnesses and much material help from the staff of the small Royal Naval hospital.

THE HEALTH OF THE TROOPS

The general health of personnel remained at an extremely high level throughout the campaign. This happy circumstance was due in part, no doubt, to the fact that the period of the year was favourable, being too early for flies and mosquitoes and too late for intense cold and prolonged blizzards, in part to the good work of the field hygiene sections and in part to the excellence of the rations. Cases of frostbite and snow-blindness were unknown among the British, and among the Allies were confined to a detachment of Chasseurs Alpins who were obliged to bivouac in deep snow. Other helpful factors may have been the very low level of disease prevalent among the civil inhabitants and the readiness of the troops to accept instruction.

Diseases among the Civil Population. Enquiries and investigations showed little of importance as likely to affect the health of the troops. Cases of enteric fever had been treated earlier in the year but none had occurred within a month before the arrival of the expeditionary force. There was evidence that in the Narvik area there was much pulmonary tuberculosis and some leprosy.

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Prostitution appeared to be uncommon in all districts occupied by the troops.

Liaison with the civil medical officer of health was established immediately after disembarkation and maintained.

Diseases among the Troops. Incidence ratios cannot be stated with accuracy, but a general analysis shows that admission to 22 B.G.H. for all other causes than battle casualties did not exceed 3·3 per 1,000 strength per week over the period of seven weeks during which this hospital received cases.

(*a*) Venereal Diseases: a total of 6 cases occurred. In all fresh cases infection appeared to have occurred before arrival in Norway.

(*b*) Scabies: 22 cases were treated, the incidence being 0·3 per 1,000 per week.

(*c*) Infectious Diseases: no major cases.

(*d*) Respiratory Diseases: upper and lower—incidence 0·58 per 1,000 per week.

(*e*) Lousiness: negligible until just before the withdrawal of the force when infestation was found to a slight degree in a fighting unit recently returned from intense and continued operations with 'Bodöforce.'

At Namsos the sick and accident admissions to hospital numbered only 24 over a period of 14 days, giving a sick rate for the force of 0·06 per cent. per day. A.D.M.S. 'Mauriceforce' remarks: 'Considering the weather conditions and the fighting conditions, the sick rate reflects the greatest credit on the soldier and his powers of endurance. The keenness of the men was such as to overcome their natural desire to report sick with ordinary complaints under trying conditions. Two days of the fighting were almost continual snowstorms and snow generally two feet deep. No facilities existed for change of clothing or bathing and in spite of this there were practically no skin complaints. Venereal disease was non-existent in the force.'

The conditions and happenings at Aandalsnes were such that it was not to be expected that more than general impressions concerning the general health of the troops and of matters connected with environment and hygiene could be brought away.

Rations. These were ample in quantity and excellent in quality (5,300 Calories daily). There was no evidence of food deficiency diseases. The composite tinned ration was supplemented by issues of bread, frozen meats, fresh vegetables and fish. Ascorbic acid tablets were on issue in the last month. There was inevitably much bartering with the French and Norwegians.

Clothing. Special clothing was issued to the troops for this campaign. It comprised:

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TABLE 11

Item	Number
Vest, light	2
Vests, woollen, heavy	2
Drawers, heavy	2
Jerseys, heavy	2
Jerkins, leather	2
Pullover	1
Overcoat, Tropal	1
Socks, woollen, pairs	9
Stockings, footless, pairs	2
Gloves, woollen, pairs	2
Gloves, leather, fur-lined, pairs	2
Mittens, pairs	2
Snow-goggles, pairs	2
Cap, fur	1
Sleeping-bag, Kapok	1
Boots, ankle-special, pair	1
Boots, ankle-rubber, pair	1
Kitbags	3

Authoritative opinion—both military and medical—held that this was not a well selected kit. Its bulk and weight reduced the efficiency, and especially the mobility of the men carrying it. Moreover, fur of any kind is difficult to dry when wet. The use of wind-proof cloth, rendering heavy undergarments unnecessary, would have delayed and minimised exhaustion in a country where movement had constantly to be made through snow or icy slush. Furthermore, excessive weight and bulk may lead—and here more than once did lead—to grave delays in embarkation and transhipment. Complaint was also made of the ill-fitting frames of the snow-glasses and of the unduly large size—mostly 12—of the boots provided. It should be observed that cases of trench feet were caused by the wearing of rubber boots instead of the leather boots which had been lost.

Nevertheless, apart from the loss of mobility, the kit, particularly the foot-wear, did afford good protection from the rigours of the climate, and the consistently high level of health maintained throughout the campaign was no doubt partly due to this.

Personal Hygiene. Notes on special health precautions were printed and circulated within a week of disembarkation. Frostbite and snow-blindness were given special attention. Repeated routine orders stressed the importance of care of the feet. Foot powder and soap were issued and attention was particularly called to the dangers of continued wearing of rubber boots.

Water Supplies. A piped supply was available at Harstad base. Careful investigation of source and distribution was carried out and supervision maintained. Instructions for treatment were issued as necessary. Distribution by water tank became necessary and was organised under medical supervision. In forward areas the use of wells and springs, some with piped distribution, was general. Treatment was carried out as

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shown to be necessary by inspection and test. The general quality was good, but deterioration was expected later in the season with the fall in ground water levels. In this connexion the D.A.D.H. comments: 'Some units arrived without water vehicles and had not drawn the water testing cases provided on the scale of vehicles. The amount of chemicals held was in many cases insufficient to carry over the initial period of supply organisation. These circumstances are mentioned as some results of alterations in war equipment scales, which could have been avoided if the essentials necessary for water testing and purification had been considered and borne in mind.'

Bathing Arrangements. At Harstad 21 Mobile Bath Unit took over the municipal and military baths on arrival and continued to manage them throughout. In the later stages unit showers were erected to supplement the military baths. Provision was ample and much appreciated.

Laundry Arrangements. A local contract was made but results were unsatisfactory. Much work was done under unit arrangements and many billets had clothes-boilers in the basement. The necessity for re-equipping units placed a great strain on ordnance stocks on several occasions and replacements were made possible only by withdrawals from units not affected. This shortage reduced the stock available for issue by the M.B.U. after bathing, and plans were prepared by the O.C. for the washing of underclothes as part of the work of his unit.

Disinfection. The A.S.H. disinfector of 21 Fd. Hyg. Sec. was used to establish a disinfecting station in Harstad. That of 25 Fd. Hyg. Sec. was used for outlying and A.A. units and work in conjunction with the mobile shower section of 21 M.B.U. Operating results were good.

Disinfestation. The Millbank disinfestor was never in full operation, one of its inner chambers not having been sent from Britain.

Conservancy. The usual technical problems presented themselves and were met with the usual solutions. In this, as in other matters, the local authorities co-operated cordially. Nevertheless, military supervision of a civil executive produced inevitable difficulties which could be solved only by a process of increasing co-operation and infiltration and would no doubt have been solved if the campaign had not ended. At Namsos the water supply had to be man-handled from wells to each building.

INTER-COMMUNICATION

D.D.M.S. Force records that: 'The difficulties in communication by message, telephone, signal or wire were very great; much time had to be spent in getting calls through, as wires were often on civilian exchanges and delays of many hours were frequent. Moreover, German spies were almost certainly present in the towns and there was a by no means negligible risk that telephoned information might reach the enemy as soon as its proper recipient.'

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Communication with the Navy also presented difficulties. For some time it was the practice for Naval units to signal their requirements and casualties independently. This was the cause of a good deal of unnecessary work, since a request made from one unit, and duly met, might be followed an hour or two later by a request from a second unit stationed close to the first, thus necessitating a second expedition when one might have served both purposes. This difficulty was partly met by establishing a more direct liaison through the posting of a Naval medical officer ashore at Harstad.

Not only did the medical units in the Narvik areas have to deal for many purposes with the natives of a foreign country, but the troops they served were mainly French or Poles or Spaniards (of the French Foreign Legion). Little mention is made of this difficulty, but it can hardly have been negligible. Fortunately English was spoken fluently by many Norwegians, especially by those living in the coastal districts.

CO-OPERATION

(*a*) The Norwegians.
(*b*) The French.
(*c*) The Royal Navy.

(*a*) With one or two exceptions in the earliest stages of the campaign, co-operation with the Norwegian medical service was cordial and complete. No doubt the fact that both sides had a good deal to offer contributed to this happy state of affairs. The Allies required suitable buildings in a country where, partly for reasons of security from air attack and partly because of the nature of the terrain, the use of tents and huts was virtually impossible; such buildings, including hospitals and many private houses, were freely put at their disposal. The Norwegians, on account of the cutting off of their usual source of supplies from Oslo, were soon in need of drugs and minor articles of equipment, and these the Allies, in spite of the loss of so much of their own equipment, were able to supply. The chief requirements of the local hospitals were X-ray films, anaesthetics and synthetic drugs. In every case where a list of requirements was sent these needs were met. At Harstad permission to use the facilities (X-ray, theatre, etc.) available in the civil hospital was readily granted, and in return British specialists and surgeons were prepared to advise or operate on any Norwegian casualties.

In both the Namsos and the Aandalsnes areas the bulk of the arrangements for evacuation and treatment of casualties was undertaken by the Norwegian medical services, either military or civil. British units dealt chiefly with the difficulties arising from the fact that the organisation of the Norwegian Services did not provide mobile medical units corresponding with the field ambulance. At Namsos this deficiency had a marked effect. Some help in evacuating cases was received from

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an American ambulance unit (A.F.S.) operating in these parts, but, generally, A.D.M.S. 'Mauriceforce' was left to struggle as best he could with the problem of improvising transport for evacuation from forward areas. Fortunately casualties during this period were remarkably light.

Relations with the civil population were also excellent. One report states: 'Of the numerous civilians who put their services at our disposal I cannot speak too highly. They willingly undertook long hours, travelled round the country at short notice and were lavish in gifts of food, bedding and dressings for the use of sick and wounded.'

Employment of local civilian labour in various minor capacities was common, and results were usually satisfactory. Mention has been made of the unreliability of the crews of the puffers, but this was due not to a reluctance to co-operate with the would-be saviours of their country but to a pardonable distaste of the prospect of being blown to pieces by bombs. A similar feeling was apt to produce similar results among the Norwegian truck-drivers sometimes employed for purposes of military transport. Further, it is relevant to remark that in using the puffers for military and medical purposes the authorities were taking from the local population their chief, in some cases their only, means of communication and supply.

Finally, in assessing the measure of Norwegian goodwill it must be remembered that its offer in some forms invited the enemy's vengeance to fall, in the most literal manner, upon Norwegian heads.

(*b*) It is clear that co-operation between British medical units and those of the French was constant and sympathetic. A.D.M.S. writes: 'Contact with the French *Medicin-en-Chef* was made on April 29, and from that date daily consultations and conferences with him were held. Changes of location, impending operations, questions of supplies were discussed and the closest touch kept between the two forces. The association was of the happiest and most valuable and his loyal co-operation in every project was much appreciated. Later, when the Poles arrived, the same co-operation was maintained.'

The hospital and medical facilities available at Harstad were, of course, used by British and Allies alike, as were the hospital ships for evacuation to the United Kingdom. For evacuation from the forward areas it seems that the Allied contingents had their own *postes de secours* to which their casualties were evacuated by sledge or, when the state of the roads made this possible, by motor ambulance; thence —whether by their own or by our personnel is not clear—to British field ambulance posts and thence by puffers to Taarstad or Harstad. During the advance on the Bjerkvik sector the A.D.Ss. of the field ambulance kept in close touch with the French and Polish troops engaged and evacuation proceeded smoothly. In the early stages the long carries over ground deeply covered by snow and often under heavy aerial bombardment were extremely exhausting. In preparation for the

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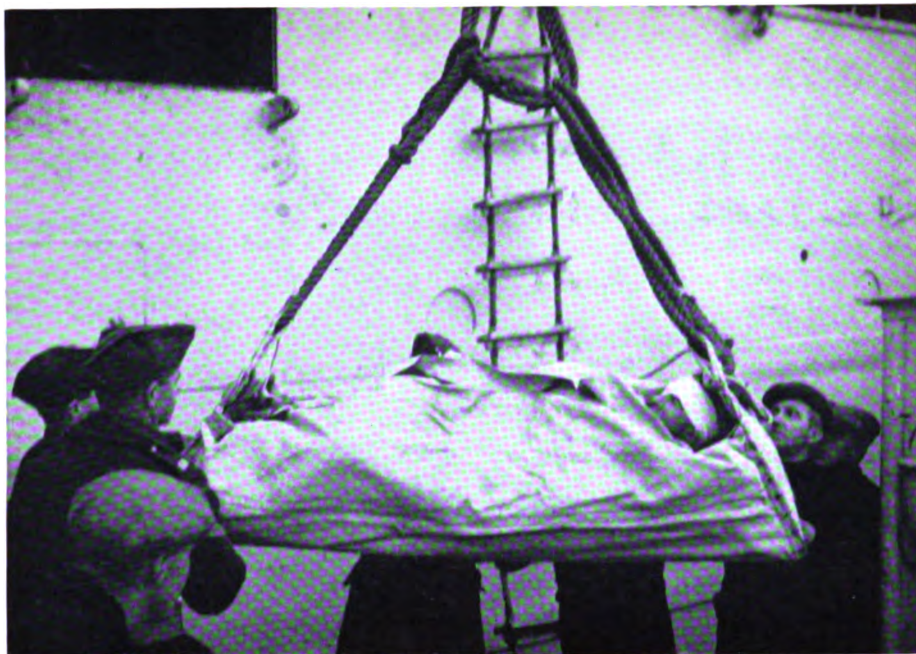

PLATE VIII. Norway, 1940. A casualty being taken aboard a Hospital Ship.

[*Imperial War Museum*

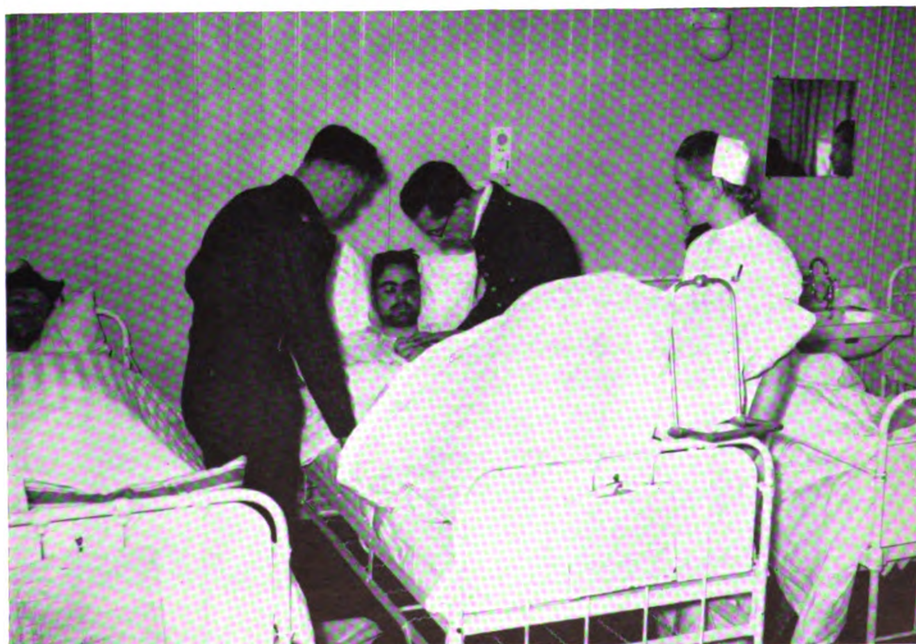

PLATE IX. Norway, 1940. British Patients, British and French Medical Officers and a Norwegian Nurse. Namsos Hospital.

[*Imperial War Museum*

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Plate X. Norway, 1940. A Stretcher-bearer Squad seeking Casualties after the Air Raid on Namsos. May 1, 1940.

[*Imperial War Museum*

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main attack one squad R.A.M.C. with a N.C.O. and equipment was attached to each of the two medical officers of the French attacking battalions; to the Polish medical officer whose battalion was not expected to encounter serious opposition, medical equipment and one squad of R.A.M.C. bearers were allocated, and a French R.M.O. whose equipment had been destroyed by bombs was re-equipped with extra stretchers, blankets, Thomas splints, dressings, etc.

French appreciation of these efforts is shown in the following letter from General Bethouart to the D.D.M.S.: 'Your Government have given to the British Medical Service the task of ensuring the evacuation and hospitalisation of the 1st Division of Chasseurs Alpins. This task has been carried out without failure from our first action to the battle after the fall of Narvik. I thank you and ask that my congratulations may be conveyed to the British Medical Service.'

Co-operation between the British medical services and those of the demi-brigade of Chasseurs Alpins operating in the Namsos area seems, so far as can be gathered from the very scanty information available, to have been on a much smaller scale. The French took over the hospital at Namsos. They offered to receive British cases and to carry out all forms of treatment, an offer of which some advantage was taken. There was a working agreement between the French at Namsos and H.Q. 158 Fd. Amb. (during the few days that the ambulance was active) about the evacuation of cases to England, by which representatives awaited any vessel coming into the harbour by night and put on board any suitable cases that its captain could be persuaded to accept.

(*c*) No doubt because it largely followed routine lines co-operation with the Royal Navy is a subject that fills little space in the official records. The evacuation of naval casualties proceeded as smoothly as difficulties of communication and interruptions by air attacks permitted. The total number of Royal Navy cases treated in 22 B.G.H. at Harstad was 153. Destroyers assisted the medical services in two ways; by acting as escort to the puffers in times of stress, and by themselves evacuating casualties, when speed was essential, direct to 22 B.G.H. The former duty was by no means a sinecure. In addition to the collection of patients by land from the R.A.F. it was often necessary to collect them by water from the north bank of Rombaks Fjord when the Germans held the south bank. At these times the collection was done from the jetty at Lilleberget while the guns of the escorting destroyer silenced the German machine-guns.

MEDICAL EQUIPMENT

Through long periods—and in some cases through the whole of the campaign—the medical services were obliged to function with incomplete equipment. There were several reasons for this, some being

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particular reasons applying to particular cases, but one being universal —the absence of a proper organisation to deal with the whole problem of loading the equipment of the expeditionary force at its port of embarkation. Much of the loading was done by civilian dock labour which worked to no tactical—or indeed any other, method. In this important detail, as in so many others, the planning of the expedition displayed the melancholy characteristics of an *ad hoc* improvisation.

Equipment was deficient for the following reasons:

(*a*) Diversion of units from their original destination owing to a last minute change of plan. When this happens as the result of orders transmitted to a convoy while at sea, it may well be that, in the absence of tactical loading, the unit goes to one place and its baggage to another.

(*b*) Original order of loading altered to transhipment and reloading.

(*c*) Dispersion of units. A field ambulance has only one quartermaster; when its component parts are dispersed, he obviously cannot organise the baggage of more than one detachment. For the rest the expert has vanished, and his substitute cannot have an equal degree of experience, knowledge, skill and authority. This dispersion of units took place to a remarkable extent. At Aandalsnes, for example, the medical services were composed of H.Q. 189 Fd. Amb., one company 158 Fd. Amb., and one company 146 Fd. Amb.

(*d*) Enemy action. Sinking of transport-ship *Cedarbank*. A large quantity of both military and medical equipment was lost when this was torpedoed and sunk off Aalesund.

Destruction by bombing. The effect of air raids directed on harbours was often, in the absence of air defence on our part, disastrous in this respect. A single quotation from a war diary, selected at random from many, will serve to show the kind of result experienced: 'Fire started by bombing on jetty and greater part of medical equipment destroyed during night. As a result medical stores now available only surgical haversacks, medical companions and shell-dressings carried by personnel.'

Loss of H.M.S. *Effingham*. On May 17, H.Q. 137 Fd. Amb. embarked on H.M.S. *Effingham* and sailed for Bodö. Nearing Bodö the ship ran aground and could not be refloated. All the personal and unit equipment was lost.

(*e*) Type of transport-ships employed. The type of transports employed to convoy the expedition was not satisfactory. The use of ships of the Royal Navy, though obviously advantageous in respect of speed and defensibility, had equally obvious drawbacks. One of these was seen when a large part of the expeditionary force, already embarked on cruisers, was forced to disembark and tranship with all possible speed, when it was learned that the German Navy was operating in Norwegian waters. Apart from such a possibility it is clear that a warship, in which almost every inch of space is already allotted, cannot be

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a convenient form of transport. Nor are large converted luxury liners much more to be commended, since the loss of one of these means the loss of a large proportion of the total resources. Transports of from 3,000 to 4,000 tons with plenty of small landing craft are suggested by one of the senior officers of the force.

REFLECTIONS UPON THE CAMPAIGN

The many difficulties which the Army Medical Services encountered in the Norwegian campaign were not of their own making. They were created by the terrain, by the weather and by the circumstances which imposed upon the force the necessity for an agitated despatch and for a mournful and inglorious return. Much of the medical equipment proved to be unsuitable, much was lost *en route* by enemy action and the campaign did not last long enough for improvements to be made and for replacements to be sent. The enemy's complete supremacy in the air made the dispersion of units imperative in a country sparsely populated with few roads and fewer towns. Evacuation by water demanded the improvisation of water transport manned by civilians of another national group. The changing composition of the force meant that R.A.M.C. personnel were called upon to serve, and to serve with, units of other armies—French and Norwegian—strangers speaking strange tongues. Yet in spite of all the difficulties it can faithfully be recorded that the Army Medical Services satisfied all save themselves in respect of the work they did and of the way in which they did it.

THE MEDICAL COMPONENT OF THE COMMANDOS

It is appropriate, perhaps, to refer here to the medical component of the Commandos, since the independent companies first used in this campaign were their forerunners. A note on this subject has therefore been given in Appendix VI.

APPENDIX V

Admiral of the Fleet the Earl of Cork and Orrery, appointed Naval Commander of the Narvik Expedition on April 10, assumed command on April 21 of all forces operating in the Narvik area. On May 7 this command was extended to include the military forces in the Mosjöen-Bodö area.

On April 21 Lieut. General H. R. S. Massy was appointed to command the North-Western Expeditionary Force, consisting of all the military forces operating in Norway, save those in the Narvik area. This command terminated on May 7 and the force at Narvik inherited the name.

Order of Battle. (*Army only*) (abbreviated).

A. The force based on Harstad.

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'Avonforce' as at April 17
- 24th (Guards) Brigade
  - 1st Scots Guards
  - 1st Irish Guards
  - 2nd South Wales Borderers
- 3rd Lt. A.A. Bty. R.A.
- 229th and 230th Fd. Coys. R.E.
- 231st Fd. Pk. Coy. R.E. detachment

'Rupertforce' as at May 10
- as 'Avonforce' plus
- 3rd King's Own Hussars, one troop (tanks)
- 203rd Bty., 51st Fd. Regt. R.A.
- 193rd Hy. A.A. Bty. R.A.
- 55th Lt. A.A Regt. R.A.
- 3rd Lt. A.A. Bty. R.A.
- 27th Demi-brigade Chasseurs Alpins
  - 6th, 12th and 14th Bns.
- 13th Demi-brigade Foreign Legion
  - 1st and 2nd Bns.

Polish Brigade
- 1st Demi-brigade
  - 1st and 2nd Bns.
- 2nd Demi-brigade
  - 3rd and 4th Bns.
- 342nd Independent Tank Company
- 2nd Independent Group Colonial Artillery
- 14th Anti-Tank Company, 13th Chasseurs Alpins

North-Western Expeditionary Force as at June 3
- 24th (Guards) Brigade
- 2nd, 3rd and 5th Independent Companies
- 3rd King's Own Hussars, one troop
- 203rd Bty., 51st Regt. R.A.
- 6th A.A. Bde. R.A.
- 55th Lt. A.A. Regt. R.A.
  - 163rd, 164th and 165th Batteries
- 56th Lt. A.A. Regt.
  - 3rd and 167th Batteries
- 51st Hy. A.A. Regt. R.A.
  - 151st, 152nd and 153rd Batteries
- 82nd Hy. A.A. Regt. R.A.
  - 156th, 193rd and 256th Batteries
- 10th Army Observer Unit, R.A.
- 229th and 230th Fd. Coys. R.E.
- 231st Fd. Pk. Coy. R.E. detachment
- French and Polish brigades as in 'Rupertforce'.

B. The force based on Namsos

'Mauriceforce'

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146th Infantry Brigade
1/4th The Royal Lincolnshire Regt.
1/4th The King's Own Yorkshire Light Infantry
The Hallamshire Battalion, The York and Lancaster Regt.
55th Fd. Coy. R.E., one section
5th Demi-brigade Chasseurs Alpins
13th, 53rd and 67th Bns.
Detachments, A.A. and A/T Artillery
One section Engineers.

C. The force based on Aandalsnes
'Sickleforce'
148th Infantry Brigade
1/5th The Royal Leicestershire Regt.
1/8th The Sherwood Foresters
15th Infantry Brigade
1st The Green Howards
1st The King's Own Yorkshire Light Infantry
1st The York and Lancaster Regt.
168th Lt. A.A. Bty. R.A.
260th Hy. A.A. Bty. R.A.
55th Fd. Coy. R.E. (less one section).

D. The force based on Mosjöen, Mo and Bodö.
'Scissorsforce' ('Bodöforce' after May 23)
May 9–11
1st, 2nd, 3rd, 4th, and 5th Independent Companies
166th Lt. A.A. Bty. R.A., one section
May 12–22
1st Scots Guards
1st, 2nd, 3rd, 4th and 5th Independent Companies
203rd Fd. Bty. R.A., one troop
55th Lt. A.A. Bty. R.A., one troop
230th Fd. Coy. R.E., detachment
May 23–29
as for May 12–22 plus
1st Irish Guards
2nd South Wales Borderers.

APPENDIX VI

THE MEDICAL ELEMENT OF THE COMMANDOS

During the course of the Norwegian campaign ten Independent Companies composed of volunteers, were hurriedly formed and five of them hastily despatched to Bodö. After Dunkirk there arose out of these companies, renamed special service battalions, the germ of the commandos, whose task was to be to conduct guerrilla warfare against a victorious enemy whose

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forces were entrenched from Narvik to the Pyrenees. The Royal Navy collaborated by supplying a variety of small craft manned mainly by R.N.V.R. personnel. Thus a special organisation came into being to conduct raiding operations. This organisation developed into Headquarters Combined Operations.

To begin with it was proposed to raise ten commandos from army units, each commando to consist of ten troops. Commanders were asked to nominate likely leaders who, being possessed of certain qualifications, were willing to volunteer for special service of an indefinite but hazardous nature. The leaders selected by the War Office would then return to their own headquarters and there choose ten troop leaders from officers likewise volunteering. Each of these would then select two junior officers and, finally, the troop officers would select 50 N.C.Os. and men.

The strength of the commando came to be:

Lieutenant-colonel	1
Major	1
Captains	10
Subalterns	24
W.O. II	2
Sergeants	42
Corporals	81
Lance-corporals	122
Privates	250

Though the reasonable opposition to this withdrawal of 5,000 picked men from among units on the part of officers commanding was stubborn, it was overcome, and during the period 1940–45 no fewer than 25,000 officers and men passed through the Commando Depot at Achnacarry. Among these were considerable numbers of Austrians, Belgians, Czechs, Danes, Dutch, French, Germans, Hungarians, Norwegians, Poles and Yugoslavs, out of whom special troops and an inter-Allied commando were formed.

In 1942 the commando organisation underwent considerable enlargement and modification. Commandos consisting solely of Royal Marines were formed for special duties. These differed from the Army commandos in that their members were not volunteers. Special boat sections, small scale raiding squadrons and pilotage parties were created. Commandos could now be grouped into brigades, four to a brigade and given heavy weapons and transport of their own. These brigades, special service brigades, could be fused to form special service groups, a group consisting of four brigades and each brigade of two Army and two R.M. Commandos.

To Headquarters Combined Operations an A.D.M.S. was appointed.

With each Army commando there was a medical officer (= R.M.O.) and five, later nine, other ranks, R.A.M.C. The latter were specially trained by the former so that they could function in a medical capacity when on detachment. The medical officer and the medical orderlies were detached from their Corps and did not claim the protection of the Geneva Convention. They were trained as, and served as, members of the commando.

On June 26, 1945 orders were issued for the conversion of 1 Lt. Fd. Amb.,

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recently returned to the United Kingdom from Italy, into 1 Medical Commando R.A.M.C. (Light) with effect from July 1. On August 9 the unit was warned for service overseas in a tropical climate. It did not sail, however, and in October was disbanded, 2 Medical Commando being formed out of its remains. This unit was not employed in active operations and with the ending of the war was disbanded in its turn.

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CHAPTER 3

THE BATTLE OF BRITAIN*

July 10–October 31, 1940

To every government and people, whether friendly or otherwise, it seemed in June 1940, that Britain must humble herself and come to terms with victorious Germany. The German Chancellor made it known that, in his opinion, this would be a reasonable and realistic attitude and commended it to the British Government. Britain stood alone. Her army had been stripped of its arms. Italy had ranged herself alongside Germany. Russia and Germany had entered into a pact that was greatly to the disadvantage of Britain. The whole Continent of Europe lay under the shadow of Axis domination. Such help as the Dominions and the Colonies could give to Britain out of their immeasurable store could not reach her in time to avert disaster. There was no possibility of intervention on the part of the United States of America at this time. All the ports along the coastline of western Europe from the north of Norway to the south of France were now in German hands as was the shipping of Norway, Denmark, Holland, Belgium and France, other than that which had sought refuge in British and neutral harbours. The Luftwaffe outnumbered the Royal Air Force by 3 to 1. The vast German armies, flushed with success and served by the arsenals of western and central Europe, gazed across the narrow seas towards the island wherein lurked the remnants of the small expeditionary force which they had flung out of Europe and which constituted the only remaining foe.

But if reason recommended submission, the history of the British people did not. The suggestion that the war had been fought and was finished was never considered. It was quickly made abundantly clear that Britain meant to fight on. Germany was therefore compelled to prepare to invade, for only by so doing could she reap the harvest of her victories. In Britain it was accepted that invasion would be attempted and all possible preparations to meet it were swiftly made.

There were fighting men aplenty. Twenty-six divisions of troops were available, some with actual war experience, some well trained, others but newly raised. There were large numbers at the depots, training schools and in the holding battalions. There was in Britain at this time Canadian 1st Division, soon to be joined by another to

* This account is subsidiary to that given in The Emergency Medical Services, Vol. 1, in this Series.

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form the Canadian Corps, as well as strong Australian and New Zealand formations. There was the Home Guard, soon to be more than a million strong. There were strong contingents of French, Poles, Norwegians and other Allies. But save for its rifles, the Army was practically unarmed, while, until a quarter of a million rifles came from the United States of America for them, the weapons of the Home Guard were more various than lethal. Upon the seas the Royal Navy held the complete mastery, but for its larger units the English Channel was made unsafe by the great coastal guns that the Germans had mounted along the French shore and by the land-based bombers of the Luftwaffe.

Soon the gentler parts of Britain's 2,000 miles of coastline which faced the Continent began to bristle with 'dragon's teeth'; lines of trenches transformed the appearance of the southern and eastern counties, road-blocks sprang up everywhere and signposts disappeared to make Britain a strange land to its own people. 'Pill-boxes' became almost the commonest feature of the landscape. In every town and in every village earnest men, in their brief spare-time, trained and prepared themselves for the fight to the death in order that Britain might live. In the factories, men and women toiled without ceasing to make good the glaring deficiencies in respect of arms, equipment and stores.

After the war was ended it became known that the invasion of Britain (Operation 'Sea Lion') was first seriously considered by the German High Command on July 2, 1940; that the invasion was postponed on several occasions during September; that it was then further postponed until the Luftwaffe had carried out its promise to eliminate the Royal Air Force; that in October it was put off till 1941; that in July 1941 it was postponed again until the campaign in Russia had been brought to a successful conclusion and that on February 13, 1942, it was finally discarded.

In retrospect it is clear that the measures taken in Britain during the summer and autumn of 1940 were sound both in conception and design. They were based on the postulates that for success the Germans must seize and hold supremacy on the sea and in the air in the area of the invasion and that they must possess a sufficient number of suitable landing craft.

In the event of invasion, military control over all ground forces throughout Britain was to be assumed by G.H.Q., Home Forces which, from then onwards and for so long as the emergency continued, would exercise not only operational but also administrative direction of the Army at home and in so doing take over many of the functions previously performed by the War Office. At G.H.Q. Home Forces was a medical adviser. Pending these developments, each command was made responsible for preparing a defence scheme to cover that section of the country

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lying within its geographical boundaries. Field formations were assigned the main operation tasks but these were to be supported by Home Guard units and improvised mobile columns built out of the personnel of depots, schools and the like.

FIG. 14. The Battle of Britain. Military Commands and Areas, September 1940.

In early September the massing of the German air and ground formations and the concentration of invasion craft in the Channel ports

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from Calais to Brest indicated that invasion was imminent and that the front to be attacked was the south rather than the east coast. Among the defensive measures taken was the deployment of the ground forces by G.H.Q. Home Forces to meet this threat. By this time the equivalent of 35 divisions was available. Of these, by September 1, four, with one armoured brigade, were on guard between Wash and Thames, nine with two armoured brigades along the south coast of England and in general reserve were four further divisions and two armoured brigades. The rest of the coastline of Great Britain was guarded by the equivalent of nineteen divisions. The formations facing the English Channel were well equipped though in some cases still short of artillery.

Tension reached its peak in the second week of September when the conditions of moon and tide were most favourable for invasion on the south-east coast. The code word 'Cromwell'—invasion imminent—was issued by Home Forces at 2000 hours on September 7 to Eastern and Southern Commands, to formations in London and to IV and VII Corps in G.H.Q. Reserve.

But the armada did not sail. It could not, for the Germans had not gained control of the sea-passage. They decided to pause awhile until the Luftwaffe had gained mastery in the air, until the Battle of Britain had been fought to its end. It was a contest between the Luftwaffe on the one hand and the Royal Air Force, supported by Anti-aircraft Command on the other. It may conveniently be divided into the following phases:

July 10–August 7	Preliminary skirmishing
August 8–23	The attack on south coast targets
August 24–September 6	The attack on Fighter Command airfields in the south of England
September 7–30	The attack on London by heavy bombers by day
October 1–31	Both day and night attacks on London

In the end victory rested with the Royal Air Force. The life of London was not destroyed. The morale of its people was not broken. Thereafter the activities of the Luftwaffe bore little or no relation to Operation 'Sea Lion'; they were concerned with indiscriminate bombing of centres of industrial production—the 'Blitz' of the winter of 1940–41. (*See also* R.A.F. Medical History, Vol. II, Chapter 2, in this Series.)

MEDICAL ARRANGEMENTS DURING THESE EVENTS

The field medical units then in Britain consisted largely of personnel without medical supplies or equipment. The static medical units, the military hospitals and reception stations, were not meant for active service with an army in the field and so had neither the organisation nor the equipment suitable for the tasks that lay ahead.

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The nature of the fighting to be expected and the presence of the civil population in the areas in which the fighting would occur necessitated many modifications of, and departures from, the methods and procedures usually employed by the medical services in the field.

In June 1940, general instructions were issued to commands by the War Office indicating the policy which was to govern the making of medical arrangements designed to meet the situation that would arise in consequence of an enemy attack on the United Kingdom. It was established that in these circumstances military casualties would be treated not only in R.A.Ps. and field ambulances but also in the first-aid posts of local civil authorities, if functioning in the same area, and that all medical establishments must be prepared to receive military or civilian patients without discrimination at any time. The same principle would apply in the disposal of casualties occurring near a hospital and needing hospital treatment; cases of this kind would be admitted direct to that hospital without regard to the civil or military status of either the patient or the hospital. Transport of casualties by motor ambulance from R.A.Ps. or first-aid posts would in the ordinary course of events be undertaken in the vehicles of the military unit or civil organisation concerned, but here again, when circumstances demanded, no discrimination would be made, and all ambulance vehicles would be made available for use in accordance with the requirements of prevailing conditions irrespective of the class of patient affected.

The arrangements designed to meet the situation as visualised involved the most thorough co-ordination of the existing civil and military medical organisations.* Military administrative medical officers were therefore required to maintain close touch with officers of the E.M.S., local authorities, ambulance associations, and voluntary bodies and to familiarise themselves with civil medical activities generally and, more particularly, with the resources expected to be available during an emergency. In this connexion it was made clear that, except perhaps in the case of an attack upon the sea coast, the local civil organisation would continue to function alongside military units even though the area were to be the object of attack and fighting was actually in progress. The opportunity was taken to impress upon all concerned a point of first importance but one which appeared to have been insufficiently appreciated. Emphasis was laid on the fact that attack upon any locality might be made from any direction and from several directions simultaneously. The kind of warfare expected to develop was therefore unlikely to reproduce the familiar battle conditions characterised by a defined fighting front with collecting,

* *See* The Emergency Medical Services, Volume 1, Chapter 5.

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evacuating, and distributing zones in rear; the usual scheme of casualty disposal would therefore be inapplicable, and medical arrangements would require adaptation to conform to a system of defence of a circumscribed area rather than of defence in depth; and disposal of casualties and their evacuation, in so far as it would be possible to effect it, would take place among medical units situated in a group instead of in the chain normally associated with an army in the field.

The responsibility for making and controlling medical arrangements to meet an invasion was entrusted to the D.Ds.M.S. in commands through the medium of their representatives in corps and areas. The arrangements were based upon the employment of the usual divisional medical units, field ambulances and M.A.Cs., together with civil motor ambulance companies, and civil motor transport. Evacuation of casualties was to take place through either military or civil medical establishments, whether C.C.Ss. and military hospitals, on the one hand, or civil casualty receiving hospitals and civil general hospitals on the other. Subsequent disposal would be to those hospitals, military or civil, assigned for the purpose by the regional hospital officer (R.H.O.) of the Ministry of Health, or in Scotland, of the Department of Health, in whose hands the ultimate allocation of hospital accommodation was placed. The duty of effecting the transfer from one hospital to another of military patients admitted to civil hospitals devolved upon the Ministry acting through their R.H.Os. The Ministry also undertook responsibility for the evacuation of patients in military hospitals on application being made to the R.H.O. by the D.D.M.S. of the command, or, in cases of extreme urgency, by the officers commanding the hospitals. Arrangements were completed for the pooling, during an emergency, of civil casualty evacuation trains and military ambulance trains except five of the latter reserved for the transport of casualties arriving at home ports from overseas. All trains so pooled were placed at the disposal of the Ministry of Health, who were thus empowered to call upon military ambulance trains as required. The actual movement of all trains remained in the hands of the Railway Executive Committee. Demands for trains to evacuate casualties from any area were to be made by the R.H.O., who was also responsible for providing the required road transport and for that purpose was authorised to call upon the local military resources if necessary. The instructions issued were supplemented by detailed information as to the medical resources available in both civil and military organisations, including location of hospitals and other establishments, beds available, ambulance car pools, detraining points, and so forth. Steps were taken to ensure reciprocal notification of all alterations in, or additions to, these resources and of any amendments in the plans for their use in connexion with local defence schemes.

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Agreement was subsequently reached between the War Office and the Ministry of Health that in an emergency, if the normal methods of supply became impossible, medical stores and hospital equipment, including tents, would be made available for issue on demand to the E.M.S. from command medical stores. The Ministry was prepared to make similar provision for the replenishment of military establishments in comparable circumstances. The policy of pooling the medical resources of the country was extended to apply to personnel, and in consequence it was agreed that, if in the course of active military operations the staff of a military hospital found themselves unable to cope with the number of casualties requiring their attention, the R.H.O. would on request provide temporary assistance from civil medical staff. Conversely, civil hospitals similarly situated would receive aid from military personnel detailed by the D.D.M.S. on request from the R.H.O.

At the end of June a conference was held between representatives of the Army Medical Services and the Ministry of Health when these arrangements were reviewed and confirmed. The Ministry took the opportunity of putting forward further suggestions in regard to several points of administrative procedure that might arise in an area when involved in military operations while the normal civil medical organisation was still in being. They desired to establish the ruling that, pending the institution of military control in any area, no evacuation of any hospital should be ordered except by the civil authorities, and if any such evacuation were required for military reasons representations should be made through the R.H.O. to the Ministry or, in the event of interruption of communications, to the Regional Commissioner. In no circumstances should an order of this kind be given by the military authorities direct to the hospital. The Ministry also wished it to be made clear that, where an area passed into military control, R.H.Os., while acting in accordance with directions from the military commander would continue themselves to operate the civil medical organisation, and, for so long as the services of a civil hospital were required, the hospital would continue to function and would still be worked by its usual staff in the normal way. The procedure as suggested by the Ministry of Health was agreed to by the War Office, as was the proposal that officers of the Army Medical Services should be appointed as liaison officers in all civil defence areas for co-operation with the civil medical administration.

As a result of all these conferences and discussions, the Ministry of Health drew up an invasion plan (Ministry of Health R.O.A. 709, June 3, 1942), which was issued to the E.M.S., with a copy to D.G.A.M.S. for information. The plan required the appointment of five senior hospital officers (S.H.O.), one to each of the five military commands

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in England and Wales, to advise D.Ds.M.S. on all matters concerning the E.M.S., with full authority to issue instructions to the R.H.Os. of the civil defence regions when required to do so by the military authorities. Assistant hospital officers in each region were designated to join corps, district and area headquarters in the invasion area when the order to stand-to was issued, with authority to act independently as regards the E.M.S., when cut off from communication with the R.H.Os. Medical officers of health and all other officers of the E.M.S. were instructed to take their orders in accordance with the provision of the invasion plan.*

From the foregoing account of the procedure evolved and the plans prepared to meet the threat of invasion it is obvious that, in the conduct of active operations within the United Kingdom at that time, the Army Medical Services would be bound to rely very largely upon the civil medical organisation. That the ultimate disposal of military casualties would be to civil hospitals of the E.M.S. was no more than an adherence to the principle adopted even before the outbreak of war, but in the circumstances that existed in the summer of 1940 much of the initial treatment of casualties, military as well as civil, would inevitably be undertaken by the first-aid posts and other medical establishments of the civil medical services. Troops of field force formations engaged in battle would be cared for in the usual way by their own R.A.Ps., and their casualties evacuated thence and disposed of by their divisional field ambulances. But these normally constituted field force formations were not the only troops likely to be involved, for local defence schemes included the employment of mobile columns to be raised from training units, depots and similar establishments, and from the Home Guard. Although these composite forces were supplied with regimental medical organisations in the persons of medical officers and medical personnel of their own units or from medical reception stations in the neighbourhood, they did not include field medical units and were therefore without provision in this respect. Moreover, there were everywhere large numbers of static units, many of them small in size and scattered in disposition, likely to suffer casualties to a greater or less extent according to the function allotted to them. Here again there were no field ambulances or other field medical units, nor could they be provided owing to shortages of medical officers and equipment. In the case of all these then, the evacuation and disposal of casualties would devolve in great measure upon the civil casualty services. For motor ambulance transport, the medical services of the Army would be largely dependent upon vehicles belonging to municipal and county authorities or to voluntary bodies such as the B.R.C.S. As regards the

* *See* The Emergency Medical Service, Vol. I, Chap. 5.

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evacuation or transfer of military casualties from one hospital to another, this was a matter controlled entirely by the civil organisation.

In order that the emergency medical arrangements described might be put to practical test and that inherent defects might be detected and remedied, exercises which included both the military and the civil defence services were held throughout the country. Efforts were made to reproduce as far as possible the conditions which might be expected to occur should an enemy attack materialise. R.A.Ps. were established, A.D.Ss., M.D.Ss., and C.C.Ss. were opened, and improvised medical units were set up to deal with special requirements; M.A.Cs., motor companies, and detachments of the B.R.C.S's. ambulance sections were employed in the usual way; dummy casualties were collected, treated, and evacuated in accordance with the system which had been elaborated. Particular attention was paid to the co-ordination of administrative measures and to intercommunication and co-operation between those directing the military and the civil sides of affairs. The result of these exercises was to show that, while the system itself was in most respects both convenient and effective, it was but imperfectly understood by many of those concerned with its operation. Many regimental medical officers appeared ignorant of the procedure for obtaining assistance from the civil authorities, and, on the other hand, civilian medical officers were not always aware of the facilities available from military sources. As most military medical officers and medical units were continually moving, whereas civil personnel and establishments were generally static, it was manifestly the responsibility of the individual R.A.M.C. officer to keep himself informed of the civil medical arrangements, including the location of first-aid posts and ambulance transport, in his neighbourhood. More detailed instructions were therefore issued for the guidance of medical officers. Full particulars were given of the civil organisation, and of the procedure to be followed in seeking assistance for casualties or provision of ambulances. All officers of the R.A.M.C. were required to make contact with the medical officer of health of the county or borough in which their units were situated and to exchange information with him, as the local representative of the R.H.O., on the subject of the facilities available and the whereabouts of medical establishments and ambulance transport both military and civil.

As time progressed and as the result of experience derived from numerous exercises held in conjunction with the civil defence services, it was sought to define with greater precision the parts to be played by the military and civil medical organisations respectively, and the position in which their diverse activities stood in relation one to the other. While no departure from the accepted policy of pooling all available resources and of mutual assistance was contemplated or attempted,

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it became possible to make a clearer allocation of function to each, as for example in the use of motor transport. Subject to variations as circumstances demanded, it was arranged that motor ambulance transport of the field ambulances belonging to a division would be employed wholly within the divisional area and undertake all transport of casualties between R.A.Ps., A.D.Ss., and the M.D.Ss. Motor ambulances at the disposal of the D.Ds.M.S. of commands, i.e. military M.A.Cs., or motor ambulance convoys assembled from cars belonging to such bodies as the B.R.C.S., would be employed in transporting casualties from divisional and corps medical units, e.g. M.D.Ss., to C.C.Ss., or hospitals, either military or E.M.S., appointed for the reception of casualties. On the other hand, evacuation of casualties from hospital or the transportation of patients between one hospital and another were responsibilities assigned to the civil medical authorities. Other developments included arrangements by which R.H.Os. of the Ministry of Health, and of the Department of Health for Scotland, in exercise of special powers conferred upon them for the purpose, allocated civil medical practitioners for emergency duty in static military medical establishments, such as military hospitals, reception stations and medical inspection rooms, in relief of military medical officers withdrawn from those places for active operational duty with field medical units and mobile columns. In regard to medical stores, action was taken to place large stocks of surgical dressings and equipment in all military hospitals and reception stations with the two-fold object of providing adequate reserves immediately accessible to all in the event of interruption in communications and transport, and of ensuring dispersal of supplies with minimised risk of loss through destruction of command medical stores by enemy action.

Measures were taken to increase to a maximum the hospital accommodation available for the reception of the large number of casualties that might be expected. It was considered that if an invasion by anything more than a raiding force were to be undertaken by the enemy, signs of preparatory action would be apparent, and that consequently some indication of the imminence of the attack would be forthcoming. This would permit of simultaneous precautionary action by the defence. It was agreed between the War Office and the Ministry of Health that during this precautionary period all hospitals would be cleared of patients in a fit state to be discharged, civilians to their homes and soldiers to convalescent hospitals or military convalescent depots. Arrangements for this evacuation would be made by the Ministry. Thus a large number of military patients, estimated at 13,000 at the time, would require accommodation in military convalescent depots. It was proposed to meet this influx in two ways, first, by returning from convalescent depots to their units all soldiers fit for defensive

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fighting, and secondly, by expansion of accommodation to provide a further 6,000 beds through the use of tents, gymnasiums, recreation rooms, etc., for sleeping purposes. The order to put this plan into effect would be issued early in the precautionary period. Hospitals situated in areas most exposed to the risk of invasion were made subject to special provisions. During the precautionary period, hospitals within a coastal belt of 20 miles in width and extending from the Wash to Weymouth were to be gradually cleared of patients, first, down to 25 or 50 per cent. of equipped beds according to their situation, and later, completely emptied. Those in the inland belt bordering on the coastal belt were also to be subject to a process of reduction in patients, first to 60 per cent., and later, to 40 per cent. of equipped beds.* These steps were to be taken on instructions issued by G.H.Q., Home Forces. During the same period hospitals under construction but not yet taken over by the War Office would be placed at the disposal of the C. in C., Home Forces, as would all field medical units, such as C.C.Ss., or general hospitals, mobilised but not yet functioning or allocated to any particular duty.

In regard to the question of the action to be taken where a hospital or other medical establishment was threatened with capture by the enemy, there had been some conflict of opinion and some doubt as to official policy. It was eventually decided that although medical personnel surplus to actual requirements at the time might be withdrawn as local conditions permitted, in no circumstances should a hospital occupied by patients be abandoned; staff sufficient to carry on the working of the hospital and adequate to attend to the needs of all patients should remain, irrespective of the military situation. It was also decided that medical stores would not be destroyed to prevent their falling into the hands of the enemy.

From July onwards reorganisation proceeded, though the shortage of weapons remained acute. All pistols and rifles were withdrawn from medical officers and medical units for redistribution among others.

Medical reorganisation continued throughout the Battle of Britain directed first of all to the conditions and circumstances which this aerial onslaught on Britain created and secondly to the preparations for future operations overseas.

The shortage of trained personnel was acute and special instructions had to be issued to the effect that specialists were not to be used for general purposes, that medical officers in an area were to be pooled and that mobile teams were to be used to cover specified areas. Particular arrangements had to be made to meet unusual circumstances. There were many mixed populations, some 8,000 French at Trentham, 1,200

* *See* The Emergency Medical Services, Volume 1, Chapter 4.

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Dutch at Porthcawl, 300 Belgians at Tenby and 6,000 Poles at Anowe Park, all dependent upon the Army Medical Services for medical attention and hospital accommodation. Language difficulties and varying standards of field sanitation caused considerable trouble. In November, 1,032 French sick and wounded were repatriated from Western Command. In Scotland there were large concentrations of Norwegians and Poles. The latter had their own medical services and to them an emergency hospital was handed over.

During this period there was much inoculation though this was attended with difficulty. During the time when invasion was regarded as imminent, inoculation ceased and was started again only after December 5 when it was ruled that not more than 5 per cent. of the strength of any unit was to be inoculated or vaccinated in each week.

Many hospitals and medical stores were hit and several were partially destroyed during this period. In one week in December, hospitals were partially destroyed by enemy bombing in Pembroke, Manchester, Liverpool, London and Plymouth. These events accelerated the construction of A.R.P. shelters for the patients and staffs of hospitals and introduced many new problems concerning the ventilation of such shelters and the maintenance of sanitary discipline among the population that would use them. These problems differed in no way from those which beset the civil population of the country, and for their solution common measures were adopted.

Specimen *Medical Administrative Instructions*, illustrative of these policies and of the actions taken at the time are given in Appendix VII.

APPENDIX VII

MEDICAL ADMINISTRATIVE INSTRUCTION

No. 1 July 29, 1940

1. *Evacuation of Casualties during active operations*

(*a*) *Responsibility.*—In divisional areas up to and including the M.D.S. the responsible officer is the A.D.M.S. Division—outside the divisional areas and from M.D.S. to hospitals acting as casualty clearing stations, the responsible officer is the A.D.M.S. Area in conjunction with the Hospital Officers of the Department of Health. A.Ds.M.S. Areas must be in the closest liaison with Hospital Officers who will inform A.Ds.M.S. Areas of the hospitals to which casualties should be sent. A.Ds.M.S. Divisions and Areas will arrange to treat and evacuate civilian casualties (including women and children) in their areas when necessary. A.Ds.M.S. Areas will make necessary medical arrangements for non-divisional units in their areas which may have an operational rôle.

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(*b*) *Provision of hospital beds.* This is the responsibility of the Department of Health . . . who arrange to provide beds by evacuating casualties from hospitals near the zone of operations which are acting as C.C.Ss. to other hospitals by ambulance train or by road, the requirements for military casualties being represented to the Department . . . by D.D.M.S. Command or by A.Ds.M.S. Areas through the Hospital Officers.

(*c*) *Transport.* (i) In Divisional areas the normal method of evacuation i.e. by motor ambulance cars of field ambulances to the M.D.S. will be adopted.

(ii) From M.D.Ss. to hospitals by improvised motor ambulance convoys. These convoys are being formed immediately from the combined resources of the Department of Health, the British Red Cross Society and the St. Andrew's Ambulance Association at . . . Each convoy consists of vehicles (cars and motor buses) capable of carrying 150 stretcher cases. . . . Each convoy will have an officer i/c appointed by the B.R.C.S. or Ambulance Association. These convoys will be under the command of the A.D.M.S. Area of the area in which they are located.

These convoys are primarily intended for the evacuation of casualties from M.D.Ss. to hospitals, but they may be employed for other purposes e.g. evacuation of hospitals to ambulance trains just as Army M.A.Cs. are used. A.Ds.M.S. Areas may find it advantageous to form subsidiary posts of cars . . . Each subsidiary post will consist of cars with a capacity of 8 stretcher cases and will be formed after consultation with O i/c Convoy.

A.Ds.M.S. Areas will arrange to instruct the personnel of these convoys in their duties, particularly in reconnoitring of routes, map-reading and the turnover of blankets, stretchers, etc., between Fd. Ambs. and M.A.C. and M.A.C. and hospitals.

Petrol and Oil ; billeting and subsistence. Instructions will be issued later.

2. *Reserve Improvised Motor Ambulance Convoy*

This being formed at . . . and will be under D.D.M.S. Command. Demands for additional motor ambulance transport by A.Ds.M.S. Areas will be made to D.D.M.S. Command by quickest route and will be met as far as possible from this reserve convoy.

3. *Reserves of Stretchers and Blankets*

These are being formed by A.Ds.M.S. Areas. These reserves are for active operations and A.Ds.M.S. Areas will meet demands from A.Ds.M.S. Divisions and from non-divisional units in their areas from this source.

4. *Replenishment of Medical Equipment and Stores*

Advanced Depots of Medical Stores are not available. Replenishment of expendible drugs will be made in the usual Field Service manner from the medical unit immediately in rear, e.g. . . . if necessary from Civil Hospitals . . . reserves of large composite equipment such as panniers . . . are not available . . . many items are available . . . this will meet immediate needs.

A.Ds.M.S. Areas will go carefully into the question of replenishment of Field Medical Units in conjunction with A.Ds.M.S. Divisions and Hospital Officers and will see that all concerned know what is required.

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5. *Returns of Casualties*

A.Ds.M.S. will notify this office daily during active operations by the quickest route and if possible by 0930 hours the total number of casualties evacuated from M.D.S. or direct into hospital acting as C.C.S. in their Area—separate figures will be given for each hospital.

MEDICAL ADMINISTRATIVE INSTRUCTION

No. 4 November 25, 1940

1. *Auxiliary Hospitals*

The attention of Officers Commanding Military Hospitals is drawn to the use of the Auxiliary Hospitals established under the Emergency Medical Services Scheme. These hospitals are intended for patients who, while not requiring full hospital treatment, are not fit for discharge to Convalescent Depot or on leave. . . .

2. *Ophthalmic Hospital*

A Convalescent Hospital for treatment of eye diseases is being opened by the War Organisation of the British Red Cross Society and Order of St. John on 1st December, 1940 at Banstead, Surrey. Details of the arrangements for admission of cases for this hospital are found in copy of W.O. letter 24/Aldt/1711 (A.M.D.2) dated 24th November, 1940 [issued as Appendix I to this Instruction].

3. *Correspondence*

In order to economise supplies of stationery, in future correspondence need only be submitted to these Headquarters in original . . .

4. *R.A.M.C. Officers—Records*

In order that records are available at Command H.Q., A.Ds.M.S. Areas and Divisions will arrange for the completion of the *pro forma* . . . and the forwarding of completed copies to this office. . . .

5. *Admissions to Civil Hospitals*

Full particulars of all cases admitted to Civil Hospitals will be sent to the parent Military Hospitals as heretofore.

6. *Army Form A.35*

In view of the shortage of paper A.F.A.35 need not be submitted for cases of . . . Such cases will however continue to be reported on A.F.A.30. . . .

MEDICAL ADMINISTRATIVE INSTRUCTION*

No. 5 (*Secret*) November 28, 1940

Subject: *Medical arrangements in the event of Enemy attack on the United Kingdom, by Air, Sea or Land*

1. From experience gained as a result of recent exercises, it is evident that medical officers with units are not in all cases conversant with the

* This Instruction was one issued by the Scottish Command.

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procedure for applying to the Civil Authorities for assistance and, similarly, the Civil Authorities are not aware of the facilities which can be made available from military sources.

2. As Military Medical units are continually moving and civil posts are static, the duty of keeping close liaison with the Civil Authorities of their locality devolves upon medical officers, who also must keep themselves informed of the location of Civil First-Aid Posts and where to apply for assistance in the matter of ambulance transport.

3. Civil First-Aid posts being peculiar to each locality, their locations must be ascertained each time a unit moves to a new area, and these locations will be made known to all concerned in the unit. . . .

4. Medical officers will be instructed to get in touch with the appropriate Medical Officer of Health as soon as possible, and inform him of any medical facilities which can be made available for assisting civilian casualties. These should include the location of unit Medical Inspection Rooms and Dressing Stations of Field Ambulances.

5. These units will not be *named* in exchanging information with the Civil Authorities, but will be designated as follows:

M.D.S. . Military Aid Post—Grade 'A'
A.D.S. . Military Aid Post—Grade 'B'
M.I. Room Military Aid Post—Grade 'C'

6. Civil Authorities will be informed that ambulance transport is usually available at Grade A and Grade B Military Aid Posts.

7. . . . .

8. *Assistance from Civil Authorities*

Civil Transport can be obtained in emergency as follows:

(i) Troops in towns which are large Burghs by communication with the Burgh A.R.P. Control Centre.

(ii) Troops not in large Burghs (even those close to the Burgh boundary) by communication with the County A.R.P. Control Centre.

When asking for assistance the following information must be given:

(*a*) . . . place. . .
(*b*) . . . number . . . lying . . . sitting . . .
(*c*) . . . gas . . .

9. *Operational Control*

All A.R.P. Services including the Casualty Services viz:—First-Aid Posts (fixed and mobile), Public Cleansing Stations—normally attached to the First-Aid posts—First-Aid Parties and Ambulances are controlled by the local authority, the A.R.P. Controller.

The County or Burgh Medical Officer of Health is responsible to the A.R.P. Controller for the A.R.P. Casualty Services. . . . forms one region under the control of the Regional Commissioner, but for administrative purposes is divided into five districts each under the control of a district Commissioner—the Regional Commissioner is stationed in . . . and the District Commissioners at . . . Operations involving the combined A.R.P. Services of two or more local authorities would be under the control of

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the District Commissioner, or the Regional Commissioner if more than one district were involved.

10. *Hospital Officers*

Hospital officers are stationed in each of the five Civil Defence Districts in . . . and are located at the Headquarters of the District Commissioners. They are directly responsible to the Department of Health . . . for all Emergency Medical Services Hospitals and for inter-hospital transport. Their area representatives are the Medical Officers of Health of the County or Large Burgh concerned.

11. Five ambulance trains which are berthed in . . . are under the direct operational control of the headquarters of the Department of Health.

12. A list of telephone numbers of various centres and officials is attached.

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CHAPTER 4

THE CAMPAIGN IN LIBYA

A. June 1940 - June 1941—General Wavell

Précis

WHEN Italy entered the war in June 1940 it was to be expected that she would pursue in North and North-East Africa her dreams of empire. She had the means, some 200,000 troops in Libya and a further 250,000 in her East African territories. All that stood in her way were the British Commonwealth troops, less than 100,000 strong, scattered widely in Cyprus, Egypt, Palestine, the Sudan, Kenya, British Somaliland, and Aden.

Middle East Command was charged with the responsibilities of safeguarding the Suez Canal and keeping open the Red Sea. The task of the Italian Command in Libya was that of getting a sufficiently large force across the Western Desert and into the valley of the Nile. That of Middle East Command was to delay any such Italian move until reinforcements could arrive.

General Wavell seized the initiative and exploiting to the full the peculiar qualities of his troops, so bemused and harassed the Italians in Libya that for a time they were persuaded that to advance would be a most hazardous operation. However, in September they ponderously crossed the Libyan–Egyptian frontier to occupy Sidi Barrani. There they halted and began laboriously to construct a system of defended positions running from the coast southward into the Desert.

General Wavell, having taken measure of his opponent, then decided to attack. The garrison of Sidi Barrani and those in the defended camps of Nibeiwa, the Tummars and Sofafi were overwhelmed on December 9–10, the 'I' tanks of 7th Armoured Division proving themselves to be quite irresistible. So overwhelming was the defeat of the Italians that the limited plan to fling them out of Egypt gave place to an enterprise that had for its object nothing less than the complete destruction of the Italian forces in Cyrenaica.

Indian 4th Division left the Western Desert for the Sudan and was replaced by Australian 6th Division which, with 7th Armoured Division, then invested Bardia. On January 3, 1941, the Australians broke into the perimeter and the garrison surrendered. Next on January 21, employing the same tactics, they stormed Tobruk. Without pause the Australians moved on to Derna and beyond, while 7th Armoured Division cut across the Desert to El Mechili. Derna was entered on the 30th and Benghazi on February 6. Meanwhile, 7th Armoured had

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reached Msus and had pressed on to Soluch, Beda Fomm and Antelat. On February 5, 7th Armoured Division was astride the road leading south from Benghazi and the Italians, retreating, were trapped. The Italian forces in Cyrenaica were thus destroyed.

When Benghazi had fallen General Wavell was required to halt, to protect Egypt with the minimum force and to send all troops, transport and stores that he could spare to Greece. This he did. 7th Armoured Division was replaced in Cyrenaica by 2nd Armoured Division. A very different enemy now entered this arena. A German force under General Rommel—the Afrika Korps—joined the Italians in Tripolitania.

On March 21 the Axis forces attacked the forward defensive line at Mersa el Brega, pierced it and so initiated an engagement that only ended when Western Desert Force was once more in its original positions on the Egyptian side of the Libyan–Egyptian frontier. This was no disaster. With the forces at his disposal it was impossible for General Wavell to hold a line so remote from Tobruk, the only available port since Benghazi was dominated by the Luftwaffe. Indeed it had been decided that should the Axis forces attack in strength, Western Desert Force would retire on Benghazi and would be prepared to yield this place if severely threatened. During this withdrawal a garrison was left in Tobruk to deny the port to the enemy and to constitute a constant threat to his communications.

Losses of armour and increasing supply difficulties brought the Axis forces to a halt on the Libyan–Egyptian frontier. Attempts were made in May and June to dislodge them from the Sollum and Halfaya positions and to relieve Tobruk. These were unsuccessful and the antagonists then settled down to prepare themselves for the next throw.

Below is a glossary of Arabic words used in this and the following chapter:

GLOSSARY

Term	Meaning
Abd	A servant of
Abiar (Abar)	Plural of Bir
Ain	A fountain
Alam (Alem)	A directional beacon. A landmark
Bir	A surface water collecting point—a well
Dar	A house
Deir	A depression
Gabr	A sepulchre
Gebel (Jebel)	A mountain. A hill
Ghot (Got)	A low lying basin
Hagfet (Hazfet)	A windy place. A hill protecting from the wind
Ilwet	A height
Maaten	A well
Mersa	An anchorage
Munquar	A cliff
Nizwet (Nezuet)	A pile of rocks excavated from the Abiar, often covered with sand, to form a mound some 10 feet high
Qabr (Kabr)	A tomb
Qur, Qurat, Qaret	A high piece of ground
Ras	A headland or cape
Sidi	A saint
Tel	A hill
Wadi	A dry watercourse

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(i)

Initial Operations in the Western Desert

STRATEGIC AND OTHER CONSIDERATIONS

Throughout history the isthmus of Suez has been a keypoint on a great trade route. It lies athwart the road which the great armies have inevitably travelled from East to West or *vice versa* under commanders who have sought world dominion. Since the Canal was constructed it has always been a keypoint in Britain's communications with other members of the Commonwealth and it has been Britain's consistent policy to make herself responsible for the defence of Egypt.

In June 1940 Britain stood alone. France had fallen (June 17) and Italy had ranged herself at the side of Germany (June 10). The British Army had been stripped of its equipment in the evacuation from Dunkirk and was being hurriedly reorganised and re-armed. The Navy and the Air Force were absorbed in their urgent tasks of protecting Britain from invasion. It was to be expected that whatever Germany might do in launching a direct attack upon Britain, she would sooner or later attack indirectly by moving the centre of military activity to the Middle East. Furthermore, now that Italy was in the war, it was to be expected that she would take steps to achieve her avowed ambitions, to dominate the Mediterranean and to build an empire even greater and more durable than that of ancient Rome. Italy was greatly advantaged when the French in North-west Africa and Syria capitulated, throwing in their lot with the Vichy Government and so uncovering Egypt. The Italians were thus free to direct their considerable military strength against Middle East Command under General Wavell. Egypt herself was not at war.

So important to British war policy was the retention of control in Egypt that her War Cabinet resolved, at a time when the outlook was blackest, to defend the Middle East with whatever resources could be spared from the United Kingdom and elsewhere. Reinforcement of Middle East Command presented almost insuperable difficulties. The shortage of trained men, of arms, of everything that armies must have, was acute. The Mediterranean passage had become highly precarious, being infested with the Italian Navy and the Regia Aeronautica. Convoys from the United Kingdom to the Middle East were obliged to travel round the Cape. Even then they were exposed to the threat of attack by Italian naval and air force elements operating in the Red Sea from Eritrea and Italian Somaliland. Nevertheless reinforcements and supplies began to flow, and flowed in ever increasing volume, from the United Kingdom, Australia, India and New Zealand. Australia, New Zealand and South Africa had declared war on Italy on June 11.

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PREPARATORY PLANNING

When Italy declared war in June 1940, the recently formed Middle East Command, comprising the forces in Egypt, East Africa, Aden, Palestine, British Somaliland, Cyprus and the Sudan, contained less than four complete divisions—British 7th Armoured Division which, with the addition of certain troops from the peace-time garrison, constituted the Western Desert Force; part of Indian 4th Division; part of the New Zealand 2nd Division both in Egypt; and Australian 6th Division in Palestine, the last three of these formations being but newly arrived. The total number of British troops in Egypt was less than 40,000 and the British field medical units, apart from the light field ambulances and the field hygiene section of the armoured division, consisted only of one field ambulance, one motor ambulance convoy, one casualty clearing station and two general hospitals of 1,200 beds each. The Indian contingent included two small general hospitals as well as divisional units, but there were as yet no hospitals in the New Zealand contingent. Two Australian general hospitals were serving with Australian 6th Division in Palestine.

G.H.Q. Middle East Force grew out of Headquarters, British Troops in Egypt by absorption and subsequent enlargement. To it passed all the senior administrative medical officers of H.Q. B.T.E. This having happened, a new H.Q., B.T.E. was formed to come under G.H.Q., M.E.F. To begin with, its medical branch consisted of D.D.M.S., H.Q. B.T.E. and a small staff, an A.D.M.S. H.Q. Canal Zone, an A.D.M.S. Cairo Sub-area and a S.M.O. Alexandria, the last post being held by the officer commanding 2/5 British General Hospital. At this time the hospitals under H.Q. B.T.E. were 2/5 and 2/10 B.G.Hs. These were soon to be re-numbered 64 and 63 respectively.

The certainty that the Middle East would before long become a major theatre of war made it necessary to develop Egypt as an overseas base, including medical resources provided on a relatively generous scale in view of the long and precarious lines of communication between that country and the United Kingdom. The War Office therefore made arrangements for the immediate dispatch of those medical units most urgently required. The units then available for this purpose were: (*a*) a few already prepared for destinations in the East; (*b*) others originally intended for the expeditionary force in France; and (*c*) those that had been re-organised and re-equipped after the evacuation from Dunkirk and were once more ready for active service. By the beginning of October the forces in M.E.C. had been appreciably strengthened, in Egypt almost doubled; divisional medical units increased as new formations arrived, and non-divisional medical units were added in proportionate numbers; beds represented by the hospitals, including

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British, Australian, New Zealand and Indian units available in, or actually on their way to, the M.E. amounted to a total of 16,600.

About this time it was decided that, for the purposes of administrative planning, it was to be assumed that the force in the M.E., exclusive of Iraq and East Africa, would be raised in strength to nine divisions immediately, to fourteen divisions by June 1941 and to twenty-three divisions by March 1942. The addition of each division was to be regarded as denoting an increment to the force of 27,000 troops and the employment of 8,000 more labourers,* for all of whom medical services would be required. A heavy programme of medical provision was thus involved. Field medical units for the divisions and corps concerned in this reinforcement would be provided in the usual way, by the allocation of units already existing or by the raising of new units as required, and would eventually accompany their formations on dispatch overseas. Besides these, however, it was necessary to find a large assortment of units for lines of communication and base, including general hospitals, the provision of which in the requisite numbers was itself a considerable undertaking.

In November 1940, H.Q. B.T.E. was informed that by June 1, 1941, it was to be expected that a further 412,000 troops would have been sent to Egypt.

On the L. of C. Western Desert	67,000
In the Northern Delta area	13,000
In and around Cairo	57,000
At Bilbeis (30 miles N.E. of Cairo)	54,000
In the Tahag–Qassassin area	23,000
In Geneifa	27,000
Elsewhere in the Canal area	9,000
Six divisions at Geneifa	162,000
	412,000

The scale of hospital accommodation to be furnished was the subject of discussion between the War Office and M.E.C. It was first suggested that the ratio of beds to the strength of the force should vary between 10 per cent. and 4 per cent., according to the class of troops or labour concerned and to the climatic conditions in the different parts of the command. Ultimately an over-all scale of 8 per cent. of total strength

* The provision of adequate medical cover for 'labour' is a matter which must be taken into account by any planning staff as well as by Q and R.E. corps or divisional staffs. The tendency is always for R.E. and Q to procure local or imported labour and to locate the camps or quarters close to important military areas or in grossly unhealthy places without previous warning to 'Medical' and without any adequate medical cover. The results are always the same—the introduction of serious infection into military formations; gross man-power wastage; the emergency provision of hygiene and medical cover from the already overtaxed available medical resources. Arrangements should be made to cope with a daily sick rate of 2 per 1,000.

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was adopted. On this basis the number of beds to be provided by June 1, 1941, for a force comprising fourteen divisions was computed at approximately 36,000, or nearly 20,000 more than the number already available in October 1940. It was proposed to supply these additional beds by the dispatch of eleven general hospitals of 1,200 beds and ten general hospitals of 600 beds which, with one exception, were already in being. The further expansion of the force to twenty-three divisions by March 1942 would call for nearly 20,000 more hospital beds, i.e. a further twelve general hospitals of 1,200 beds and nine of 600 beds, all save one of which would need to be raised anew. Other units necessary for lines of communication and base included field hygiene sections, motor ambulance convoys, casualty clearing stations, ambulance trains and convalescent depots on the scale of 3 per cent. total strength, and depots of medical stores and field laboratories. This programme of expansion, as formulated in the autumn of 1940, drew heavily upon the total reserve of medical units available in the United Kingdom for service overseas and also involved the raising of more than sixty new units exclusive of those allocated as divisional or corps troops.

The fulfilment of medical requirements for the Middle East, as for other operational centres elsewhere, was hampered by the constant shortage of shipping space. Time and time again medical personnel and, even more often, medical units assembled ready for departure were excluded from the convoys to which they had been assigned, their places being taken by personnel and units of other kinds higher in order of priority. This state of affairs was to some extent unavoidable inasmuch as it was on occasions the direct result of enemy action. Not infrequently, when a convoy had been arranged in accordance with the shipping available at the time and a fair proportion of space allotted to all concerned, at the last moment some of the ships detailed to form the convoy were put out of commission, thus necessitating rearrangement of the whole convoy and the inclusion of only those units for which there was the most urgent demand. Even so, there is evidence to suggest that enemy action was by no means the only cause of the difficulty experienced in effecting prompt dispatch of medical reinforcements. At all events, vigorous representations made by D.G.A.M.S. were followed by marked improvement in this respect, so much so that in January 1941 hospitals to the total of no less than 5,000 beds were included in one convoy, and thereafter medical units proceeded at more or less regular intervals. A further obstacle in the way of precise planning was the impossibility of ensuring the simultaneous arrival of a unit's personnel and its equipment, since the former travelling by fast convoy often reached their destination many weeks before the latter, relegated to slower ships. Moreover, much equipment was lost

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in transit and a considerable time then elapsed before replacements were received.

The disposal of casualties among the forces in the Middle East was a matter of some complexity. The virtual closure of the Mediterranean severed the normal lines of communication with the United Kingdom and entailed the use of the long sea route round the Cape of Good Hope; at the same time the paucity of shipping imposed drastic restrictions in the provision of hospital ships. Evacuation of sick and wounded from Egypt to England had therefore to be kept within the narrowest bounds; on the other hand the difficulty of obtaining suitable and conveniently accessible hospital sites in the requisite numbers precluded the retention locally of an unlimited number of casualties. At first it was the intention that casualties from the Middle East should be evacuated to India, but the many disadvantages attaching to this course made it desirable to find an alternative, and the establishment of a medical base in South Africa was then mooted. It was considered that if a medical base consisting initially of two general hospitals of 1,200 beds each and a convalescent depot for 2,000 patients were opened in South Africa this would suffice to relieve the Middle East of two classes of casualty, those unlikely to be fit for duty within three months and those whose recovery would be assisted by removal to a more salubrious climate. After recovery and convalescence, casualties would return direct from South Africa to the theatre of operations; invalids unfit for further military service would ultimately be evacuated to the United Kingdom. The scheme entailed a hospital ship service between the Middle East and South Africa but almost entirely eliminated the use of these ships between the Cape and home ports, inasmuch as a large proportion of invalids for evacuation to the United Kingdom could be retained until well enough to travel by returning transports.

In September 1940 the Government of the Union of South Africa was asked for their views on these proposals. The War Office undertook to supply the requisite units complete with personnel and equipment and to send a small staff in the form of a medical mission to undertake administrative arrangements in connexion with the reception and disposal of patients and to effect the collection of the hospital records and statistics required by the British military authorities. The Union Government at once agreed to the establishment of a medical base for casualties from the Middle East, but expressed their desire that the hospitals and convalescent depot proposed should be provided and operated as a part of the Union defence organisation on a repayment basis. Sites were offered at Port Elizabeth and near Johannesburg and it was suggested that the accommodation should consist of huts with brick or concrete operating theatres, etc., that construction could be put in hand at once and buildings completed and made ready for

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the reception of patients in six months. It was requested that, owing to the shortage of essential hospital requisites in South Africa, medical supplies, stores and equipment should be supplied by War Office. The appointment of a small staff of R.A.M.C. personnel for administrative duties was welcomed.

It remained to make provision for immediate needs since there was the probability that hostilities on a large scale would develop within the six months required for the construction of hospital buildings. The Union Government was therefore asked if they could arrange some temporary form of hospital accommodation, pending more permanent construction, in order that the requisite number of beds might be available by the end of the year; tents would be forthcoming from the United Kingdom if necessary. The suggestion was accepted by the South African authorities, who also undertook to convert a hutted camp, intended for convalescent Union Defence Force soldiers, into a temporary hospital to receive some 1,600 casualties awaiting evacuation from the Middle East. Thereupon medical and ordnance equipment, including tents, were despatched and a small medical mission embarked for duty in South Africa. This mission consisted of a senior administrative and liaison officer, three medical registrars for the projected hospitals, a medical embarkation officer and clerical staff.

As a result of a review of the situation in the Middle East it was considered desirable to increase previous estimates of hospital beds required in South Africa to a total of 6,000 in addition to the depot of 2,000 patients. A proposal to this effect was put forward early in 1941. Again the consent of the Union was readily given, but during the subsequent discussion of ways and means the programme was revised and the number of hospital beds was reduced to 4,800, to be provided in hospitals at Durban, Howick, Johannesburg and Pietermaritzburg, while the convalescent accommodation was increased to 3,200. A further consignment of medical and general stores was despatched to South Africa from the United Kingdom.

The fulfilment of the programme, however, was impeded by delay in building construction due, in part at least, to the seemingly interminable discussion of financial principles that preceded the conclusion of arrangements acceptable both to the Treasury and to Union Government. Indeed, owing to differences of opinion as to the basis upon which contracts should be fixed and payments made, construction of the hospital at Johannesburg, provisionally agreed upon in October 1940, was not begun until September 1941, and then only after a personal assurance had been given by the South African Minister of Defence that, having regard to local conditions, the proposals put forward by those on the spot offered the only practicable method of procedure. However, two of the four hospitals were completed by

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December 1941 and a third in March 1942, by which time 4,100 hospital beds and 1,200 convalescent beds had been equipped and were ready to receive patients. All expenses incurred in connexion with this hospital building programme were borne by Britain. Equipment and stores, both medical and ordnance, on the scale of four general hospitals of 1,200 beds each and one convalescent depot of 2,000 beds, were supplied from reserves in the United Kingdom while all medical personnel, except three commanding officers, three quartermasters, five registrars and five clerks, were provided by the Union of South Africa.

THE ITALIAN AND THE BRITISH TACTICAL PLANS

It soon became manifest that the Italians were preparing to invade Egypt from Libya and that this operation was to be covered by the invasion of Greece and by large-scale raids into Kenya and the Sudan.

In so far as the Egyptian enterprise was concerned the problem confronting the Italian Command was that of getting a sufficiently large force from the Libyan–Egyptian frontier at Sollum across the miles of desert to the valley of the Nile. Should such a force be checked in this desert it would quickly become endangered, for supply and maintenance difficulties would speedily mount. So the Italians had built great magazines and depots along the whole length of the magnificent coastal road at Benghazi, Derna, Tobruk, Bardia and Sollum and were actively assembling a large striking force at the head of this road. There were eight Italian metropolitan and Libyan divisions in Tripolitania, four in Cyrenaica and a further three along the northern section of the Libyan–Egyptian frontier, some fifteen divisions or 215,000 troops in all.

The problem facing General Wavell was that of persuading the Italians in Libya to delay their advance against Egypt. At this time, he had some 36,000 troops in Egypt, some 9,000 in the Sudan, 8,500 in Kenya, 1,475 in British Somaliland, 27,500 in Palestine, 2,500 in Aden and 800 in Cyprus. Besides being far fewer in total numbers they were widely scattered over immense distances. Moreover, in the Italian possessions of Eritrea, Somaliland and Abyssinia there were some 250,000 men under arms. So that there was no possibility whatsoever of concentrating all these British troops in Northern Egypt. It was necessary to gain time in order that reinforcements from overseas might arrive before the threat to Egypt developed further.

A plan of strategic defence had been prepared against this eventuality. It was intended to hold Mersa Matruh as a base for the operations of a mobile force designed to harass the enemy by raiding patrols and to seize advantage of every tactical blunder that he might make.

THE TERRAIN, CLIMATE AND COMMUNICATIONS

North-East Africa consists in the main of a vast desert, in size and shape not unlike India. In the north it is bounded by the Mediterranean

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shore from the Delta in the east to the hills of Tunisia, 1,200 miles away, in the west. A thousand miles to the south it blends with the

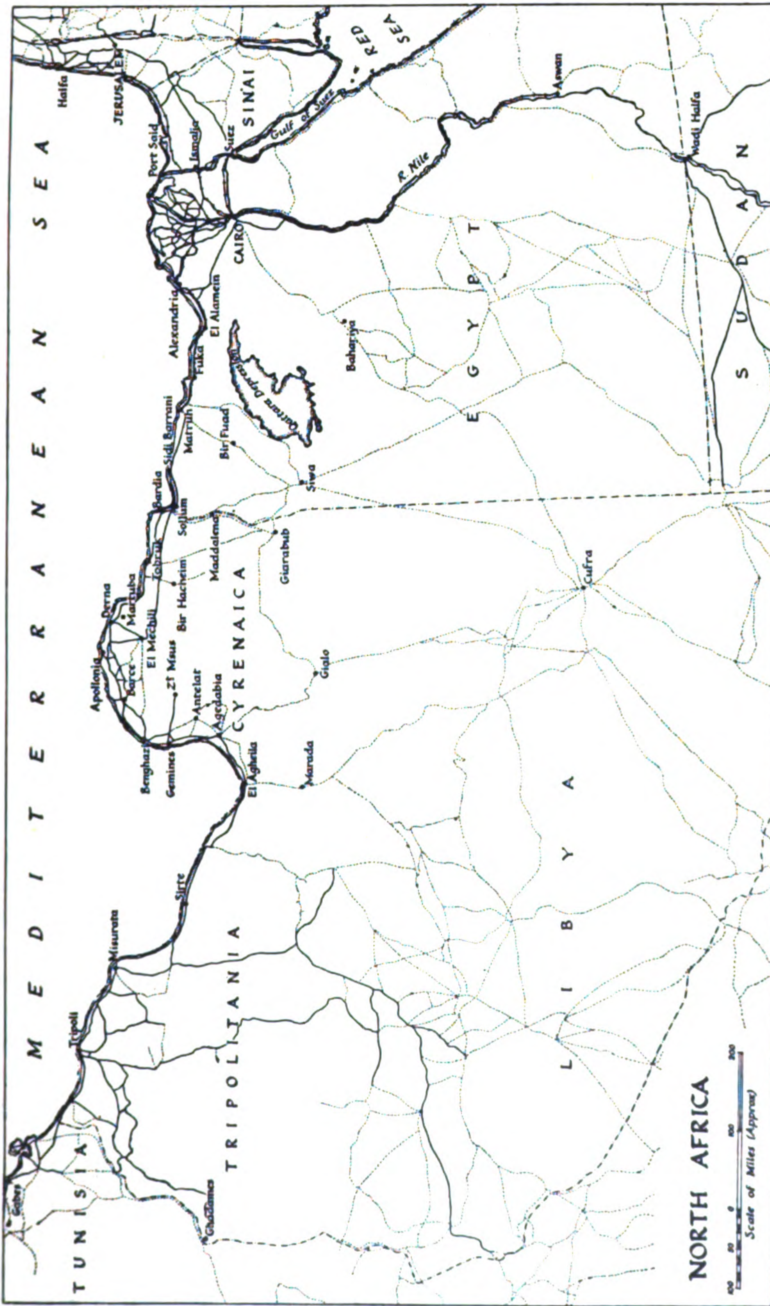

FIG. 15. North-East Africa.

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scrub-covered wilderness of the Sudan. On the east its frontier is the Nile and in the west it is separated from the deserts of the French Sahara by the rock masses of Ennedi, Erdi and Tibesti.

Wind erosion has stripped the earth of its soil and has bared the rocks. Here and there it has exposed water-bearing strata so that there are widely separated oases, either with shallow wells or else with gushing streams that quickly lose themselves in shallow lake or salty swamp.

The northern part of the desert is mainly composed of limestone, the southern of sandstone. Plateaux of broken stone, stretches of brown pebbles, flat-topped hillocks of black or white rock, expanses of powdered clay in the northern part give place in the south to the great sand sea, 600 miles long by 150 miles wide. Further south, beyond this, lies the Inner Desert, generally flat and dominated by the plateau of the Gilf Kebir, the Gebel 'Uweinat and the rough basalts of the Gebel Soda and the Harug el Aswad.

That part of the desert in which the Libyan campaign was fought was the Western Desert, named so to distinguish it from the Syrian or Eastern Desert. It is a narrow strip of country which runs up the western bank of the Nile and then turns westward along the Mediterranean coast. Across it the caravans have passed from time immemorial to pause at one or other of a chain of oases—Siwa, Giarabub, Gialo, Augila, Marada, Hon, Giofra. From Siwa another chain—Bahariya, Farafra, Dakhla, Kharga, Kurkur, El Sheb and Selima—runs towards Wadi Halfa near the Egyptian–Sudanese border.

From Alexandria westwards the coastline is flat and is guarded by limestone reefs. The beach gently rises to a range of coastal dunes composed of porous limestone. Three feet below the surface is a water-bearing stratum. The water therein is salty. Behind these dunes runs a strip of soft ground one to four miles wide which, when dry, is a dust bowl and when wet a quagmire. Further inland stretches the stony Deffa, featureless save for an occasional pan of dried mud. At the Libyan–Egyptian border the scene changes. From Sollum westwards as far as Derna the dunes rise straight from the sea to form a desert plateau. At Derna they recede from the sea again and are separated therefrom by the rolling highlands of the Gebel Akhdar, the Green Hills, fertile and cultivated.

Mersa Matruh (pop. 6,000) and Sollum (pop. 4,000) were the only towns of any considerable size. Both had small harbours, as also had Bardia, Tobruk, Derna and Apollonia. But none of these were large enough to serve the needs of an army. Benghazi was the first port to the west of Alexandria that could do so.

Over the treeless coastal strip, varying from two to twenty miles in width, enough rain (about 4 inches) falls each year to maintain a sparse

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crop of drought-resisting vegetation. But over the rest of the Desert no rain falls, save during the thunderstorms that occur at ten- to twenty-year intervals. The violent swings of temperature, characteristic of a desert, increase with increasing distance from the sea. The prevailing wind is northerly and mild. Even in summer the nights are cool. But for periods of one to four days at a time the wind swings round to the east, south or west and reaches storm strength. In winter it can become bitterly cold and often fierce. In summer, heated by the sands of the desert, it takes on the quality of rushing flame. In spring and autumn heat and cold can alternate within a few days. The wheels of mechanised armies quickly churned up the surface to produce an ankle-deep layer of fine dust which wind caught up and fashioned into great clouds that covered everything, penetrated everything and everywhere.

From Alexandria a good metalled road and a single line of broad gauge railway ran as far as Matruh, the road continuing thereafter alone to Sidi Barrani. Thence to the frontier at Sollum there was nothing but a rough desert track through the dust or mud.

In Libya the Italians had constructed a first class road along the coastline, ending abruptly at the frontier. Subsidiary roads ran between Benghazi and Derna. Inland, communications consisted of tracks made by the wheels of heavy vehicles that had passed that way. During the war these were marked with petrol tins and barrels. Along the whole length of the Libyan–Egyptian border the Italians had constructed a wide wire fence upon a quadruple line of 5 foot metal stakes embedded in concrete.

There was no knowing what the native population of Libya numbered —possibly some 70,000. The people are nomadic Bedouins who raise camels, small cattle and a little grain. In the south the population is of mixed Arab and negro blood.

Egypt and its people were well known to the British Army and to its medical services. It was fully understood that problems of military hygiene would assume very considerable dimensions when large numbers of troops, imperfectly trained in matters of private and public sanitation, became congregated in the country. It was fully expected that dysentery, sand-fly fever, the enteric group and skin diseases would command the very active attention of the Army Medical Services.

WESTERN DESERT FORCE

During the months immediately preceding the outbreak of war and also during the interval between the declaration of war upon Germany and the entry into the war of Italy on June 10, 1940, the British Commonwealth forces in the Middle East were steadily reinforced by units from the United Kingdom and also by the first flights of Australian, New Zealand and Indian formations. Australian

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6th and 7th, New Zealand 2nd and Indian 4th Divisions were on the move.

Ind. 11th Inf. Bde. (2nd Camerons, 1/6th Rajputana Rifles, 4/7th Rajput Regt.) sailed from Bombay on August 3, 1939 and reached Suez on August 16. With the brigade came 11 I.G.H. (H.Q. and four sections, 400 beds), 19 (Ind.) Fd. Amb., and 15 (Ind.) Fd. Hyg. Sec. The brigade moved to training camps in the Fayid area. 11 I.G.H. opened at Mena. On September 7 'B' Coy. 19 (Ind.) Fd. Amb. moved to El Daba. In October the brigade moved to Mena camp.

On October 4 H.Q. Indian 4th Division (formerly H.Q. Deccan District) and Ind. 5th Inf. Bde. (1st R.F., 3/1st Punjab Regt., 4/6th Rajputana Rifles) reached Suez. With this convoy came:

10 I.G.H. (H.Q. and four secs.) to the Citadel in Cairo. To it were transferred all the patients (237) of 11 I.G.H.
2 (Ind.) C.C.S. to Beni Yusuf.
2 (Ind.) Con. Depot to the Citadel.
2 (Ind.) Amb. Train (personnel) to the Citadel.
4 (Ind.) Depot Med. Stores to the Citadel.
18 I.S.S. to Maaten Baqqush to open a camp hospital.
19 I.S.S. to Burg El Arab.
14 (Ind.) Fd. Amb. with the brigade to Beni Yusuf.

Location Statement of Indian Medical Units at the end of July, 1940.

Beni Yusuf .	2 (Ind.) C.C.S.
	15 (Ind.) Fd. Hyg. Sec. (Detach.)
Mena . .	11 I.G.H. 200 beds (V.D.)
	15 (Ind.) Fd. Hyg. Sec. (H.Q. and one sec.)
	14 (Ind.) Fd. Amb.
Cairo . .	10 I.G.H. 400 beds
	2 (Ind.) Con. Depot (closed)
	4 (Ind.) Depot Med. Stores
Ikingi Maryut .	19 (Ind.) Fd. Amb. (less one coy.)
El Daba .	19 (Ind.) Fd. Amb. (one coy.)
	15 (Ind.) Fd. Hyg. Sec. (one sec.)
Burg El Arab .	19 I.S.S.
Mersa Matruh	18 I.S.S.

Ind. 7th Inf. Bde. (1st R. Sussex, 4/11th Sikh Regt., 4/16th Punjab Regt.) with 17 (Ind.) Fd. Amb. reached Suez on October 12, 1940.

The first flight of the New Zealand Expeditionary Force, including N.Z. 4th Bde., eighteen members of the N.Z.A.N.S., 4 (N.Z.) Fd. Amb. and 4 (N.Z.) Fd. Hyg. Sec. reached Port Tewfik on February 13, 1940. The second, which included N.Z. 5th Bde., 1 N.Z.G.H. and 5 (N.Z.) Fd. Amb. reached Gourock in Scotland on June 16. The third which included N.Z. 6th Bde., 2 N.Z.G.H. and 6 (N.Z.) Fd. Amb. reached Port Tewfik on September 28, 1940.

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N.Z. 4th Bde. moved to Maadi Camp in the Desert about eight miles from Cairo. There the field ambulance established a camp hospital of 100 beds. The nurses were attached to 2/10 B.G.H. at Helmieh as were also a number of N.Z. medical officers and orderlies. Pending the arrival of 2 N.Z.G.H., a general hospital, 4 N.Z.G.H., was established in the Grand Hotel at Helwan, a health resort on the Nile 18 miles from Cairo. Its staff was found from 4 (N.Z.) Fd. Amb., N.Z.A.N.S. personnel as these arrived, 12 Q.A.I.M.N.S., Australian M.Os. and orderlies.

At the end of August and the beginning of September N.Z. 4th Bde. moved into the Desert to help defend a perimeter around Maaten Baqqush and Maaten Burbeita. 4 (N.Z.) Fd. Amb. established a M.D.S. at Maaten Burbeita.

2 N.Z.G.H. took over the general hospital at Helwan on October 8 and the staff thus released returned to their respective units. 1 N.Z.G.H. reached the Middle East from the United Kingdom to open at Helmieh on December 15.

The New Zealand force in the United Kingdom, assigned an active rôle in the event of an attempted invasion, was first stationed in the Aldershot area. 1 N.Z.G.H. by arrangement with the E.M.S., took over a new hutted hospital at Pinewood Sanatorium, near Wokingham, about ten miles distant from the main New Zealand camp. In September the New Zealanders were in bivouacs covering Dover u/c XII Corps and were expecting to move to the Middle East at the end of October. This move was delayed, however, for the reason that the most urgent need in the Middle East at this time was for armour, guns and A.A. units. The New Zealand force then was concentrated in the Maidstone–Ashford area in Kent.

The departure of 1 N.Z.G.H. was not postponed. Handing over to 18 B.G.H. the unit sailed from Gourock on October 4 and reached Port Tewfik on November 16.

The rest of the force sailed for the Middle East in a convoy that left Belfast on January 12, 1941, reaching Port Tewfik on March 3.

On December 15, 1939, the staff of an overseas base sailed from Australia for the Middle East. The base was established in Jerusalem early in 1940. Six tented camps in the area Gaza–Qastina in Palestine were prepared for Australian 6th Division of the Second Australian Imperial Force (A.I.F.). On February 13, Aust. 16th Inf. Bde. disembarked at Kantara and proceeded to Palestine. The balance of the division arrived on May 18. The G.O.C. of the A.I.F. (M.E.) and his staff, including the D.D.M.S. and his staff, reached the Middle East on July 20.

One of the convoys from Australia was diverted to the United Kingdom when, on June 10, 1940, Italy entered the war. Among the 8,000

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troops so diverted were the medical staffs of 2/3 (Aust.) Fd. Amb. and 3 (Aust.) Special Hospital (V.D.) and 77 members of the A.A.N.S.

Accompanying Australian 6th Division to Palestine were 2/1 A.G.H., which was established at Gaza Ridge, and 2/1 (Aust.) Con. Depot which was opened at Kafr Vitkin on the coast in northern Palestine. 2 (Aust.) Special Hospital was created out of available personnel to replace 3 (Aust.) Special Hospital which had been diverted to the United Kingdom. The divisional units accompanying Aust. 16th Bde. were 2/1 (Aust.) Fd. Amb. and 2/1 (Aust.) Fd. Hyg. Sec. The other divisional field ambulances were 2/2 and 2/7 (Aust.). In later convoys came 2/1 (Aust.) C.C.S. and 2/2 A.G.H. which remained at Kantara.

At the end of 1940 Australian 7th Division began to reach the Middle East from Australia. Accompanying this division were 2/5 A.G.H. which was established at Kafr Balu near Rehovot in Palestine and 2/2 (Aust.) C.C.S. which opened at Dimra.

The Australian troops in the United Kingdom were organised into two brigade groups, with a number of forestry units in addition. The officer commanding 2/3 (Aust.) Fd. Amb. was appointed A.D.M.S. to the force and the ambulance itself split to form 2/3 and 2/11 (Aust.) Fd. Ambs. To serve the force a general hospital was created, 2/3 A.G.H., with 360 beds in a hutted wing of the King George V Sanatorium, Godalming, by arrangement with the Emergency Medical Services of the Ministry of Health. 3 (Aust.) Special Hospital was absorbed into this hospital.

In late 1940 the Australian troops in the United Kingdom, less the forestry units, began to move to the Middle East. There 2/3 A.G.H., being surplus to requirements, ceased to function as an active unit.

Medical Units of W.D.F. and at Base. June 11, 1940.

	215 Fd. Amb. (Corps Fd. Amb.)
7th Armd. Div. .	2/3 and 3/3 Lt. Fd. Ambs. (Later to become 13 and 15)
	2/1 Lt. Fd. Hyg. Sec. (Later to be renumbered 7)
Ind. 4th Div. .	14 and 19 (Ind.) Fd. Ambs.
	15 (Ind.) Fd. Hyg. Sec.
N.Z. 4th Bde. Gp.	4 (N.Z.) Fd. Amb.
	4 (N.Z.) Fd. Hyg. Sec.
Matruh Garrison	2/1 Fd. Amb. (Later to become 14)
	2/1 Fd. Hyg. Sec. Detach.
L. of C. . . .	2/2 M.A.C. (Later to be renumbered 16)
	2/5 C.C.S. (Later to become 24)
	2 (Ind.) C.C.S.
	18 and 19 Indian Staging Sections
Base	63 B.G.H. (1,200 beds) Cairo
	64 B.G.H. (1,200 beds) Alexandria
	Military Hospital (200) Moascar

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Military Families Hospital (70) Abbassia
Military Families Hospital (7) Mustapha
Government Fever Hospital (28) Abbassia
10 I.G.H. (400) Cairo
11 I.G.H. (400) Mena
5 Base Depot Med. Stores Cairo
3 (Ind.) X-ray Unit Cairo
2 (Ind.) Con. Depot, On the Canal
Improvised Con. Depot Moascar
2 (Ind.) Hospital Train personnel Cairo
1 and 2 Egyptian Ambulance Trains
4 (Ind.) Depot Med. Stores

W.D.F. was based upon Matruh, which was being transformed into a fortress. To the west of Matruh was a covering force consisting of units of 7th Armd. Division. With this covering force were 2/3 and 3/3 Lt. Fd. Ambs. 2/1 Fd. Amb. was serving the Matruh garrison (22nd Inf. Bde.); H.Q., W.D.F., was at Maaten Baqqush; Adv. H.Q., 7th Armd. Division at Buq Buq.

On June 8, 1940, General O'Connor, with H.Q. 6th Division, came from Palestine to assume command of all British Commonwealth troops in the Western Desert. The Order of Battle of W.D.F. on this date is given in Appendix VIII.

THE ITALIANS INVADE EGYPT

On June 11 at 1800 hours 11th Hussars moved forward to Dar el Brug and reached the frontier wire as light was failing. Gaps were made, and on June 12, the unit passed through to raid Italian posts and to ambush their convoys. It captured two officers and 68 other ranks who only then learnt that they had become involved in a war. Two days later 11th Hussars, together with a company of 2nd Rifle Brigade (motorised) captured the small forts of Capuzzo and Maddalena and on June 16 raided deep into Cyrenaica to intercept convoys on the Bardia–Tobruk road. Soon the patrols were dominating some 4,000 square miles of Italian territory. The Support Group of 7th Armd. Division was in the area of Sidi Barrani and Buq Buq, having been reinforced by 3rd Coldstream Gds. and 2nd Highland Light Infantry of 22nd Inf. Bde. from Matruh. 11th Hussars were operating north of Sidi Omar as far as the Bardia–Tobruk road and south of Sidi Omar as far afield as Capuzzo and Sidi Azeiz. 2nd H.L.I. were on top of the escarpment two miles north of Sollum. 2nd R.B. were also on top of this escarpment some three miles south of Sollum, while 1st King's Royal Rifle Corps (motorised) of the Sp. Gp. of 7th Armd. Division were watching the frontier wire from Sidi Omar to Giarabub.

The medical arrangements demanded by a military operation of this kind presented a number of unusual problems. The total front covered

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by 7th Armd. Division was about 104 miles and the distance from rear divisional headquarters to the front line about 115 miles. The field ambulances were below strength in respect of medical officers and of vehicles; 3/3 Lt. Fd. Amb. had twelve motor ambulance cars, 2/3 had but four and 2/2 M.A.C. supplied five. These cars were distributed as follows:

5 to clear the left flank R.A.Ps. to the M.D.S. at Dar el Brug
2 at the Car Post at Sollum
2 at the A.D.S. at Buq Buq
5 to clear the M.D.S. at Dar el Brug to the main M.D.S. on the Sidi Barrani–Matruh Road
7 at the main M.D.S. to work a shuttle system of evacuation.

Time to reach the M.D.S. at Dar el Brug 4–6 hours
Resting at this M.D.S. 6–8 hours
Time to reach the main M.D.S. (75 miles) 12 hours.

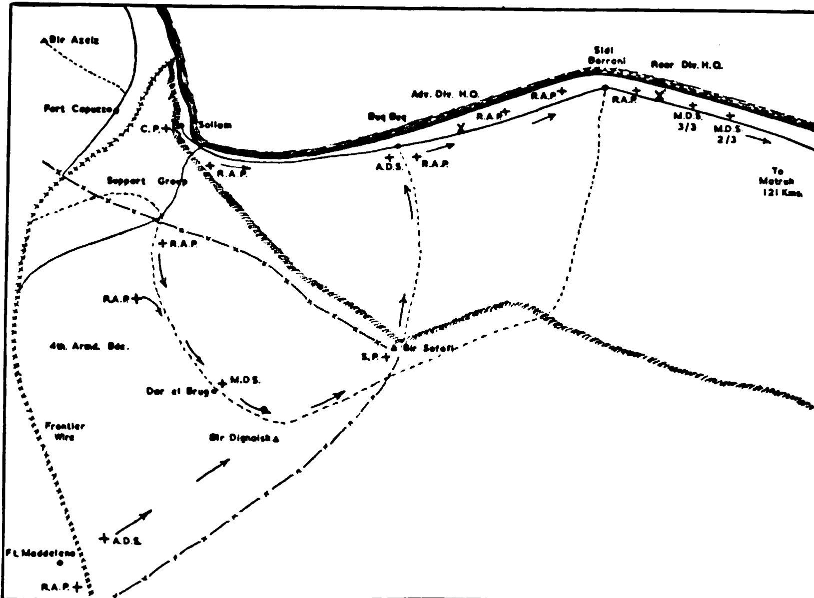

FIG. 16. Initial Operations in the Western Desert. The Distribution of the Medical Units of 7th Armoured Division.

THE WITHDRAWAL TO THE EGYPTIAN FRONTIER

By the end of the month the Italians had greatly increased their strength in the forward areas and occasionally were venturing over the border in the form of strong columns protected by armour, only, however, to return with nothing accomplished. On June 28 they surged forward to re-occupy Capuzzo and Sidi Azeiz. On July 3 they made an abortive attempt to press on to Sollum.

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It was not intended that W.D.F. should attempt to halt this advance until such time as it began to threaten Matruh. Its task was to harass the Italians as they came forward and, risking little, to take full advantage of any tactical blunder that they might make. Meanwhile the Naghamish Wadi defensive position to the east of Matruh was being rapidly completed by Indian 4th Division and another defensive position was being constructed to cover the water supply at Maaten Baqqush.

Slowly, step by step, the covering force fell back to the area Maaten el Firikhet–Charing Cross–Abar el Kanayis, where 7th Armd. Division was concentrating, while its Support Group was taking up an observation line from Sollum to Fort Maddalena. The divisional axis was Bir Enba–Alem Shitewan–Charing Cross–Siwa Road.

On September 11 the Italians at long last moved again. Under the cover of a heavy artillery barrage a strong force advanced against the escarpment above Sollum. On the 12th they halted and began to dig in along the Wadi Nazrani on the Hafid ridge and to concentrate in the area of Sidi Omar. On the 13th they occupied the barracks at Sollum and began to move along the Halfaya Pass. During this time they were punished severely from aerial attack and with artillery fire. The road from Sidi Barrani eastwards had been mined as the covering force withdrew. On September 14, 3rd Coldstream Gds., who had been holding a line twelve miles east of Sollum, were pulled back to three miles east of Buq Buq and later to Matruh.

The Italians moved no further but began to build a road between Sidi Barrani and Sollum. Elsewhere they had tardily moved into the Sudan, Kenya and British Somaliland and had bombed Malta. The British had given up Kassala and Gallabat in the Sudan and had withdrawn altogether from British Somaliland. But there also the Italians halted.

In this strange fashion the overture to the Libyan campaign ended. During the next three months there was much patrolling on the part of the British and an occasional reconnaissance in force by the Italians, and all the while General Wavell's audacious plan for a counter-offensive was maturing.

During these months W.D.F. had been receiving further reinforcements. There were now some 4,000 native labourers employed with the Army and No. 208 Army Co-operation Squadron, R.A.F. Various A.M.P.C., Palestinian and Cypriot labour units had multiplied, a number of British infantry battalions had reached the Delta and others were on their way. There had also arrived: 16th Inf. Bde., 7th Armd. Bde. of 7th Armoured Division, Ind. 7th Inf. Bde. of Indian 4th Division and a French Marine battalion (motorised).

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THE EVACUATION SYSTEM BEFORE THE WITHDRAWAL

The distribution of the medical units of 7th Armd. Division is shown in Fig 15. The M.D.S. of 2/3 Lt. Fd. Amb. was at Km. 120 on the Sidi Barrani–Matruh road, that of 3/3 at Dar el Brug. At the A.D.S. at Bir Sofafi casualties evacuated from the M.D.S. at Dar el Brug were inspected before they proceeded to the M.D.S. at Km. 120.

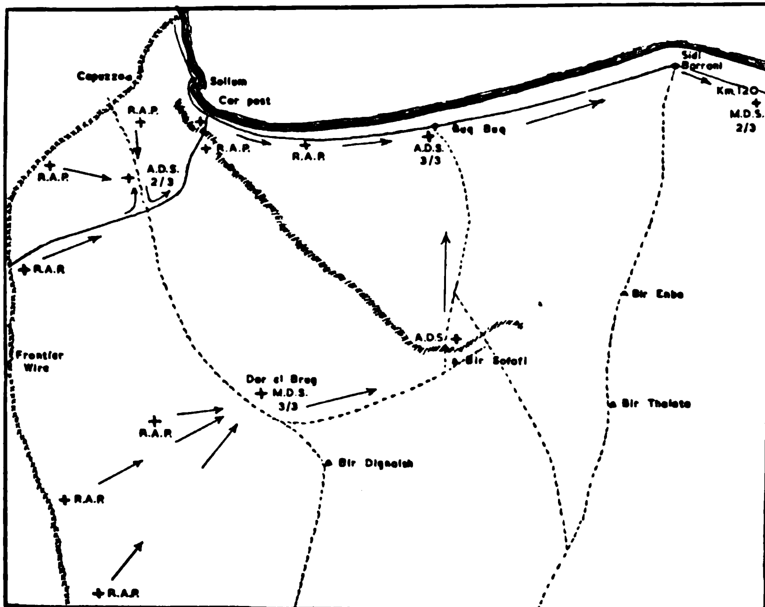

FIG. 17. The Evacuation Chain of 7th Armoured Division before the Withdrawal to the Libyan–Egyptian Frontier.

Coastal R.A.Ps. to the A.D.S. of 2/3 Lt. Fd. Amb. and thence to the M.D.S. of 2/3 Lt. Fd. Amb. at Km. 120.
Other R.A.Ps. to the M.D.S. of 3/3 Lt. Fd. Amb. near Dar el Brug and thence through the A.D.S.s of 3/3 Lt. Fd. Amb. at Bir Sofafi and Buq Buq to the M.D.S. of 2/3 Lt. Fd. Amb. at Km. 120.

At Mersa Matruh (The Adv. Operating Centre and Railhead)	2/1 Fd. Amb. less one sec. 18 I.S.S. 1 Amb. Train, two coaches
At Km. 14 on the Matruh–El Daba Road	Sec. 2/1 Fd. Amb.
At Km. 43 . . .	H.Q. 2/2 M.A.C. 2/1 Lt. Fd. Hyg. Sec. of 7th Armd. Div.
Maaten Baqqush . .	Detachment of 2 (Ind.) C.C.S.
Fuka	R.A.F. Med. Reception Station
El Daba	2/5 C.C.S.

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	2 (Ind.) C.C.S., less detach.
	1 Amb. Train
	2 Amb. Train, one coach
	15 (Ind.) Fd. Hyg. Sec. detachment
	19 (Ind.) Fd. Amb. Company
Burg el Arab . . .	19 I.S.S.
Base	In addition to the medical units that were present at the base at the opening of hostilities, the following had arrived:
	Cairo Sub-area
	9 and 15 B.G.Hs.
	2 N.Z.G.H.
	36 and 48 Fd. Hyg. Secs. (awaiting transport)
	1 N.Z. Convalescent Depot (for Canal Sub-area)
	R.A.M.C. Base Depot
	7 Adv. Depot Med. Stores
	Alexandria Sub-area
	8 B.G.H.
	Suez Canal Sub-area
	Egyptian Government Convalescent Depot (a temporary unit)
	19 and 27 B.G.Hs.
	17 Fd. Hyg. Sec.
	In transit camp
	15 C.C.S. } (awaiting stores and transport)
	173 and 189 Fd. Ambs. }

Each of the light field ambulances of 7th Armd. Division was allotted by division a No. 9 wireless set carried in an 8-cwt. truck. At rear headquarters for the use of A.D.M.S., was another set. Without these the work of the field ambulances would have been greatly restricted.

N.Z. 4th Bde. at this time was in the Maaten Baqqush area. 4 (N.Z.) Fd. Amb. was at Maaten Burbeita, 34 miles east of Mersa Matruh. Evacuation therefrom was by ambulance car to Sidi Haneish Station and thence by rail to 2/5 C.C.S. at El Daba and to 4 N.Z.G.H. at Helwan. During this period the ambulance personnel learnt much from the medical units of 7th Armd. Division, particularly as regards the methods of dispersal of A.D.S. and M.D.S. and the use of the 40 × 40 ft. tarpaulins. As a result, tarpaulins were provided for 4 (N.Z.) Fd. Amb. A truck, such as the operating truck, was used as the principal support for the tarpaulin, one side of which was spread over the vehicle and the other sides pinned to the ground. Poles inside raised the tarpaulin off the ground sufficiently to provide coverage for 20 to 30 stretchers. The

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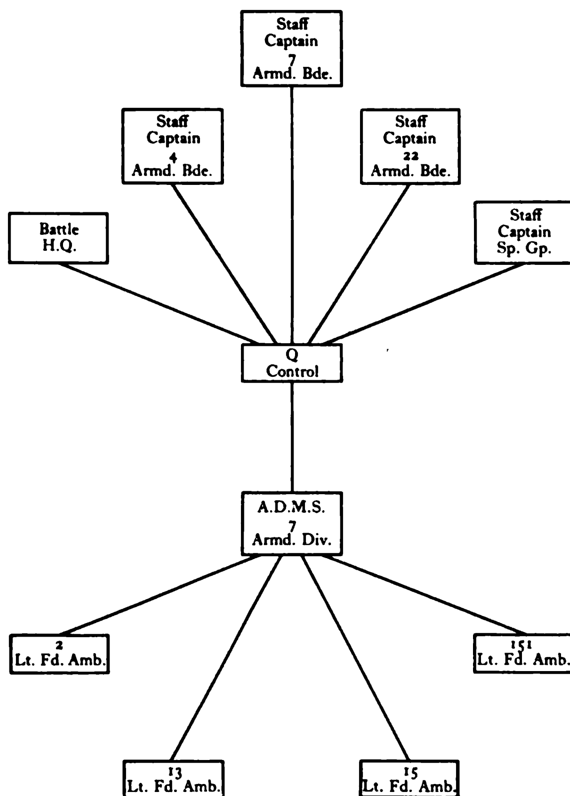

FIG. 18. The Wireless Net of 7th Armoured Division.

open end of the truck faced inwards so that the equipment was easily available for use inside the marquee-like structure which could be erected in a few minutes.

MEDICAL COVER DURING THE WITHDRAWAL

As the covering force slowly withdrew, the forward medical units conformed. 2/2 M.A.C. evacuated along the Siwa track to Matruh to begin with. H.Q. 2/2 M.A.C. moved back step by step and on September 18 was at Km. 36 on the Matruh–Alexandria road where the Road to Rome track from Siwa joined the main Alexandria road. From there evacuation was by track to the main road and thence to 2/5 C.C.S. at Daba. Cases reaching Km. 36 late in the day were accommodated by 4 (N.Z.) Fd. Amb. at Maaten Baqqush for the night and entrained the following morning. 2/1 Fd. Amb. closed at Matruh since its function as Adv. C.C.S. had ceased. 14 (Ind.) Fd. Amb. moved to Gerawla and 19 (Ind.) Fd. Amb. to Maaten Baqqush along with 15 (Ind.) Fd. Hyg. Sec.

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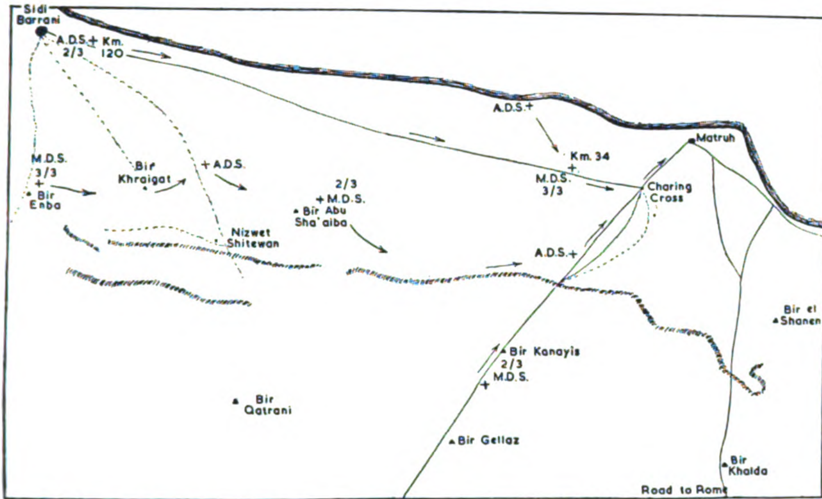

FIG. 19. The Withdrawal. First Phase. The Distribution of the Medical Units of 7th Armoured Division. The M.D.S. of 3/3 Lt. Fd. Amb. at Km. 34 received and evacuated all cases.

At first no ambulance trains were available. A temporary arrangement was accordingly made whereby an ambulance coach travelled with the ordinary train from Matruh to Daba, was unloaded there and returned to Matruh each day. Further evacuation of such as should be sent to

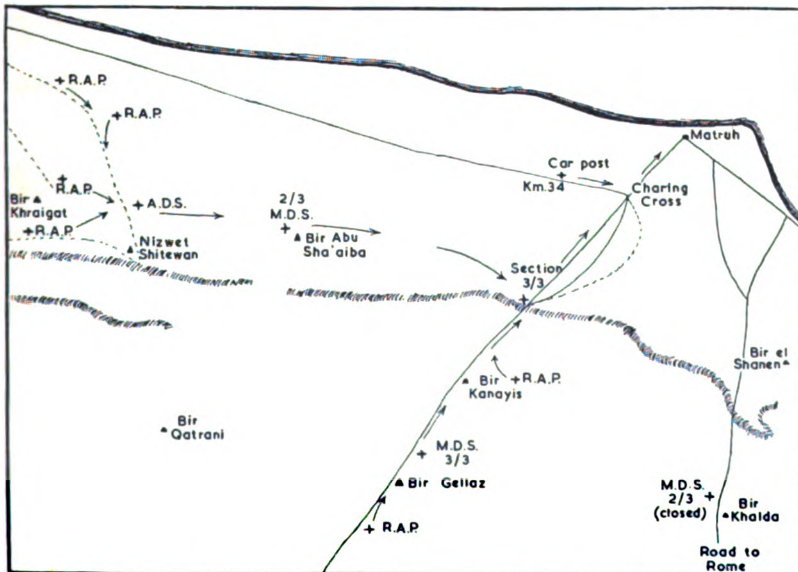

FIG. 20. The Withdrawal. Second Phase. The Distribution of the Medical Units of 7th Armoured Division.

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the base hospitals was arranged by the despatch of a second ambulance coach from Alexandria to Daba. Later, ambulance trains ran daily

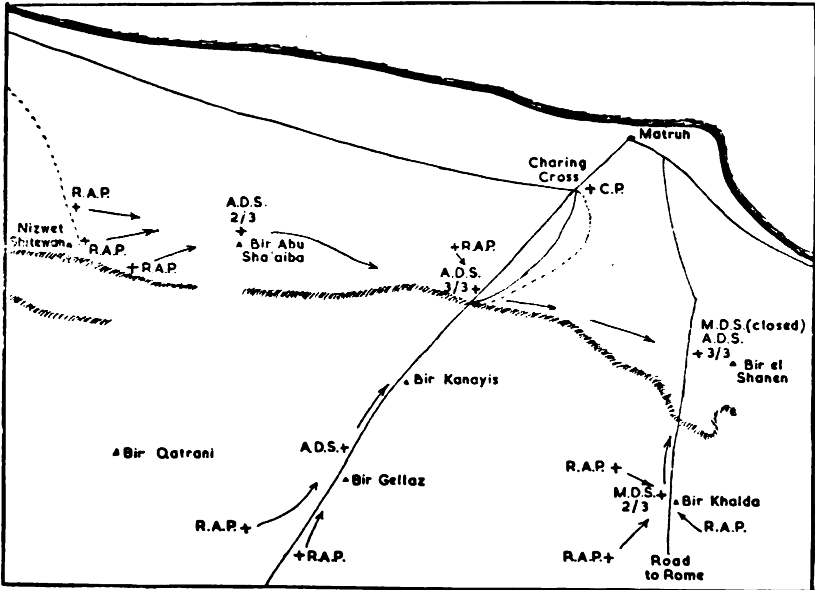

FIG. 21. The Withdrawal. Third Phase. The Distribution of the Medical Units of 7th Armoured Division.

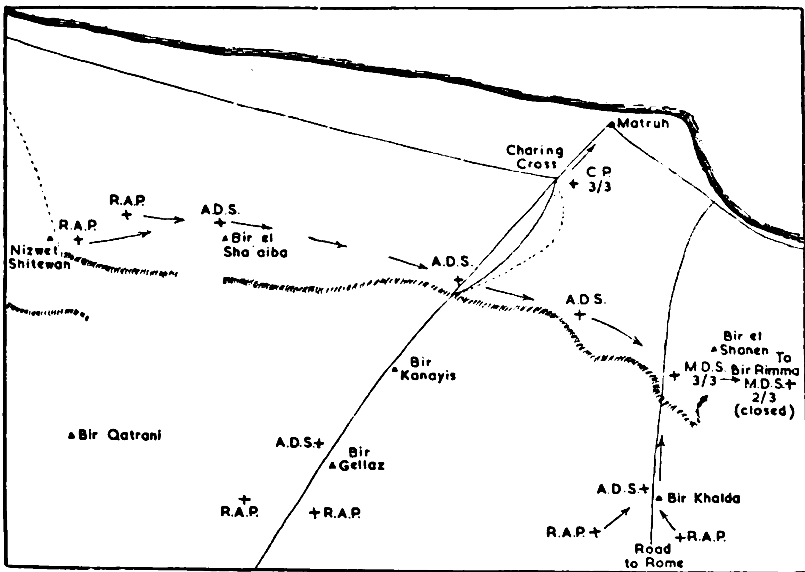

FIG. 22. The Withdrawal. Fourth Phase. The Distribution of the Medical Units of 7th Armoured Division.

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from Matruh, stopping at Gerawla, Sidi Haneish and Fuka, to pick up cases from field ambulances and the R.A.F. medical reception station and continuing to Daba, unloading there cases for admission to 2/5 C.C.S., and taking aboard other cases for evacuation from the C.C.S. to base hospitals and then proceeding to Alexandria and Cairo.

During late September the demands upon the railway increased greatly and it was therefore decided that ambulance railhead should be at Daba and that 2/2 M.A.C. should clear all medical units in front of this place.

Since no advanced depot of medical stores had yet reached the Desert, arrangements were made whereby 2/5 C.C.S. and 2 (Ind.) C.C.S. held a three months reserve of stores. Transport difficulties rendered this arrangement ineffectual. However, 7 Adv. Depot Med. Stores did reach the Western Desert late in September.

Number of Sick Admitted to and Evacuated from Field Medical Units, W.D.F. Quarter ending September 30, 1940.

	British	*Indian*
Admitted	5,979	1,384
Evacuated from W.D.F.	4,948	514

Number of Wounded Admitted to Field Medical Units. June 26–*October* 20.

7th Armd. Division	55
Matruh Garrison	76
Ind. 4th Division	7
Lines of Communication	3
	141

(ii)

The Counter Offensive and Pursuit to El Agheila, December 9-16, 1940

Though vastly outnumbered in respect of men, guns and aircraft, General Wavell, having taken the measure of his antagonist, now decided to fling the Italians out of Egypt. He had been planning for this ever since the Italians began to settle down on September 21 on the general line Sidi Barrani–Alam el Rabia. He proposed to destroy the enemy in the Nibeiwa and Tummar defended camps and to capture the installations and supply dumps about Buq Buq. As early as October 20 he had instructed General Maitland Wilson, commanding B.T.E., to consider the possibility of such an enterprise. But on October 28

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the Italians invaded Greece and troops from Egypt had to be sent to Crete. The operation in the Desert had therefore to be postponed. Then in November, General O'Connor, commanding W.D.F., began to plan afresh.

The order of battle of Western Desert Force at the time of the beginning of this counter-offensive ('Compass' Operation) is given in Appendix IX.

THE TACTICAL PLAN

(*a*) Indian 4th Division would attack the Nibeiwa, Tummar East, Tummar West and Point 90 defended camps.

(*b*) Indian 11th Bde. Gp. would be divided into a Tank Group and an Assault Group.

(*c*) 7th Armd. Division would keep the ring, preventing any interference by enemy reinforcements of the activities of Indian 4th Division.

(*d*) 16th Inf. Bde. would exploit the successes of these divisions, moving northwards towards Sidi Barrani.

(*e*) Matruh Garrison would provide Matruh Force ('Selforce') which would move out to the west on Maktila and attack its garrison. Matruh Force would be grouped into three columns, a main one built around a squadron of 7th Hussars, two companies of 3rd Coldstream Gds., and a company of 1st Royal Northumberland Fusiliers, another built round a company of 1st South Staffordshire Regiment and a company of 1st Cheshire Regiment, and a third consisting of a detachment of 1st Durham Light Infantry, the last two being liberally equipped with dummy guns and dummy tanks.

Supplies were to be moved forward and stored in the desert some 20–30 miles in front of the British defensive line. The assault troops were to carry out the approach march in two stages, an advance of some 30 miles on the night of December 7/8, halt in the desert during the day of the 8th and then move forward again during the night of December 8/9 to attack the enemy defended camps on the morning of the 9th.

On December 6, Indian 4th Division left Maaten Baqqush and Naghamish for the rendezvous at Point 206. On December 8 the division was in its concentration area north of Piccadilly, 15 miles south-east of Nibeiwa, while the Tank Group of Ind. 11th Inf. Bde. moved by Alam el Qreish to assault Nibeiwa from the north-west at dawn on the 9th; 7th Armd. Division took up the line Alam el Qreish–Wadi el Kabah–el Sanah, and Matruh Force, its columns moving by different routes, occupied the line of the Wadi Nafla with its H.Q. at Bir el Mahafiz.

During these events the Navy shelled Maktila, Sidi Barrani and the coast road, while the Royal Air Force kept the sky clear of hostile aircraft.

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THE MEDICAL TACTICAL PLAN

On November 29, D.D.M.S., W.D.F., was instructed immediately to make plans for the care and evacuation of casualties (estimated at 2,000) from an attack about to be made on enemy positions at Nibeiwa, Tummar and Sidi Barrani. He was warned that any overt action which might suggest that any such attack was contemplated was strictly forbidden.

The medical units then with W.D.F. were:

Forward .	2/3 Lt. Fd. Amb. 3/3 Lt. Fd. Amb.	7th Armd. Division in the forward areas
	14 (Ind.) Fd. Amb. 17 (Ind.) Fd. Amb. 19 (Ind.) Fd. Amb.	Indian 4th Division in Naghamish area
	15 (Ind.) Fd. Hyg. Sec.	
At Matruh .	2/1 Fd. Amb. with a surgeon and surgical equipment attached	
In the Maaten Buqqush area	215 Fd. Amb. (Corps Fd. Amb.) 2/2 M.A.C. 2/1 Lt. Fd. Hyg. Sec. 4 (N.Z.) Fd. Amb.	
At Daba .	2/5 C.C.S. 2 (Ind.) C.C.S. A Mob. Surg. Team from 8 B.G.H. 36 Fd. Hyg. Sec. 7 Adv. Depot Med. Stores 5 Mob. Bact. Lab.	

An ambulance train schedule was already in existence, one such train running daily between the Delta and Matruh, and timings were reserved for a second train a day in case of need.

D.D.M.S. decided that the only additional requirement was a second M.A.C. 11 M.A.C., less one section, was sent up to Daba on the pretext of an exercise, reaching there on December 4. According to rumour deliberately spread, it was to relieve 2/2 M.A.C. by December 7. The moves of other medical units were explained in an order issued by 'G' branch to the effect that an enemy advance was to be expected and that this would be opposed on a line west of Matruh.

Accommodation in the Egyptian Military Hospital in Matruh was provided secretly and with the compliance of the Commander, Matruh Garrison, and arrangements were made whereby Lt. Sec. 2 (Ind.) C.C.S., Lt. Sec. 2/5 C.C.S. from Daba and a surgical team from 8 B.G.H. in the Alexandria Sub-area would move thereinto. 2/1 Fd. Amb. had been functioning as an advanced C.C.S. in 'B' Post, a concrete air-raid shelter in Matruh. Its commanding officer was let into the secret and was instructed to detach a company to move with 'Selforce' and with the rest of his unit to join the light sections of the

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C.C.Ss. to form a combined C.C.S. The mobile surgical team at Daba was also ordered to move up to Matruh to open an additional operating theatre in another dug-out near the harbour. A surgical team from 27 B.G.H. was sent forward to join this combined C.C.S.

By December 8 all these units were in position. Equipment was moved up from Daba in the transport of 215 Fd. Amb. Personnel moved by train. Reserves of stretchers, blankets and field ambulance stores were all available. To avoid undue attention to the affairs of the light sections of the C.C.Ss. it was decided not to equip them with beds and bedding; stretchers would be used instead.

In front of Matruh, evacuation from Indian 4th Division medical units was to be along the line of the divisional axis which, though not reconnoitred or mapped, would begin to operate on December 9 from the divisional dump area about Nizwet el Anmar to a rendezvous to be selected. Indian 4th Division indicated that a probable site for a M.D.S. during the initial stages of the operation would be in the neighbourhood of The Graves.

The main Sidi Barrani–Matruh road had been so wrecked by demolition during the period of the Italian advance that it could not now be used for ambulance traffic. It was decided (1) to establish a staging post at Nizwet el Anmar where cases could be held for the night on the journey back to Matruh; (2) to attach a number of 11 M.A.C. cars to Indian 4th Division to follow its line of approach until a M.D.S. had been opened, and (3) to place a reserve of M.A.C. cars at the rendezvous to be selected early on the 9th to be ready to move up to the M.D.S. as soon as the first casualties came down the line. For these purposes the whole 2/2 M.A.C. was allotted to Indian 4th Division.

Since the line of evacuation involved the use of a route of which nothing was known, an alternative plan was prepared. Patrols of 7th Armd. Division had continuously been in touch with the enemy and A.D.M.S. 7th Armd. Division had already established a line of evacuation along which, in echelon, he had placed the H.Qs. of 2/3 and 3/3 Lt. Fd. Ambs. It was decided, therefore, that, if the more northerly route should prove to be unsatisfactory, Indian 4th Division casualties would be evacuated directly south through Piccadilly, held for the night at one or other of the M.D.Ss. of 7th Armd. Division and thence sent on to Matruh, the railhead.

Since it was expected that neither 7th Armd. Division nor Matruh Force would encounter much opposition and that their casualties would therefore be light, most medical attention was focused on Indian 4th Division which, it was thought, would probably be called upon to make frontal attacks on the defended camps. So ten more M.A.C. cars were sent to join this division, which had 33 under command on the 9th.

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Casualties in Matruh Force were to be evacuated by attached cars from 11 M.A.C. to the staging post of 215 Fd. Amb. at Nizwet el Anmar by a route leading to a well marked gap in the minefields at Km. 70 on the Sidi Barrani–Matruh road. 11 M.A.C., less the cars attached to Matruh Force, was allotted to 7th Armd. Division for evacuation behind the M.D.Ss. of 2/3 and 3/3 Lt. Fd. Ambs.

To overcome any difficulties that might arise if any considerable delay in evacuation from the M.D.S. should occur, it was arranged that the Indian field ambulances should carry 50 per cent. reserve of dressings, 300 per cent. reserve of medical comforts and 200 per cent. reserve of stretchers, blankets and ground sheets. Seven 30-cwt. lorries, fitted with Berridge* equipment, were allotted to each field ambulance so that each could carry 48 lying and 102 sitting cases in one journey.

These medical arrangements can be summarised so:

1. A.D.Ss.	
Ind. 5th Inf. Bde. .	One Coy. 14 (Ind.) Fd. Amb.
Ind. 7th Inf. Bde. .	One Coy. 17 (Ind.) Fd. Amb.
Ind. 11th Inf. Bde. .	One Coy. 19 (Ind.) Fd. Amb.
2. M.D.S.	
H.Q. 14, 17, 19 (Ind.) Fd. Ambs.	
3. In Reserve	
One company each of 14, 17 and 19 (Ind.) Fd. Ambs.	
4. M.A.Cs.	
Ind. 4th Division .	5 subsecs. 2/2 M.A.C.
7th Armd. Division .	1 subsec. 11 M.A.C.
'Selforce' . .	1 subsec. 11 M.A.C.
5. Staging Posts	
215 Fd. Amb. H.Q. 2/2 M.A.C.	at Nizwet el Anmar
C.P. 2/2 M.A.C. .	at junction of Track B and Siwa Rd.
H.Q. 11 M.A.C. .	at junction of Rome–Siwa Roads
C.P. 11 M.A.C. .	on the Siwa Rd. just N. of Bir Kanayis
6. Adv. Combined C.C.S.	at Mersa Matruh
7. Railhead . . .	Mersa Matruh
8. Ambulance Trains, 1 and 2	Matruh–Alexandria
9. 11 I.G.H. . . .	Abu-el-Quadir, Alexandria
10. 10 I.G.H. . . .	Cairo, expanded to 600 beds
63 B.G.H. . . .	Cairo
64 B.G.H. . . .	Alexandria
Ambulance coaches .	Alexandria–Cairo

* The Berridge equipment consists of a set of leather straps and steel hooks, designed by Major Berridge, R.I.A.S.C., by means of which a standard lorry can easily be converted into a 4-stretcher ambulance.

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THE BATTLE OF SIDI BARRANI

The surprise was complete. The 'I' tanks of 7th R. Tks. proved to be quite irresistible and were able to move on to and among the enemy defended camps almost at will. Everything went according to plan.

7th Armd. Division thrust between the Nibeiwa and Sofafi groups of camps. Its Support Group detached itself to deal with the Sofafi garrisons while the rest of the division turned north to protect Indian 4th Division in its assaults upon the Nibeiwa and Tummar camps.

The Tank Group of Ind. 11th Inf. Bde. attacked Nibeiwa at dawn and quickly overran it at a loss of 8 officers and 48 O.Rs. Some 2,000 P.o.W. were taken.

Ind. 5th Inf. Bde., without delay then moved on to attack Tummar West and Tummar East. It was joined by 7th R. Tks. The 'I' tanks went in at the north-west corner of the Tummar West camp and were quickly followed by the infantry who debussed 500 yards outside the camp. This action was quickly over and Ind. 5th Inf. Bde. promptly turned its attention to Tummar East. The attacking battalion (3/1st Punjab Regt.) encountered the garrison of Tummar East coming to the help of that of Tummar West but with the aid of the rest of the brigade overcame all resistance and captured the camp on December 10. These events took place during a raging dust storm.

On the 9th, 16th Inf. Bde., in reserve, moved by way of Alam el Qreish, Bir el Garrara and Point 87 to the west of Ilwet Matrud and Ind. 11th Inf. Bde. with 7th R. Tks. and artillery of Indian 4th Division were sent up to join this brigade. On the 10th these units moved on to the low ridges of Alam el Daba, which were taken by 1st Argyll and Sutherland Highlanders, while 2nd Leicesters got to within two miles of Sidi Barrani itself. Then the 'I' tanks came up and by nightfall on the 10th Sidi Barrani had been occupied.

Point 90 camp was still held in force. So Ind. 5th Inf. Bde. with 7th R. Tks. moved against it. The garrison promptly surrendered on December 11.

On December 9, on learning that Nibeiwa had fallen, O.C. Matruh Force despatched 3rd Coldstream Gds. to block the western exits from Maktila. Its garrison had, however, moved out on the night of the 9/10th. On the 10th, 6th R. Tks., operating to the west of Sidi Barrani, moved to the east to assist Matruh Force. The Italians were found in a defended camp, were promptly assailed and quickly surrendered.

On December 11, Indian 4th Division prepared to move south to cut off the remnants of the Sofafi and Rabia camps, but learnt that the camps had been captured by the Sp. Gp. of 7th Armd. Division. 7th Armd. Bde. Gp. was operating in the Buq Buq area rounding up prisoners, 4th Armd. Bde. Gp. was in the area of Ghot el Shalludi and

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the Support Group was in Sofafi. Matruh Force and 16th Inf. Bde. were meantime clearing the battlefield.

Losses between December 9–11 were 624 killed, wounded and missing.

During this three-day battle W.D.F. had taken some 38,300 P.o.W. and had captured more than 1,000 motor vehicles, 237 field guns, 73 light and medium tanks, together with a quantity of stores and equipment seemingly beyond measurement.

On December 12, Indian 4th Division began to move back to Naghamish and Maaten Baqqush to refit and then move to the Sudan to join the Indian 5th Division there in the East African campaign. Australian 6th Division began to move up from the Delta area to replace the Indian division.

On December 16, the garrisons of the defended positions at Sollum, Halfaya Pass, Capuzzo, Sidi Omar, Misaia and the line of forts that the Italians had constructed on the lip of the escarpment all capitulated.*

MEDICAL COVER FOR THE BATTLE OF SIDI BARRANI

At 0630 hours on December 9, 19 (Ind.) Fd. Amb. opened a M.D.S., just north-east of Piccadilly and an A.D.S. near The Graves. When Nibeiwa had been taken, this unit closed its M.D.S. and moved forward to The Graves, there to re-open. There were very few casualties and none were evacuated from this unit on the 9th. The 33 cars of 2/2 M.A.C. remained with this unit throughout the day. At dawn on the 10th, eleven of these cars left the M.D.S. for Matruh *via* Bir Shitewan along a very rough track and in a violent dust storm, which reduced visibility to nothingness and made intercommunication exceedingly difficult, if not impossible.

17 (Ind.) Fd. Amb. moved forward from Piccadilly to Tummar West and opened a M.D.S. about 1,000 yards to the south-west of this camp. 14 (Ind.) Fd. Amb. closed at The Graves and joined 17 (Ind.) Fd. Amb. to open a M.D.S. at Ilwet Shamaon, about 1,000 yards south-west of Tummar West. It dealt with 417 casualties on the 10th and sent 240 of these along the line of evacuation on the morning of the 11th.

On its forward move from Piccadilly towards The Graves, 19 (Ind.) Fd. Amb. and its attached M.A.C. cars had become completely lost in the flying dust. A subsection of the M.A.C. which set out from Ilwet Shamaon to clear the A.D.Ss., in front, got lost when returning during the night of 10th/11th. D.D.M.S., W.D.F., himself found 19 (Ind.) Fd. Amb. on the morning of the 11th near Nibeiwa and brought it to 14 (Ind.) Fd. Amb. at Ilwet Shamaon where over 800 casualties had accumulated.

During December 11, the weather conditions became even worse with continuous blinding dust storms. It was decided to concentrate

* If greater detail is sought, the Official Indian Medical History should be consulted.

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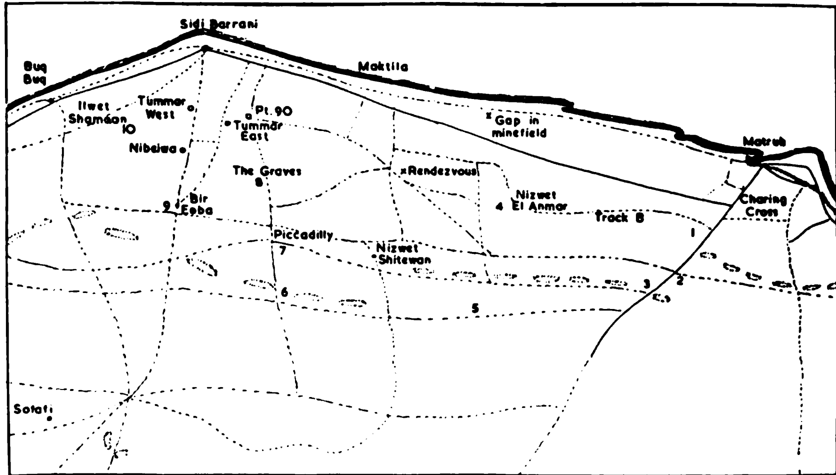

FIG. 23. The Battle of Sidi Barrani. Medical Cover.

At Matruh. The advanced C.C.S. (Lt. Sec. 2 (Ind.) C.C.S.
Lt. Sec. 2/5 C.C.S.
2/1 Fd. Amb. and Surgical Teams)

1. 2/2 M.A.C. .	. Car Post	7. 14, 17, 19 (Ind.) Fd. Ambs.	Dec. 8
2. 11 M.A.C. .	. H.Q.	19 (Ind.) Fd. Amb. .	. Dec. 9
3. 11 M.A.C. .	. Car Post	8. 14, 19 (Ind.) Fd. Ambs. .	Dec. 9
4. 2/2 M.A.C. .	. H.Q. Dec. 9	9. 2/3, 3/3 Lt. Fd. Ambs. .	Dec. 11
215 Fd. Amb.	. Staging Post	10. 14, 17 (Ind.) Fd. Ambs. .	Dec. 10
5. 3/3 Lt. Fd. Amb.	Dec. 9	Sidi Barrani 17 (Ind.) Fd. Amb.	. Dec. 13
6. 2/3 Lt. Fd. Amb.	Dec. 9	215 Fd. Amb.	

all these casualties in the M.D.Ss. of 2/3 and 3/3 Fd. Ambs., now at Bir Enba, on the escarpment for the night and then move them next day direct to the combined C.C.S. at Matruh. All reserves of M.A.C. cars were brought up and on the 12th all the patients, save the few too ill to be moved, were sent in convoys to Matruh under extremely difficult conditions and by compass bearing.

The Nizwet el Anmar route was not used by Indian 4th Division. Later it was used for the evacuation of wounded P.o.W. in empty supply lorries returning to the dump.

The few casualties of 7th Armd. Division about Buq Buq on December 9 and 10 were evacuated without difficulty by the light field ambulances to the M.D.S. of 2/3 Lt. Fd. Amb., and thence by 11 M.A.C. to Matruh.

On December 10 Matruh Force encountered enemy forces attempting to escape and suffered a few casualties. These were brought to an

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A.D.S. established by 'A' Coy. of 2/1 Fd. Amb. and sent back therefrom by ambulance cars of 11 M.A.C. to the staging post of 215 Fd. Amb. at Nizwet el Anmar. These cars lost themselves, and so later casualties were carried forward in the A.D.S. and taken to the Italian Military Hospital at Sidi Barrani, which was taken over on December 13 by 17 (Ind.) Fd. Amb. Thence they were cleared by 2/2 M.A.C. to Matruh on the following day. In this hospital were some 200 Italian wounded. Later it was taken over by 215 Fd. Amb.

Two ambulance trains a day cleared Matruh, and by the 15th the Combined C.C.S. was empty of British and Indian casualties.

400 British and 88 Indian wounded together with 879 wounded and sick P.o.W. and 64 British and Indian sick were admitted to the field medical units of Indian 4th Division during the period December 6–13.

TABLE 12

Admissions into the Field Medical Units of Indian 4th Division, December 6–13, 1940

	Battle casualties			Sick	P.o.W.	Totals
	British officers	B.O.R.	I.O.R.			
December 6	—	—	—	25	—	25
„ 8	—	—	—	10	—	10
„ 9	4	39	15	—	99	157
„ 10	18	275	61	18	280	652
„ 11	—	50	12	6	300	368
„ 13	—	14	—	5	200	219
	22	378	88	64	879	1,431

The clever improvisation that proved its worth in this engagement was the C.C.S. concocted out of Lt. Sec. 2 (Ind.) C.C.S., Lt. Sec. 2/5 C.C.S., 2/1 Fd. Amb. and surgical teams. Though this was lacking in many important respects, beds, nurses, special dietaries and the like, it was at least mobile since one of its component parts possessed transport of its own and it could also undertake serious surgery.

Matruh now became a sub-area, extending as far as Sidi Barrani inclusive, and was administered by H.Q., B.T.E. direct.

In late summer of 1940, Australian 6th Division began to move from Palestine towards the Western Desert there to relieve Indian 4th Division. Its field ambulances (2/1, 2/2 and 2/7) and field hygiene section (2/1) were concentrated around Amiriya and Burg el Arab. The field ambulances were as yet incomplete in respect of equipment and especially of transport. This was particularly so in the case of 2/7 (Aust.) Fd. Amb. 2/1 (Aust.) C.C.S. accompanied the division, opened in Amiriya and remained u/c H.Q., M.E.C.

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On December 10, Aust. 16th Inf. Bde. moved up towards Bardia and 2/1 (Aust.) Fd. Amb. opened in Sidi Haneish. Aust. 17th Bde., with 2/2 (Aust.) Fd. Amb. also moved to Sidi Haneish but 19th Aust. Bde., with 2/7 (Aust.) Fd. Amb., remained in Alexandria for the time being, it being intended that this unit should be moved forward by sea.

2/1 (Aust.) Fd. Amb., moving forward with Aust. 16th Bde., next opened its M.D.S. in Sollum and its A.D.Ss. at the Halfaya Rd.–Main Rd. junction and just beyond the wire at Gap 35.

Indian 4th Division, being thus relieved, on December 14, 14 (Ind.) Fd. Amb. moved back to Naghamish and 19 (Ind.) Fd. Amb. to Maaten Baggush. On the following day, being relieved by 215 Fd. Amb., 17 (Ind.) Fd. Amb. left for Maaten Baggush. With the division to the Sudan went all the Indian medical units at the base. Indian sections were left at Mena (200 beds) and Geneifa (100).

THE ASSAULT ON BARDIA

So overwhelming had been the defeat which the Italians had endured that the limited plan to thrust the enemy out of Egypt now gave place to an enterprise that had for its object the complete destruction of the Italian forces in Cyrenaica. The resourcefulness of General Wavell, the audacity of General O'Connor and the hesitant behaviour pattern of the Italians remained, but all else was now changed. There could be no more surprise. The Italians were occupying a series of prepared positions along the coastal strip—at Bardia, Tobruk, Derna, Barce and Benghazi. Bardia had a double perimeter some 18 miles in length with an anti-tank ditch and a ring of concrete block houses and wire. Its garrison numbered about 45,000. The perimeter of Tobruk was even longer and harboured, besides a complete division and a corps H.Q., large numbers of such as had withdrawn from the east. As the British Commonwealth forces moved westwards their lines of communication would lengthen as they advanced. The road which the Italians had built between Sollum and Sidi Barrani was surfaced with loose stones and would not stand up to continued heavy traffic, while that between Sidi Barrani and Matruh had been wrecked by mine removal. The port facilities at Sollum were exceedingly limited.

However, General Wavell decided to proceed. He arranged that the Royal Navy, and the Royal Air Force would 'soften' each Italian position in turn and each in succession would be isolated by the armour encircling it and reaching the coast in its rear. Then the infantry would attack frontally.

On January 1, 1941, W.D.F. was re-designated XIII Corps.

The order of battle of XIII Corps as on this date is given in Appendix X.

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Medical Units with XIII Corps:

	215 Fd. Amb.
	2/1 Fd. Amb.
	2/2 M.A.C.
	11 M.A.C.
	4 A.C.C.
	15 C.C.S.
	Lt. Sec. 2/5 C.C.S.
With 7th Armd. Div..	2/3 and 3/3 Lt. Fd. Ambs.
With Aust. 6th Div. .	2/1, 2/2 and 2/7 (Aust.) Fd. Ambs.
	2/1 (Aust.) Fd. Hyg. Sec.

THE TACTICAL PLAN

Phase I. Aust. 16th Inf. Bde. + 7th R. Tks. would break through the perimeter on its eastern face, while Aust. 17th Inf. Bde. and Sp. Gp. of 7th Armd. Division would press against the defences and 4th and 7th Armd. Bdes. would prevent reinforcements approaching from the west.

Phase II. Aust. 17th Inf. Bde. would assault the south-west section of the perimeter.

THE MEDICAL TACTICAL PLAN

A.D.M.S. Australian 6th Division intended that 2/1 (Aust.) Fd. Amb. should deal with casualties from both 16th and 17th Bdes. while 2/2 (Aust.) Fd. Amb. remained closed, ready to move into Bardia when this town had been taken, there to establish an advanced operating centre. Arrangements were made whereby a surgical team from 2/1 (Aust.) C.C.S. would be attached to the M.D.S. of 2/2 (Aust.) Fd. Amb. It was agreed that as far as possible Australian casualties should be evacuated along a line of Australian medical units. It was arranged therefore that 2/1 (Aust.) C.C.S. would replace 2/1 (Br.) Fd. Amb. at Matruh. This field ambulance would then move forward to Halfaya there to relieve 3/3 Lt. Fd. Amb. of 7th Armd. Division. It was arranged also that 2/2 (Aust.) C.C.S. would move from Palestine to Amiriya, remain closed and be prepared to relieve 15 (Br.) C.C.S. in Alexandria when the latter unit moved forward into the Desert. 2/9 A.G.H., *en route* from Australia, would, on arrival, open in Amiriya.

H.E.M.S. *El Amira Fawzia* (an armed ship, not a hospital carrier) would be available for evacuation of casualties by sea between Sollum and Alexandria and Haifa. Three Australian medical officers and 14 A.A.M.C. O.Rs. were placed aboard this ship, which could take about 122 stretcher cases. Medical equipment and stores for her were obtained from a variety of sources—the Navy, Ordnance, 2/5 A.G.H. in Palestine, the Australian Red Cross and the B.R.C.S., among others.

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By December 24, 2/2 (Aust.) Fd. Amb. had reached Sollum in the vicinity of which were the M.D.Ss. of 2/1 (Aust.) Fd. Amb. and 3/3 Lt. Fd. Amb. On the 26th the M.D.S. of 2/1 (Aust.) Fd. Amb. moved forward just beyond the frontier wire to join its 'A' Coy. which had been there for some days. 'B' Coy. 2/2 (Aust.) Fd. Amb. moved to Sidi Barrani. A detachment of 2/7 (Aust.) Fd. Amb. was sent forward to join 2/1 (Aust.) Fd. Amb.

By the 28th the whole of 2/1 (Aust.) Fd. Amb. was concentrated beyond the wire. With it was 'A' Coy. 2/2 (Aust.) Fd. Amb. which was to serve Aust. 17th Bde. The M.D.S. of 2/1 (Aust.) Fd. Amb. opened near Adv. H.Q. Australian 6th Division and its A.D.Ss. near the headquarters of Aust. 16th and 17th Bdes.

Eight S.Bs. from 2/1 (Aust.) Fd. Amb. were attached to each of the forward battalions and to the divisional artillery and with each R.M.O. here were an ambulance and a bearer squad.

H.Q. 2/2 (Aust.) Fd. Amb. was kept on wheels ready to move into Bardia. An officer of 2/7 (Aust.) Fd. Amb. was attached to the A.D.M.S. to act as liaison officer between him and the forward medical units. A list of volunteer blood donors was compiled from among the personnel of H.Q. 2/1 (Aust.) Fd. Amb. 'B' Coy. 2/2 (Aust.) Fd. Amb. established a dressing station below the escarpment in order to ensure that Australian casualties would pass along an Australian evacuation chain. It prepared to hold up to 100 patients. Arrangements were made whereby a section of 3/3 Lt. Fd. Amb. at Halfaya would be prepared to receive Australian casualties should the need arise.

2/1 (Aust.) Fd. Hyg. Sec. was more than fully occupied in attempts to overcome the water shortage (the ration was 2 pints per man per day). This unit was also much involved in removing the numerous impediments to efficient sanitation caused by the nature of the ground.

A.D.M.S. Australian 6th Division, basing his preparations on an expectation of 1,000 casualties, had decided that the forward work should be the responsibility of 2/1 (Aust.) Fd. Amb. and 'A' Coy. of 2/2. O.C. 2/1 would be in charge of all ambulance units on the top of the escarpment, with the exception of H.Q. 2/2 which was to be held in reserve. 'A' Coy. 2/2 would establish an A.D.S., leave this in charge of a mobile section and return to the M.D.S. of 2/1 near Fort Capuzzo. When Bardia had been taken 2/2 would take over from 2/1 and the latter unit would pass into reserve. To a considerable extent the ambulance transport (15 ambulances altogether) was pooled. 11 M.A.C. (45 cars) would evacuate casualties from the M.D.S. to Sidi Barrani. A dump of 40 stretchers, and 600 blankets was attached to the M.D.S. of 2/1 (Aust.) Fd. Amb. The C.C.S. itself had reached Matruh and had opened. On January 2, 'A' Coy. 2/7 (Aust.) Fd. Amb., with Aust. 19th Bde., reached the forward area.

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On January 1, two companies of 2/1 (Br.) Fd. Amb., with a surgical team attached, reached Sollum from Matruh and there opened a M.D.S. H.Q. 2/1 (Br.) Fd. Amb. remained in Matruh until 2/1 (Aust.) C.C.S. had become fully established there.

THE ASSAULT

On January 3, Aust. 16th Inf. Bde. broke through the perimeter. Its engineers cleared mines and filled in the anti-tank ditch. Then Aust. 17th Inf. Bde. attacked, broke through the perimeter and became involved in much confused fighting. On the 4th the Australian attack was pressed home. On the 5th, Aust. 19th Inf. Bde. moved into Bardia and the garrison surrendered. 16th Inf. Bde. became responsible for Bardia as part of the administrative area of Bardia and Sollum under Adv. H.Q., B.T.E., which moved up to Capuzzo.

The Australians captured over 40,000 officers and men, more than 400 guns and many hundreds of motor vehicles in this action at a cost of 456 casualties.

MEDICAL COVER FOR THE ASSAULT ON BARDIA

The movements of ships unloading at Sollum were so irregular as the result of enemy air attack and shelling that these could not be fitted into an evacuation scheme. Evacuation therefore had to be by road. Sidi Barrani was selected as the site for the forward C.C.S. Sollum, the site of choice on the map, offered no kind of shelter and a tented unit would have been a target for aerial attack. The road from Sollum to Matruh was not suitable for ambulance traffic. Buq Buq, quite conveniently sited in respect of distance from the front, was unusable, being badly fouled by Italian dysentery and gas gangrene cases. There was thus no alternative to Sidi Barrani. The combined C.C.S. was moved up from Matruh to Sidi Barrani by the transport of 215 Fd. Amb. The move was completed by December 21.

The first casualty arrived at the M.D.S. of 2/1 (Aust.) Fd. Amb. at 1030 hours on January 3. Thereafter there was a steady stream of Australian wounded and a veritable torrent of unwounded Italians, who, in their thousands, sat around the M.D.S. to create insoluble problems in the field of hygiene. Italian medical officers and orderlies attempted to tend their own wounded while Australian 30-cwt. lorries prowled wide and far to pick up walking wounded.

On the 4th, while Aust. 19th Bde. went in to finish the business, the vehicles of 2/7 (Aust.) Fd. Amb. went back to Sollum to bring up 'A' Coy. of the unit. But even yet H.Q. 2/7 (Aust.) Fd. Amb. was immobilised at Matruh.

During this action, up to 1830 hours on the 4th, 310 A.I.F. and 12 U.K. wounded passed through the M.D.S. of 2/1 (Aust.) Fd. Amb.

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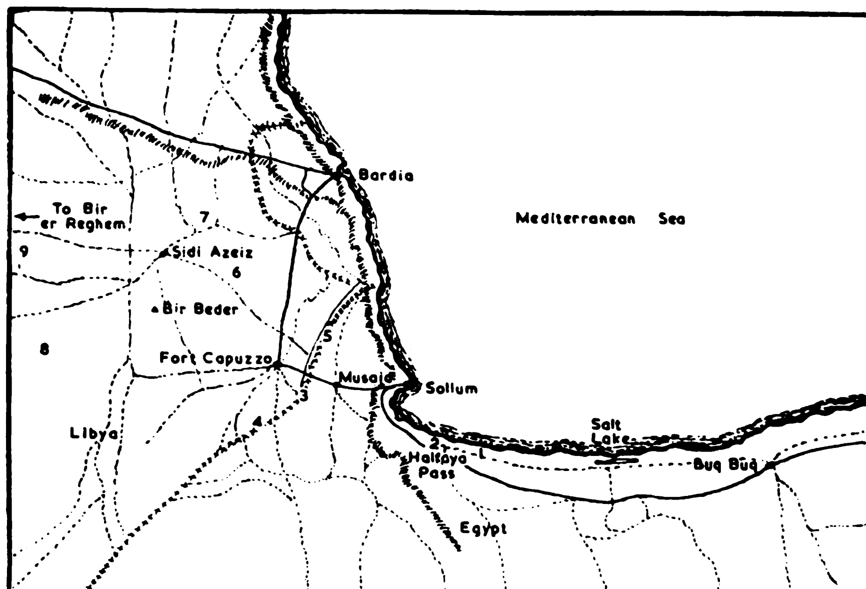

FIG. 24. The Battle of Bardia. Medical Cover.

1. 2/2 (Aust.) Fd. Amb. Coy. . . . Rest Station
2. 2/7 (Aust.) Fd. Amb. Coy. . . . Rest Station
   2/1 (U.K.) Fd. Amb.
   3/3 Lt. Fd. Amb.
3. 2/1 (Aust.) Fd. Amb. M.D.S.
4. 2/2 (Aust.) Fd. Amb. H.Q.
5. 2/2 (Aust.) Fd. Amb. Coy. . . . . A.D.S.
6. 2/1 (Aust.) Fd. Amb. Coy. . . . . A.D.S.
7. 2/1 (Aust.) Fd. Amb. Coy. . . . A.D.S.
8. 3/3 Lt. Fd. Amb. . . Jan. 3
9. 2/3 Lt. Fd. Amb. . . Jan. 3

By the 5th all these had been evacuated. There still remained large numbers of Italians who needed attention and the affairs of the two Italian hospitals in Bardia, one tented and the other hutted, had still to be straightened out.

2/1 (Aust.) C.C.S. at Matruh, reinforced by a surgical team from 2/2 A.G.H. at Kantara, dealt with 354 casualties up to January 10 and of these all but 8 had been sent on either to the C.C.S. at Daba, if likely to return to their units within a reasonable time, or else to Alexandria.

11 M.A.C. kept the M.D.S. of 2/1 (Aust.) Fd. Amb. clear. Patients were taken first to the staging post of 2/1 (Br.) Fd. Amb. at Sollum and then on to the Combined C.C.S. at Sidi Barrani. S.S. *Fawzia* lay off Sollum on the night of January 3/4 and came alongside the quay next morning. But it was found that she was quite unsuitable for the transport and nursing of serious cases, so she took aboard 130 light cases, including 40 P.o.W.

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By January 7 S.S. *Fawzia* was back again at Sollum prepared to undertake a ferry service between there and Matruh. H.M.H.S. *Dorsetshire* had also arrived and took aboard the few serious cases still awaiting evacuation. Then both the hospital ship and S.S. *Fawzia* were loaded with wounded P.o.W. and departed on the 8th and 9th respectively. Thenceforward evacuation from Sollum was by sea, the road being used only exceptionally for the evacuation of the sick and P.o.W.

THE ASSAULT ON TOBRUK

On January 5, 7th Armd. Bde. occupied El Adem and began to reconnoitre towards Tobruk, and, on the 6th, Australian 6th Division began to move on Tobruk. By the 10th, Aust. 16th and 19th Inf. Bdes. were on a line south and south-west of Tobruk; Aust. 17th Inf. Bde. was in reserve. H.Q. XIII Corps were now at Gambut. During the period January 11–20, the Australians continually probed the perimeter.

THE TACTICAL PLAN

Australian 6th Division and attached troops would penetrate the perimeter at a point about three miles east of the Tobruk–El Adem road with 16th and 19th Bdes., while 17th Bde. would demonstrate against the eastern section of the perimeter and 4th Armd. Bde. and Sp. Gp. of 7th Armd. Division against the west and south-west faces.

On January 20/21, Aust. 17th Inf. Bde. was pressing against the perimeter from the sea to Sueisi; Aust. 16th Inf. Bde. + 7th R. Tks. were in the area around Sghifet el Duda and Aust. 19th Inf. Bde. was around Bir el Adem. 4th Armd. Bde. and Sp. Gp. of 7th Armd. Division were against the perimeter on its south-west and west faces.

January 21, a perfect day in so far as the weather was concerned, began with a heavy aerial bombardment by the R.A.F. Then at 0540 hours Aust. 16th Inf. Bde. attacked, followed at 0840 by 19th Bde. 17th Bde. followed later to take over the objectives gained by 16th Bde. Steady progress was made throughout the day. At dawn on the 22nd the attack was resumed. 4th Armd. Bde. and Sp. Gp. of 7th Armd. Division broke through the perimeter and by mid-day all resistance had collapsed.

XIII Corps casualties were just over 400. Over 25,000 prisoners were taken as well as 208 guns and 87 tanks.

MEDICAL COVER FOR THE ASSAULT ON TOBRUK

At Bardia there were two well-equipped Italian camp hospitals, both immediately suitable for transformation into a forward C.C.S. The one near the Tobruk–Bardia–Sollum road junction was selected and emptied of Italian patients and medical personnel. It could hold 350 patients,

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had four operating theatres, a mobile X-ray installation and ample stores. 'A' Coy. 2/1 Fd. Amb. was selected to run this C.C.S. and the Lt. Sec. of 2/5 C.C.S. was moved up to it from Sidi Barrani in the transport of 2/1 Fd. Amb. To this C.C.S. were added by D.M.S., A.I.F., two Australian surgical teams and a F.T.U.

H.Q. and 'B' Coy. 2/1 Fd. Amb. at Sollum provided a staging post for the accommodation of cases awaiting evacuation by sea and also for the reception and treatment of cases received *via* Hagfet en Nezha and Bir el Rezhem where the M.D.Ss. of 2/3 and 3/3 Lt. Fd. Ambs. respectively were sited. A surgical team from 27 B.G.H. was attached to this staging post.

Since all evacuation was now by sea from Sollum, a company of 215 Fd. Amb. was brought up from Sidi Barrani to Sollum to provide stretcher-bearers for embarkation duties on the quay and to be available for the staffing of another staging post, if required, after Tobruk had fallen.

Even before Tobruk had fallen, 7th Armd. Division was already re-forming for a further advance to the west, and this procedure disrupted its line of evacuation to Sollum. It was arranged therefore that its M.D.S. at Hagfet en Nezha should evacuate not through the M.D.S. of 3/3 Lt. Fd. Amb. at Bir er Rezhem but *via* El Adem and the track leading past the M.D.S. of 2/1 and 2/7 (Aust.) Fd. Ambs. to the Tobruk–Bardia road and thence to the C.C.S. at Bardia.

The distribution of the forward medical units of Australian 6th and of 7th Armd. Divisions is shown in Figs. 25 and 26.

The Australian medical services had profited from their experience at Bardia and were in consequence much better able to make their preparations for the assault upon Tobruk. Their problems were unchanged, the great distances between M.D.Ss. and C.C.S., the wretched state of the tracks along which the ambulances had to proceed and the insufficiency of transport. It had been hoped that H.M.H.S. *Dorsetshire*, coming up to Sollum, might there serve as an advanced operating centre. Two Australian surgical teams from 2/2 A.G.H. at Kantara were posted for this purpose. But the plan was dropped. It was then decided to combine the M.D.Ss. of 2/1 and 2/7 (Aust.) Fd. Ambs. to serve as the advanced operating centre and to attach to this centre surgical teams and a F.T.U. Italian operating tents, 12 × 8 ft., with an aluminium floor and celluloid windows, were appropriated and it was found that by attaching a smaller tent to the entrance, dust was excluded and the warmth of the operating tent itself conserved. This was a matter of some importance for by this time the nights were growing cold. 2/7 (Aust.) Fd. Amb. after Bardia, found itself in possession of enough Italian vehicles to make good its own deficiencies and to give mobility, at long last, to the unit.

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Twenty-one ambulance cars, belonging to the three Australian field ambulances, were pooled and lorries were detailed for the collection of walking wounded. It was not possible to do much in the matter of marking the evacuation routes, for marked tracks attracted the unwelcome attention of the Regia Aeronautica. Drivers had to depend upon their skill in navigation particularly during the frequent duststorms that cut down visibility practically to zero. Evacuation from the M.D.S. by air was recognised to be most desirable but attempts to have aircraft made available for this purpose were unsuccessful. The time for this was not yet. Thus it was that the Australians encountered, in its most acute form, the eternal problem of making the best use of the field ambulance under conditions which forced this unit to hold considerable numbers of serious cases for considerable periods of time and yet which demanded that the ambulance should at all times be ready to move with the formation to which it was attached.

For the coming battle, A.D.M.S. Australian 6th Division made the following arrangements:*

2/1 (Aust.) Fd. Amb. (Aust. 16th Bde.) would serve the left flank.
2/2 (Aust.) Fd. Amb. (Aust. 17th Bde.) would serve the right flank.
2/7 (Aust.) Fd. Amb. (Aust. 19th Bde.) would move with its brigade.
2/1 and 2/7 (Aust.) Fd. Amb. (with surgical teams and a F.T.U.) would conjointly provide a forward operating centre. 2/1 would admit and sort the cases; 2/7 would undertake the major surgery. 2/1 would be equipped to hold 230 cases. The centre would hold a reserve of 100 stretchers and 1,000 blankets. The centre would accept casualties from 7th Armd. Division.
2/1 (Aust.) Fd. Hyg. Sec. would be prepared to undertake the task of coping with the sanitary problems of Tobruk and with the management of the water and sanitation needs of the huge numbers of P.o.W. that were to be expected.

Evacuation from the forward operating centre would be by M.A.C. to Bardia where 15 C.C.S., newly arrived by sea from Egypt, was open, and on to 2/1 (Aust.) C.C.S. at Matruh.

These arrangements worked smoothly and well, but the need for air ambulances was keenly felt. The total A.I.F. infantry casualties, January 17–22, were 18 officers and 221 A.O.Rs. The condition of the casualties on arrival at 2/2 A.G.H., Kantara was good. Progressive infection was found in only 6·7 per cent. It was noted, however, that Italian wounded who had received no treatment other than the first field dressing several days before were equally free from infection. The excision of lacerated wounds proved to be far more efficacious than

* If greater detail is sought, the Official Australian Medical History should be consulted.

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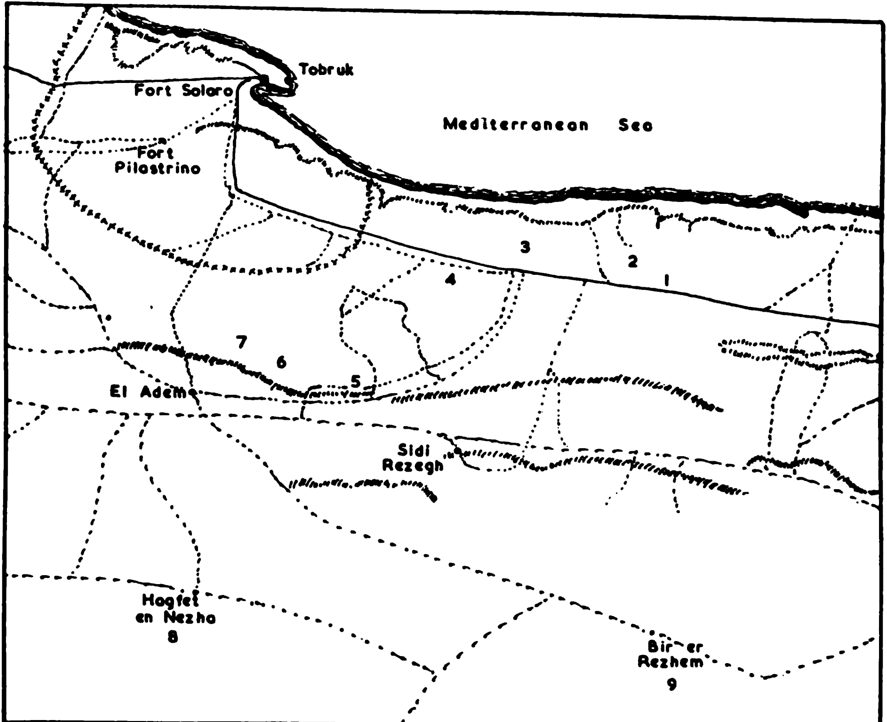

FIG. 25. The Battle of Tobruk. January 21, 1941. Medical Cover.

1. 2/1 (Aust.) Fd. Hyg. Sec.
2. 2/2 (Aust.) Fd. Amb. Rest Station
3. 2/2 (Aust.) Fd. Amb. H.Q. M.D.S.
4. 2/2 (Aust.) Fd. Amb. A.D.S.
5. 2/1 and 2/7 (Aust.) Fd. Amb. H.Q. . M.D.S.
6. 2/1 (Aust.) Fd. Amb. . A.D.S.
7. 2/7 (Aust.) Fd. Amb. . A.D.S.
8. 2/3 Lt. Fd. Amb. . . M.D.S.
9. 3/3 Lt. Fd. Amb. . . M.D.S.

primary suture and packing. For fractures plaster was found to be preferable to fixed extension when a long journey had to be faced. The inevitable rumour that Australian casualties admitted to British medical units received treatment below the accepted Australian standards became current. It was thought necessary for the officer commanding 2/1 (Aust.) C.C.S. to inspect all such cases. He reported favourably on their comfort and progress.

An unfortunate incident occurred on the 22nd. The Italian Air Force bombed the P.o.W. cage at El Adem. Casualties amounted to at least 100 killed and over 280 wounded. The latter were cared for by the Australian field ambulances aided to some extent by Italian medical officers.

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PLATE XI. Tobruk.

[*Imperial War Museum*

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PLATE XII. Tobruk. Water is rationed.

[*Imperial War Museum*

PLATE XIII. An Advanced Dressing Station of 2/2 (Australian) Field Ambulance in a Cave near Tobruk. January 31, 1941.

[*Australian War Memorial*

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PLATE XIV. Looking down the Wadi Auda, Tobruk, from the escarpment above. February 9, 1941.

[*Australian War Memorial*

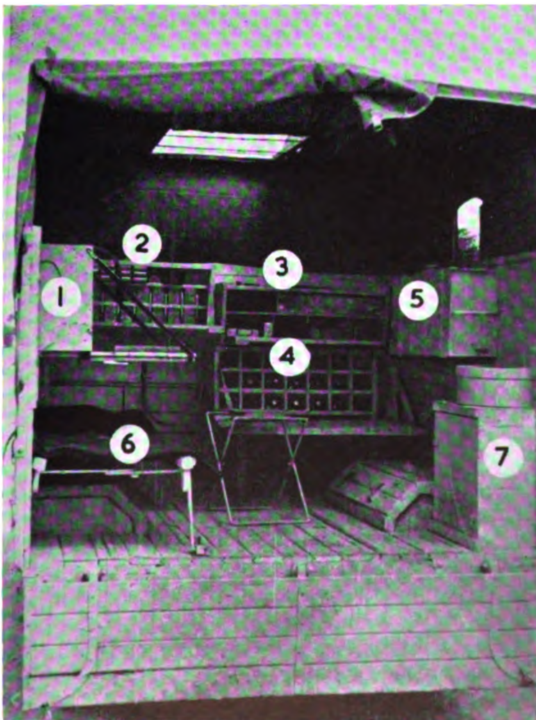

PLATE XV. The L.R.D.G. Mobile Medical Inspection Room (*see* p. 384).

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Following upon the occupation of Tobruk, an Australian medical officer was appointed A.D.M.S. of the new sub-area. The M.D.S. of 2/1 (Aust.) Fd. Amb. together with 'B' Coy. 2/7 (Aust.) Fd. Amb. and a surgical team moved into the town. The remainder of 2/7 set up a rest station to serve 17th Aust. Bde. The Australian field ambulances replenished and augmented their stores and equipment from captured Italian material. (Plates XI to XIV illustrate the activities of Australian medical units during the advance to Tobruk.)

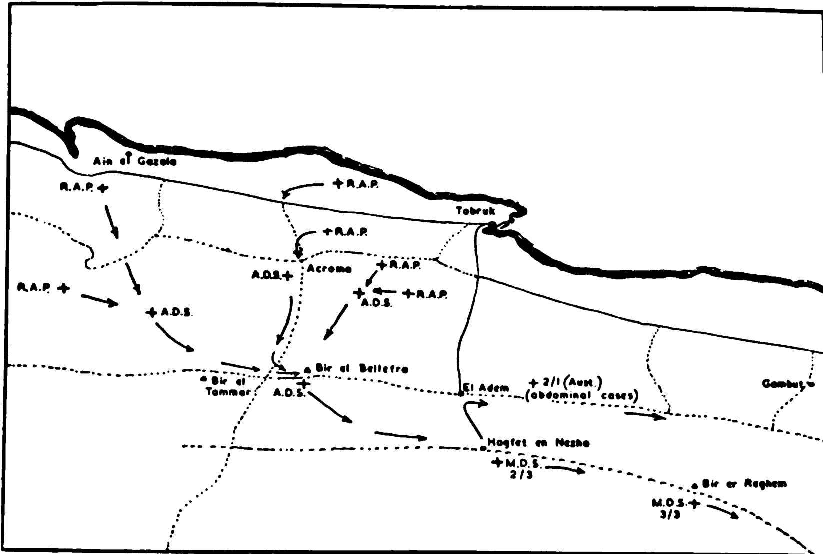

FIG. 26. The Battle of Tobruk. Medical Cover. 7th Armoured Division.

THE ADVANCE TO DERNA AND EL MECHILI

To the west of Tobruk there were two strong positions, one at Derna on the coast and the other at El Mechili, some 50 miles inland therefrom. 7th Armd. Division was ordered to move on El Mechili while Australian 6th Division advanced on Derna.

From the sea the country rises at and near the coast in one or more steep escarpments to a central desert plateau 500 ft. above the sea level. This plateau rises south of Derna and Barce to a mountainous region, the Gebel Akhdar. In the winter of 1940/41 the only extensively developed means of communication was a good tarmac road following the coastline generally from Sollum to El Agheila and into Tripolitania. Along this ran a civil telegraph line. At Lamluda this main tarmac road was duplicated as far as Barce. Twelve miles west of Derna a semi-metalled road ran to Apollonia with branches to Lamluda and Cirene. Numerous tracks connected this coast road with the interior.

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One of these ran through El Mechili–El Charruba, this being part of the caravan route from Bomba to Benghazi. The western coastal belt from Barce to Agedabia was well developed and areas of cultivation extended from the coast eastwards to within a few miles of Msus.

On January 22, 7th Armd. Division set out for El Mechili and on January 25, Aust. 19th Bde. Gp. moved towards Derna. Adv. H.Q., XIII Corps opened at Bomba. On the 26th, Aust. 17th Bde. moved towards El Mechili in support of 7th Armd. Division. But on January 26/27 the Italians withdrew from El Mechili towards Slonta. On the 27th, Aust. 19th Inf. Bde. was in contact with the enemy at Derna and Aust. 17th Inf. Bde. had come up to occupy a position on the left of 19th Bde. Adv. H.Q. Australian 6th Division opened at Tmimi.

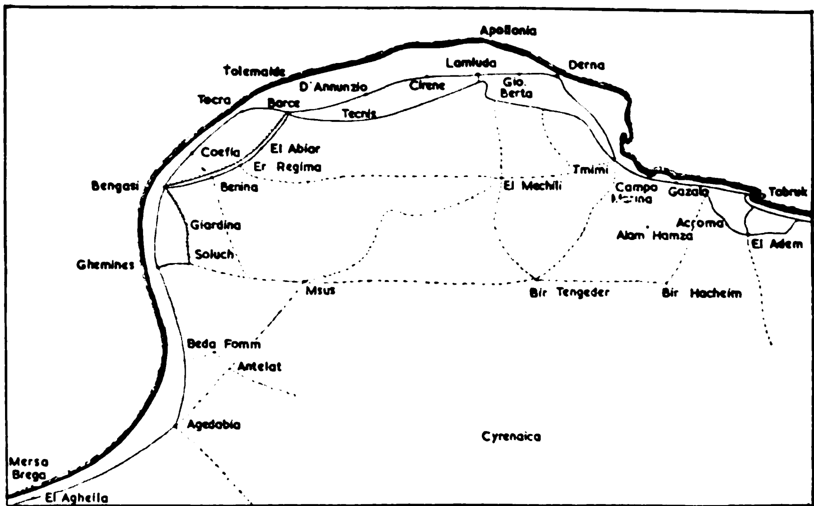

FIG. 27. Cyrenaica.

On the 28th, the Australians were facing strong opposition at Derna while 4th Armd. Bde. of 7th Armd. Division was following the retreating Italians from Mechili over very rough country. On the 28th/29th, the Australians succeeded in getting across the stoutly defended Wadi Derna and on the 30th the Italians withdrew, Derna being entered by Aust. 2/11th Inf. Bn. at 1030 hours. On the 31st, Aust. 19th Inf. Bde. moved forward to six miles west of Derna and Aust. 17th Inf. Bde. to fourteen miles south-east of Giovanni Berta.

By February 1, Aust. 19th Inf. Bde. had reached Cherusa and 17th Bde. had crossed the Wadi Beddahach. The retreating Italians were about Chaulan. On the 2nd, meeting no serious opposition, 17th and 19th Inf. Bdes. were well to the west of Giovanni Berta.

Meanwhile 7th Armd. Division was encountering many difficulties in keeping in touch with the Italians retreating from the El Mechili

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area. The country was not tank country and, moreover, the British armour was suffering severely from the results of over-use. The division was ordered to make for Msus while Australian 6th Division pressed down the coast road from the north. Air reconnaissance made it clear that the Italians were pulling out of Cyrenaica.

On February 3, Australian 6th Division, less Aust. 16th Inf. Bde. at Tobruk, pushed on to Cirene and El Faidia. On the 4th, the Australians were moving along the Beda Littoria–Barce and the Slonta–Barce roads. On the 5th, Adv. H.Q. XIII Corps moved to El Mechili and thence to Msus and Cyrenaica became a separate command under G.H.Q., M.E. Aust. 19th Inf. Bde. entered Barce and Aust. 17th Inf. Bde. was moving on El Faidia. 4th Armd. Bde. thrust south-west from Msus to Antelat and beyond towards Sidi Saleh and Beda Fomm, while the Sp. Gp. of 7th Armd. Division thrust from Msus towards Soluch and Ghemines.

THE BATTLE OF BEDA FOMM

On February 5, 2nd R.B. of 7th Armd. Division, together with elements of the divisional artillery, took up a position astride the main Benghazi–Agedabia road at Beda Fomm, about 50 miles south of Benghazi. Towards evening an enemy column, withdrawing along this road, ran up against this position and promptly surrendered. On the 6th, 7th Armd. Division was in Soluch, Giardina and Ghemines and H.Q. of 7th Armd. Division moved to Antelat. The Italians, attempting to escape into Tripolitania, were now in a hopeless situation. The road was blocked and along its length from Beda Fomm to Agedabia 4th and 7th Armd. Bdes. of 7th Armd. Division lay in wait, while the Support Group was approaching El Agheila. The Italians as they drew near went into action piecemeal, were defeated and surrendered.

During this time they had been harried southwards by the Australians. On the 5th, Aust. 17th Inf. Bde. was at El Faidia and 19th Bde. at Benina. On the 6th, H.Q. Australian 6th Division moved to Tecnis, Aust. 17th Inf. Bde. was at Cirene, El Faidia and Slonta and 19th Inf. Bde. was at El Abiar *en route* for Benghazi, which was entered that day. The town was formally surrendered on the following day. On February 8th, Adv. H.Q. XIII Corps moved to Ghemines. H.Q. Australian 6th Division was still at Tecnis and Aust. 17th and 19th Inf. Bdes. were in the Barce–Tocra area, only one battalion of 19th Bde. being in Benghazi itself.

On this day 3rd Armd. Bde. of 2nd Armd. Division, moving up to relieve 7th Armd. Division, reached El Adem.

Losses of XIII Corps December 7, 1940–February 7, 1941, were: 500 killed; 1,373 wounded and 55 missing. Enemy taken prisoner, 130,000.

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MEDICAL COVER FOR THE PURSUIT TO EL AGHEILA

7th Armoured Division

D.A.D.M.S. XIII Corps accompanied the rear M.D.S. of 7th Armd. Division as a link between A.D.M.S. Division and D.D.M.S. Corps. It was known that the journey would be an exceedingly rough one and that the whole enterprise was distinctly hazardous. He was instructed to take steps to ensure that when Msus was reached all casualties should be held there until Soluch had fallen, by which time it was expected that Benghazi would have been occupied by Australian 6th Division, so that evacuation from Msus could be northward to Benghazi. Fifteen cars of 2/2 M.A.C. went with D.A.D.M.S. to Msus, while a further ten remained at El Mechili ready to move forward with 2/1 Fd. Amb. to Soluch.

The race to Beda Fomm and beyond was an astonishing performance on the part of 7th Armd. Division. Its field ambulances carried casualties forward until such time as they could be evacuated to Benghazi.

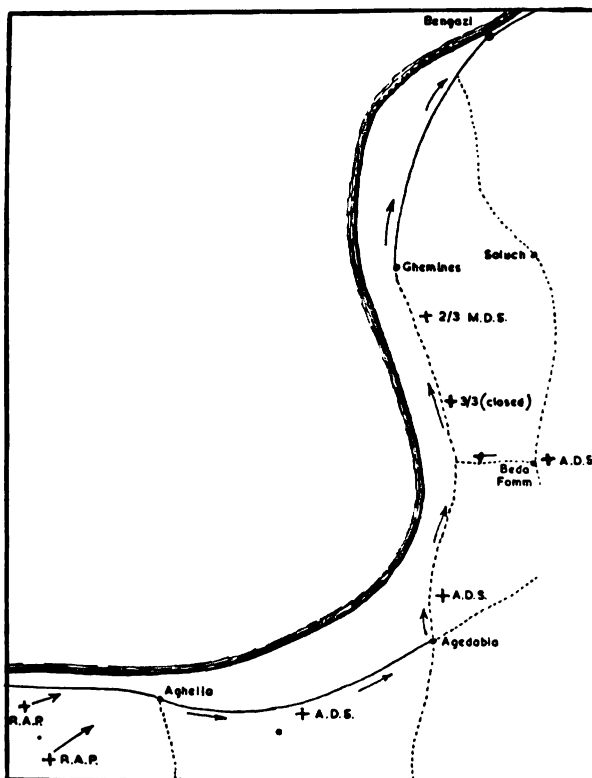

FIG. 28. The Pursuit to El Agheila. Medical Cover. 7th Armoured Division.

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2/3 Lt. Fd. Amb. (now numbered 13) first moved to Campo Marina near Bomba and 3/3 Lt. Fd. Amb. (now numbered 15) to an Italian hospital 31 kms. west of Tobruk. Thence they took the desert track to Bir El Aleima and Mechili. 15 Lt. Fd. Amb. was ordered to proceed from Mechili to Msus, a hundred miles away. 'A' Coy. 2/1 Fd. Amb. then opened a M.D.S. in Mechili and 13 Lt. Fd. Amb. moved to Sceleidima.

All 2/2 M.A.C. cars were moved up just east of Derna and additional cars of 4 A.C.C. were posted for duties in Tobruk and between Tobruk and Bardia. All evacuation beyond Tobruk was suspended pending the arrival of a hospital ship.

Casualties were very few, but the ambulances were called upon to deal with some 300 wounded Italians. Then two sections of 15 Lt. Fd. Amb. were sent on from Msus to Antelat and M.D.Ss. were successively opened at Soluch and Magrum (El Magrun). The control of these medical units was made possible only by the use of wireless intercommunication. Their distribution at the end of this operation is shown in Fig. 28.

On February 5, H.M.H.S. *Aba* arrived at Tobruk, as did also additional ambulance cars of 4 A.C.C. Of the latter 20 were at once sent forward to Derna, there to release an equivalent number of 2/2 M.A.C. cars working behind the M.D.S. of Australian 6th Division and to move forward as soon as Benghazi had fallen and endeavour to join up with 7th Armd. Division in the Soluch area. As soon as Benghazi had been occupied 'A' Coy. 2/1 Fd. Amb. at El Mechili was sent forward to Msus. It moved out of El Mechili at dawn on February 17 in a severe dust storm and had to leave its M.A.C. cars behind because of a shortage of petrol. When this was remedied these cars set out, but heavy rain bogged them. The road had been destroyed by the retreating Italians and the field ambulance was forced to make a wide detour. It did not reach Soluch in time, therefore. However, the M.A.C. cars which had accompanied D.A.D.M.S. Corps sufficed to deal with the casualties (31) incurred. These were cleared to 2/2 (Aust.) Fd. Amb. which opened in Benghazi on February 7. 'A' Coy 2/1 Fd. Amb. reached Soluch by the desert route in time to help 2/3 and 3/3 Fd. Ambs. of 7th Armd. Division in their task of treating large numbers of Italian wounded, who were then evacuated by returning lorries to Soluch and thence to Benghazi.

The wounded from the engagement at Beda Fomm had to be retained for several days at Benghazi until the roads, blown up by the retreating Italians and washed away by the heavy rain, had been repaired. The casualties were congregated in the La Salle school where on February 10, 2/1 (Aust.) Fd. Amb. had opened a M.D.S. The building was badly damaged by a land mine dropped by Italian aircraft on

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February 13. By this time the roads were in good order and so all the patients were moved to Barce, where 2/7 (Aust.) Fd. Amb. was open, on by stages to Derna where 2/1 Fd. Amb. less one company was functioning, and thence to 2/2 (Aust.) C.C.S. at Tobruk, there to await evacuation by hospital ship to Egypt.

Australian 6th Division

On January 25, 'A' Coy. 2/7 (Aust.) Fd. Amb. with Aust. 19th Inf. Bde. began to move towards Derna. By the 27th, 2/1 (Aust.) Fd. Amb. had set up a staging post about 20 miles beyond Tobruk. The M.D.S. of 2/2 (Aust.) Fd. Amb. to which 'B' Coy. 2/7 (Aust.) Fd. Amb. was attached, had been established a little over twenty miles from Derna. In front of this were three mobile sections, each with a battalion. Already the transport of these medical units was showing signs of wear and tear. At Tmimi, at the junction of the roads and tracks from the Derna and El Mechili areas, a staging post with two surgical teams, one Australian and one United Kingdom, was established by 'B' Coy. 2/2 (Aust.) Fd. Amb.

It had been intended to send H.Q. 2/7 (Aust.) Fd. Amb., which had reached Ain el Gazala on the 27th, to El Mechili, but when it was learnt that 7th Armd. Division had not succeeded in trapping the Italian armour there, this move did not take place.

On January 28 the Australian medical units were still widely dispersed. H.Q. 2/1 (Aust.) Fd. Amb. was in Tobruk and one of its companies was moving up to Tmimi there to relieve 'B' Coy. of 2/2 (Aust.) Fd. Amb. The other company was moving to join 2/7 (Aust.) Fd. Amb. H.Q. and 'A' Coy. 2/2 (Aust.) Fd. Amb. together with 'B' Coy. of 2/7 were still east of Derna with mobile sections with the battalions of Aust. 19th Bde. On relief, the detached company at Tmimi was to join its H.Q. The main body of 2/7 was moving on Derna.

On January 29 the Tmimi staging post was established. Blood for its attached bloodbank was being flown up from base.

When on the 30th Derna was entered, 'B' Coy. of 2/7 (Aust.) Fd. Amb. moved into a building near the aerodrome to establish an A.D.S. and on the 31st, the road being repaired, the rest of 2/7 moved into the town to take over an Italian hospital of 200 beds. Other hospitals in the town were cleansed and an inventory of captured Italian medical stores taken.

In January, Australian I Corps was created at Ikingi Maryut. Australian 9th Division was being formed, partly out of units recently arrived in the Middle East from the United Kingdom. To begin with it consisted of 18th and the newly formed 25th Bde. On its arrival in Egypt, Aust. 24th Inf. Bde. was added. Later, when Australian I

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Corps left for Greece, 18th and 25th Bdes. went to Australian 7th Division in exchange for 20th and 26th.

On January 30, 2/5 (Aust.) Fd. Amb., attached to Aust. 18th Bde. of Australian 9th Division, reached Tobruk to free H.Q., 2/1 (Aust.) Fd. Amb. for forward movement. 2/3 (Aust.) Fd. Hyg. Sec. (an Australian corps unit) also reached Tobruk there to relieve 2/1 (Aust.) Fd. Hyg. Sec. 2/2 (Aust.) C.C.S. moved from Bardia to Tobruk.

In Derna, 2/7 (Aust.) Fd. Amb. was required to act as a forward C.C.S. and arrangements were made to reinforce this unit with detachments either from 2/1 (Br.) Fd. Amb. or from 2/5 (Aust.) Fd. Amb. and with surgical teams. Evacuation from Derna was by M.A.C. to Tobruk where an Australian rest camp was established to prevent undue man-power wastage.

The pace of the pursuit west of Derna was such as to test the medical services to the full. Resistance was slight and casualties few, which was just as well, for the area to be covered by the medical services was vast, the medical units few, their transport was in bad repair and the distances between the dressing stations and the nearest C.C.S. were continually extending.

2/7 (Aust.) Fd. Amb. moved forward with Aust. 19th Bde. and the Derna hospital was taken over by 2/1 (Br.) Fd. Amb. Soon the mobile sections of 2/7 were scattered over a distance of over a hundred miles. On February 5 the main body of 2/2 (Aust.) Fd. Amb. moved some sixty miles on to Slonta. As Aust. 19th Bde. neared Benghazi in heavy rain, the main parties of 2/2 and 2/7 (Aust.) Fd. Ambs. managed to reach Tecnis and to press on beyond.

When Aust. 19th Bde. pushed south from Benghazi towards Ghemines, mobile sections of 2/2 followed upon its heels. On February 9, 'B' Coy. 2/1 (Aust.) Fd. Amb. reached Barce and at once pressed on to Benghazi, there to open a M.D.S. in the La Salle hospital. An Australian and a United Kingdom surgical team soon joined this unit. 2/7 (Aust.) Fd. Amb. with two Australian surgical teams, took over an Italian hospital two miles south of Barce. In Tocra and in Benghazi also, 2/2 (Aust.) Fd. Amb., less one company, established M.D.Ss. 2/1 (Aust.) Fd. Hyg. Sec. was hard at work in the Benghazi area.

On February 13, H.Q. Australian Corps reached El Abiar and took over from H.Q. XIII Corps. Cyrenaica Command was created and D.D.M.S. XIII Corps became D.D.M.S. 'Cyrcom'. The order of battle of 'Cyrcom' is given in Appendix XI.

On February 13 many buildings in Benghazi were destroyed or damaged in an air raid. During the night of the 15th/16th in another raid the officer commanding 2/1 (Aust.) Fd. Amb. (S.M.O. Benghazi) and a medical orderly were killed in the La Salle Hospital. H.Q. and 'B' Coy. 2/1 (Aust.) Fd. Amb. thereupon moved into another hospital in

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another part of the town, taking it over from 2/2 (Aust.) Fd. Amb. The Italian P.o.W. in the Colonial Hospital were transferred elsewhere to make fifty beds available for air-raid casualties. 2/2 (Aust.) Fd. Amb. opened an Adv. Surg. Centre at Coefia with accommodation for 50 patients. 2/1 (Aust.) Fd. Amb. opened a rest station at Tecnis.

2/2 (Aust.) C.C.S., arriving from Egypt, moved into the Italian hospital at Tobruk and Lt. Sec. 2/1 (Aust.) C.C.S. moved forward from Matruh to Benghazi. 2/4 A.G.H. was moving up from Egypt to Barce there to take over from 2/7 (Aust.) Fd. Amb.

When the pursuit was halted at the Agheila position and when 7th Armd. Division and Aust. 17th Inf. Bde. were holding the forward areas, 'B' Coy. 2/2 (Aust.) Fd. Amb. moved some 150 miles south to Ghemines in order to ease the burden of 2/3 (13) and 3/3 (15) Lt. Fd. Ambs. of 7th Armd. Division.

Then came the decision to send an expeditionary force to Greece. H.Q. Australian I Corps handed over to H.Q. Australian 6th Division on February 24 and returned to Egypt. The replacement of Australian 6th Division by Australian 9th Division and of 7th Armd. Division by 2nd Armd. Division was initiated. The forward medical units of Australian 6th Division began to concentrate prior to moving eastwards.

Up to February 12, 1941, a total of 1,420 wounded (Sidi Barrani 512, Bardia 525, Tobruk 206, Derna 27, Beda Fomm 31) including 119 wounded in air attacks on rearward areas, were admitted to the field medical units of XIII Corps. Of these 30 died while in these units.

(iii)

The Withdrawal to the Libya-Egyptian Frontier

THE GERMANS INTERVENE

Any possibility of following the remnants of the Italian Army across the border into Tripolitania was precluded by the imminence of the German invasion of Bulgaria. General Wavell had received instructions to make preparations forthwith for the defence of Egypt with minimum forces and for the despatch to Greece of such land and air forces as could be spared, should Bulgaria be invaded.

The only enemy troops at liberty in Cyrenaica were at Giarabub, where there was a garrison of some 800 Italians and 1,200 Libyan levies.

In November 1940, a squadron of Australian 6th Divisional Cavalry Regt., u/c H.Q., B.T.E., relieved the small United Kingdom force that was investing Siwa and Giarabub. After the fall of Bardia, Aust. 18th

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Bde. aided by squadrons of the Long Range Desert Group and with 13 Lt. Fd. Amb. attached, moved against Giarabub and captured it on March 19–21. Australian casualties numbered less than a hundred.

Each squadron of the divisional cavalry was provided with a miniature R.A.P. with its own transport. Casualties were evacuated to the dressing station at Siwa. Thence evacuation was by air to Matruh, 200 miles to the north. From Giarabub to Siwa, 90 miles away, evacuation was by 15-cwt. truck or by ambulance car of 13 Lt. Fd. Amb. At Siwa there was an Egyptian hospital to which a R.A.M.C. officer and medical orderly were attached.

It was known that the Italians were reorganising and reinforcing their forces in the Tripoli area and that a German light division, the first of the formations which, under General Rommel, were to constitute the Deutsches Afrika Korps, and Luftwaffe elements were reaching Tripolitania. Though it was recognised that this German intervention threatened danger, it was calculated that there could be no serious attack on the forward troops near Agheila until May.

But difficulties were mounting. The Luftwaffe was now interfering seriously with the use of Benghazi as a port and Tobruk, 200 miles away to the east, had to be used instead. Road transport was therefore in urgent demand for the conveyance of stores and supplies and there was a great shortage of vehicles. It became increasingly evident that it would be difficult, if not impossible, to maintain so far away from base a force sufficiently large to withstand an attack by the strongly reinforced Axis forces in Tripolitania. General Neame, now commanding in Cyrenaica, was instructed that if he were attacked he should not attempt to stand but should fight a delaying action back to Benghazi; and even be prepared to yield this position and withdraw further eastwards, should the situation, in his opinion, demand it.

On February 21 the distribution of the Australian forward medical units was as follows:

South of Agedabia	'A' Coy. 2/2 (Aust.) Fd. Amb.	A.D.S.
In vicinity of Agedabia	'B' Coy. 2/2 (Aust.) Fd. Amb.	M.D.S.
Benghazi	Lt. Sec. 2/1 (Aust.) C.C.S.	
	2/1 (Aust.) Fd. Hyg. Sec.	
Barce	2/7 (Aust.) Fd. Amb.	
Tocra	2/2 (Aust.) Fd. Amb.	C.R.S.
Tecnis	2/1 (Aust.) Fd. Amb.	Con. Depot
El Faidia	2/1 (Aust.) Fd. Amb.	S.P.
Tobruk	2/2 (Aust.) C.C.S.	
	2/5 (Aust.) Fd. Amb.	

On February 27, H.Q. Australian 6th Division moved to a point 27 miles south of Agedabia. Between March 1–14, Australian 9th Division (20th, 24th, 26th Bdes.) relieved Australian 6th Division, Aust. 20th

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Inf. Bde. replacing Aust. 17th Inf. Bde. in the Mersa Brega position, Aust. 18th Inf. Bde. (Aust. 7th Div.) replacing Aust. 16th Inf. Bde. at Tobruk and Aust. 26th Inf. Bde. replacing Aust. 19th Inf. Bde. at Ain el Gazala. Aust. 24th Inf. Bde. was training in the Tobruk–Gazala area. On March 20, H.Q. 2nd Armd. Division took over from H.Q. Australian 9th Division at Agedabia. Of its two armoured brigades, one was left behind to go to Greece. 7th Armd. Division was moving back to the Delta to rest and refit.

These events necessarily affected the medical services. When the Axis air forces began to bomb the rear areas in a systematic fashion, there were in them many thousands of troops and many thousands of Italian P.o.W. To serve these adequately was no easy matter at a time when divisions were about to be relieved and when in this process the medical units were themselves involved. It was necessary to make use of a series of staging posts at 30 mile intervals, strung along the line of evacuation from the Agheila position to Benghazi.

All the surgical teams were withdrawn from Cyrenaica, with the exception of the one with 2/2 (Aust.) Fd. Amb., and rejoined their parent units at the base. On March 7 the advance party of 2/4 A.G.H. reached Barce. It had been delayed by shipwreck on March 4. However, there had been no loss of life or of stores and the party getting ashore made its way to Tobruk. On the 12th, 2/4 A.G.H. took over the hospital and its 350 patients from 2/7 (Aust.) Fd. Amb.

2/8 (Aust.) Fd. Amb. of Australian 9th Division took over from 2/2 (Aust.) Fd. Amb. of Australian 6th Division in the area south of Ghemines to serve Aust. 20th Bde. of 9th Division in the Mersa Brega area. 2/3 (Aust.) Fd. Amb., with Aust. 26th Inf. Bde. of Australian 9th Division, opened a C.R.S. at Ain el Gazala on March 19. On this date, 2/11 (Aust.) Fd. Amb., the third field ambulance of Australian 9th Division, was moving from Palestine to Egypt. 2/4 (Aust.) Fd. Hyg. Sec. of Australian 9th Division was at work in the Gazala area.

In the Delta during March the following medical units began to congregate in connexion with the expeditionary force for Greece:

7 B.G.H. (600 beds)
16 B.G.H. (600 „)
6 B.G.H. (1,200 „)
17 C.C.S.
24 C.C.S.
5 Mob. Bact. Lab.
6 Mob. Bact. Lab.
3 Mob. Hyg. Lab.
1 Amb. Train
2 Amb. Train
13 Lt. Fd. Amb.
15 Lt. Fd. Amb.
17 Fd. Hyg. Sec.
36 Fd. Hyg. Sec.
48 Fd. Hyg. Sec.
7 Lt. Fd. Hyg. Sec.
16 M.A.C.
4 A.C.C. 3 Secs.

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THE WITHDRAWAL FROM CYRENAICA

2nd Armoured Division was holding the line Mersa Brega–Bir es Suera–Wadi Faregh. Australian 9th Division was on the general line Tolmeita–Tocra–Er Regima–Wadi Gallera. It was not expected that the Axis forces would attack in the immediate future but 2nd Armoured Division was instructed to withdraw gradually to the north should strong pressure be exerted upon it. The task of Australian 9th Division was to deny the enemy access to the escarpment.

On March 31 the Axis forces attacked Mersa Brega and quickly overran 1st Tower Hamlet Rifles and C. Coy. 1st R.N.F. of the Sp. Gp. of 2nd Armd. Division which was therefore forced to withdraw; 3rd Armd. Bde. of 2nd Armd. Division also withdrew. On April 1, H.Q. 2nd Armd. Division was at Maaten el Baghlea while Sp. Gp. 2nd Armd. Division was astride the main Mersa Brega–Benghazi road. On April 2, under continuous pressure, H.Q. 2nd Armd. Division moved back to Antelat and then to Sceleidima and the R.A.F. vacated the Benina airfield. On April 3, Benghazi was evacuated. 2nd Armd. Division was now instructed to protect the left flank of Australian 9th Division and also to safeguard 19th Field Supply Depot at Msus. A most unfortunate and serious mistake was made on this day. The Recovery Section of 3rd Armd. Bde., together with a squadron of the L.R.D.G. in the area of Msus, were mistaken by a R.A.F. pilot for an enemy formation with the result that 2nd Coy. French 1st Motor Marine Battalion, the garrison of this place, promptly destroyed the petrol stocks and pulled out. Not only was the British armour crippled by this action but Msus itself was quickly occupied by Axis troops and so the Australian line was turned. 20th Bde. of Australian 9th Division, having checked the German infantry at the escarpment at Er Regima, moved back on April 4 to the escarpment east of Barce and then, under increasing pressure, to the Wadi Derna. A further disaster overtook 2nd Armd. Division; two petrol convoys for 3rd Armd. Bde. were attacked from the air and completely destroyed in the Tecnis area.

On the 5th, H.Q. 2nd Armd. Division were back at Maraua and its Sp. Gp. was at El Adem; Australian 9th Division, together with 1st R.N.F. and 1st K.R.R.C. were around Derna. On the 6th, Indian 3rd Motor Bde., new to the Desert and quite untried, reached El Mechili from the base. Australian 9th Division was back at Ain el Gazala with its H.Q. and 26th Bde. at Tmimi; 3rd Armd. Bde. of 2nd Armd. Division was at Maraua. On the 7th, H.Q. Cyrenaica Command reached Tobruk, as did also Aust. 24th Inf. Bde. Aust. 20th and 26th Inf. Bdes. were at Acroma outside the Tobruk perimeter.

On April 8, there were at El Mechili, in addition to Indian 3rd Motor Bde., H.Q. 2nd Armd. Division and elements of Australian and Indian

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artillery and engineer units. They were heavily attacked and overwhelmed, and all save a few who managed to get to Tobruk, were captured.

General Neame and General O'Connor, who had been sent forward to give assistance, were ambushed by a German patrol on the Barce–Derna road and taken prisoner.

General Wavell flew up to Tobruk, decided to cut his losses, to withdraw into Egypt, but to hang on to the fortress of Tobruk in order to deprive the Axis forces of the use of this port and also to protect the vast accumulation of stores that were there. He placed General Lavarack of the Australian 7th Division in command of Cyrenaica. H.Q. 'Cyrcom' left Tobruk by sea for Maaten Baqqush, there to be absorbed into H.Q. W.D.F. Aust. 18th Inf. Bde. of Australian 7th Division was sent by sea to Tobruk. On April 11, Tobruk was invested and the Axis forces pressed on towards Egypt, taking Bardia on April 12. On reaching the frontier, however, losses in armour and increasing supply difficulties brought them to a halt.

MEDICAL COVER DURING THE WITHDRAWAL FROM CYRENAICA

Australian 9th Division, on its way forward to relieve Australian 6th Division, was greatly hampered by insufficiency of transport. However, its H.Q. established itself 16 miles south of Agedabia on March 20, and Aust. 20th Inf. Bde. was in the Mersa Brega area in the neighbourhood of El Agheila. 2/8 (Aust.) Fd. Amb. had its M.D.S. 8 miles south of Ghemines, its A.D.S. 21 miles south of Agedabia and a mobile section with H.Q. 20th Bde. 12 miles north of Mersa Brega. 2nd Armd. Division had its H.Q. at Agheila and was being served by 3 Lt. Fd. Amb. with its M.D.S. about 13 miles north of Agedabia.

Evacuation from both divisions was by 16 M.A.C. along the main Agedabia–Benghazi road to 2/4 A.G.H. at Barce. Lt. Sec. 2/1 (Aust). C.C.S. was at El Coefia. A detachment of 15 C.C.S. was staging in the Colonial Hospital, Benghazi. Lt. Sec. 15 C.C.S., with a surgical team attached, was open south of Ghemines. Hy. Sec. 15 C.C.S. was in Derna.

When the retreat from Agheila became imminent, A.D.M.S. Australian 9th Division, realising that should the Australians be required to move back under cover of 2nd Armoured Division, 3 Lt. Fd. Amb. would be hard pressed, proposed to leave 2/8 (Aust.) Fd. Amb. behind to help. But since this most generous gesture threatened to disrupt the accepted arrangement by which Australian casualties were to be evacuated along a line of Australian medical units, a compromise was reached. 'B' Coy. 2/8 (Aust.) Fd. Amb., it was agreed, would establish a staging post in the rear of 3 Lt. Fd. Amb.

On March 23, 2/2 (Aust.) C.C.S. at Tobruk moved up to Barce and 2/4 A.G.H. moved back from Barce to Tobruk. 2/3 (Aust.) Fd. Amb.,

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with Aust. 26th Inf. Bde., had now reached Ain el Gazala and 2/11 (Aust.) Fd. Amb. with Aust. 24th Inf. Bde. was expected at Tobruk on March 26.

When the retreat began and the medical units were required to conform, 2/8 (Aust.) Fd. Amb. first moved back to El Abiar, leaving mobile sections with the battalions of Aust. 20th Inf. Bde. On April 4, all patients that could be moved and the more easily movable and the more valuable equipment and stores were evacuated from the forward areas. Lt. Sec. 2/1 (Aust.) C.C.S. closed at El Coefia and moved to the east. 2/2 (Aust.) C.C.S. closed at Barce and moved hurriedly to Tobruk. 2/4 (Aust.) Fd. Hyg. Sec. moved back with H.Q. Australian 9th Division to Derna. Aust. 26th Inf. Bde. with 2/3 (Aust.) Fd. Amb. attached, moved forward to the area of Barce in which town an A.D.S. was opened; the staging post and Lt. Sec. of 15 C.C.S. moved back to join the heavy section of this C.C.S. at Derna.

As the retreat continued, 2/8 (Aust.) Fd. Amb. established its M.D.S. in Lamluda on April 5. By the 6th, as the retreating Australian columns neared Tobruk, the roads became choked with vehicles of all kinds and the pace of the movement became increasingly sluggish. A senior officer of 2/8 (Aust.) Fd. Amb. attempting to find an alternative route, chose one leading through Giovanni Berta on to a desert track. Along this he encountered a man in Australian uniform who directed him and his party along a track running north towards Derna. Along this track the party was ambushed by a German patrol concealed in a wadi, El Fetei. While prisoners, the party, during the next two days, witnessed the capture of many small groups as, in succession, they walked into the trap.

15 C.C.S., leaving its G.1098 behind because of lack of transport, pulled back to Tobruk and cleared its patients into 2/4 A.G.H. This C.C.S. later embarked for Egypt. 16 M.A.C. and 4 A.C.C. withdrew, step by step, with their cars and workshop into Tobruk.

3 Lt. Fd. Amb. of 2nd Armd. Division, and 3 (Ind.) Lt. Fd. Amb. less its H.Q., attached to Ind. 3rd Motor Bde., were taken prisoner in the El Mechili area on April 7.

OPERATION 'BATTLEAXE'

By the end of April, Indian 4th Division returned to Egypt from East Africa. It took over the defensive positions about Baqqush from Australian 6th Division. Its 5th Brigade left for Syria and was replaced by Br. 23rd Inf. Bde. which, together with a Czechoslovakian battalion, was placed u/c Indian 4th Division. With 23rd Brigade came 14 Fd. Amb.

In the middle of May, by which time many new tanks, meant for Greece but diverted to Egypt, had arrived, General Wavell thought

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he saw a 'fleeting opportunity of attacking the enemy forward troops on the Egyptian border near Sollum in favourable circumstances'. In a limited operation, 22nd Gds. Bde. captured Sollum and Capuzzo and 7th Armd. Bde. moved on to Sidi Azeiz. But on the next day the Axis armour counter-attacked and thrust the British forces back.

By June a further 150 new tanks had arrived so that there were now some 230 tanks of different kinds in W.D.F. It was decided to attack again (Operation 'Battleaxe').

The plan was that:

(*a*) Ind. 11th Bde. Gp. would attack on the right, advance along the coast towards Sollum and assist in the capture of the Halfaya area.

(*b*) 4th Armd. Bde. Gp. together with 22nd Guards Bde. would move well south of Sollum and then turn north to capture Capuzzo, Musaid and Bir Wair.

(*c*) 7th Armd. Division, less 4th Armd. Bde., would advance on the left of the central column and protect its left flank.

(*d*) If the objectives named were taken, then the columns would move up to the Tobruk–El Adem area while the Tobruk garrison would sally forth in force.

The approach march of Ind. 11th Inf. Bde. from Maaten Baqqush to the concentration area at Ilwet el Nass, some 130 miles, was completed on the evening of June 14. For this move an ambulance car was attached to each battalion. Casualties were evacuated by these cars to 19 (Ind.) Fd. Amb. which travelled in the rear of the divisional column. From this unit further evacuation was to 14 (Ind.) Fd. Amb. at Km.90 on the Sidi Barrani–Matruh Road and thence to the Indian wing of 17 C.C.S. at Matruh and to 2 (Ind.) C.C.S. at Baqqush. 7 M.A.C. cleared the M.D.Ss. of 7th Armd. Division and of 14 (Ind.) Fd. Amb. to 17 C.C.S. 'C' section 4 A.C.C. (30 cars) was in reserve at Matruh.

At dawn on June 15 the right column moved forward, to be greeted by intense artillery fire. The supporting 'I' tanks suffered much loss and at the end of the day Halfaya Pass remained untaken. In the centre the Guards Bde. captured Capuzzo and during the night of the 15th/16th occupied Musaid.

On June 16 no progress was made. Halfaya and Sollum repulsed all attacks and in the afternoon strong Axis armoured columns appeared to the south of the battle. 7th Armd. Division moved to deal with this threat and clashed with the enemy in the area of Sidi Omar. The British armour found itself outnumbered and out-gunned and was forced to withdraw, after suffering disastrous loss.

On the 17th, the Guards Bde. was driven out of Capuzzo and its withdrawal was threatened by the advance of the Axis armour. It was decided therefore that the operation must be brought to an end and that the whole force must withdraw.

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Commonwealth casualties during Operation 'Battleaxe' were 122 killed, 588 wounded and 259 missing.

Following these events there was no set-piece battle in the Desert until November 18. The Axis forces began to strengthen the frontier defences from Halfaya to Sidi Omar, 25 miles to the south. They constructed four 'boxes' or defended localities in which their 88 mm. guns figured prominently.

MEDICAL COVER FOR OPERATION 'BATTLEAXE'

It was arranged that while Indian 4th Division would be responsible for all evacuation north of the escarpment, 7th Armoured Division would be responsible for evacuation south of the escarpment since this was where the light field ambulances could be used to the best advantage. Since it was here also that most casualties were expected, twenty-five cars of 7 M.A.C. were allotted to A.D.M.S. 7th Armd. Division.

On June 12 the following instructions were issued:

151 Lt. Fd. Amb. (the third field ambulance of 7th Armd. Division) would be prepared to establish a M.D.S. at Bir Enba on the 13th.

13 Lt. Fd. Amb. would establish a M.D.S. in the area of Bir Sofafi on the 15th.

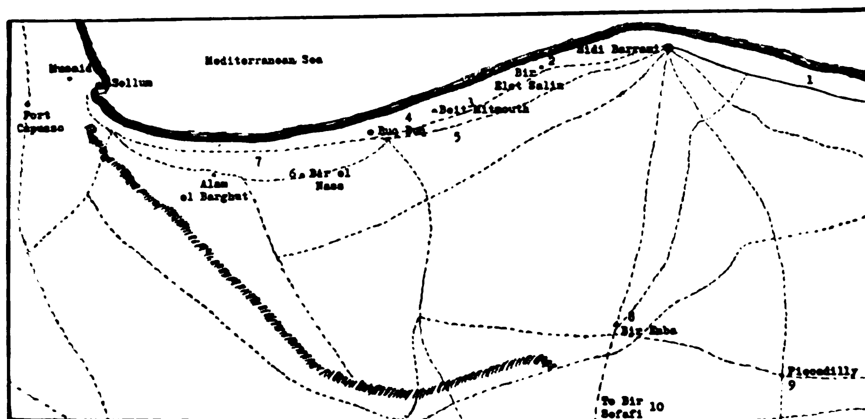

FIG. 29. Operation 'Battleaxe'. June 15–18, 1941. Medical Cover. 7th Armoured and Indian 4th Divisions.

1. 173 Fd. Amb.	. June 14	7. 19 (Ind.) Fd. Amb.	. June 16
2. 19 (Ind.) Fd. Amb.	June 14–15	8. 151 Lt. Fd. Amb.	. June 13
3. 19 (Ind.) Fd. Amb.	June 15	13 Lt. Fd. Amb.	. June 13
4. 173 Fd. Amb.	. June 16	9. 151 Lt. Fd. Amb.	. June 17
5. 19 (Ind.) Fd. Amb.	June 15	13. Lt. Fd. Amb. .	. June 18
6. 19 (Ind.) Fd. Amb.	June 14–16	10. 13 Lt. Fd. Amb.	. June 13–17

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15 Lt. Fd. Amb. would open a M.D.S. near Halfway House when ordered forward.

15 Lt. Fd. Amb. would open an A.D.S. at Bir el Khraigat on the 15th.

Ten cars of M.A.C. would be attached to the M.D.S. at Bir Enba.

Ten cars of 7 M.A.C. would remain at Piccadilly with a section of 14 (Ind.) Fd. Amb.

Evacuation would be along the route marked from Bir Sofafi *via* Bir Enba to Piccadilly and thence to Km. 91 on the Sidi Barrani–Matruh road and on to 17 C.C.S. at Matruh.

P.o.W. casualties would be evacuated by maintenance channels, until British and Indian wounded had been cleared.

When the attack developed on the 15th, 151 Lt. Fd. Amb. opened its M.D.S. at Bir el Khraigat and its A.D.Ss. just beyond the frontier wire. It soon became clear however that these dressing stations were too far forward and on the morning of the 16th, 151 Lt. Fd. Amb. withdrew, leaving two sections at Bir el Khraigat to form an A.D.S. 15 Lt. Fd. Amb. thereupon established a M.D.S. at Bir Zigdin el Abiad. Later in the day this M.D.S. closed and withdrew in its turn and the M.D.S. of 13 Lt. Fd. Amb. at Bir Sofafi became the forward M.D.S. of the division.

During the three days, June 15–18, some 420 cases passed through these medical units. 'D' section of 13 Lt. Fd. Amb. was with 4th Armd. Bde., 'A' and 'B' sections of the same field ambulance were with 7th Armd. Bde. and 'D' section of 15 Lt. Fd. Amb. was with the Support Group. Of the cases sent back by these sections into the M.D.S., about 295 were battle casualties, 130–140 belonging to 7th Armd. Division, the rest either to the Guards Bde. serving with 7th Armd. Division, or to Indian 4th Division.

When the engagement was broken off the A.D.S. at Bir el Khraigat and the M.D.S. at Bir Sofafi closed and the M.D.S. of 15 Lt. Fd. Amb. at Bir Enba thereafter served the division.

Ten M.A.C. cars were allotted to Indian 4th Division for the evacuation of casualties to the corps M.D.S. at Km. 132 on the Sidi Barrani road, and thence to 2 (Ind.) C.C.S. at Baqqush.

At 0830 hours on June 15 there were established:

A.D.S. 19 (Ind.) Fd. Amb.	at Bir el Nass.
Adv. M.D.S. 19 (Ind.) Fd. Amb.	Alam el Shibeika.
Rear M.D.S. 19 (Ind.) Fd. Amb.	Beit Mitmouth.
Casualty Collecting Post (C.C.P.)	Alam Barghut.

The advanced M.D.S., being so near the rear M.D.S., remained closed on the 15th and on the following day moved forward to Alam Barghut while the C.C.P. moved on to a wadi area further forward.

By 1000 hours on the 16th the advanced M.D.S. was open at Bir el Nass, a company of 173 Fd. Amb. (the corps field ambulance) with

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PLATE XVI. Q.A.I.M.N.S. personnel in the Western Desert.

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PLATE XVII. In the Western Desert. *Goolahs* to keep the water cool.

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PLATE XVIII. A Regimental Aid Post in the Western Desert.

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PLATE XIX. Foot inspection in the Western Desert.

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TABLE 13

Period April 9 to June 25, 1941
Admissions to the Medical Units of XIII Corps

Admitted to Field Medical Units	8,867
Evacuated therefrom	6,783
Returned to duty	2,708
Average daily rates:	
Admitted to Field Medical Units	115
Evacuated therefrom	88
Returned to duty	35

Weekly admissions of wounded into Field Medical Units

Week ending:		
April 16	13	
„ 23	28	during the Withdrawal
„ 30	41	ditto
May 7	11	
„ 14	23	
„ 21	158	the action of May 15
„ 28	74	ditto
June 4	29	
„ 11	2	
„ 18	618	Operation 'Battleaxe'
„ 25	135	ditto
	1,132	

Ratio of wounded to sick 1 : 8

Died in Field Medical Units:	
Sick	3
Accidental injuries	9
Wounds by enemy action	25
	37

The hospitals now at the base were:

Cairo area	Alexandria area	Canal area
9 B.G.H. 15 B.G.H. 63 B.G.H. 15 I.G.H. 5 S.A.G.H. 1 N.Z.G.H. 3 N.Z.G.H.	3 B.G.H. 8 B.G.H. (one sec. I.G.H. attached) 64 B.G.H. 30 I.G.H. 58 C.G.H. 1 Pol. G.H.	1 B.G.H. 2 B.G.H. 6 B.G.H. (500 bedded annexe for P.o.W.) 13 B.G.H. 19 B.G.H. 27 B.G.H. 54 B.G.H. 10 I.G.H. 2 A.G.H.

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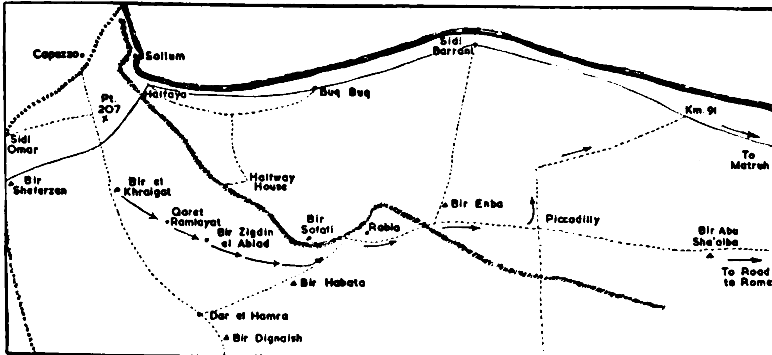

FIG. 30. Operation 'Battleaxe'. Evacuation Chain of 7th Armoured Division.

2 F.T.U. attached, was open at Buq Buq and receiving casualties from this advanced M.D.S., while the rear M.D.S. was closed at Beit Mitmouth and ready to move. On the 17th when the general withdrawal was ordered, 173 Fd. Amb. moved back to Sidi Barrani and the two M.D.Ss. of 19 (Ind.) Fd. Amb. to Bir Elet Salin. The C.C.P. and the A.D.S. moved with the right column, Ind. 11th Inf. Bde., to Baqqush.

The field medical units of Indian 4th Division and 7th Armd. Division dealt with 876 casualties, including 63 P.o.W., during the period June 15–23. Among these there were 31 deaths.

1 Con. Depot opened at Mustapha and offered accommodation for 750 U.D.F. personnel. 2 Con. Depot (60 officers and 2,000 O.Rs.), 2 Ind. Con. Depot and 1 N.Z. Con. Depot were all in the Canal Area.

During the quarter ending June 30, the average number of wounded in B.T.E. hospitals per day was 1,430, including 23 British officers and 477 British O.Rs. For the quarter ending September 30, the average was:

TABLE 14

	Officers	O.Rs.
United Kingdom . .	105	1,787
Australians . .	86	2,269
New Zealanders . .	13	406
South Africans . .	11	54
Indians . . .	—	433
	215	4,949

Throughout this phase of the campaign there was a growing shortage of R.A.M.C. personnel, the majority of the base units fell far below their establishment and the reinforcements that arrived were most inadequate. The result of this was that in July, for example, although

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there were 18,512 equipped beds with 3,623 vacant (1,000 of these vacant beds being in fact 'dead beds', either officer beds that could not be used for other ranks or infectious disease wards beds that could not be used for general purposes), there were not nearly enough R.A.M.C. and Q.A.I.M.N.S. personnel to look after them. Strenuous efforts had to be made to weed out the more trivial cases and send them either back to their units or on to a convalescent depot.

The organisation of the medical branch of G.H.Q., M.E.F. at this time is given in Appendix XII.

OBSERVATIONS OF D.D.M.S. XIII CORPS ON THIS PHASE OF THE CAMPAIGN

'In reviewing the medical arrangements for the Cyrenaica campaign, the first comment which springs to the mind is that, at no stage of the whole campaign, did a C.C.S. function as such, according to establishment, in its proper location in relation to a fighting front.

'The reason for this can be summed up in one word—immobility. This, of course, is nothing new—a C.C.S. has always been recognised as an immobile unit, but this defect has always been camouflaged by a pious hope that application to the proper quarter would produce transport, either by rail or road, at the appropriate moment.

'A campaign of this nature, away from railways and with barely enough transport to feed and supply the rapidly advancing troops, revealed how misleading such teaching can be. The time of preparation for each succeeding attack—normally the time when a C.C.S. should move forward to a new position—was the time when transport was at a premium for the assembly of food, petrol, ammunition and sometimes water in forward areas. The actual timing of each attack, and in the end our ability to destroy the enemy before he made good his escape, depended upon the transport situation more than on any other factor. The principle had to be accepted from the start that medical transport must suffice for medical units, if they were to keep pace and position with the rest of the force.

'In other words, if the medical services were to take their part in the organisation without hampering the plan, a unit had to be improvised which would carry out the duties of a C.C.S. but which could be moved into position at the right moment without deflecting transport from more essential tasks. The solution offered was the improvised or "advanced C.C.S.", as described in the narrative, a combination of part, or the whole, of a corps field ambulance with the light section of a C.C.S. and additional surgical teams and mobile specialised units, e.g., transfusion unit, bacteriological laboratory, etc.

'Such an improvised unit provides all necessary operating facilities but is apt to lack nursing personnel—a deficiency which will become

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more marked when the supply of trained R.A.M.C. nursing orderlies to field ambulances becomes more difficult.

'Other obvious deficiencies are the lack of beds, bedding, hospital clothing and feeding utensils. After the capture of Sidi Barrani these were available from captured sources, which rendered the improvisation of a C.C.S. easier as the advance proceeded.

'But no attempt is made to hide the fact that the whole standard of comfort was necessarily far below that achieved during the static war in France between 1914 and 1918. In fact for such an improvised unit to be successful it had to be combined with rapid evacuation by sea, road or train to base hospitals and this perpetually raised the problem of how soon to move a post-operative case to better conditions of nursing.

'The solution offered in the Cyrenaica campaign to compensate for the immobility of the C.C.S. is not claimed as the perfect one or as in any way final. It had to be adopted for lack of anything better, and as no opportunity had occurred of working out better establishments in advance.

'A far better solution would be to have a definite amount of transport permanently allotted to each C.C.S. to bring them into line with the remainder of the new mechanised army. It is calculated from experience that fourteen 3-ton lorries would move the light section and personnel in one trip and would move the whole unit (less tentage) in two or three trips. Such transport need not lie idle between moves but could be usefully employed in transporting sitting cases, patients' kits (which generally overcrowd ambulance cars), or even lying cases, if fitted with Flint stretcher gear. It would thus release some of the ambulance cars which have to be detached from M.A.Cs. or A.C.Cs. for duties in connexion with loading ambulance trains or hospital ships, or for collecting sick from L. of C. areas.

'Another unit which lacks mobility in modern mechanised warfare is the "surgical team". This should be a unit with a separate G.1098 and I.1248 scale of equipment and transport, as it will always be made use of to supplement a C.C.S. even if the latter is mobile. It is believed that the establishment of a mobile surgical unit is already being worked out at G.H.Q., M.E. It is hoped that an efficient and portable steam steriliser for dressings will not be omitted. At present this is lacking even from the equipment of the light section and special arrangements for its provision had to be made in the Cyrenaica campaign.

'7th Armd. Division, during the long period when they led forward troops patrolling hundreds of miles in advance of their H.Q., were quick to recognise the fact that there is a limit to the distance which can be covered during the hours of daylight by a motor ambulance car. The optimum distance varies with the nature of the road or track and

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the weather conditions (e.g. dust storms) but is always governed by the need of patients (and drivers) for food, rest or medical attention at regular intervals.

'The system of evacuation in this division soon, therefore, became established as a series of staging posts formed by sections of light field ambulances along a well-defined track (or axis).

'The term "staging post", which frequently occurs in the narrative, may not be familiar to many students of military medical organisation, though its function will be obvious to any who have served in a frontier campaign in India where its necessity has long been recognised by the grant of an establishment (staging section).*

'When W.D.F. as a whole became strung out on long lines ahead of its R.H. the need for staging posts on the line of evacuation behind divisional M.D.Ss. was quickly apparent, and the corps field ambulance, divisible as it is into three self-supporting sub-units, provided the necessary establishments, together with that essential attribute, mobility.

'It was a logical development to attach a surgical team to a forward staging post to form an "advanced operating centre" where emergency operations could be performed on cases to whom surgery was vital at the time they reached there.

'As the staging post was generally housed in bivouacs and tarpaulin shelters it was never intended to take the place of the C.C.S. as the main operating centre. But there is no doubt that lives can be saved by the provision of surgery at the earliest opportunity, and as the M.D.S. of a field ambulance is not the right place for surgery an advanced operating theatre is most conveniently combined with a S.P. when the C.C.S. is many miles away.

'Regarding the question of surgery in field ambulances, Australian 6th Division were, at first, very keen to develop this, and while this division was attacking limited objectives whose capture would necessarily be followed by a period of re-organisation, no obstacles were put in their way. But it was made clear to them that a field ambulance immobilised by immovable post-operative cases could not fulfil its true function in a division whose movements forwards or backwards could not be predicted. During the rapid advance of this division after the retreating enemy following the fall of Derna they were given an opportunity of seeing for themselves that the practice of surgery in a field ambulance must depend upon the type of military operation in progress.' (Plate XXI illustrates an improvised mobile operating theatre.)

* The advantages of having a number of these small scale units with a definite establishment are many and the disadvantages few. In long distance warfare, in rapid advance or in retirement the possession of a few staging sections is a boon to a harassed D.D.M.S.

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NOTES ON THE EMPLOYMENT OF FIELD AMBULANCES*

The method of employment of field ambulances during the entire period was that of using M.D.Ss. in echelon with some sections brigaded as A.D.Ss. and others sited for other functions in accordance with the situation. On some occasions, when the intervening distance was rather great, a section was placed between the advanced and rear M.D.Ss. and on other occasions sections were opened for the same reason between the rear M.D.S. and the C.C.S.

The method of progression adopted was that of 'leap-frogging' and the evacuation of casualties was carried out by the unit's own ambulance cars with the assistance of a M.A.C. operating on a shuttle system. (Plate XXII shows an ambulance car in the desert.)

The rôle of advanced C.C.S. was carried out by the H.Q. and companies of the corps field ambulance—a very necessary procedure in view of the rapid movement. The distances shown in Table 15 indicate that a C.C.S. with normal establishment would have been insufficiently mobile to cope with the situation.

Distances. R.A.P. to A.D.S.—The distance between the R.A.Ps. and the nearest A.D.S. was from 8 to 12 miles but these distances varied not only with the situation but also with each particular unit according to its allotted duties. (*See* Plates XVIII and XXIII.)

A.D.S. to Advanced M.D.S.—This figure remained fairly constant at about 12 to 15 miles. It will be noted that the figure is given for the distance from the nearest A.D.S.; there were at the same time some which were stationed up to 30 miles away.

Advanced M.D.S. to Rear M.D.S.—This distance was subject to greater variation. The average works out at 53 miles, but as the figures taken for computation include one enormous jump of 130 miles in 30 hours, a more accurate figure would be about 46 miles.

Rear M.D.S. to C.C.S.—The average distance between these was about 80 miles, but this also was subject to great variation and the field ambulance employed as a C.C.S. experienced some difficulty in keeping up with the pace of the advance. Starting at Mersa Matruh it had to move in turn to Sidi Barrani (60 miles), Tobruk (120 miles) and Benghazi (450 miles), its work being made none the easier by the fact that the railhead remained at Mersa Matruh. The corps field ambulance had also to act occasionally as a general hospital during the period when the nearest was at Alexandria and, since this town is almost 1,000 miles from Benghazi, it was not always easy to maintain the chain of evacuation.

C.C.S. to General Hospital.—Since the field ambulances were carrying out a dual rôle for a certain period of the campaign the average

* Adapted from *With a Field Ambulance in Libya*, by Capt. W. T. E. Blackmore, R.A.M.C. *Journal of the R.A.M.C.* Volume LXXIX.

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Distances between A.D.Ss., M.D.Ss., C.C.Ss., and General Hospitals.

December 1940—*February* 1941

TABLE 15

Date	Advanced M.D.S. (2/3 Lt. Fd. Amb.)	Distance travelled by Adv. M.D.S. in jumps	Distance from nearest A.D.S.	Distance from rear M.D.S.	Distance between rear M.D.S. and C.C.S.	Distance between C.C.S. and nearest general hospital
		Km.	Km.	Km.	Km.	Km.
December 8, 1940	Sinia Road	—	10	45	105	168
,, 9 ,,	Bir Thalata	95	6	50	75	288
,, 15 ,,	Bir Enba	50	45	125	75	288
,, 17 ,,	Bir Sofafi	35	30	55	150	288
,, 21 ,,	Bir Khreigat	50	25	105	150	288
,, 23 ,,	Bir el Maraa	45	20	90	185	288
January 6, 1941	Bir el Hamarin	25	30	60	80	408
,, 9 ,,	Hagfet el Nezha	80	20	80	160	408
,, 20 ,,	Ain el Gazala	85	20	75	230	408
,, 26 ,,	Bir el Aleima	45	25	95	30	658
February 2 ,,	Div. Axis	35	22	80	90	658
,, 7 ,,	Mechili	35	15	25	200	658
,, 9 ,,	Soluch	240	30	240	200	440
,, 16 ,,	Ghemines	22	40	75	50	50
,, 28 ,,	Beda Fomm					
	Average	65 Km.	25 Km.	85 Km.	128 Km.	378 Km.
	Distances	45 miles	15 miles	53 miles	80 miles	236 miles

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distance between these units cannot be given with accuracy, but a figure of 250 miles would not be very wide of the mark.

Map Reading. All officers, N.C.Os. and ambulance drivers received training in map reading and use of both the prismatic and the sun compass, together with a good working knowledge of stellar constellations. The infrequency of recognisable features on the landscape made 'travelling on a bearing' a matter of daily routine, and often during 'khamsins' competence in this art, together with adequate track-making, saved many who would otherwise have been hopelessly lost.

Shelters. During the training period particular attention was paid to instruction in the loading and unloading of vehicles and also in the rapid erection and striking of shelter tents, a policy which during rapid movement was amply justified.

Penthouse shelters were not an issue at that time. Field ambulances worked with tarpaulin lean-to shelters, 30 ft. × 40 ft. or 30 ft. × 30 ft., and these were in several respects, notably for easy camouflage and greater available floor space for stretcher cases, superior to the penthouse.

Passive Air Defence. P.A.D. measures again proved the value of dispersion. It was an inflexible rule that 200 yards must be left between vehicles both on the move and when established in a M.D.S., and the parking of two vehicles together was never permitted. It was also laid down that slit trenches must invariably be dug before a shelter was erected. The shelter itself was dug in, wherever possible, or a low sand-bagged wall built around its inside wall; the lorry engine was protected with a further wall of sand-bags.

A slit trench dug under cover of the shelter itself, large enough to take a stretcher and covered with boards until required, proved to be valuable protection for casualties. Air sentries, equipped with whistles both on the move and while stationary, were always used as a further P.A.D. measure.

Clearing the Forward Area. Experience established the conclusion that evacuation must be initiated from before backwards. R.M.Os. all had ambulance cars allotted to their units and cleared their casualties in these vehicles back to the A.D.S.* The depth of the battle zone necessitated this procedure, areas being so great that if A.D.Ss. had been left to clear them the scheme of evacuation would have been slowed up considerably with a deleterious effect on the condition of the casualty.

Personnel. An officer of one of the field ambulances records:

'It is emphasised that personnel of field ambulance units must be regarded as trained primarily as soldiers; competence in first aid,

* In many of the campaigns the attachment of one or two ambulance cars and one or two stretcher squads to and under temporary command of the R.M.O. proved of great value.

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PLATE XX. Counter-offensive in the Western Desert. An Anti-Fly Squad out with its 'Bruton' traps.

[*Imperial War Museum*

PLATE XXI. A Mobile Operating Theatre in the Western Desert.

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PLATE XXII. An Ambulance Car on the road to Derna.

[*Imperial War Museum*

PLATE XXIII. An A.D.S. in the Western Desert.

[*Imperial War Museum*

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although essential, must always be secondary to their training as field troops.

'It is impossible to make a doctor out of a R.A.M.C. recruit in six or twelve months, but, if in the same space of time he can learn to march 100 miles in 3 days on a tin of "bully" and a "billy" of tea and do a full day's work at the end of it, if he can find his way about strange country, with or without a map, without losing his head or himself, can make himself a comfortable "bivvy" out of nothing and can cook himself a good meal with the aid of a mess tin and a handful of wood, then he is likely to be much more of an asset to a field ambulance than the man who knows all the knots on all the bandages on a Thomas splint but who cannot fend for himself, let alone his patient.'

NOTES ON ENEMY WOUNDED AND ITALIAN MILITARY MEDICAL SERVICES

During the course of these events large numbers of enemy wounded were taken prisoner. No accurate record of the number was kept in the forward area. The policy of evacuating enemy wounded to Egypt as soon as transport could be spared from the needs of British Commonwealth casualties was primarily dictated by the difficulty of feeding them in the forward area. Pending evacuation they were treated by their own medical personnel in their own hospitals.

After the capture of Sidi Barrani the Italian field hospitals (tented) at Nibeiwa, Sidi Barrani (2) and Buq Buq were found to be full of wounded and sick. The hospital at Nibeiwa had been damaged by rifle and machine-gun fire and isolated from maintenance services, so all patients and staff were evacuated as rapidly as possible to Sidi Barrani. (*See* Plate XXV.) Meanwhile sufficient captured medical equipment was collected to open an Italian hospital at Mersa Matruh, and, as soon as this was in position, all patients and sufficient staff were transferred there from Sidi Barrani and Buq Buq to wait until evacuation to Egypt became possible. The Italian hospital in Matruh remained open and was useful in treating wounded and sick prisoners passing through from later battles.

The main Italian camp hospital at Sidi Barrani was converted into an advanced C.C.S. and later into a reception station for that area. Other hospitals in this area, and another which was found empty at Sofafi, were salvaged under arrangements made by Matruh Sub-Area.

The fall of Bardia added 1,100 Italian patients, though some were only minor sick. Wounded were collected by the Italian medical services into two camp hospitals at Bardia. One of these was rapidly emptied by evacuation to Egypt and transfer of minor sick to the other hospital as the site was required for an advanced C.C.S. The second remained open for the reception of enemy casualties and sick from P.o.W. cages. (*See* Plate XXIV.)

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In Tobruk a large number of casualties (about 1,400 in all) were found in four separate hospitals—one an underground naval hospital dug in to the cliff-side near the quay, the remainder located under canvas in different parts of the perimeter camp. All cases not evacuated early were collected into the largest camp hospital on the western edge of the perimeter, the equipment of the others being salvaged as far as possible by 2/1 Lt. Fd. Hyg. Sec. and finally handed over to 7 Adv. Depot Med. Stores. Most of the patients were evacuated to Egypt before February 15 but the large camp hospital was still open on that date.

At Derna no military hospital or patients were found, but an excellent civil hospital (Princess of Piedmont) was taken over complete with equipment and used for the treatment of British casualties and of local civil inhabitants, several of whom were found to be suffering from wounds.

An accumulation of about 400 enemy wounded was found at Barce in a military hospital—an excellent building with a large amount of equipment. This was emptied of enemy cases by transfer to Tobruk and used as a treatment centre for British cases pending the arrival of a general hospital.

After the final battle about 400 fresh enemy casualties were evacuated to Benghazi where another 300 were already under treatment in one large and one small civil hospital (the Colonial and the Princess of Piedmont). These cases were still under treatment there when H.Q. Cyrenaica Command took over the medical administration.

The field medical unit of the Italian Army appeared to be a camp hospital with standardised pattern of ward tents and operating tents which could be multiplied as necessary to meet the needs of the force. The tentage was well designed and in many cases floored with tiles or beaten stones. Portable electric sets and X-ray installations were attached to the larger hospitals. Equipment was of good pattern and medical stores plentiful, though most of the drugs were proprietary brands put up in ampoules. No transport appeared to be allotted to these field hospitals.

The military hospital buildings found were of a standard type, obviously designed for use either as a barrack or as a hospital according to circumstances. This may explain the frequent exhibition of large Red Cross signs on buildings which recently had been clearly used as barracks and not as hospitals.

Reserves of medical stores found were generally stored with ordnance and other stores, as if they were handled by one supply organisation. Portable beds, bedside tables and operating theatre furnishings were of excellent design in light metal.

Libyan patients were treated to a lower scale of hospital comfort and were accommodated on straw on the ground.

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Nothing approximating to an organised latrine, flyproof or otherwise, was found in any field medical installation. No signs could be found of any attempt to control sanitation, with the result that the ground around each camp hospital was badly fouled. Slit trenches dug near, and sometimes within, the ward tents for protection against air attack were obviously used as open latrines and must have been not only most noisome shelters in which to take refuge but a constant source of infection in the fly-breeding season.

There was no doubt, from observations made in P.o.W. cages, that bacillary dysentery was prevalent among the Italian troops in the Sidi Barrani area. A scrutiny of their A. & D. Books showed 'Enteritis' as the common cause of admission, but no entries of 'Dysentery'.

There was no apparent shortage of medical staff in the Italian Army, the numbers who appeared wearing Red Cross brassards in each captured hospital frequently amounting to hundreds. It seemed that these included not only regimental medical officers and stretcher-bearers but also sanitary staff and medical store and administrative personnel.

All the captured ambulance cars were in a very bad state of repair, quite unfit to leave the main roads and obviously lacking maintenance. There were few that were worth repairing.

Large numbers of these P.o.W. were sent to India, beginning to arrive there towards the end of 1940. The Port Health Officer, Bombay, had reason to call attention to the heavy louse infestation among them. The ships and the rolling stock used for their transport soon became heavily infested. Arrangements were made whereby all P.o.W. clothing and bedding were disinfested in M.E.C. before embarkation.

The first batches reached India before arrangements for their reception were completed, and so it was that in the early part of 1941 the sanitary arrangements of the camps were far from satisfactory. Many of the P.o.W. were in a debilitated condition and among them there were cases of enteric fever.

The following camps were ready and occupied in 1941:

Camp		Camp	
Bangalore	24,000	Dehra Dun	12.000
Bhopal	24,000	Dehra Dun (Officers)	88
Ramgarh	12,000	Yol	12,000

Between February and July 1941 there were 127 cases of enteric fever in the Bangalore Camp and 93 cases of enteric and 81 cases of dysentery in the Ramgarh Camp. In March 50 cases of beriberi were diagnosed in Ramgarh Camp, while in June 1941 there were 14 cases of cholera with 7 deaths among the Italian P.o.W. and 11 cases with 6 deaths among the Indian guards. In May there were some 18 cases of 'heat effects' with 1 death among the P.o.W. *en route* from Bombay to Ramgarh.

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It was generally remarked that the Italians were careless in respect of sanitation and uncooperative, and that their officers were frequently quite uninterested in the affairs of the camps.

67,566 Italian P.o.W. were sent to India during the War, together with 757 Germans and 62 others—Hungarians, Rumanians and the like.

As for rations, they were placed on the peace scale for British troops plus a cash allowance of 3½ annas a day (working parties 4 annas). In January 1944 the working parties were placed on the British troops' field scale ration. In 1945, owing to grave shortages it was necessary to reduce the P.o.W. ration to conform with civilian scales, i.e. calorie value of 2,900.

(Plates XVI to XXIII illustrate various features of the work of the medical services during this campaign.)

(iv)

The Health of the Troops

During the period June 1940—February 1941 the numbers of sick requiring evacuation from the W.D.F. were small. Accurate figures for the whole of this period cannot be given owing to the disturbance caused by the replacement of Indian 4th Division by Australian 6th Division. Returns for the period January 2–February 15, 1941 show that an average of 36 sick a day were evacuated from W.D.F., which at this time consisted of two complete divisions plus corps troops and with a total strength of about 20,000. The sick rate was therefore well below 3/1,000/day.

Direct admissions from labour units along the L. of C. into C.C.Ss. considerably swelled the numbers of sick being evacuated. No accurate figures relating to these are available owing to the creation of L. of C. sub-areas which passed from the administrative control of W.D.F.

DISEASES AMONG THE INDIGENOUS POPULATION

All local inhabitants and their flocks were evacuated east of Daba during April 1941. D.D.M.S., W.D.F. comments:

'The good effect of this move has been largely undone by the importation of Bedouins and Libyans, P.o.W. recruited into labour battalions, particularly around Baqqush, and now unhappily into Matruh Fortress. From the small amount of work done by this class of labour it really is hardly worth while running the serious risk of maintaining near troops a large and potent reservoir of disease. Cases of typhus fever and deaths have been reported and two mass disinfestations of all available labour have been undertaken with the aid of the railway disinfector coach.

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'The sanitation of labour camps and the sanitary provision for labour while engaged on work leave very much to be desired. The labour camps absorb a large amount of the time of the few hygiene personnel available on the L. of C.

'Despite one year's correspondence and agitation, the medical arrangements for labour provided by the Egyptian Government are still not adequate. Two medical officers, a few tents and one ambulance car and no medical equipment can hardly be considered adequate for a force of nearly 7,000 Bedouins.

'During the second quarter of 1941 six cases of typhoid fever occurred among native labourers. An attempt was made to immunise all these labourers by T.A.B. inoculations, but after the first dose there was a 100 per cent. refusal to submit to a second, and to prevent a mass desertion the second dose had to be abandoned.

'The problem of lice infestation was tackled more satisfactorily. All labour was deloused in batches of 100 at the Egyptian C.C.S., being shaved and bathed at the same time. Serbian barrels were installed in each camp.

'It is significant that the arrival of a fresh batch of Saidi labourers in the middle of September was followed by a check in the steady decline of dysentery figures that had been a feature of the previous quarter.'

DISEASES OF MILITARY IMPORTANCE*

Dysentery

For the first quarter of 1941 the Western Desert had been almost devoid of human and animal population, so that by April, when the campaign had returned to the Egyptian Desert, conditions were exceptionally favourable. This, however, did not apply to Matruh, where a small residual military population remained in occupation and where conditions, particularly in the town area, were definitely bad. D.D.M.S., W.D.F., writes:

'The new force employed in the area during the quarter consisted of unseasoned troops, as far as desert discipline and sanitation are concerned, and the adaptation to problems of extreme dispersion has been poor. It has been noted that it is not so much a latrine problem this summer but a problem of the disposal of swill and rubbish. Early and complete incineration, with burial only of the indestructible residues, is being advised. Units, however, still persist in burial of rubbish in inadequate pits and they seem unable to realise the extra labour of digging a series of fresh pits. Finally, the R.M.O. does not always seem to have the knowledge and training to appreciate that at least 75

* For further information concerning these matters, reference should be made to the Australian and Indian Official Medical Histories, also to the Volume *Medicine and Pathology*.

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per cent. of his work " out of the line" is preventive medicine, reduced in this theatre to the simplest form of camp sanitation.

'Another factor making it difficult to attain a satisfactory standard in the defensive areas has been the considerable moves and changes of the fighting troops holding the various sectors and perimeters; Indians, British, Colonials, Czecho-Slovakians and Poles follow one another with bewildering frequency and different customs and evacuation postures have to be catered for.'

TABLE 16

Sample Weekly Returns of cases of Clinical Dysentery admitted to Field Medical Units, British and Indian Troops

Week ending	British	Indian	Totals
July 7, 1940	26	11	37
" 14 "	43	22	65
" 21 "	60	11	71
" 28 "	31	10	41
August 4 "	12	15	27
" 11 "	24	9	33
" 18 "	14	15	29
" 25 "	16	10	26
September 1 "	23	19	42
" 8 "	24	27	51
" 15 "	33	39	72
" 22 "	70	51	121
" 29 "	77	37	114
Totals . . .	453	276	729

TABLE 17

Week ending	Clinical dysentery	Total sick admissions	Dysentery percentage of total sick
July 9, 1941	88	1,170	7·5
" 16 "	79	1,090	7·3
" 23 "	50	935	5·4
" 30 "	72	1,078	6·7
August 6 "	52	1,145	4·5
" 13 "	40	1,155	3·5
" 20 "	35	1,045	3·4
" 27 "	37	1,020	3·6
September 3 "	40	990	4·0
" 11 "	43	965	4·5
" 18 "	30	1,200	2·5
" 25 "	30	982	3·0
	596	12,775	4·7

It is to be noted in Table 17 that:

(*a*) progressive decline in incidence occurs over successive weeks and, what is possibly more significant, the usual autumnal secondary rise is absent;

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(*b*) there is an increase in the incidence owing to the introduction to the force of cases and carriers of amoebic dysentery among troops returning from East Africa and troops from the Union, Mauritius, Seychelles, etc. No cases were traceable to a primary source in the Western Desert.

The Enteric Group

During the first quarter of 1941 only one, but in the second, eight cases were reported as follows:

	Source of Infection
(1) 2 Mauritians—Paratyphoid B. carriers 18.7.41	Mauritius
(2) 2 Polish O.Rs.—Typhoid Fever 7.7.41 . .	Alexandria area
1 N.Z. O.R.—Typhoid Fever 16.9.41 . .	Helwan
1 British Officer—Typhoid Fever 19.9.41 .	Gerawla Camp
(3) 1 British Officer—Paratyphoid C. 7.9.41 .	?
(4) 1 S.A.A.F. Officer–Unclassified Enteric Fever 5.9.41	Delta

In all but the single case of Paratyphoid C. infection movements indicated infection before entering the Western Desert.

Infective Hepatitis

In the first quarter of 1941 mention was first made of this disease, which was to prove so formidable in its effects and so difficult of prevention and treatment. Cases began to occur sporadically in all areas and all formations. The high rate of incidence among officers, which was so remarkable a feature of the disease, was at once noted. In the second quarter the number of cases was as follows:

July . . .	18
August . .	54
September . .	62
	134

About half of these cases were evacuated to the base. In general an absence from duty of a month to six weeks was caused. An autumnal rise in the incidence, equally widespread in all areas, was noted.

Relapsing Fever

This was first diagnosed in an Indian follower in early June 1940. A search was then instituted for other cases and 33, all Indians, were definitely diagnosed by demonstration of the infecting spirillum. Nearly all the cases came from two units. The early cases were reported as probably tick-borne as no lice were found on the patients and many of them complained of having been bitten by ticks. Later lice were found at routine inspections of these units and the men were disinfested. After the move of both units to new locations the number of cases

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dropped rapidly. But it remained uncertain what was the vector. Many ticks were identified but none belonging to the species known to carry relapsing fever.

This disease began its reappearance soon after Indian 4th Division returned to its old sites. Twenty-eight cases, all except five in Indian troops, were reported. One of the five cases was a Libyan refugee who was lousy. No evidence of lice was found in any other cases.

Cases in the second quarter of 1941 were as follows:

	British	*Indian*	*U.D.F.*	*A.I.F.*	*Libyan*	*Totals*
July . .	—	21	5	2	2	30
August . .	1	6	2	—	1	10
September .	3	1	—	1	1	6
Totals . .	4	28	7	3	4	46

These figures indicate two factors:

1. Highest incidence in midsummer with rapid decline at the approach of autumn.
2. High incidence in Indian troops in the Baqqush Box. Remaining cases originated in Matruh garrison.

Diphtheria

During the first quarter of 1941, 13 cases were reported, one resulting in death. This case ran a most atypical course and was more in the nature of a gangrenous pharyngitis, but *C. diphtheriae* were found in a specimen taken post-mortem. Seven cases occurred in the 1st Royal Sussex Regt. where investigations by the mobile laboratory discovered a number of carriers and three cases where virulent *C. diphtheriae* were recovered from desert sores.

During the second quarter cases were reported as follows:

	July	*August*	*September*	*Totals*
Royal Sussex Regt. .	5	16	5	26
Others	6	10	16	32
Totals	11	26	21	58

It is seen that during the quarter nearly half the number of cases of diphtheria were provided by one unit, the 1st Royal Sussex Regt. All cases were sporadic and unconnected, no other unit having more than two cases. The Royal Sussex Regt. first became infected in East Africa where a number of cases occurred. Infection continued to cause casualties during a rest period at Mena and cases occurred in the unit on its arrival in the Western Desert at the end of June.

Desert Sores

This condition accounted for at least 50 per cent. of minor sick reporting to R.A.Ps. and M.I. Rooms. The hospitalisation rate was of

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PLATE XXIV. The Entrance to an Italian Military Hospital in Bardia.

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PLATE XXV. An Italian Field Hospital abandoned during the Retreat to the West.

[*Imperial War Museum*

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course much lower. 60–70 per cent. of cases were primarily traumatic and a further 15 per cent. originated in insect bites.

Malaria

Cases reported were as follows:

TABLE 18

1941

	July	August	September	Totals
B.T. Primary	8	14	61	83
Relapse	11	6	20	37
M.T. Primary	4	39	38	81
Relapse	8	27	9	44
Quartan Primary	1	—	—	1
Relapse	1	—	—	1
Clinical	11	21	24	56
Totals	44	107	152	303

The incidence of malaria was due to the increase of the garrisons of the Oases of Siwa and Giarabub.

At the end of July, before the large-scale occupation of Siwa, a R.A.M.C. officer was despatched to carry out a malarial survey there. Two malarial vectors were found—*Anopheles superpictus* and *Anopheles sergenti.* These were found breeding in collections of water formed from overflows from irrigation channels and pond reservoirs. Most of these collections could be dealt with by repairs to the sides of the channels and by clearing of vegetation.

Spleen and parasite rates indicated higher endemic malaria among the local inhabitants and so all anti-malarial precautions, including suppressive quinine, were ordered. Quinine was recommended only because the general situation made it essential that the troops should remain in the garrison, as reinforcement was difficult. Oiling of water was not resorted to immediately but became necessary later as breeding spread to collections that could not be dealt with by manual labour. A stock of Malariol was therefore despatched with the necessary spray pumps. In spite of precautionary measures a large increase in the incidence of primary malaria occurred in August and September. This increase was made up entirely of cases from the garrison of Siwa. As usual a small number of cases were traceable to the Delta. No primary cases were contracted in other parts of the Western Desert.

On the whole, suppressive quinine did not prove a success and the U.D.F. battalion that composed the garrison, as well as producing 39 cases in the course of two weeks, had undoubtedly a high percentage of sub-clinical infections. Investigation showed that this was due in

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large part to slackness in anti-mosquito discipline—in the use of nets, protective clothing and cream.

Giarabub was surveyed early in August. The following were the findings:

1. No anopheles were found.
2. Numerous possible breeding places existed.
3. No reservoir of infection existed because the native population had been absent from the area for nearly a year.

Since, however, the possible introduction of both the vector and the disease by convoys passing through Siwa to Giarabub had to be considered, the following steps were recommended:

1. Filling in of all water collections not required for supply purposes.
2. Anti-mosquito precautions to be observed by all troops.
3. Periodic mosquito surveys to detect introduction of anopheles.
4. Suppressive quinine withheld so that the comparatively few cases expected to develop should become apparent and be evacuated.

161st Inf. Bde., after a period of service in West Africa during which time, according to reports, 80 per cent. of the men of this formation were infected with malignant tertian malaria, moved into the Baqqush position where, owing to the absence of anophelene vectors, it was thought that they would have a chance to recuperate. 13 Fd. Amb., attached to the brigade, opened a 50-bed hospital for treatment of the expected relapses; here examination and categorisation according to fitness for duty of the whole brigade were undertaken. The findings and the subsequent low relapse rate (less than 50 cases) belied the original gloomy prognosis. A month's recuperation by the sea dispelled the introspective attitude fostered by the invalid treatment the men had had and by September the brigade as a whole was fighting fit and was indeed undertaking the full duties of an infantry brigade in war.

Sandfly Fever

The discovery of genuine specimens of *Phlebotomus papatasii* in Matruh cleared up the doubt that existed regarding the aetiology of a three days' pyrexia accompanied by headache and general pains which was widespread in all areas but transient and involving little prolonged absence from duty. The diagnosis of sandfly fever was long doubted because of two factors:

1. comparative mildness of symptoms in all cases with absence of the prostration which is a feature of the typical case;
2. the sandfly itself long eluded identification by competent observers.

HYGIENE

Almost all the troops in the Western Desert were catered for by a conservancy contractor when war broke out. As might have been

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foreseen, the contractor's employees immediately ran away, with the inevitable result that there was considerable disorganisation and fouling of ground until units got their local sanitary arrangements tightened up. Matters were made worse by the arrival of Cypriot troops with no hygienic training and no medical supervision or organised sanitary labour. Improvement of this deplorable state of affairs was effected by 2/1 Lt. Hyg. Sec. which also proved invaluable in visiting, advising and helping in sanitary work such small units as M.T. companies, R.E. construction companies, ordnance field workshops and the like, which joined the Force without medical officers or trained sanitary personnel.

The deep trench latrine was the approved pattern in all places except temporary bivouacs and certain water-bearing areas where shallow trench latrines had to be used, but the supply of superstructures for latrines and for Otway Pits was not equal to the demand.

By mid-1941, D.D.M.S., W.D.F., had cause to observe that:

'Deep trench latrines remained the standard method of disposal in the Western Desert except in the water-bearing areas. Here bucket latrines are used and the contents emptied into Otway Pits.

'A year's experience of Otway Pits shows this method to be ideal, except that units will still, despite threats and warnings, carry their rubbish and swill long distances to empty them into Otway Pits. If this material is not speedily removed and burnt the natural operation of decomposition of faeces within the pits is soon disturbed, smells result and flies are attracted.

'The general standard of hygiene in the Force is now deplorably low and discipline in this, as in other matters, is very lax.

'It is inevitable that the high state of sanitary efficiency of the Regular Army units which composed this force a year ago should be watered down by other reinforcements, and in fact, by whole formations not used to life and war in a desert area. The state of absolute helplessness and supineness displayed shows the dependence on other arms of the Service to do the "chores", which must be a feature of administration in other theatres of war. Owing to the shortage of timber and other supplies the construction of sanitary appliances has been difficult and gift of improvisation not often seen.

'Swill and rubbish are being burnt generally though there still exist, unhappily for their neighbours, units who prefer to maintain filthy collections of rubbish and food tins in and around their camps. Anti-fly supplies have been available, but not readily so, and in fact if the obtaining of Flysol, fly pumps, etc., is made any more complicated than drawing rations, units are too apathetic to take further steps.

'The recognised issue fly-trap has worked well on the whole; the ideal bait has yet to be found. It is not widely enough known that it is a light-attraction trap and that therefore each day's catch should be

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destroyed each afternoon. The "Bruton" fly and larvæ trap has shown very promising results and can undoubtedly produce in a few days a very striking diminution in flies in a badly infested area.' (*See* Plate XX.)

It may be mentioned that one unit of 7th Armd. Division which had been suffering badly from flies reported: 'We now realise that it was our own fault and that we can beat the fly.'

No mobile bath unit was operating in the W.D.F. All units who could possibly do so were encouraged to allow their men to bathe in the sea as often as possible.

Later, D.D.M.S. records: 'It can be fairly said that an improvement in sanitary discipline is apparent in the force . . . Dysentery has definitely decreased and the expected autumnal rise has so far not developed.

'The courses run by the Middle East School of Hygiene are undoubtedly having valuable results, especially the officers' courses. The average junior combatant officer is woefully ignorant on matters of sanitation and looks on it as being something faintly amusing and possibly slightly vulgar, or tends to leave sanitation to look after itself or to consider it the affair of the long-suffering "doctor", a feeling too readily transmitted to the soldier. Attendance at an interesting and practical hygiene course does much to neutralise this attitude and units are urged to make full use of the vacancies allotted to this force. An increase in the number of vacancies would be desirable, especially, as stated above, for officers' courses.'

WATER SUPPLIES

Lack of water constitutes probably the greatest problem of desert warfare. In the coastal area the shallow layer of fresh water beneath the rock that underlies the surface sand rests upon a substratum of salt water filtered in from the sea. It was therefore impossible to sink wells. The Romans of classical times overcame this difficulty by constructing stone aqueducts into which the fresh water could trickle and out of which it could be pumped without drawing up the salt water from below.

The main sources of water for the force were:

(*a*) Such aqueducts, repaired and developed by the R.E., at Mersa Matruh, Maaten Buqqush and Birbeita. Later, pipelines were laid to new water points. The water thus obtained was good and easily rendered sterile, but unfortunately the amount available was limited by the fact that over-pumping at once produced salinity.

(*b*) Water trains from Alexandria.

There was the further difficulty of distribution to forward and dispersed troops for whom water carts and containers were not available

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in sufficient numbers. For some months the ration was from 1 to 1½ gallons per man per day and no washing was possible except in the sea.

Early in 1941 water was available by pipe-line from Alexandria at Daba. The Birbeita–Matruh pipe-line was in full operation and the extension to Charing Cross, 12 Kms. south-west of Matruh, was used for supplying forward units.

Apart from the Birbeita–Baqqush system bulk chlorination was not done because of technical difficulties. No automatic chlorination plant was in operation in the force.

RATIONS

The ration during 1940 was comprehensive and contained all necessary ingredients, but the conditions under which 7th Armd. Division were operating rendered cooking very difficult, so that such fresh vegetables as could not be cooked in salt water were useless.

Anti-scorbutic tablets were available for issue but it was thought that it would be difficult to ensure the swallowing of these tablets by small and isolated detachments. The issue of lime juice and tinned fruits was therefore recommended as these are popular and readily consumed by the troops. A tobacco ration was also issued.

During the first quarter of 1941 supplies of fruit and vegetables were generally satisfactory, but in the second the lack of potatoes and of a continuous fresh vegetable supply was much felt and the diet tended to be a little monotonous because of this shortage. The difficulties of supply and transport, especially to the forward areas, were however appreciated and supply services were always found willing and prompt to carry out any special issues of vitamin concentrates recommended on medical grounds.

The dangers of inexperience in the handling of tinned rations and in their issue and acceptance were emphasised on September 22, 1941, when a very acute outbreak of food poisoning, involving 105 cases, occurred in the H.Q. Camp, XIII Corps Area H.Q. The men affected had all had breakfast three hours previously from the same cookhouse, that of 4 L. of C. Signals, and were suddenly stricken with acute abdominal pains, vomiting, diarrhoea, and in many cases, collapse. They were all admitted to hospital and treated within an hour of the onset of symptoms. No deaths occurred and all returned to duty within seventy-two hours. Investigation narrowed the source of infection down to sausages issued for breakfast, and it was found that the cook had removed the sausages from their tins the evening before, put them all together in one baking dish and kept them in the oven overnight. There is no doubt that one tin at least was faulty and contaminated and should have been suspect. Nevertheless, the harm was very much aggravated by the twelve hours' incubation in the oven with its consequent

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enormous increase in toxic output. Cooking next morning sufficed to kill all bacteria so that nothing could be cultured from any food debris, vomit or faeces, but the toxin had drastic effects. This is only one example of ignorance on the part of those responsible for the feeding of troops. The victims stated definitely that the sausages had a 'funny taste', and it is likely that the most rudimentary interest in the tin and its contents before cooking would have revealed the fault.

D.D.M.S. XIII Corps records: 'Again and again it has been urged that rations should not only be examined before cooking by a competent officer or N.C.O. but should be drawn by a N.C.O. who knows his job and not, as is so often the case, by the first man the R.S.M. sees without occupation. Had the organism been other than a simple staphylococcus, as it probably was, this outbreak would not have had such a happy ending.'

CLOTHING

The change from serge battle dress to shirts and shorts for units operating in the desert and to khaki drill for those elsewhere was made in April. This change was generally welcomed, but laundry arrangements in the desert presented a problem which was not satisfactorily solved. Moreover, the efforts of a well-meaning government to protect the knees of its M.E. troops from insect bites were not appreciated since the first action of almost every man to whom a pair of the new turn-up shorts was issued was to have them converted into the customary article. In view of the number of cases of heatstroke or sunstroke during the first quarter, strict measures were taken to ensure the wearing of sun helmets by all ranks during the hours 0900 to 1600. These rules were relaxed on September 15.

MEDICAL STORES

During July 1941 medical units in the force obtained their medical stores from an improvised 'force store' in Matruh administered by A.D.M.S. 91 Sub-Area and staffed by personnel detached from medical units. This worked well, the only difficulty being that it had no authorised establishment with a Q.M. in charge.

On August 1, 7 Adv. Depot Med. Stores opened at Ikingi Maryut as the Medical Store for the force. Owing to its location so far back and difficulties in communication, there was great delay between a unit putting in its indent and the receipt of the stores. Because of these difficulties the depot moved to Baqqush on September 1. Thereafter units were able to send their transport to the depot and collect stores there.

5 Base Depot Med. Stores was far from expeditious in its despatch of stores either to the force medical store in Matruh or to the advanced

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depot. The delay between the receipt of the indent and the despatch of the stores was at times as long as two months. This sometimes led to acute shortage of essential stores and to much anxiety.

A 90-day siege reserve was held in Matruh and a 30-day reserve in Baqqush.

The supply of medical stores to a force advancing as rapidly as the W.D.F. and fighting four major actions in two months would, at first sight, appear to be a difficult problem, particularly when it is considered that the force was out of touch with railways and short of transport for anything but the most essential stores.

As a matter of fact, and more by luck than skilful planning, there was never a shortage of medical stores in the forward area during the whole campaign. This was due to two factors:

(1) the accumulation during 1940 of a large siege reserve of medical stores in Matruh for use in case of isolation by investment; and
(2) the capture of large amounts of enemy medical stores.

The siege reserve of medical stores was used in the preparatory stage to replenish and stock all medical units in the forward area. By this means sudden large indents on advanced and base depots medical stores, which might call attention to military intentions, were avoided. When Sidi Barrani had fallen, the risk of investment of Matruh became negligible and all remaining reserves were moved forward, first to Sidi Barrani and later to Bardia as part of the load of the advanced C.C.S. which transport of the corps field ambulance was called upon to carry. The move of these stores generally called for some planning and timing so as not to interfere with other calls on the transport of the unit concerned, but they always managed to keep pace with the movement of the force as a whole.

Further supplies of medical stores were sent up with the C.C.Ss. (15 and 2/2 Aust.), landing at Sollum and Tobruk respectively, but were not used by divisional units to any great extent before an advanced depot of medical stores was finally landed at Tobruk. This was due to the fact that R.M.Os. and field ambulances were able to replenish their stock of bandages, dressings, etc., from captured enemy stores, while no treatment of sick was being carried out in areas in advance of the C.C.S. It should be added that the use of enemy stores for our own troops did not interfere with the treatment of enemy casualties in Italian hospitals. Supplies were ample for all and large amounts still remained in hand at the end of the campaign.

The only medical requirement of which a deficiency was threatened at any time was stretchers. Ample stocks were available at the start of the campaign but reserves, when once issued, are notoriously difficult to collect once more. In spite of repeated orders and instructions a large number of stretchers 'disappeared', possibly with outgoing units of

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Indian 4th Division or more probably to illegitimate uses in non-medical units.*

Requisitions for stores, stretchers, etc., from divisional medical units were passed back to Adv. C.C.S. by M.A.C. cars and replenishments brought up by the same means. The officer commanding the M.A.C., was ordered to establish a 'clearing house' system by which the receipt and delivery of requisitions and stores could be checked.

The Red Cross again generously supplemented medical comforts. A new introduction was the Dunlopillo mattress, a number of which were supplied for the greater comfort of surgical cases being transported by ambulance car. The R.M.Os.' armoured cars were altered to take one lying case on a Dunlopillo mattress and three sitting. The mattress was fitted into a skeleton frame with a webbing attachment and could be used as a stretcher.

APPENDIX VIII

WESTERN DESERT FORCE

Order of Battle, June 11, 1940 (*abbreviated*)

H.Q. W.D.F.
- Signals. New Zealand 2nd Division
- Sappers and Miners, 4 Field Company, Indian 4th Division
- 11th Field Park Company, Indian 4th Division
- 4/7th Rajput Regiment, Indian 4th Division

7th Armoured Division
- 4th Armoured Brigade
  - 7th Hussars (medium tanks)
  - 6th Royal Tank Regiment (medium tanks)
- Support Group
  - 1st King's Royal Rifle Corps (motorised)
  - 2nd Rifle Brigade (motorised)
  - and R.A. units
- Divisional Troops
  - 11th Hussars (light tanks)
  - and R.E. units

22nd Infantry Brigade
- 2nd Highland Light Infantry
- 1st Welch Regiment

* The 'disappearance' of stretchers and blankets required by medical units is a matter which demands close attention by medical and Q staff. The bulk of these losses occurs on the L. of C. at Staging Posts and at bases where personnel of every class and rank appropriate stretchers for use as beds or even as store-racks. The loss of stretchers may cause serious embarrassment to forward medical units in times of emergency. Strict disciplinary control and an organised system of return are needed.

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1st Cheshire Regiment
3rd Coldstream Guards, expected shortly

Indian 4th Division
Indian 5th Infantry Brigade
1st Royal Fusiliers
3/1st Punjab Regiment
4/6th Rajputana Rifles
Indian 11th Infantry Brigade
2nd Queen's Own Cameron Highlanders
1/6th Rajputana Rifles
4/7th Rajput Regiment
Divisional Troops and Services

New Zealand 2nd Division
New Zealand 4th Brigade
New Zealand 18th Battalion
New Zealand 19th Battalion
New Zealand 20th Battalion
New Zealand 27th Battalion (M/G)
New Zealand 2nd Cavalry Regiment
Divisional Troops and Services

APPENDIX IX

WESTERN DESERT FORCE

Order of Battle, Operation 'Compass,' December 9, 1940 (*abbreviated*)

Protection of Vulnerable Points in Rearward Areas.
1st Royal Sussex Regiment, Indian 7th Infantry Brigade, Indian 4th Division
4/11th Sikh Regiment, Indian 7th Brigade, Indian 4th Division

W.B.F. Reserve
Indian 7th Infantry Brigade, less two battalions
4/16th Punjab Regiment

Matruh Force ('Selforce'). The Garrison
7th Hussars, one squadron
3rd Coldstream Guards, two companies
1st Royal Northumberland Fusiliers, one company
1st South Staffordshire Regiment, one company
1st Cheshire Regiment, one company
1st Durham Light Infantry, detachment

7th Armoured Division
4th Armoured Brigade (as in Appendix VIII)

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Support Group (as in Appendix VIII)
7th Armoured Brigade, less one regiment attached to Indian 4th Division
3rd Hussars (medium tanks)
2nd Royal Tank Regiment (medium tanks)

Indian 4th Division, with under command 16th Infantry Brigade and 7th Royal Tank Regiment of 7th Armoured Brigade (heavy 'I' tanks)

Indian 5th Infantry Brigade (as in Appendix VIII) plus 1st Royal Northumberland Fusiliers, 'Z' Company

Indian 11th Infantry Brigade (as in Appendix VIII) plus 1st Royal Northumberland Fusiliers, 'Y' Company

(Br.) 16th Infantry Brigade
1st Argyll and Sutherland Highlanders
2nd Leicesters
1st Cheshire, 'D' Company

Divisional Troops, including The Central India Horse

APPENDIX X

XIII CORPS

Order of Battle, January 1, 1941 (*abbreviated*)

H.Q. XIII Corps
7th Armoured Division
4th Armoured Brigade
7th Hussars
2nd Royal Tank Regiment
7th Armoured Brigade
3rd Hussars
8th Hussars
1st Royal Tank Regiment
Support Group
11th Hussars
1st King's Royal Rifle Corps
2nd Rifle Brigade
Australian 6th Division
Australian 16th Infantry Brigade
Australian 2/1st Battalion
Australian 2/2nd Battalion
Australian 2/3rd Battalion
1st Royal Northumberland Fusiliers, company (M/G)

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Australian 17th Infantry Brigade
Australian 2/5th Battalion
Australian 2/6th Battalion
Australian 2/7th Battalion

Australian 19th Infantry Brigade
Australian 2/4th Battalion
Australian 2/8th Battalion
Australian 2/11th Battalion

(Br.) 16th Infantry Brigade
2nd Queen's Own Royal Regiment
2nd Leicesters
1st Argyll and Sutherland Highlanders

APPENDIX XI

CYRENAICA COMMAND

(*April* 1–14, *thereafter W.D.F.*) (*abbreviated*)

H.Q. 'Cyrcom'.
2nd Armd. Division
Australian 9th Division
H.Q. Benghazi B.S.A.
H.Q. Tobruk B.S.A.
H.Q. Bardia–Sollum B.S.A.

Mobile Force in Forward Area
7th Armoured Division

Matruh Fortress
H.Q. Matruh B.S.A.
Australian 7th Division (until June, then S.A. 1st Division—S.A. 2nd and 5th Bdes., Polish Carpathian Bde.)

Baqqush Box
Indian 4th Division

Tobruk Fortress
Australian 9th Division (operational only)
82 L. of C. S.A. (later 83)

Medical Units
April 1–14
2/4 A.G.H.
2/2 (Aust.) C.C.S.
15 C.C.S.
15 I.G.H., Section
18 I.S.S.
5 Adv. Depot Med. Stores

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	5 Mob. Bact. Lab.
	1 Mob. Ophthalmic Unit
	16 M.A.C.
	36 Fd. Hyg. Sec.
April 15–June 30	17 C.C.S.
	2 (Ind.) C.C.S.
	15 I.G.H., Section (Left W.D.F. in May)
	12 I.S.S. (Left W.D.F. in May)
	7 M.A.C.
	11 M.A.C. 'C.' Section
	5 Mob. Bact. Lab.
	2 F.T.U.
	Surg. Team of 6 B.G.H. (Left W.D.F. June 28)
	Surg. Team of 9 A.G.H.
	173 Fd. Amb.

3 Lt. Fd. Amb. with 2nd Armd. Division.
2/3, 2/8, 2/11 (Aust.) Fd. Ambs. with Australian 9th Division.
2/4 (Aust.) Fd. Hyg. Sec. with Australian 9th Division.
11 and 12 (S.A.) Fd. Ambs. with S.A. 1st Division.
Polish Carpathian Fd. Amb. Polish Fd. Hyg. Sec. } (Joined W.D.F. beginning of June)
14, 17, 19 (Ind.) Fd. Amb. with Indian 4th Division. (14 left W.D.F. mid-May)
15 (Ind.) Fd. Hyg. Sec. with Indian 4th Division.
14, 215 Fd. Ambs. with 6th Division (215 left W.D.F. June 22)
33 Fd. Hyg. Sec. with 6th Division (Left W.D.F. June 20)
13, 15, 151 Lt. Fd. Ambs. with 7th Armd. Division.
7 Lt. Fd. Hyg. Sec. with 7th Armd. Division.
2/4, 2/6 (Aust.) Fd. Ambs. with Australian 7th Division.
2/2, 2/6 (Aust.) Fd. Ambs. with Australian 7th Division. } (Left W.D.F. end of May)
4 A.C.C. 'C' Section.
1 A.C.C. 'C' Section.

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APPENDIX XII

THE ORGANISATION OF THE MEDICAL BRANCH, G.H.Q., M.E.F.

- **D.M.S. (1)**
  - Brigadier Deputy to D.M.S.
    - Operations
    - Planning
    - Tours of Inspection
    - **A.D.M.S. (Lt. Col.)**
      - Moves of Medical Units
      - Liaison — P.M.O., R.N., and R.A.F.
      - W.S. Convoys-Units
      - War Diary
    - **D.A.D.M.S. (Maj.)**
      - Evacuation of Casualties and Invalids
      - Questions affecting Casualties
      - Means of Evacuation
      - Hospital Ships
      - Ambulance Trains
      - Motor Ambulance Convoys
- **D.M.S. (2)**
  - A.D.M.S. (Colonel)
    - Personal Services
    - Officer Personnel
    - Officer Postings
    - Officer Appointments
    - War Establishments—Policy
    - D.M.S. Administrative Instructions
    - Consultants
    - **A.D.M.S. (Lt. Col.)**
      - Medical W.E.s
      - Officer Reinforcements
      - Applications for Employment
      - Civilian Personnel
      - P.A.D. – Medical Questions
      - Personnel Training
    - **D.A.D.M.S. (Maj.)**
      - Reinforcements—Medical
      - Postings — Other Rank Personnel
      - Promotions – Other Rank Personnel
      - Personnel Statistics
    - **Staff Captain**
      - Medical Boards
      - Order of Battle
      - W.S. Convoys–Drafts
      - Medical Library
      - War Diary
- **D.M.S. (3)**
  - **A.D.M.S. (Lt. Col.)**
    - Bulk Estimated Requirements
    - Indents—Planning
    - Local and Other Resources
    - Depots of Medical Stores
  - **D.A.D.M.S. (Maj.)**
    - Supplies within Command
    - Medical Equipment
    - British Red Cross Stores
    - American Red Cross Stores
    - Canadian Red Cross Stores
  - **Staff Captain**
    - Ordnance Equipment
    - R.E. Stores and Equipment
    - Medical Comforts
    - Vehicles
- **D.M.S. (4)**
  - Principal Matron
    - Matron
      - Nursing Services
- **D.M.S. (5)**
  - Deputy Director of Hygiene
    - Assistant Director of Hygiene
      - Hygiene
      - Disinfestation
      - Water Supplies
      - Rations; Clothing
      - Barrack Accommodation
      - Anti-Malarial Measures
      - Medical Statistics
      - Recruiting and Standard of Fitness
      - Mobile Hygiene Laboratories
- **D.M.S. (6)**
  - Deputy Director of Pathology
    - Deputy Assistant Director of Pathology
      - Pathology Laboratories
      - Mobile Bacteriological Laboratories
      - Inoculations and Vaccinations
      - Blood Transfusion Service
      - Chemical Warfare Research
- **D.M.S. (7)**
  - Deputy Director of Dental Service
    - Army Dental Service
- **D.M.S. (8)**
  - Consultants
    - Consultant Surgeon
    - Consultant Surgeon (Orthopaedic)
    - Consultant Physician
    - Consultant in Tropical Diseases
    - Consultant Ophthalmologist
    - Consultant in Psychological Medicine
    - Consultant Neurologist
    - Consultant Malariologist
    - Adviser in Radiology
    - Adviser in Venereology

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CHAPTER 5

THE CAMPAIGN IN LIBYA

B. July 1941-August 1942—General Auchinleck

Précis

GENERAL Auchinleck succeeded General Wavell as G.O.C., M.E.F., on July 5, 1941.

During the months that followed the abortive Operation 'Battleaxe' in June 1941, both sides busied themselves with re-equipment and reinforcement.

The exertions of the Malta garrison, of the Royal Navy and of the Royal Air Force at this time were creating serious difficulties for the Axis forces by disrupting their supply line across the Mediterranean.

The Axis forces were holding the line Sollum–Halfaya–Sidi Omar. Eighth Army was reorganised into XIII and XXX Corps. In the beleaguered fortress of Tobruk was 70th Division. South African 2nd Division had reached the Desert and was in reserve. There was no great disparity between the antagonists in respect of the numbers of men, tanks and aircraft, but the Germans had better planes and better A/T guns. They had also achieved a greater degree of integration in the tactical employment of armour, artillery and infantry. Both General Rommel and General Auchinleck were preparing to attack in November, the former to reduce Tobruk, the latter to clear Cyrenaica of enemy forces.

On November 18, 1941 Eighth Army struck. For the first three days all went well. During the 22nd and 23rd one of the most extensive tank versus tank battles of the war was fought around the Sidi Rezegh escarpment and airfield. The British armour failed to secure the escarpment. Heavy tank losses were endured.

On the 24th, General Rommel hurled his armour eastwards into the rear areas of Eighth Army, to cause great confusion. H.Q. XXX Corps was forced to seek refuge in Tobruk and H.Q. XIII Corps lost contact with its component formations. General Cunningham, commanding Eighth Army, was reaching the conclusion that the offensive should be discontinued; General Auchinleck, however, decided that Eighth Army should fight it out.

General Ritchie succeeded General Cunningham in command of Eighth Army. The New Zealand Division attacked, regained the key position at Sidi Rezegh and joined up with elements of the Tobruk garrison at El Duda. But at once the Axis forces counter-attacked and drove the New Zealanders back. Tobruk was cut off once more.

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On December 2, XIII Corps struck against Sidi Rezegh and El Adem. General Rommel concentrated his armour about El Gubi. Indian 4th Division attacked and drove the Axis armour back. General Rommel decided to cut his losses and retire. On December 9 Tobruk was finally relieved. XIII Corps then pursued the Axis forces westwards to Agedabia and El Agheila. S.A. 2nd Division stormed Bardia on January 2, 1942 and on the 17th the Halfaya garrison capitulated.

Losses in men and material were severe on both sides. Nevertheless, less than a fortnight after he had reached the El Agheila line General Rommel was able to counter-attack and, in the course of seventeen days, to fling Eighth Army back to the Ain el Gazala position, which was reached on February 7. The reasons for this setback were various. Eighth Army was not in a condition to withstand a serious onslaught in front of El Agheila. Its supply ports were too remote, its numbers far too few, its replenishments in respect of armour too tardy. Moreover, the Germans had taken adequate steps to reinforce and re-equip General Rommel in Tripoli. Malta had been pounded unmercifully and the Mediterranean rendered unsafe for shipping by the intensified activities of German submarines. So it was that Eighth Army at this time was unable to prevent the unexpected Axis attack or to hold it when it was launched.

The Gazala position consisted of a number of defended localities—'boxes'—strung in a line from Gazala southward into the Desert. XIII Corps garrisoned these boxes while XXX Corps remained mobile.

On May 26 General Rommel resumed the attack and his armour reached Acroma, El Duda and Sidi Rezegh. Then, between May 28 and May 31, vicious and confused fighting raged without pause, especially in the Cauldron, west of the Knightsbridge Box held by the Guards Brigade. The Italians cleared two lanes in the minefields covering the boxline and on the night of the 31st the Axis armour withdrew into these lanes to rest and refit.

On June 1 the Axis armour emerged, to overwhelm 150th Inf. Bde. of 50th Division. On the night of the 4th, Indian 10th Division attacked the Axis leaguers, but the supporting armour encountered serious trouble and was repulsed. At once the Axis armour counter-attacked and overwhelmed Ind. 10th Bde. Next the Bir Hacheim Box (Free French) was attacked and its garrison forced to withdraw on the night of June 10/11.

On June 12 a fierce tank battle raged about Knightsbridge and El Adem. The British armour was worsted and in consequence the Guards Bde. was forced to withdraw from the Knightsbridge Box. This withdrawal bared the 50th Division Box and the Gazala Box (S.A. 1st Division). These formations were therefore obliged to withdraw to the east. S.A. 2nd Division was left in Tobruk.

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On June 20 General Rommel unleashed a most violent assault upon Tobruk. By 0745 hours on the 21st his troops had overwhelmed its garrison and were in full possession of the fortress.

With hardly a pause the Axis forces moved eastward, to cross the frontier on the 23rd. On June 25 General Auchinleck took over the command of Eighth Army, which moved back to the Matruh position and then to the Alamein Line, which was occupied on June 30.

For three days the situation remained exceedingly critical. But the Axis army was in no condition to reap fully the fruits of its victory. Then Eighth Army attempted to seize the initiative and launched a series of attacks upon the Axis positions. These being unsuccessful, this phase of the Libyan campaign was over by the end of July 1942.

(i)

The Advance

OPERATION 'CRUSADER'

In July 1941 General Wavell left the Middle East for India and in his place stood General Auchinleck. During the months that followed Operation 'Battleaxe', while much was happening elsewhere, upon the Western Desert had fallen a quiet as the antagonists built up their strength for a renewal of the conflict. By the end of October the railway had been extended to Misheifa, seventy-five miles to the west of Matruh, and a hundred and forty-five miles of water pipeline had been laid. Reinforcements of men and material had been reaching both sides. To the Desert had returned Indian 4th and New Zealand 2nd Divisions, there to be joined by South African 1st and 2nd Divisions. The British Commonwealth forces under Middle East Command were shortly to be regrouped into Eighth Army (The Western Desert), Ninth (Palestine and Syria), Tenth (Persia and Iraq) and British Troops in Egypt.

The Order of Battle of Eighth Army at this time is given in Appendix XIII.

In the north facing the Axis Line, which ran from Sollum along the escarpment to Halfaya and thence south to Sidi Omar, stood XIII Corps with S.A. 2nd Division in reserve. In the centre was 7th Armd. Division of XXX Corps and to the south, based on Giarabub, were 4th Armd. Bde., 22nd Gds. Bde. Gp. and S.A. 1st Division of XXX Corps.

Both commanders were planning to attack, General Rommel on November 23, General Auchinleck on November 18; the former to overwhelm Tobruk, the latter to destroy the Axis forces in Cyrenaica and to occupy Tripolitania (Operation 'Crusader').

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During this quiescent period the bulk of the forward troops in the Desert were engaged in strengthening three defended areas, at Alamein, Baqqush and Matruh. At the same time the oasis area about Siwa was being prepared as a base from which minor offensive operations could be launched against the southern flank of the Axis forces.

During this period, while Eighth Army was preparing for the coming offensive, small columns operated between the respective front lines between the coast west of Buq Buq and the vicinity of Sidi Omar. Each column had with it a medical officer and two or three ambulance cars. Evacuation was to the coast road by way of the best possible track and thence to 8 (S.A.) C.C.S. at Mersa Matruh. In the coastal sector 19 (Ind.) Fd. Amb. had a M.D.S. at Bir Mumin and an A.D.S. at Bir Salamus. In the Desert sector 5 Lt. Fd. Amb. had its M.D.S. at Bir Enba and 13 Lt. Fd. Amb. its M.D.S. at Bir Afrita. 14 Fd. Amb. (XIII Corps) established a S.P. and an advanced operating centre first at Km. 70 and later at Km. 127 on the Sidi Barrani–Matruh road. 7 M.A.C. was responsible for evacuation from the M.D.Ss. to Mersa Matruh.

'OASES' FORCE

The oases of Siwa, Giarabub and Gialo form a triangle, of which Giarabub is the north-westerly apex about sixty miles from Siwa, from which Gialo lies over two hundred and forty miles to the west. The fort at Giarabub had been held by an Italian garrison when General Wavell attacked in December 1940. It was easily captured by an Australian force (Aust. 18th Bde.) on March 21, 1941. Gialo remained in Italian hands.

In August 1941 elements of S.A. 1st Division and Ind. 7th Inf. Bde. of Indian 4th Division were sent to garrison Siwa and Giarabub; they came directly u/c Eighth Army.

MEDICAL COVER FOR 'OASES' FORCE

At Siwa . . .	8 (S.A.) C.C.S. (detach.)
	12 (S.A.) Fd. Amb. 'A' Coy.
	17 (Ind.) Fd. Amb. (detach.)
Giarabub . . .	17 (Ind.) Fd. Amb. (detach.)
William's Pass . .	17 (Ind.) Fd. Amb. 'B' Coy. staging post
Qaicab . . .	17 (Ind.) Fd. Amb. H.Q.
Bir Fouad . . .	17 (Ind.) Fd. Amb. (detach.)
	12 (S.A.) Fd. Amb. (detach.) S.P.

Evacuation was first to Siwa by ambulance car and thence by 'C' Sec. 11 M.A.C. to Matruh where 8 (S.A.) C.C.S. was located. To this C.C.S. were added Indian detachments from 15 I.G.H. at Cairo and 17 (Ind.) Fd. Amb. If necessary Indian casualties could be sent to 2 (Ind.) C.C.S. at Baqqush.

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In October Ind. 7th Bde. was relieved by Ind. 29th Bde. and 17 (Ind.) Fd. Amb. by 21 (Ind.) Fd. Amb.

OPERATION 'CRUSADER'—TACTICAL PLAN

The general plan was for XIII Corps to contain the enemy in the frontier area and coastal sector from Halfaya to Sidi Omar while XXX Corps made a wide encircling movement to the south and then swept northwards toward Tobruk, 70 miles away.

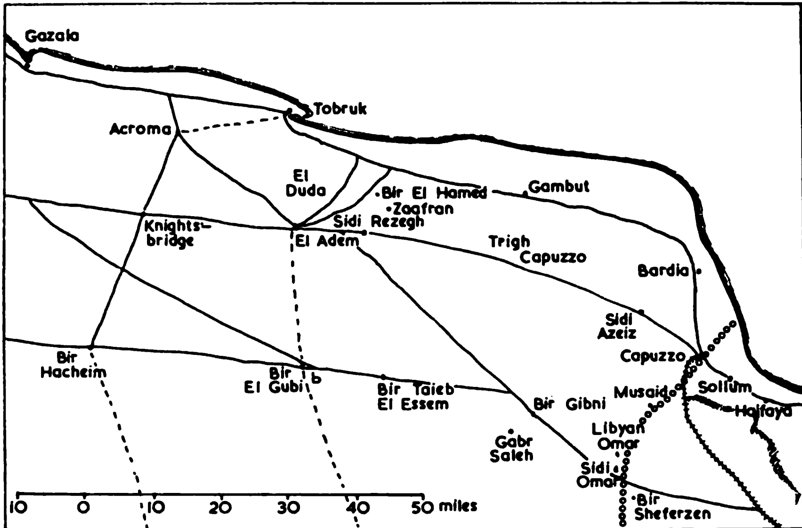

FIG. 31. Operation 'Crusader'. November 18, 1941. The Battlefield.

(*a*) Indian 4th Division would pin the enemy down in his positions with Ind. 5th and 11th Inf. Bdes., while Ind. 7th Inf. Bde. would secure a position astride the frontier and mask Sidi Omar.

(*b*) N.Z. 2nd Division would move round the flank and to the rear of the enemy positions and thrust to the north-west to link up with the garrison of Tobruk, thus isolating the enemy forces in Bardia, Sollum and Halfaya.

(*c*) 7th Armd. Division would pass through the frontier wire at Fort Maddalena and move to the west to Gabr Saleh, there to seek out the enemy armour and force it to give battle. S.A. 1st Division would protect the south and south-western flanks of 7th Armd. Division and later secure a defended locality around Bir el Gubi. 22nd Gds. Bde. would protect the L. of C. dumps and L.Gs. in the rear.

(*d*) When the enemy armour was thus engaged 14th and 16th Inf. Bdes. (70th Division) and 32nd Army Tk. Bde. of the Tobruk

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garrison would sally forth to El Duda, there to await the coming of the relieving force, while S.A. 1st Division would threaten the rear of the Axis forces investing Tobruk.

(*e*) In a diversionary operation Ind. 29th Inf. Bde. Gp. ('E' Force) at Giarabub would move on Gialo and thence thrust north-west to cut the Tripoli–Benghazi road.

(*f*) When the Axis armour had been destroyed Eighth Army would move with all speed on Benghazi and, if possible, on to Tripoli. The L.R.D.G. would observe enemy movements south of the Gebel Akhdar.

(*g*) The date of the attack would be November 18.

THE ATTACK

At dawn on November 18, Eighth Army attacked. As it moved forward 7th Armd. Division encountered no enemy and no hostile aircraft interfered. By nightfall 7th Armd. Bde. was ten miles to the north of Gabr Saleh, 22nd Armd. Bde. was to the rear of 7th Armd. Bde. and to the west of Gabr Saleh and 4th Armd. Bde. was nearing El Cuasc. On the 19th, 7th Armd. Bde. reached a position to the north of the Sidi Rezegh escarpment and 7th Sp. Gp. was on this escarpment. 22nd Armd. Bde. met and fought the Ariete Armoured Division at Bir el Gubi. 4th Armd. Bde. engaged a German armoured force east of Gabr Saleh.

On November 18, Ind. 7th Inf. Bde. established a defended area about Bir Sheferzen without opposition and on the 19th occupied Bir Bu Deheua, between Sidi Omar and Capuzzo. Its task was to cover the concentration of the New Zealand Division, to stop any Axis movement to the south from the Omars, to cut off the Axis forces in the Omars and to protect the right flank of the New Zealand Division.

On the 18th, N.Z. 2nd Division moved up to the frontier and crossed it some fifty miles from the coast. On the 19th, N.Z. 6th Bde. boarded its vehicles and, keeping out of range of the guns at Sidi Omar, moved along the Trigh el Capuzzo towards the airfield at Gambut.

On November 20 General Rommel seized the chance of dealing with the scattered British armoured brigades in turn. He flung a strong armoured force upon 4th Armd. Bde. at Gabr Saleh. At once 22nd Armd. Bde. was ordered to disengage at Bir el Gubi and hurry to the assistance of 4th Armd. Bde. The Axis armour withdrew, to return when 22nd Armd. Bde. had joined 4th Armd. Bde. After a while the Axis armour withdrew again and rushed north-west upon 7th Armd. Bde. and 7th Sp. Gp. at Sidi Rezegh. On the 21st it was the turn of 4th and 22nd Armd. Bdes. to hurry to the help of the threatened 7th Armd. Bde. and a fierce and long-continued tank battle began in the Sidi Rezegh area during which 7th Armd. Bde. suffered severely.

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On the 20th the sortie from Tobruk was launched. After very severe fighting 2nd Black Watch, the Bedfords, the King's Own and the Queen's, strongly supported by tanks and guns, gained their primary objectives and held grimly on to the salient thus created. But the opposition was so stiff and the losses so great that the operation was halted and the York and Lancaster Regiment did not pass through to secure further objectives. It is recorded that this fighting was the hardest that the Black Watch had known since Loos, and as at Loos the pipers played the battalion in.

Meanwhile, S.A. 5th Bde. of S.A. 1st Division, advancing in the direction of El Duda, was held up some ten miles from Sidi Rezegh by the Italian Ariete Division and N.Z. 5th Bde. captured Sidi Azeiz and established itself on the escarpment overlooking the Tobruk–Bardia road. During the 22nd heavy rain fell all day to turn the surface of the desert into red cloying mud. During the night of the 22nd/23rd the New Zealanders, on their way to assist 7th Armd. Division at Sidi Rezegh, captured Capuzzo. Throughout the 22nd and 23rd the tank battle raged about Sidi Rezegh and in the end 7th Armd. Division was forced off the Sidi Rezegh airfield and escarpment and withdrew to Gabr Saleh. S.A. 5th Bde., digging in on the southern escarpment of Sidi Rezegh, became involved, was overwhelmed and destroyed. Indian 4th Division occupied Sidi Omar and Omar Nuovo and the New Zealanders took the barracks at Sollum and Musaid. Their 4th Bde. cut the Tobruk–Bardia road, thus separating the Axis forces on the frontier and those in the west. Their 6th Bde. moved forward to take up a position to the east of that held by S.A. 5th Bde. The Tobruk garrison had now reached half way to El Duda.

The loss of the Sidi Rezegh escarpment imperilled the whole operation. A junction with the Tobruk garrison had not been effected. Tank losses had been heavy on both sides but the Axis recovery system was conferring the advantage upon them locally. Reserves were on their way to Eighth Army but could not arrive yet awhile.

N.Z. 6th Bde., u/c XXX Corps, attacked Point 175, on the ridge five miles west of Sidi Rezegh, won it and held it at heavy cost. Then N.Z. 4th Bde. pressed forward to link up with N.Z. 6th Bde., while N.Z. 5th Bde. remained to mask Bardia.

At this point General Rommel acted in a characteristically audacious manner. He rushed his 15th and 21st Panzer Divisions down the Trigh El Abd towards Bir Sheferzen into the rear areas of his opponent and among his soft-skinned transport in an attempt to disrupt the administrative and supply services and so force XXX Corps to fall back. The Axis armour outflanked 7th Armd. Division and overran its supply dumps, put XXX Corps H.Q. to flight and scattered the vast numbers of administrative and supply transport. The utmost confusion resulted.

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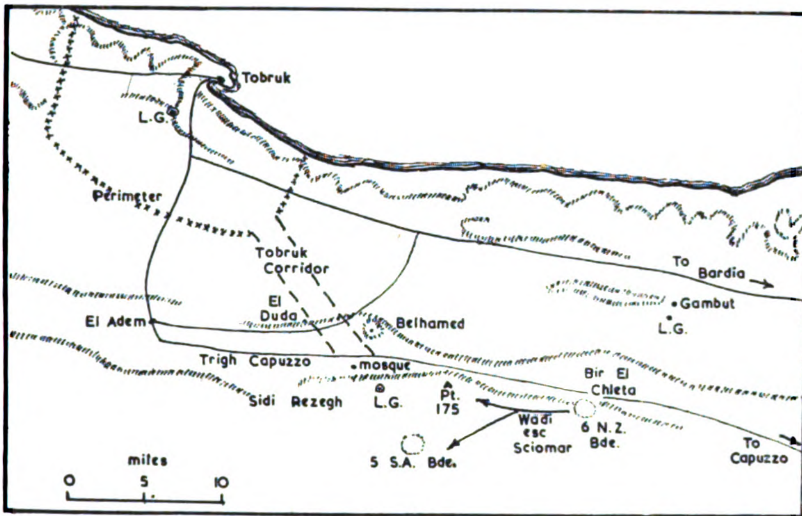

FIG. 32. Operation 'Crusader'. The Attack on Point 175 by N.Z. 6th Bde.

Units were taken prisoner only to become in their turn the custodians of their erstwhile captors.

General Cunningham, commanding Eighth Army, was rapidly reaching the conclusion that it had become necessary to abandon the offensive when General Auchinleck flew from Cairo to the battlefield on the evening of the 23rd, sensed the enemy's condition could not be so very much better than that of Eighth Army and issued orders that the offensive should be continued. General Ritchie replaced General Cunningham on the 26th. He organised a number of small groups of guns, armoured cars and lorried infantry—'Jock columns'—and sent these out into space to harass, destroy and cause havoc in the rear of the battlefront of the Axis forces. S.A. 1st Bde. at Bir Taieb el Essem and Indian 4th Division at the Omars stood fast while the armoured car regiments and S.A. 4th and 6th Bdes. of S.A. 2nd Division did much to prevent the enemy raiding columns completing the disorganisation of the rear areas.

Indian 4th Division was placed in command of the area Capuzzo–Bardia–Omars and New Zealand units in the Capuzzo area came under its command. On November 25 Axis columns appeared to the east of the Omars, but after fierce fighting withdrew. Ind. 5th Inf. Bde., which had been engaged on L. of C. duties, was reconstituted and moved to Conference Cairn.

By the 27th the Axis raiding columns had been pulled back to the Sidi Rezegh area to deal with the 4th and 6th Bdes. of the New Zealand Division which had opened a corridor to Tobruk through Sidi Rezegh, Zaafran and Belhamed and had linked up with the Tobruk garrison at

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El Duda. The New Zealanders were forced back. Again N.Z. 6th Bde. attacked and took Sidi Rezegh, but H.Q. New Zealand Division, H.Q. XIII Corps, less Battle H.Q., N.Z. 18th Bn. and two companies of N.Z. 19th Bn. were obliged to withdraw into Tobruk and the fortress was invested once more on December 1, although Aust. 2nd/13th Inf. Bn. still hung on to El Duda. The tank battle about Sidi Rezegh moved southwards and so the left flank of the New Zealand Division became uncovered. During the 27th–29th strong Axis forces attacked the New Zealand Division which soon was in a desperate plight. S.A. 1st Bde., sent forward to help, could not arrive in time. However, 4th Armd. Bde. of 7th Armd. Division arrived on December 1 to cover the withdrawal to Zaafran.

Indian 4th Division had by now liquidated the Omar defended localities and was free to operate further west. On December 3 it handed over the frontier area to S.A. 2nd Division and came u/c XXX Corps for operations for the relief of Tobruk.

Eighth Army was now regrouped, as shown in Appendix XIV.

XIII Corps was instructed to press along the El Adem ridge towards Tobruk while XXX Corps captured Bir el Gubi and then advanced north to secure the western end of the El Adem ridge. Ind. 11th Inf. Bde., attached to 7th Armd. Division, was, together with 4th Armd. Bde., attacking Bir el Gubi on December 4, but without much success. Out of three unbrigaded Indian battalions Ind. 38th Inf. Bde. was formed and to it was assigned the task of protecting the L. of C. 1st Armd. Division, newly arrived from the U.K., was placed u/c Eighth Army.

On December 6 the Axis forces to the east of Tobruk withdrew as Indian 4th Division and 7th Armd. Division moved forward to attack and contact with 'Tobfort' was once more effected on the Bardia road.

Throughout December 7, Indian 4th Division columns operating to the north were in contact with Axis forces and reported that these were withdrawing to the west. On the 8th, 23rd Inf. Bde. of the Tobruk garrison had reached El Adem, there to be met on the evening of the 9th by elements of Ind. 7th Inf. Bde. and S.A. 1st Bde. On the 10th the Polish Bde. broke out along the Derna road and 16th Inf. Bde. reached Acroma, there to meet elements of Ind. 7th Inf. Bde. Tobruk was relieved.

The diversionary operation undertaken by 'E' Force was successful. At this time Ind. 29th Inf. Bde. was garrisoning Siwa and Giarabub. For the seizure of Gialo there was insufficient transport to carry the whole of the brigade and so 'E' Force was compounded out of the following:

H.Q. Ind. 29th Inf. Bde.
3/2nd Punjab Regt.
S.A. 6th Armoured Car Regt.

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S.A. 7th Recce Bn.
with a battery of field artillery, a battery of A/T guns, a battery of light A/A guns, a company of Indian Sappers and Miners and 21 (Ind.) Fd. Amb.

The force moved out of Giarabub on November 18. Augila was captured and on the 24th Gialo was stormed. 'E' Force thereafter moved to Giof el Matar, south-west of Saunnu, to play its part in the operations which resulted in the withdrawal of the Axis forces to the Agheila–Marada Line.

OPERATION 'CRUSADER'—MEDICAL TACTICAL PLAN

Experience gained from Operation 'Battleaxe' had revealed the urgent need for the provision of surgical facilities at the M.D.S. and for the increase of the transport of the C.C.S. in order that this unit could become truly mobile under desert conditions. For Operation 'Crusader' therefore it was intended that there should be a sufficient number of mobile surgical teams, fashioned on the model of the Robin Line and the Greek Units which had been presented to M.E.F. by philanthropic bodies in the United States of America. These surgical teams were to be attached to the C.C.Ss. and pushed forward to selected M.D.Ss. as occasion demanded. A mobile military hospital, modelled on the American Field Service Unit, was made self-sufficient in respect of transport. A platoon of a G.S. company, R.A.S.C., with its 34 3-ton lorries, was attached to each C.C.S. so long as it was employed as a mobile unit, while 7 (S.A.) C.C.S. was allotted 27 3-ton load carriers and allowed to retain them throughout the operation.

At the beginning of Operation 'Crusader', therefore, the transport of the Robin Line and Greek Units, 14, 15 and 7 (S.A.) C.C.Ss. was as under:

Units W.E. Vehicles	14 C.C.S.	15 C.C.S.	7 (S.A.) C.C.S.
Cars utility	3	3	3
X-ray Lorry	1	1	1
Water-trucks	3	3	3
Motor Cycles	2	2	2
Lorries 3-ton	—	—	27
Attached Vehicles	Robin Line Unit		Greek Unit*
Operating Theatre Lorry	1		1
Sterilisation Lorry	1		1
Lorries 3-ton	2		2
R.A.S.C. Platoon	14 and 15 C.C.Ss.		
Lorries 3-ton	34		

* This Greek Unit was built around a comprehensive set of equipment that, donated by American sympathisers, was meant to go to the Greeks during the campaign in Greece. It remained in the Middle East.

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14 and 15 C.C.Ss.

Cars 2-seater . .	1
Trucks 15 cwt. . .	1
Motor Cycles . .	4

It will be noted that 2 (Ind.) C.C.S. was not put on wheels, the reason being that at the beginning of the operation it was functioning in a static rôle. Its lack of mobility later militated against its usefulness.

The casualties in the forthcoming operation were estimated as follows:

Strength:

(*a*) Own Div. Tps.	95,000
(*b*) Own Army Tps.	65,000
(*c*) Total Eighth Army	160,000
(*d*) Enemy Div. Tps.	80,000

Estimated Casualties:

8 weeks of normal scale for (*a*)	8,380
8 weeks of normal scale for (*b*)	4,190
	12,570

or 1,500 a week.

First Battle:

4 per cent. of (*a*) plus (*d*)	7,000
2 per cent. of (*b*)	1,300
	8,300

Second and Third Battles:

3 per cent. of (*a*) and (*d*)	5,250
1½ per cent. of (*b*)	975
	6,225

Plan therefore for:

First Battle	8,500
Second and Third, 6,500 each . . .	13,000
	21,500

The general medical tactical plan was based upon two lines of evacuation, one for each corps. These converged at Bir el Thalata, south of Bir Enba and fifteen miles west of the main medical centre which was to be at Minqar El Zannan. D.D.M.S. Eighth Army issued the following instructions:

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1. XIII Corps.

An advanced operating centre (H.Q. of an (Ind.) Fd. Amb. plus Lt. Sec. 2 (Ind.) C.C.S.) at Bir Mumin will serve Indian 4th Division. Evacuation therefrom will be to Hy. Sec. 2 (Ind.) C.C.S. at Km. 107 on the Matruh–Sidi Barrani road.

In the rear of New Zealand field ambulances will be a New Zealand mobile surgical team for emergency operative treatment. Supporting this in the Bir Habata area will be an advanced operating centre consisting of the corps field ambulance, the Lt. Sec. of 14 C.C.S. and 2 F.T.U.

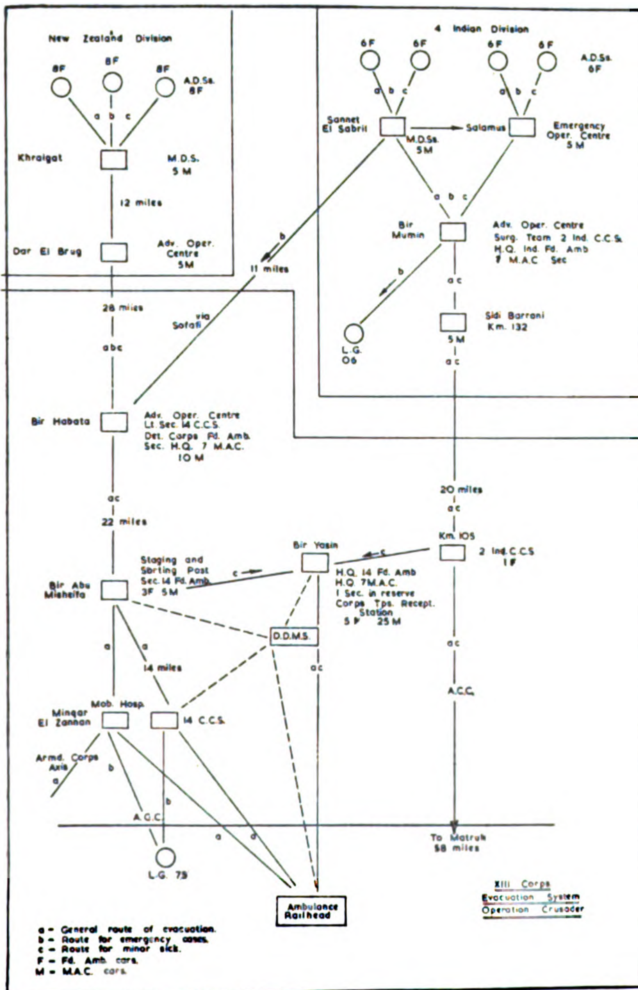

FIG. 33. Operation 'Crusader'. XIII Corps. Evacuation Chain.

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It is expected that cases will be evacuated from the Indian field ambulances to the advanced operating centre at Bir Habata. There will be a staging and sorting post (a company of a field ambulance) at Bir Abu Misheifa.

H.Q. 7 M.A.C. with H.Q. 14 (Ind.) Fd. Amb. will be at Bir Yasin.

2. XXX Corps.

15 (S.A.) Fd. Amb. will be used as the corps field ambulance and 7 Lt. Fd. Hyg. Sec. as the corps field hygiene section.

The M.D.S. of the corps field ambulance will be in the vicinity of Alam Diqnaish.

15 C.C.S. (with 5 surgical teams—its own, two from 15 B.G.H. and one from 16 B.G.H.) will be kept on wheels east of Diqnaish and 7 (S.A.) C.C.S. on wheels in the area of Quaretazza.

H.Q. 16 M.A.C. will be in the region of Point 214.

The line of evacuation will be Maddalena–Diqnaish–Bir el Wasi–Minqar el Zannan.

(Since it was impossible to foretell what course the section would take following the break through, XXX Corps planned to give to its medical units the greatest possible degree of freedom of action. The fewest possible were to be opened at the beginning of the operation and the greatest possible number kept on wheels. Only the corps field ambulance, 15 (S.A.) Fd. Amb., was given a fixed position near the concentration area at Alam Diqnaish. 15 C.C.S. was kept on wheels ready to follow 7th Armd. Division as it swung north-west. 7 (S.A.) C.C.S. was ready to follow S.A. 1st Division.)

3. Army.

C.C.S. to R.H.

Evacuation from Minqar el Zannan to Railhead (eight miles) will be by 'A' Sec. 1 A.C.C. (30 cars).

Evacuation from Hy. Sec. 2 (Ind.) C.C.S. at Km. 107 on the Matruh–Sidi Barrani road will be by half of 6 and 9 (Ind.) M.A.Ss. (37 cars), allowing a one day turn round; this giving a capacity of 148 cases.

4. R.H. to Matruh and Gerawla and thence to the Delta:

(*a*) by road 75 cars of 2 M.A.C.
25 cars of 10 (S.A.) M.A.C.
Total = 100 × 4 stretcher cases. Allowing one sitting case in addition and assuming that the turn round time will be two days, the daily capacity is 250 cases.

(*b*) by rail

1 ambulance train (all stretchers)	240 cases
1 passenger train (sitting) .	420 cases
Daily total . .	660 cases

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5. Air Ambulance Transport.

From forward L.Gs. to Matruh and Gerawla.

It is understood that three ambulance planes will be available for the evacuation of casualties. These will carry 7 stretchers each, giving a total of 21 cases each trip. It should be possible to make five trips a day, giving a total of 105 cases daily.

(It was hoped that plying between the advanced operating centres and the static C.C.S. at Matruh—8 (S.A.) C.C.S.—and the general hospitals at Gerawla—43 B.G.H. and 2 N.Z.G.H.—there would be three R.A.A.F. and one S.A. air ambulances and two R.A.F. Lodestars and that flying between Matruh and Gerawla and the base would be a number of Bombays.)

6. Summary of Ambulance Capacity.

The total number of cases that can be evacuated daily from forward units to Matruh and Gerawla is therefore:

148 by M.A.S. from Hy. Sec. 2 (Ind.) C.C.S.
250 by M.A.C. and A.C.C. from R.H.
660 by ambulance train from R.H.
105 by air from forward L.Gs.

1,163

7. Summary of Distribution of Ambulance Cars.

XIII Corps	7 M.A.C.	75
	6 M.A.S. (half)	37
	9 M.A.S. (half)	
XXX Corps	16 M.A.C.	75
	10 (S.A.) M.A.C. (Sec.)	25
R.H.	1 A.C.C. ('A' Sec.)	30
	10 (S.A.) M.A.C. (Sec.)	25
	2 M.A.C.	75
Matruh–Gerawla	10 (S.A.) M.A.C. (Sec.)	25
	200 Fd. Amb.	8
	12 (S.A.) Fd. Amb.	14

8. Medical Arrangements at R.H.

1 Mob. Mil. Hosp. (with two surgical teams of its own and one from 54 B.G.H. attached) and Hy. Sec. 14 C.C.S. (with its own surgical team, one from 13 B.G.H., one from 1 B.G.H. and one (chest surgery) from 9 B.G.H.) will be in the area Minqar el Zannan prepared to undertake emergency surgery and to hold 500 cases.

9. Hospital Accommodation at Matruh and Gerawla.

At Matruh will be:

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	beds
8 (S.A.) C.C.S. (including 100 in 'Bondi') .	400
18 (Ind.) Staging Sec.	50
200 Fd. Amb. (in the East Egypt Barracks)	400
'Glenelg'	80
'B' Post	50
'P' Post	50
Capacity . .	980 plus 50 Indian
	1,030

These units will deal with casualties evacuated from 2 (Ind.) C.C.S. and from forward medical units by air or road and with transfers of less serious cases from Gerawla.

At Gerawla will be:

43 B.G.H.	600 beds
2 N.Z.G.H.	600 beds

Both these can be expanded to 1,000 beds. They will receive cases evacuated from R.H. by ambulance train.

10. Oases Group.

21 (Ind.) Fd. Amb. and 9 Lt. Fd. Amb. at Giarabub will hold as many cases as possible (about 250). Two light sections of 9 will be available to accompany any mobile force should such be employed. To this end one surgeon and one anaesthetist, in addition to the surgeon with 9 Lt. Fd. Amb., are available.

Air evacuation will be available for emergency cases and a number of cases can be evacuated by road by 'C' Sec. (25 cars) 11 M.A.C.

11. Medical Stores.

6 tons of medical stores have been placed in 1 Forward Base Dump, 10 tons in 2 Forward Base Dump and 5 tons in 3 Forward Base Dump. These stores will be taken into use on instructions from H.Q. Eighth Army.

In these dumps also are reserves of stretchers and blankets.

1 Forward Base Dump	500 stretchers, 1,000 blankets
2 Forward Base Dump	1,000 stretchers, 2,000 blankets
3 Forward Base Dump	500 stretchers, 1,000 blankets

These reserves will be for supply to R.M.Os. and field ambulances. C.C.Ss. will be supplied from these dumps only in an emergency. C.C.Ss. and 1 Mob. Mil. Hosp. will be supplied from 7 Adv. Depot Med. Stores and general hospital indents will have to be passed to base for supply.

A reserve of 2000 bottles of glucose-saline and 200 pints of whole blood is being built up at 7 Adv. Depot Med. Stores. Transfusion

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fluids will be moved forward by refrigerator vans of F.T.Us. or by air.

These instructions were later amplified by D.D.M.S., who submitted the following information to D.A.Q.M.G., Eighth Army, in connexion with the forthcoming battle:

(*a*) C.C.Ss.

XIII Corps .	2 (Ind.) C.C.S. at Km. 105 Sidi Barrani Rd.
	Lt. Sec. 14 C.C.S. (mobile)
XXX Corps .	7 (S.A.) C.C.S. mobile in rear of S.A. 1st Division
	15 C.C.S. (mobile) in rear of 7th Armd. Division
	Hy. Sec. 14 C.C.S. Minqar el Zannan
	1 Mob. Mil. Hosp. Minqar el Zannan

(*b*) M.A.C.

XIII Corps	7 M.A.C.
	9 M.A.S.
XXX Corps	16 M.A.C.
	10 (S.A.) M.A.C., one sec.
Army .	10 (S.A.) M.A.C., less one sec.
	2 M.A.C. 50 cars (later)
	6 M.A.S. 12 cars
	A.C.C. one sec.

(*c*) Evacuation.

(1) From field ambulances to C.C.S. under corps arrangements by M.A.C.

(2) From C.C.S. to R.H. under Army arrangements.

(*d*) Air Evacuation.

Ambulance aircraft can be called forward for the evacuation of emergency cases from corps forward areas *vide* 'Special Instructions Air Evacuation in the Forward Area' issued to D.Ds.M.S. corps.

(*e*) Loading Parties.

Arrangements are being made by Army for parties to be provided.

(1) by 86 S.A. for duty at Desert Amb. R.H. and C.C.S. in that area
(2) by 91 S.A. for duty at C.C.S., railway station and L.G. at Matruh
(3) by 83 S.A. for duty at general hospitals and railway station at Gerawla
(4) on relief of Tobruk evacuation of casualties will be to medical units in that area.

MEDICAL COVER FOR OPERATION 'CRUSADER'

In 7th Armd. Division a motor ambulance car was allotted to each unit, an A.D.S. to each brigade together with two ambulance cars and an A.D.S. to the 'B' echelon of each formation. By this time a Dunlopillo had been supplied for each R.M.O's. car, to the great benefit of the casualty who had to be evacuated. It was noted that ambulance drivers, new to the Desert, could quickly immobilise a field ambulance. Thus 2 Lt. Fd. Amb. was out of action for several days owing to cracked cylinder heads.

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On November 18, 14 (Ind.) Fd. Amb. established a M.D.S. at Conference Cairn. Attached to it were Lt. Sec. 14 C.C.S. and 2 F.T.U. 17 (Ind.) Fd. Amb. was kept closed and in reserve. Seven ambulance

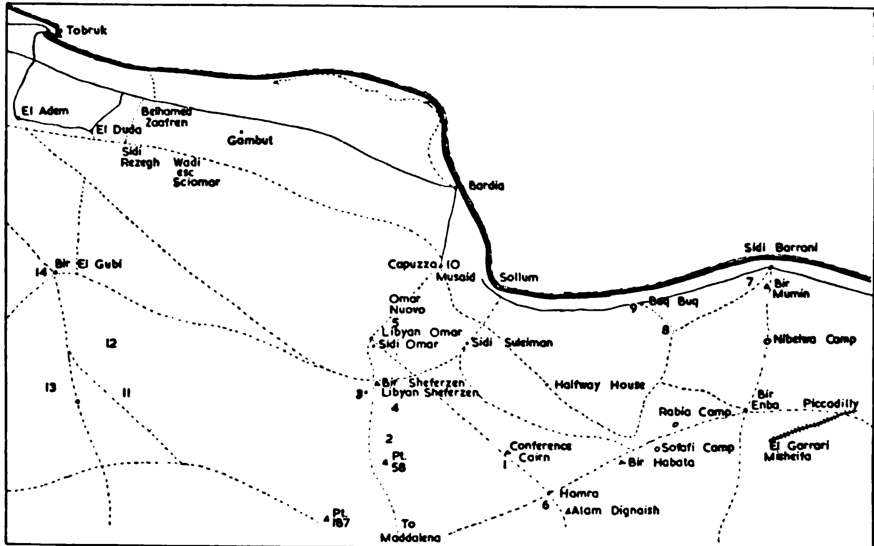

FIG. 34. Operation 'Crusader'. Indian 4th Division. Medical Cover. November 18–December 9.

1. 14 (Ind.) Fd. Amb. M.D.S.	Nov. 18–Dec. 4
2. 17 (Ind.) Fd. Amb. M.D.S. . . .	Nov. 18
14 (Br.) Fd. Amb. .	Nov. 18
3. 17 (Ind.) Fd. Amb. A.D.S.	Nov. 18–23
4. 17 (Ind.) Fd. Amb. M.D.S.	Nov. 21–24
5. 19 (Ind.) Fd. Amb. M.D.S. . . .	Dec. 2
17 (Ind.) Fd. Amb. A.D.S.	Nov. 23–Dec. 2
6. 17 (Ind.) Fd. Amb. from captivity . . .	Nov. 26
7. 19 (Ind.) Fd. Amb. M.D.S.	closed Nov. 30
8. 19 (Ind.) Fd. Amb. A.D.S.	closed Nov. 30
9. 19 (Ind.) Fd. Amb. A.D.S.	closed Nov. 30
10. 14 (Ind.) Fd. Amb. A.D.S. . . .	Dec. 1
11. 14 (Ind.) Fd. Amb. M.D.S.	Dec. 5–7
19 (Ind.) Fd. Amb. H.Q. in reserve	
12. 17 (Ind.) Fd. Amb. one company	
19 (Ind.) Fd. Amb. one company with Adv. Div. H.Q. . . .	Dec. 5
13. 14 (Ind.) Fd. Amb. M.D.S.	Dec. 8
17 (Ind.) Fd. Amb. M.D.S.	Dec. 6–8
14. A.D.Ss. of 14 and 17 (Ind.) Fd. Ambs. .	Dec. 8
A.D.S. 19 (Ind.) Fd. Amb. . . .	Dec. 5

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cars were attached to Ind. 7th Inf. Bde. With 1st Army Tk. Bde. was 14 Fd. Amb. which opened A.D.Ss. in front of Conference Cairn in the neighbourhood of Bir Sheferzen.

On November 21, 17 (Ind.) Fd. Amb. opened a M.D.S. near Bir Sheferzen, just west of the frontier, and to it a detachment of Lt. Sec. 14 C.C.S. was attached.

On November 22, Sidi Omar was captured and on the following day an A.D.S. was opened at Omar Nuovo by 17 (Ind.) Fd. Amb. Casualties were evacuated thence to the M.D.S. of 17 Fd. Amb. near Bir Sheferzen, thence to the M.D.S. of 14 (Ind.) Fd. Amb. at Conference Cairn and thence by M.A.S. to the east. The A.D.Ss. of 14 Fd. Amb. were at Bir Rafaa, to the west of Omar Nuovo, and at Sidi Azeiz.

Though Indian 4th Division held on to its gains in the area of Sidi Omar, the M.D.S. of 17 (Ind.) Fd. Amb. near Bir Sheferzen was overrun, its personnel taken prisoner and most of its equipment taken away on the evening of November 24. The patients were attended by an Italian medical officer. About 0730 hours on the 25th a German column passed through and was subjected to heavy artillery fire. Its tanks were parked among the tents of the M.D.S., which admitted German casualties. On repeated requests the Germans withdrew to a position about two hundred yards away from the medical unit. At 1130 hours the personnel of the M.D.S., leaving the tents standing, moved back to Conference Cairn and thence to Hamra. The detachment of Lt. Sec. 14 C.C.S. was then attached to the M.D.S. of 14 (Ind.) Fd. Amb. On the 25th this detachment joined Lt. Sec. 14 C.C.S., which was pulled back from Conference Cairn to Habata.

On the 28th the forward medical units of Indian 4th Division were distributed as follows:

14 (Ind.) Fd. Amb. M.D.S.	Conference Cairn (one coy. in reserve)
17 (Ind.) Fd. Amb. A.D.S.	Omar Nuovo (with Ind. 7th Inf. Bde.)
H.Q. and one coy.	Hamra
19 (Ind.) Fd. Amb.	With Ind. 11th Inf. Bde. at Sidi Barrani and Buq Buq.

When Ind. 11th Inf. Bde. handed over the coastal sector to S.A. 2nd Division on November 29, 19 (Ind.) Fd. Amb. closed and moved to El Rabia, one company being placed u/c Ind. 11th Inf. Bde.

On November 30, one company of 14 (Ind.) Fd. Amb. moved with Ind. 5th Inf. Bde. to the Capuzzo area. Evacuation from its A.D.S. was to Conference Cairn. Casualties from the New Zealand Bde. Gp. u/c Indian 4th Division were likewise evacuated from the Capuzzo area along this route.

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On December 2, a company of 17 (Ind.) Fd. Amb., together with a company of 19 (Ind.) Fd. Amb., formed a staging post at boundary post 58, while 19 (Ind.) Fd. Amb. established a M.D.S. at Omar Nuovo, 17 (Ind.) Fd. Amb. then closing its A.D.S. there and remaining with Ind. 7th Inf. Bde. All casualties were now evacuated to this M.D.S. and thence *via* the staging post to Conference Cairn.

For the final operation for the relief of Tobruk, to each of Ind. 5th, 7th and 11th Inf. Bdes. was attached one company of each of 14, 17 and 19 (Ind.) Fd. Ambs. On December 5, 14 (Ind.) Fd. Amb., having closed at Conference Cairn, moved to a site to the south-east of Bir el Gubi, there to open a M.D.S. 17 (Ind.) Fd. Amb. opened an advanced M.D.S. at Point 173 to deal with casualties from the El Gubi area.

On December 7, this M.D.S. of 17 (Ind.) Fd. Amb. was heavily dive-bombed and suffered serious damage. It had to be withdrawn to the area of the M.D.S. of 14 (Ind.) Fd. Amb. which then moved to take its place.

As the Indian infantry brigades moved towards Tobruk the field ambulances opened their A.D.Ss. near Bir el Gubi on December 8. Evacuation to the rear of the M.D.S. was under corps and Army arrangements to 15 C.C.S. at Hamra and onwards to Minqar el Zannan.

South African 1st and 2nd Divisions arrived in Egypt during the period May–September 1941. S.A. 1st Division was concentrated in the Matruh area, S.A. 2nd Division in the Alamein area. The South African Base was in the Delta. At the head of the South African Army Medical Services was a D.M.S., U.D.F. (M.E.F.).

With S.A. 1st Division were 15 (S.A.) Fd. Amb., the divisional field ambulance, 10 (S.A.) Fd. Amb. with S.A. 1st Inf. Bde., 12 (S.A.) Fd. Amb. with S.A. 2nd Inf. Bde., 11 (S.A.) Fd. Amb. with S.A. 5th Inf. Bde. and the divisional field hygiene section. 'A' Coy. 12 (S.A.) Fd. Amb. was with 'Oases' Force at Siwa from July 29 to October 7. The field hygiene section had its H.Q. Sec. with divisional headquarters, a section with the divisional troops and a detachment with each of the three brigades. 2 and 3 (S.A.) F.D.Us. were attached to the division; 5 and 7 (S.A.) F.D.Us. of S.A. 2nd Division were on loan to S.A. 1st Division from August 18.

7 (S.A.) C.C.S. reached the Middle East on September 29 and in November 1 (S.A.) Con. Depot took over the Mustapha Barracks in Alexandria from 1 (Br.) Con. Depot.

While the division was serving in Matruh fortress the field ambulances established dressing stations in (1) the Egyptian barracks, (2) 'Glenelg', (3) 'Bondi' and (4) 'P' Post, the last three being stoutly constructed dug-outs. They also ran three brigade rest camps on the shore. They spent much time in training for the desert type of warfare. They had lost much equipment during their journey from East Africa by sea

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and overland and found great difficulty in obtaining replacements up to the South African scale.

S.A. 1st Bde. with 10 (S.A.) Fd. Amb. crossed the frontier wire on November 18, its assignment being to secure a defended locality in the vicinity of El Gubi. On the 19th the brigade was dive-bombed, the casualties being 2 killed and 28 wounded. 10 (S.A.) Fd. Amb. was in the rear of the brigade. A half company of 'B' Coy. was left with the wounded and remained with them for three days. On the 20th A.D.M.S. S.A. 1st Division was killed when an armoured vehicle passed over the slit trench in which he was sleeping. The brigade, now attacking El Gubi, was again attacked from the air and among the casualties were 1 O.R. killed and 6 O.Rs. wounded among the field ambulance personnel. During the 21st the aerial bombing continued as the fighting raged. On the 22nd the field ambulance was cleared by M.A.C. cars which reached the unit at 1300 hours. During the night of November 22/23 it moved forward to a position near El Gubi. At 0700 hours on the 23rd the field ambulance, then four or five miles in the rear of S.A. 1st Bde., was overrun by Axis armour and the majority of its personnel taken prisoner. However, 9 officers and 3 O.Rs. did get away.

Hy. Sec. 11 (S.A.) Fd. Amb. and a company of 15 (S.A.) Fd. Amb. were sent by A.D.M.S. S.A. 1st Division to serve S.A. 1st Bde. The remnants of 10 (S.A.) Fd. Amb., short of rations, water and fuel, moved back along the corps axis. They made contact with D.A.D.M.S. XXX Corps who told them that the nearest F.S.D. was at the boundary wire. There they encountered A.D.M.S. S.A. 1st Division who sent them back along the axis line. They reported to brigade H.Q. at 1000 hours on the 26th, to find that 15 (S.A.) Fd. Amb. had taken over their functions. After the battle had died down the remnants of 10 (S.A.) Fd. Amb. were employed on the forward landing ground. Thus it was that 10 (S.A.) Fd. Amb. failed to provide the service that its brigade needed at a time when the need was indeed great. The cause of this failure would seem to be the spatial relationship of brigade and ambulance during the advance and the subsequent action. The ambulance moved in the rear of the brigade and possessed no means of intercommunication other than the D.R.

S.A. 5th Inf. Bde. with 11 (S.A.) Fd. Amb. crossed the frontier on November 16. In contrast to the arrangements made in S.A. 1st Inf. Bde., 11 (S.A.) Fd. Amb. was divided up as follows:

H.Q. Coy. provided a M.D.S. at 'B' Echelon
'A' Coy. Hy. Sec. provided a divisional medical post
'A' Coy. Lt. Sec. provided an A.D.S. for 1st S.A. Irish
'B' Coy. Hy. Sec. provided an A.D.S. for 2nd Regt. Botha
'B' Coy. Lt. Sec. provided an A.D.S. for Transvaal Scottish

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On November 20 the brigade was attacked from the air. 17 casualties were evacuated to the A.D.S. of the Hy. Sec. of 'A' Coy. 11 (S.A.) Fd. Amb. On the 21st a convoy of British casualties, 59 in all, having lost its bearings, arrived at the M.D.S. of 'B' Echelon. These were treated and sent on, in requisitioned lorries, to the M.D.S. of 7th Armd. Division. During the 22nd casualties reached the M.D.S. in a continuous stream so that at the end of the day the unit was holding some 200. A.D.M.S. S.A. 1st Division sent forward 9 ambulance cars and a number of 3-ton lorries to clear the M.D.S. Nevertheless, by the morning of the 23rd the unit was holding some 250, mostly British.

On November 23, S.A. 5th Bde. was overrun by Axis armour south-west of Sidi Rezegh. The M.D.S. area was heavily shelled and at 1300 hours a tank battle began to move nearer as Eighth Army armour was pushed back by Axis armour. The former passed through the M.D.S. area, then the M.D.S. was between the two, then the Axis armour passed through the M.D.S. area, carefully avoiding the patients who were lying on the ground. Then came the Axis guns and infantry and the M.D.S. was captured along with its 300 patients. During this action several patients were run over, certainly not deliberately, and two were wounded.

Most of the medical staff and all the walking wounded were marched away to the Axis rear and most of the equipment of the M.D.S. and the trucks of 'B' Echelon were removed. The two medical officers and 12 O.Rs. R.A.M.C. who were permitted to remain were encouraged to continue their work. British tanks approached the M.D.S. and the Germans promptly embussed and, taking the brigadier commanding S.A. 5th Inf. Bde. with them, withdrew. But this was not a relief, for the five British tanks were not counter-attacking but seeking a way of escape. One of them was hit and the remainder made off. The Germans then returned.

On the 25th a R.A.M.C. officer who had been captured informed the German guards that at the R.A.P. of the S.A. Irish about two miles away there were many casualties. Contact was made with this R.A.P., where 79 casualties were needing attention.

On the 26th an Italian armoured force passed the M.D.S. and later came hurrying back in great disorder. British tanks reached the R.A.P. and took away the most seriously wounded. On the 27th, N.Z. 2nd Division, advancing, reached both the R.A.P. and the M.D.S. and soon ambulances and trucks of 6 (N.Z.) Fd. Amb. transported staff and patients to the New Zealand medical area in the Wadi esc Sciomar, about six miles away. Here a South African section was formed by the 9 officers and 60 O.Rs. S.A.M.C. who were there available. Tentage and equipment were provided by the New Zealanders and the section was soon holding some 250 patients. Then, on November 28, the

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South Africans were captured again when the New Zealand medical area was overrun in its turn. When relieved on December 6 by 11th Hussars the South African medical staff and patients were evacuated to the A.D.S. of 151 Lt. Fd. Amb. and thence to 7 (S.A.) C.C.S.

As is told in connexion with the story of the New Zealand field ambulances, during this period of captivity the attitude of the Italians evoked much critical comment. Shortage of water gave rise to much anxiety and to not a little distress. From the South African records it appears that water shortage was seriously complicating the operations of the Axis forces and also that they were badly needing mechanical transport. The New Zealanders had removed the rotor arms from their vehicles. The Italians demanded their return and threatened to withhold water from their prisoners unless they were returned.

Eight officers and 430 O.Rs. of the S.A.M.C. and 127 South African casualties were released on December 6. 11 (S.A.) Fd. Amb. had lost 9 killed, 10 wounded, 41 missing and 76 prisoners-of-war. During the period of captivity the unit had treated some 1,000–1,500 casualties. Thus, though greatly impeded, the unit, because it was actually with its brigade, was able to serve it.

By December 8 the survivors of S.A. 5th Inf. Bde. were at Mersa Matruh. Serving them were a company of 18 (S.A.) Fd. Amb. of S.A. 2nd Division, 8 (S.A.) C.C.S. and Br. 200 Fd. Amb. 10 (S.A.) Fd. Amb., also at Matruh, was in process of being reconstituted. Later, in June 1942, the remains of 10 and 11 (S.A.) Fd. Ambs. were amalgamated to form 10/11 (S.A.) Fd. Amb.

South African 2nd Division on its arrival in the Middle East was first distributed in the Mareopolis, Wadi Natrun and El Alamein areas. 17 (S.A.) Fd. Amb. with S.A. 4th Inf. Bde. and 18 (S.A.) Fd. Amb., the divisional field ambulance, established C.R.Ss. To that of 18 (S.A.) Fd. Amb. 28 M.D.U., 4 and 6 F.D.Us., 3 (S.A.) Mob. X-ray Unit and 2 (S.A.) Mob. Bact. Unit were attached. On October 21, 18 (S.A.) Fd. Amb. closed and moved to Baqqush, there to take over from 2 (Ind.) C.C.S. The field ambulance functioned as a modified C.C.S. and in addition ran a M.D.S. at 'Bondi' in Matruh and C.R.Ss. at El Daba and Alamein.

As Operation 'Crusader' developed S.A. 2nd Division took over the frontier defences from Indian 4th Division. Its headquarters moved forward to Baqqush. H.Q. Coy. 16 (S.A.) Fd. Amb. with S.A. 3rd Bde. was in Matruh, while another company was running a M.D.S. in Matruh. 14 (S.A.) Fd. Amb. was with S.A. 4th Bde. 17 (S.A.) Fd. Amb. was still at Alamein. H.Q. and 'A' Coy. 18 (S.A.) Fd. Amb. were at Baqqush, 'B' Coy. at Matruh. If the division moved forward 18 (S.A.) Fd. Amb. was to remain on the L. of C. 8 (S.A.) C.C.S. was in Matruh.

A.D.M.S. New Zealand Division allotted a section of a field

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ambulance to each of the brigades. The rest he intended to use for the establishment of M.D.Ss. as occasion demanded. The New Zealand Mob. Surg. Unit (functioning as a light section of a C.C.S.) was to be attached to that M.D.S. which was at a given time active, there to deal with major surgery. Evacuation was to be to 14 C.C.S. and 1 Mob. Mil. Hosp. at Minqar el Zannan and thence to Amb. R.H. at Misheifa and thence to Matruh and Alexandria. As soon as the Indian Division had captured Sidi Omar, evacuation would be switched to the coast road. The general plan involved the setting up of dressing stations or staging posts not more than twenty-five miles apart. But these smooth plans were disrupted by the course of the battle.

When the division moved up from Baqqush to take part in the battle, 4 (N.Z.) Fd. Amb., with the N.Z. Mob. Surg. Unit attached, opened a M.D.S. eight miles to the south-west of Sidi Azeiz while 5 (N.Z.) Fd. Amb. established a staging post at Point 187. On November 23, 6 (N.Z.) Fd. Amb. moved from Sidi Azeiz along the Trigh Capuzzo to open a M.D.S. to the east of Gambut where N.Z. 4th and 6th Bdes. were then located. On the 24th the tank battle began and 6 (N.Z.) Fd. Amb. moved to a wadi—the Wadi esc Sciomar—seven miles east of Sidi Rezegh, where its 'A' Coy. was holding some 250 cases, including about 200 South Africans from the overwhelmed S.A. 5th Bde. On the 25th and 26th this unit dealt with 450 casualties and 5 (N.Z.) Fd. Amb. with the N.Z. Mob. Surg. Unit and the (N.Z.) Fd. Hyg. Sec. were sent up to help. Two German medical officers and several medical orderlies were placed in charge of the many wounded P.o.W. in the nearby cage. It was noted that the German medical officers were reluctant to accept the care of Italian wounded and that the German medical orderlies tended to avoid all contact with them.

On the 26th, twenty cars of 7 M.A.C. reached 6 (N.Z.) Fd. Amb. and took 279 cases back to 4 (N.Z.) Fd. Amb., five miles to the south of and parallel to the Trigh Capuzzo. But this unit had left for Abiar Araaz carrying with it 150 wounded and leaving behind a detachment with such of its patients as could not be moved. The M.A.C. therefore went on to Conference Cairn.

On the 27th, 4 (N.Z.) Fd. Amb. opened a M.D.S. alongside that of 6 (N.Z.) Fd. Amb. On this day and the following, remnants of South African and other medical units that had been overrun, trickled into this combined M.D.S., which was holding some 862 cases. At this time it was assumed that these would be evacuated into Tobruk within a day or so.

On the 28th, in the late evening, Axis lorried infantry and armoured cars overran the combined M.D.S. and P.o.W. cage. On the 29th A.D.M.S. New Zealand Division, with Rear Divisional H.Q., was forced to seek refuge in Tobruk.

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When the corridor was opened again New Zealand casualties were evacuated along a chain of three A.D.Ss. back to the M.D.S. of 173 Fd. Amb. (70th Division) at El Duda and thence to 62 B.G.H. at Tobruk.

'B' Company of 4 (N.Z.) Fd. Amb. with N.Z. 4th Bde. moved with this brigade and opened its A.D.S. at Menastir on November 22. Then, when Gambut was taken, the A.D.S. moved on to Gambut aerodrome. On the 24th the A.D.S. was established at Zaafran, north-east of Sidi Rezegh, and cleared into the M.D.S. of 6 (N.Z.) Fd. Amb. On the 30th its cases were sent into Tobruk so long as the corridor was open. When N.Z. 4th and 6th Inf. Bdes. were pulled out to return to Baqqush, 'B' Company 4 (N.Z.) Fd. Amb. carried its patients back and transferred them to 14 C.C.S. at Minqar el Zannan. This company of 4 (N.Z.) Fd. Amb. was the only organised group of New Zealand medical personnel that was at no time during the battle for Tobruk in enemy hands.

'B' Company of 5 (N.Z.) Fd. Amb. with N.Z. 5th Bde. opened its A.D.S. near Sidi Azeiz on November 22. It received much material help from 14 Fd. Amb. during the attacks on Capuzzo, Sollum and Musaid. Its casualties were evacuated to the M.D.S. of its parent unit which had a car post at Fort Capuzzo. When this M.D.S. was closed on November 25 owing to enemy threats the A.D.S. held its patients. On the 26th fierce fighting took place in the vicinity of the A.D.S., which admitted casualties from both sides. On the 27th, at 0715 hours, the A.D.S. came under heavy shell and machine gun fire. H.Q. N.Z. 5th Inf. Bde. was completely overwhelmed and its scattered remnants, including the A.D.S., surrendered. The Germans commandeered all the vehicles of the A.D.S. as well as all equipment not in actual use. A German medical officer granted every facility for the collection and treatment of casualties, New Zealanders and Germans alike. General Rommel himself visited the A.D.S. The German wounded were taken away. Two New Zealand regimental medical officers of N.Z. 5th Bde. with their orderlies joined the A.D.S. bringing welcome supplies and equipment. A message was received from a German medical officer that there was no accommodation for the A.D.S's. patients in Bardia but that he would do his best to have rations and water sent out to the A.D.S. However, these were not required for the A.D.S. personnel managed to salvage sufficient. On November 29 the Germans departed and on the following day a New Zealand patrol contacted the A.D.S. A convoy was quickly organised and the medical personnel were sent off to Capuzzo, there to be accommodated in an underground cistern. The patients were taken by 7 M.A.C. to 19 (Ind.) Fd. Amb. at Sidi Omar.

At Capuzzo 'B' Company 5 (N.Z.) Fd. Amb. opened its A.D.S., equipping it with salvaged stores and equipment. On December 5 it

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admitted 67 casualties, transferring them to the M.D.S. at Sidi Omar. On the 8th a sufficient number of New Zealand medical personnel of 4, 5 and 6 (N.Z.) Fd. Ambs. released from captivity reached the A.D.S. and this was enlarged to become a M.D.S. for N.Z. 5th Bde., now reorganised and preparing for further action in the area of Gazala.

'A' Company 6 (N.Z.) Fd. Amb. with N.Z. 6th Bde. moved on November 22 ten miles west of Sidi Azeiz on the Trigh Capuzzo for the attack on Gambut. On the 23rd, in connexion with the attack on Point 175, it opened its A.D.S. in the Wadi esc Sciomar. Here it became involved in an armoured engagement. It packed up and sent off its casualties, some 200, to 7 (S.A.) C.C.S. This was closing, however, and so the convoy went on to 15 C.C.S. Here the casualties could not be accommodated and on the 24th the convoy moved on to stay for the night at Alam Diqnaish. On the 25th it reached Minqar el Zannan and the serious cases were distributed between 14 C.C.S. and 1 Mob. Mil. Hosp.

On the morning of November 24, 'A' Company 6 (N.Z.) Fd. Amb. again set up its A.D.S. in the Wadi esc Sciomar. Almost at once some 200 casualties from S.A. 5th Bde. were brought in. Fortunately H.Q. and 'B' Company 6 (N.Z.) Fd. Amb. arrived to establish a M.D.S. and to take over the patients of the A.D.S. On the 25th, N.Z. 6th Bde. attacked Sidi Rezegh while N.Z. 4th Bde. moved on Belhamed. The A.D.S. of 'A' Company 6 (N.Z.) Fd. Amb. was called up to deal with large numbers of casualties which were evacuated to the M.D.S. On the 27th evacuation ceased because of the turmoil that raged. On the night of the 28th the A.D.S. was established near Belhamed and for the next two days evacuated its patients into 62 B.G.H. in Tobruk, 600 cases in all.

At dawn on December 1 the German tank attack broke over the A.D.S., which was completely overrun and captured. N.Z. 4th and 6th Bdes. were rescued by elements of 7th Armd. Division. The captured medical personnel of the A.D.S. were taken back to the P.o.W. cage at Benghazi, save those who had been wounded. These were taken to a German hospital at El Adem.

By December 4 all the patients of this German hospital, save 25 British Commonwealth casualties, had been taken away. To care for these a small German medical staff and one medical officer and 5 O.Rs. of 'A' Company 6 (N.Z.) Fd. Amb. had been left behind. Then, on December 8, the German medical staff departed. The hospital was reached by Eighth Army patrols on December 10 and the New Zealand medical personnel and their patients were sent to 62 B.G.H. in Tobruk.

A detachment of 4 (N.Z.) Fd. Amb. was left behind at Sidi Azeiz when the parent unit moved forward. On November 26 an armoured

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engagement took place in its vicinity. The British armour withdrew and the Germans then entered the A.D.S. and confiscated an assortment of medical supplies. General Rommel himself visited this A.D.S. at 1630 hours and, being satisfied with the treatment the German patients were receiving, issued instructions that the work of the A.D.S. was not to be disrupted. He left 22 severely wounded Germans, badly in need of treatment, with the A.D.S. At 1700 hours a convoy of 7 M.A.C. with 279 patients from the M.D.S. of 6 (N.Z.) Fd. Amb. pulled in to the A.D.S. The patients were given attention throughout the night and the convoy, now with 304 patients, moved off at 0645 hours on the 27th. It was soon halted by an Italian column which ordered it to change direction. However, British armoured cars appeared and the obstruction was removed. Ultimately this convoy reached 7 (S.A.) C.C.S.

At dusk on the 28th the M.A.C. convoy returned, bringing rations and water. It left again on the 29th with 123 patients, including 30 Germans and 17 Italians, and after many adventures once more reached 7 (S.A.) C.C.S.

Next the M.A.C. convoy set out to search for the A.D.S. of 5 (N.Z.) Fd. Amb. Hearing that this had been captured, the convoy went to the A.D.S. at Capuzzo to evacuate its patients to Sidi Omar. Then the M.A.C. convoy was instructed by XIII Corps to attach itself to the reorganised N.Z. 5th Bde.

As has been already reported, the combined M.D.S. of 4, 5 and 6 (N.Z.) Fd. Ambs., N.Z. Mob. Surg. Unit and 4 (N.Z.) Fd. Hyg. Sec. at Wadi esc Sciomar was overrun on the 28th. It was permitted to continue its work but all around it the battle raged. It was mutually agreed that the O.C. 5 (N.Z.) Fd. Amb. should command the whole. It did not have a store of rations, water and supplies sufficient for the 1,800 personnel and patients. Meals were reduced to two a day and the water allowance to one pint per day per man. German medical personnel were helpful but it was noted that such help was deliberately withheld from Italian casualties.

On the 29th the Germans decided to evacuate their own wounded and for this purpose made use of all the New Zealand transport. The German commander left with the New Zealanders written instructions for the Italians who were replacing the German units in this area to the effect that the M.D.S. was not to be molested and that its rations and water were to be left intact for staff and patients. The M.D.S. found itself in the very centre of a tank–artillery engagement and there were casualties among the medical staff and wounded were wounded again. The Ariete Division took over and an Italian medical officer was at once appointed as commandant. He disregarded the German instructions and was most obstructive.

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On December 2 the Italians evacuated their own wounded to Derna and proceeded to ransack the M.D.S. They took away with them as P.o.W. 14 medical officers and 182 O.Rs. of 5 and 6 (N.Z.) Fd. Ambs. and 4 (N.Z.) Fd. Hyg. Sec., leaving behind 11 S.A. medical officers and O.Rs., 2 attached British medical officers, 5 New Zealand medical officers and the Mob. Surg. Unit. Of those to be taken away one officer and 38 staff and patients escaped during the night of December 2/3, as did, on the 4th, 4 more officers and 19 more O.Rs. But some 150 walking wounded were taken away to Benghazi on the 4th. On the 5th the staff and its 860 patients were in desperate need of water and rations. Fortunately, however, relief in the form of elements of 7th Armd. Division came on the 6th and the staff and wounded (some 200 staff and some 800 patients) were quickly evacuated by a R.A.S.C. company through 151 Lt. Fd. Amb. to 7 (S.A.) C.C.S. while the medical personnel were sent on to Baqqush.

On December 5, two ships with two escort vessels left Tobruk for Alexandria at 1730 hours. The larger of the two, S.S. *Chakdina*, under arrangements made by A.D.M.S. Tobruk, carried 380 wounded, including 97 New Zealanders. At 2100 hours the *Chakdina* was attacked by a low-flying torpedo-carrying aircraft. The ship was hit and disappeared below the water in three and a half minutes. There were only 80 survivors. Of the many P.o.W. and wounded below deck very few were saved. Of the New Zealanders only 18 were picked up.

Save for 'B' Company 4 (N.Z.) Fd. Amb., all the divisional medical units of N.Z. 2nd Division were in enemy hands at one time or another during the battle. However, most of the personnel of 4 (N.Z.) Fd. Amb., 'B' Company of 5, some of 'A' Company of 6 and of 4 (N.Z.) Fd. Hyg. Sec. and all the N.Z. Mob. Surg. Unit, save its driver, were either released later or else escaped.

Casualties during the battle:

	Killed, Wounded, Missing	
	Officers	*O.Rs.*
4 (N.Z.) Fd. Amb.	5	23
5 (N.Z.) Fd. Amb.	8	137
6 (N.Z.) Fd. Amb.	7	144
4 (N.Z.) Fd. Hyg. Sec.		22
Mob. Surg. Unit		7
R.M.Os.	2	
	22	333

The losses in respect of transport and equipment were exceedingly heavy, equal indeed to those incurred in Greece and Crete.

In Tobruk preparations in connexion with Operation 'Crusader' included the expansion of hospital accommodation.

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The Town hospital was expanded to .	750
Beach Section	550
Sidi Mahmoud Section . . .	160
Dock Section	50
	1,510
Concrete splinter-proof accommodation near P.o.W. Cage	350
	1,860

173 Fd. Amb. was functioning in the east and south-east sector and had opened a M.D.S., A.D.S., car post and W.W.C.P. Evacuation from these was by ambulance car to the operating centre at Sidi Mahmoud.

On November 25, H.S. *Ramb IV*, a captured Italian hospital ship, left Tobruk with 270 patients. On the 26th New Zealand casualties were being evacuated by 173 Fd. Amb. to 62 B.G.H. in Tobruk. The hospital accommodation in Tobruk was further extended to 2,100 and a captured Italian field ambulance was placed in charge of the P.o.W. cage. On the 27th the *Ramb IV* returned to take off 274 patients. On December 2 the *Chakdina* embarked 380 patients. On the 5th, as has already been recounted, she was bombed and sunk. In the corridor, the Lt. Sec. of 215 Fd. Amb. was serving the brigade that was holding on to El Duda. D.D.M.S. XIII Corps and A.D.M.S. New Zealand Division found themselves in Tobruk. On the 11th there were 1,500 patients in the Tobruk hospitals, including 471 P.o.W., 250 of whom had been transferred from German field hospitals. On the 16th, H.S. *Somersetshire* embarked 516 patients. The medical arrangements in Tobruk had become somewhat complicated by the admission of Indian battle casualties. Arrangements were therefore made to have 2 (Ind.) C.C.S. sent up to Tobruk.

THE PURSUIT TO AGHEILA

While S.A. 2nd Division of XXX Corps contained the Axis garrisons isolated in Bardia, Sollum and Halfaya, XIII Corps set off from Tobruk in pursuit of the main Axis forces withdrawing to the west and preparing to stand on the Gazala Line, running from Gazala southwards into the Desert. The weakness of this line lay in the facts that its right flank was in the air and that the remaining Axis armour was not sufficiently strong to screen it.

On December 11, N.Z. 5th Bde. and the Polish Carpathian Brigade, with their left flank guarded by 32nd Army Tank Bde., moved forward on the right to mask the Gazala position. On the left Ind. 5th and 7th Inf. Bdes. moved towards Alam Hamza, while 4th Armd. Bde. and 7th Sp. Gp. of 7th Armd. Division made a wide detour in the south to

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turn the Axis right flank. On the 13th and on the two following days Ind. 5th Inf. Bde. was held up by strong Axis opposition. On the 14th, N.Z. 5th Bde. and the Poles breached the enemy's line and were then strongly counter-attacked but held their ground.

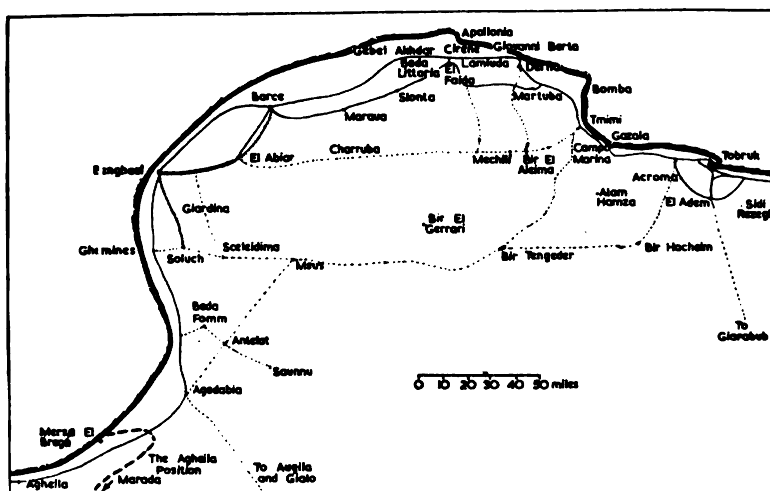

FIG. 35. Cyrenaica.

On the 16th it was discovered that the Axis forces were moving west out of the Gazala Line and on the 17th the pursuit was resumed. 7th Sp. Gp. was sent forward to secure the road junction at Carmusa to prevent the Axis forces from standing on the Derna–Mechili line. Carmusa was occupied on the 18th, but not in time to disrupt the Axis withdrawal. Ind. 7th Inf. Bde. reached Carmusa on the 18th, left a battalion there and moved off with the 7th Sp. Gp. to secure Martuba and the landing ground at Derna.

Ind. 5th Inf. Bde. was ordered to move on Lamluda and Giovanni Berta so as to cut off the Axis forces remaining in Derna. On the 19th Derna was occupied by Ind. 7th Inf. Bde. while Ind. 5th Inf. Bde. reached Lamluda. In the Desert 7th Armd. Division occupied Mechili.

On the 20th, Ind. 5th Inf. Bde. seized Giovanni Berta and it was learnt that the Axis forces were moving out of Benghazi to the south. Heavy rain now fell to delay pursuit. In the coastal sector the advance was held up, but in the Desert Antelat was reached on the 22nd. On the 23rd Barce was occupied by Ind. 5th Inf. Bde. and Benghazi was entered on the 24th by 7th Armd. Division. The L.R.D.G. with a M.E. commando successfully raided the Sirte and Agedabia airfields.

On Christmas Day 7th Armd. Division was in contact with the enemy positions about Agedabia. The Axis forces had been reinforced from

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Tripoli and on January 7 they withdrew from Agedabia to the prepared and strong positions in the Agheila area and there stood. Before they could be assailed Benghazi had to be repaired as a port of supply. The battlefield—Cyrenaica—was in the possession of Eighth Army, but the Axis forces had not yet been destroyed.

THE ASSAULTS ON BARDIA AND SOLLUM

At 0400 hours on December 31, under cover of a heavy artillery barrage, the South African engineers blew gaps in the perimeter wire and cleared lanes in the minefield. Then the infantry advanced to form a bridgehead within the perimeter. The armour, 42nd and 44th R. Tks., then passed through and fanned out, the infantry following to clear up all pockets of resistance. At 2200 hours on the night of January 1 the general advance was resumed. The German garrison surrendered in the early morning of the following day.

On the morning of January 11, S.A. 6th Inf. Bde. attacked Sollum. The garrison of Sollum capitulated at 0900 hours on the 12th and those of Halfaya and Point 207 on the 17th, just before the contemplated assault was launched.

MEDICAL COVER FOR THE PURSUIT TO AGHEILA

5 (N.Z.) Fd. Amb. moved with the reorganised N.Z. 5th Bde. from Tobruk on December 11 for the attack on the Gazala line. It established its M.D.S. in the vicinity of Acroma and to this casualties were sent by the A.D.S. which accompanied the brigade. On the 14th this A.D.S. was subjected to several dive-bombing attacks and endured casualties. On the 17th the brigade and the field ambulance moved back through El Adem to railhead and reached Baqqush on December 29.

On December 10, 19 (Ind.) Fd. Amb. opened a M.D.S. on the Trigh el Abd, running south from Acroma. From this casualties were evacuated to the M.D.S. of 14 (Ind.) Fd. Amb., away to the south-east, *via* a S.P. of 17 (Ind.) Fd. Amb. sited half way between the two. From the M.D.S. of 14 (Ind.) Fd. Amb. further evacuation was to Amb. R.H.

On December 11, the M.D.S. of 19 (Ind.) Fd. Amb., less one company, moved forward to Bir el Zebli. The company left behind now formed a S.P. and that of 17 (Ind.) Fd. Amb. closed. The M.D.S. of 14 (Ind.) Fd. Amb. closed and moved forward to join 19 (Ind.) Fd. Amb. On the 12th this M.D.S. moved to Gabr el Abidi, there soon to be bombed. An A.D.S. of 19 (Ind.) Fd. Amb. was captured during the fighting at Alam Hamza. The distribution of the medical units of XIII Corps on the 14th is shown in Figure 36. On the 15th the M.D.S. of 14 (Ind.) Fd. Amb. at Gabr el Abidi was filled to capacity with casualties, but the situation was eased when the fighting died down.

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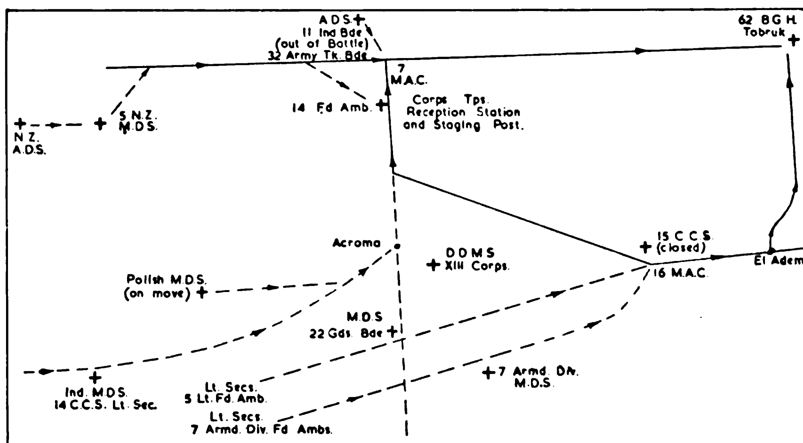

FIG. 36. XIII Corps. Evacuation Chain as at December 14, 1941.

XIII and XXX Corps established corps rest stations and the Army organised a rest area near the sea in the area of Sidi Bengalad, some 66 kms. west of Matruh.

The movements of the field ambulances of Indian 4th Division between December 11 and January 12 are shown in Figure 37.

On December 18th the distribution of the forward Indian medical units was as follows:

H.Q. 19 (Ind.) Fd. Amb.
One coy. 17 (Ind.) Fd. Amb.
Mob. Surg. Team } moving with Adv. Div. H.Q.

H.Q. and one coy. 14 (Ind.) Fd. Amb. M.D.S. at Gabr el Abidi

17 (Ind.) Fd. Amb., less one coy. Reorganising

19 (Ind.) Fd. Amb. and remnants of the coy. that had been taken prisoner at Alam Hamza

As Eighth Army moved forward the system of evacuation was by 10 M.A.C. from Derna *via* a S.P. at Tmimi to 62 B.G.H. and 2 (Ind.) C.C.S. at Tobruk. From the Bardia and Omar area it was by 2 M.A.C. to Hy. Sec. 14 C.C.S. at Minqar el Zannan, near the Desert R.H. at Misheifa, or by ambulance aircraft from L.G. 164, fifteen miles east of Msus, to 62 B.G.H. at Tobruk. From Amb. R.H. evacuation was by ambulance train and from Tobruk by hospital ship to the Delta. Air evacuation was from forward L.Gs. as these became available to 8 (S.A.) C.C.S. at Matruh and the Delta.

On the 19th one company of 17 (Ind.) Fd. Amb. was detailed to take over the hospital at Derna. On the 20th, 2 (Ind.) C.C.S. reached Tobruk and opened there on the 22nd. Hospital ships were now plying from Tobruk. 19 (Ind.) Fd. Amb. had opened its M.D.S. at Carmusa on the

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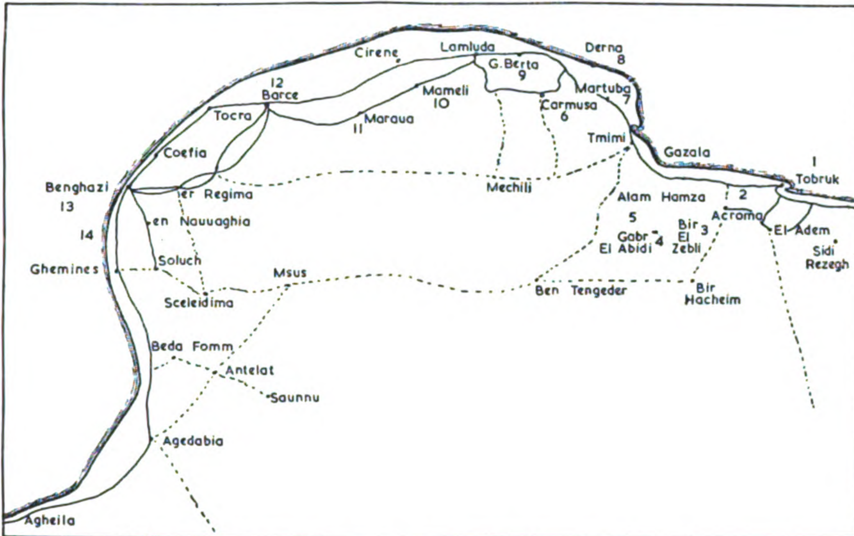

FIG. 37. Indian 4th Division. Medical Cover.
December 11, 1941–January 12, 1942.

1. 62 B.G.H.	
2 (Ind.) C.C.S.	Dec. 20
17 (Ind.) Fd. Amb. (reorganising)	Dec. 18
2. S.P. 17 (Ind.) Fd. Amb.	Dec. 12
3. M.D.S. 19 (Ind.) Fd. Amb. bombed and closed	Dec. 11
4. M.D.S. 19 (Ind.) Fd. Amb. (bombed)	Dec. 12
H.Q. 19 (Ind.) Fd. Amb.,	
Operating team and Coy.	
17 (Ind.) Fd. Amb. in reserve	
5. A.D.S. 19 (Ind.) Fd. Amb.	Dec. 12
6. M.D.S. 19 (Ind.) Fd. Amb.	Dec. 19
7. M.D.S. 17 (Ind.) Fd. Amb.	Dec. 21
8. Coy. 17 (Ind.) Fd. Amb.	Dec. 22
9. M.D.S. 14 (Ind.) Fd. Amb.	Dec. 21
M.D.S. 17 (Ind.) Fd. Amb. in reserve	Dec. 24
M.D.S. 19 (Ind.) Fd. Amb. in reserve 10 miles south of G. Berta	Dec. 22
10. M.D.S. 14 (Ind.) Fd. Amb.	Dec. 25
S.P. 14 (Ind.) Fd. Amb.	Jan. 4
2 (Ind.) C.C.S.	Jan. 12
11. Coy. 14 (Ind.) Fd. Amb.	Dec. 24
12. M.D.S. 19 (Ind.) Fd. Amb.	Dec. 25
Coy. 14 (Ind.) Fd. Amb.	Dec. 25
14 (Ind.) Fd. Amb. in reserve	Jan. 12
13. Coy. 14 (Ind.) Fd. Amb.	Dec. 26
Coy. 17 (Ind.) Fd. Amb.	Jan. 4
14. M.D.S. 17 (Ind.) Fd. Amb.	Jan. 4

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19th, and, on the 21st, 14 (Ind.) Fd. Amb. had its M.D.S. at Giovanni Berta and 17 (Ind.) Fd. Amb. was in the civil hospital at Martuba.

On the 22nd the distribution of the Indian forward medical units was as follows:

H.Q. and one coy. 14 (Ind.) Fd. Amb. M.D.S. Giovanni Berta
H.Q. 19 (Ind.) Fd. Amb. closed, ten miles south of Giovanni Berta
H.Q. 17 (Ind.) Fd. Amb. with rear Div. H.Q.
One coy. 17 (Ind.) Fd. Amb. with 7th Bde.
One coy. 14 (Ind.) Fd. Amb. with 5th Bde.
One coy. 19 (Ind.) Fd. Amb. with 11th Bde.
One coy. 17 (Ind.) Fd. Amb. with Lt. Sec. 2 (Ind.) C.C.S. at Derna

On December 24, one company 14 (Ind.) Fd. Amb. moved forward to Maraua and then on into Barce. H.Q. 17 (Ind.) Fd. Amb. moved into Giovanni Berta. On the 25th, H.Q. 19 (Ind.) Fd. Amb. moved into Barce and there opened a M.D.S. H.Q. 14 (Ind.) Fd. Amb. moved forward to Mameli.

On the 25th the distribution of Indian forward medical units was as follows:

M.D.S. 14 (Ind.) Fd. Amb. at Mameli
M.D.S. 17 (Ind.) Fd. Amb. moving into Benghazi
M.D.S. 19 (Ind.) Fd. Amb. at Barce
Coy. 14 (Ind.) Fd. Amb. with 5th Bde.
Coy. 14 (Ind.) Fd. Amb. with 19 (Ind.) Fd. Amb. at Barce
Coy. 17 (Ind.) Fd. Amb. at Derna
Coy. 17 (Ind.) Fd. Amb. with 7th Bde.
Coy. 19 (Ind.) Fd. Amb. with 11th Bde.
Coy. 19 (Ind.) Fd. Amb. reorganising

From December 26 casualties from the Mameli area were sent direct to Derna. The company of 14 (Ind.) Fd. Amb. with 19 (Ind.) Fd. Amb. at Barce moved to Benghazi and evacuated casualties therefrom to Barce, where great quantities of Axis medical stores were available.

On January 12 the distribution of Indian forward medical units was as follows:

H.Q. 14 (Ind.) Fd. Amb. and two coys. in reserve at Barce
M.D.S. 19 (Ind.) Fd. Amb. at Barce
One coy. 19 (Ind.) Fd. Amb. in reserve at Barce
One coy. 19 (Ind.) Fd. Amb. with 11th Bde.
M.D.S. 17 (Ind.) Fd. Amb. 12 miles south of Benghazi on the Benghazi–Ghemines road
One coy. 17 (Ind.) Fd. Amb. in reserve with this M.D.S.
One coy. 17 (Ind.) Fd. Amb. with Ind. 7th Inf. Bde.
2 (Ind.) C.C.S. at Mameli.

The movements of the light field ambulances of 7th Armd. Division during these events are shown in Fig. 38. After December 11 casualties

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were evacuated to Tobruk. After the 21st evacuation was to Km. 79 on the Tobruk–Derna road and thence to Tobruk. After the 21st evacuation was *via* Mechili to Carmusa and beyond.

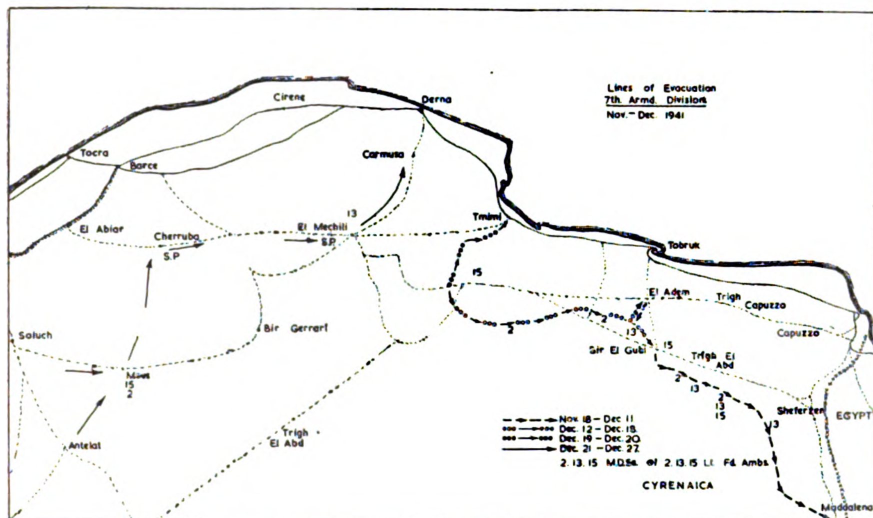

FIG. 38. 7th Armoured Division. Medical Cover. November–December 1941.

These medical units were very experienced and managed to escape disaster during the confused fighting in November. 151 Lt. Fd. Amb., when dealing with casualties in the neighbourhood of Reghem on November 24–25, was attacked by Axis armour and its surgical shelter was destroyed. The unit moved quickly; it was actually chased through and beyond the frontier wire but got back to Sofafi safely. Ten ambulance cars that had been sent to the Support Group were captured by an enemy column on November 23.

The distribution of these forward medical units in January is shown in Fig. 39. When the minefields to the south-west of Agedabia had been cleared, it became possible for 5 Lt. Fd. Amb. to move south and open a shorter evacuation route from Haseiat to Antelat, so by-passing Agedabia. From Msus serious cases were being evacuated to Tobruk by air ambulance, the remainder by track to the main road at Maraua and thence to 2 (Ind.) C.C.S. at Mameli and to 15 C.C.S. at Derna. From Derna and Mameli evacuation was by 10 (S.A.) M.A.C. to 62 B.G.H. at Tobruk.

The salvaging of captured enemy medical stores and equipment was systematically conducted, detachments of 9 Lt. Fd. Amb. at Benghazi being detailed for this purpose. The salvaged stores were collected in 5 Adv. Depot Med. Stores in Tobruk and despatched thence by ship

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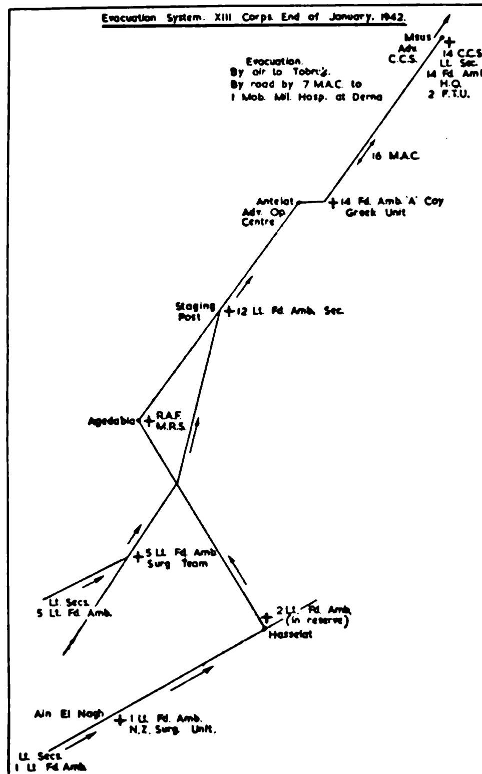

FIG. 39. XIII Corps. Evacuation Chain as at End of January 1942.

to the Delta. All usable and repairable ambulance cars were handed over to the M.A.C.

1 Mob. Mil. Hosp. moved to Benghazi and 15 C.C.S. to Barce in preparation for a further advance of Eighth Army.

MEDICAL COVER FOR THE ASSAULTS ON BARDIA AND SOLLUM

16 (S.A.) Fd. Amb. had its M.D.S. at Sidi Azeiz
its A.D.S. on the Capuzzo–Bardia road
a detachment to the north of the perimeter
a detachment at Menastir to serve S.A. 3rd Inf. Bde.
a detachment at the Sidi Azeiz L.G.

14 (S.A.) Fd. Amb. had its M.D.S. at Capuzzo to serve S.A. 6th Inf. Bde.
its A.D.S. near the point where the Trigh Capuzzo meets the Capuzzo–Bardia road

17 (S.A.) Fd. Amb. had its M.D.S. south-east of Bir Sheferzen
a detachment at Omar Nuovo

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a staging post at Sofafi
7 (S.A.) C.C.S. u/c XXX Corps was at Sidi Azeiz
2 (Br.) M.A.C. u/c XXX Corps had detachments at Capuzzo and Sidi Azeiz.

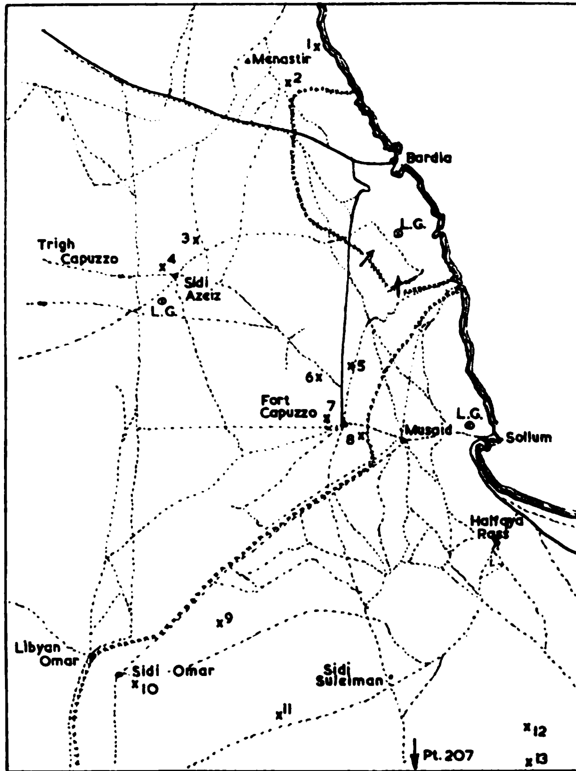

FIG. 40. The Assaults on Bardia and Sollum by S.A. 2nd Division. Medical Cover.

1. 16 (S.A.) Fd. Amb. detachment . December 30
2. 16 (S.A.) Fd. Amb. detachment . December 30
3. 7 (S.A.) C.C.S. . . . . . December 30
4. 16 (S.A.) Fd. Amb. M.D.S. . . December 30 and January 11
5. 16 (S.A.) Fd. Amb. M.D.S. . . December 30
6. 7 (S.A.) C.C.S. . . . . . January 11
7. 14 (S.A.) Fd. Amb. M.D.S. . . December 30 and January 11
8. 14 (S.A.) Fd. Amb. A.D.S. . . Janauary 11
9. 17 (S.A.) Fd. Amb. A.D.S. . . January 11
10. 17 (S.A.) Fd. Amb. detachment . December 30
11. 17 (S.A.) Fd. Amb. M.D.S. . . January 11
12. 17 (S.A.) Fd. Amb. A.D.S. . . January 11
13. 17 (S.A.) Fd. Amb. A.D.S. . . December 30

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The numbers of casualties admitted to the field ambulances were 157 on December 30, 26 on December 31 and 143 on January 1, these including 98 Germans. From 7 (S.A.) C.C.S. during this operation 136 and 1 German out of the 277 and 45 Germans and Italians admitted were evacuated by air.

In Bardia there were two military hospitals, a German hospital in buildings and an Italian tented hospital in a wadi near the Bardia–Tobruk road. Both were in a very insanitary state and both contained a number of cases of amoebic dysentery. The enemy hospital patients were evacuated to Tobruk by January 7, Germans 50 wounded and 50 sick, Italians 59 wounded and 70 sick.

Following the capitulation the problems created by the grossly insanitary conditions within the perimeter demanded immediate solution.

It was known that in Bardia were many British Commonwealth P.o.W. A.D.M.S. S.A. Division therefore detailed a section of 14 (S.A.) Fd. Amb., together with a surgical team, to be ready to deal with such of these as were sick or wounded. The unit went into Bardia about 1300 hours on D-day+3.

In the Italian tented hospital one New Zealander was found. He was a dysentery case and was taken back to 7 (S.A.) C.C.S. at Sidi Azeiz. The hospital was well found and apparently well run. In it there were some 70 sick and 60 wounded. Among the sick were many cases of dysentery, a bacillary type according to the Italian staff.

The Germans had a hospital in a building in Bardia. Outhouses lining a large square had been used as wards for light cases. The hospital was filthy, badly kept and badly organised. Forty cases of amoebic dysentery had been left behind.

1,070 British Commonwealth P.o.W. had been lodged in a field in the rear of these outhouses. Among them were several cases of dysentery and fifteen battle casualties. A.D.M.S. S.A. 2nd Division used the M.D.S. of 14 (S.A.) Fd. Amb. at Capuzzo as a dysentery hospital and all the released P.o.W. were carefully inspected. When all the sick and wounded had been dealt with, the German and Italian medical personnel were sent back to Tobruk.

Casualties during the attack on Sollum were numerous and their evacuation presented much difficulty because of the nature of the ground. Stretcher-bearer parties from 14 (S.A.) Fd. Amb. had to be employed to assist the regimental stretcher-bearers.

14 (S.A.) Fd. Amb. had its	M.D.S. at Capuzzo
	A.D.S. at Musaid
16 (S.A.) Fd. Amb.	M.D.S. at Sidi Azeiz
	A.D.S. at Omar Nuovo
	detachments at the Sidi Azeiz L.G. and at Gambut

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Cases evacuated by 14 (S.A.) Fd. Amb. on January 11, 12 and 13 were 101 plus 35 Germans and Italians, and on January 17 and 18 by 14, 16 and 17 (S.A.) Fd. Ambs. were British P.o.W., 2 officers and 64 O.Rs. all treated as patients and admitted to 14 (S.A.) Fd. Amb., and Germans, 1 officer and 36 O.Rs.; Italians, 2 officers and 113 O.Rs.

Halfaya was subjected to heavy artillery and aerial bombardment and it was hoped that this might persuade the garrison to surrender. Deserters brought news that there was a grave shortage of medical supplies in Halfaya and so when a German ambulance car brought four wounded R.A.F. personnel into the South African lines it was loaded with medical stores and sent back. When Halfaya surrendered on January 17, it was found that in spite of all the bombardment there were only 152 casualties. All the British Commonwealth P.o.W. were taken to 7 (S.A.) C.C.S. now at Capuzzo, and treated as invalids.

MEDICAL ARRANGEMENTS AT THE BASE

Developments affecting the Army Medical Services at this time are outlined in Appendix XV.

Attention is drawn to the number and variety of the specialist teams and units which by this time had claimed their places within the medical services in the field. Their increase shows that a policy of providing the best medical care at the first possible opportunity was being actively pursued. The co-existence of the neuro-surgical team and the maxillo-facial team is of particular interest in that it marks a stage in the development of the 'trinity' of specialist teams—neuro-surgical, maxillo-facial and ophthalmic—that was to prove so successful in Italy.

1 Mobile Neuro-surgical Unit served in France and was captured at Dunkirk. It was reconstituted for this Campaign. It was formed at the Military Hospital for Head Injuries at Oxford and trained under the supervision of the Consulting Neuro-surgeon to the Army. Its establishment consisted of a neuro-surgeon, a neurologist, an anaesthetist, 4 G.D.Os., 2 nursing sisters, 4 medical orderlies and 2 R.A.S.C. drivers. It had 2 sets of neuro-surgical and 1 set of general surgical instruments, 2 operating tables, surgical diathermy, motor suction and material sufficient for 200 neuro-surgical operations. It had its own transport, with a petrol engine and generator. It depended on a host unit for beds, nursing, X-ray sterilisation and pathological services.

1 Maxillo-facial Unit was formed in Alexandria in the spring of 1941. Unlike the M.N.S.U. the unit had no transport of its own. 2 M.F.U. was mobilised at Park Prewett Hospital, Basingstoke, late in 1940 and was sent to Jerusalem in August 1941 where it played its part in the Syrian Campaign. In November it moved to Heliopolis.

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Two small thoracic surgical units were organised for service in the Middle East. Each consisted of a thoracic surgeon, a thoracic physican and a thoracic anaesthetist.

The Venereal Diseases Treatment Centre was another important innovation for the reason that later this unit was to be used in the forward areas to ensure both early and continuous treatment and to prevent the prolonged and unnecessary absence of men from their units.

In order to provide accommodation in the hospitals in Egypt and Palestine for the casualties expected from Operation 'Crusader', the following evacuations were carried out between October 12 and November 18, 1941:

H.S. *Vita* from Suez to Massawa, 145 patients to M.E. Hospital Centre, Asmara
H.S. *Amra* from Suez to S. Africa, 365 patients to Durban
H.S. *Llandovery Castle* from Suez to India, 335 P.o.W. to Bombay
H.S. *Wanganella* from Suez to Australia, 323 patients to Freemantle
H.S. *Manganui* from Suez to New Zealand, 367 patients to Wellington
H.S. *Aba* from Suez to S. Africa, 436 patients to Durban
H.S. *Talamba* from Suez to Massawa, 423 patients to Asmara
H.S. *Oranje* from Suez to Australia, 478 patients to Freemantle
H.S. *Talamba* from Suez to India, 368 patients to Bombay
Total: 3,240

Convalescent patients transferred from Egypt to Palestine between October 16 and November 18, 1941:

October 16 .	406
21 .	405
30 .	371
November 10 .	476
	1,658

The first casualties from the Desert during Operation 'Crusader' reached B.T.E. on November 27. For them 850 beds for officers and 9,500 for other ranks had been prepared, together with a further 3,160 which could readily be made available if the need arose.

The system of evacuation within B.T.E. area was as follows:

By rail: (6 ambulance trains) Polish, Czech and sometimes U.D.F. casualties were taken off the ambulance trains at Abd el Qadir and transferred to a shuttle ambulance coach service to the hospitals in Alexandria Area.

By sea: On arrival at Alexandria the more serious and urgent cases were taken to 8 or 64 B.G.H. Those fit to travel were taken on by ambulance train to Cairo.

By air: From the airport at Heliopolis to 63 B.G.H.

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P.o.W.:		
	Italians and Libyans	to Egyptian Govt. Hosp., Alexandria; to Cairo to any B.H.G. except 63; to Canal Area to 6 and 19 B.G.Hs.
	Germans . .	to 63 B.G.H., Cairo; to 6 and 19 B.G.Hs., Geneifa; to 3 B.G.H., Buseili.

Base Transport:

		Cars
Cairo . .	11 M.T.C.	20
	1 A.C.C., two sub-secs. .	10
Cairo . .	11 S.A. M.A.C., one sec. .	25
	11 S.A. M.A.C., two sub-secs.	10
		65
Alexandria .	11 M.A.C.	50
	11 M.A.C. H.Q. and three sub-secs. . . .	15
		65
Canal Area .	4 A.C.C., H.Q. and three secs.	68
	11 S.A. M.A.C., one sec. .	25
		93

The medical arrangements worked smoothly, but the shortage of R.A.M.C. personnel that had existed for some time now began to have its repercussions. The strength of most medical units was well under establishment, with the result that relaxation was much curtailed. An exceptionally high sick rate began to distinguish the Army Medical Services.

(ii)

The Siege of Tobruk
April 11 – December 10, 1941

Tobruk fell to 7th Armoured and Australian 6th Divisions on January 24, 1941. When 7th Armd. Division and Australian 17th and 19th Infantry Brigades moved on towards El Mechili and Derna after a brief pause, Australian 16th Infantry Brigade remained in Tobruk for the time being, as did also 2/1 (Aust.) Field Ambulance and 2/1 (Aust.) Field Hygiene Section. These medical units were relieved before the end of the month by 2/5 (Aust.) Fd. Amb. and 2/3 (Aust.) Fd. Hyg. Sec. 2/2 (Aust.) C.C.S. reached Tobruk from Alexandria on January 28 and took over the Italian barracks.

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The town was in a most insanitary state: there were great mounds of refuse everywhere and a veritable plague of flies. The water supply and the sanitary systems had been badly damaged by the Royal Navy and Royal Air Force. The Engineers quickly restored the water supply so that it became possible to satisfy the needs of the 25,000 Italian P.o.W. These were in a cage 10 kms. along the Tobruk–Bardia road and presented the field hygiene section with problems of great magnitude. Soon deep trench latrines had been dug and the hazards of disease reduced. Nevertheless anxiety persisted and D.D.M.S. Australian I Corps was impelled to appeal to D.M.S., G.H.Q., M.E.F., 'Consider hygiene situation Tobruk area very dangerous. Essential that transport be made available urgently for conservancy purposes. Twelve lorries required immediately.'

During the latter part of February it was not possible to evacuate any Italian P.o.W. Fresh sites for their cages were provided and a satisfactory conservancy system organised, Italian medical officers being placed in charge of it. Italian disinfestors were brought into use and vast quantities of disinfectants distributed. The Italian sick were evacuated from the cage to an improvised Italian medical unit along the Derna road (*via* Balbia) staffed with no less than 100 Italian medical officers and 600 medical orderlies and capable of holding 800 patients.

Among the 16,000–18,000 individuals included in the population of the fortress at this time were men from Australia, Cyprus, Libya, New Zealand, Palestine (both Jews and Arabs) and the United Kingdom. The lack of an Arabic speaking medical officer was felt.

H.E.M.S. *Fawzia* reached Tobruk on February 7, H.S. *Aba* on the 8th and H.S. *Dorsetshire* on the 9th and removed several hundreds of patients and P.o.W. 5 Adv. Depot Med. Stores arrived and took over the excess stores of 15 C.C.S. at Bardia and 2/2 (Aust.) C.C.S. at Tobruk. Large quantities of captured medical equipment and stores were sent back to the Delta.

On February 24, Hy. Sec. 2/2 (Aust.) C.C.S. moved out of the town of Tobruk to Pilastrino so as to avoid the air raids that were increasing in frequency. Lt. Sec. 2/2 C.C.S. remained in the Italian barracks. At Pilastrino 2/5 (Aust.) Fd. Amb. was holding some 400 patients in tents.

On March 8, the hospital ships returned and were warmly welcomed, for on this date there were 506 patients in the medical units and dysentery was causing anxiety.

On March 9, 2/4 A.G.H. passed through Tobruk *en route* for Barce. On the 18th, 167 survivors from the S.S. *Rosauro*, which was evacuating Italian wounded and which had struck a mine and sunk, were admitted to the Tobruk medical units. Hy. Sec. 2/2 (Aust.) C.C.S. moved from Pilastrino to a new site three miles out of Tobruk beneath the escarpment on the south side of the harbour. On the 27th a hospital ship

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arrived with 63 nurses for the C.C.S. aboard and took away some 450 patients.

Tobruk was inevitably affected by the repercussions of the withdrawal from El Agheila. On March 30, 2/4 A.G.H. at Barce and 2/2 (Aust.) C.C.S. at Tobruk exchanged locations, the hospital reaching Tobruk on April 4. 2/4 A.G.H. and 2/3 (Aust.) Fd. Amb. promptly opened a tented overflow beach hospital as the main part of 2/4 A.G.H. at once became filled with battle casualties from the forward areas. On April 8, H.S. *Vita* took off the 63 nurses and 323 patients and the rest of 2/5 (Aust.) Fd. Amb. reached Tobruk, as did Aust. 18th Inf. Bde. fresh from the Giarabub engagement.

General Wavell decided that Tobruk should be held even though the main body of W.D.F. withdrew further east. The medical units in Tobruk were:

Australian
- 2/4 A.G.H.
- 2/2 (Aust.) C.C.S. (until July)
- 2/3 (Aust.) Fd. Amb. (Aust. 26th Inf. Bde. and Ind. 18th Cav.)
- 2/5 (Aust.) Fd. Amb. (Aust. 18th Inf. Bde.)
- 2/8 (Aust.) Fd. Amb. (Aust. 20th Inf. Bde.)
- 2/11 (Aust.) Fd. Amb. (Aust. 24th Inf. Bde.)
- 2/4 (Aust.) Fd. Hyg. Sec.

United Kingdom
- 36 Fd. Hyg. Sec.
- 5 Adv. Depot Med. Stores
- 1 Mob. Ophthalmic Unit (withdrawn in April)
- 6 Mob. Bact. Lab. (withdrawn in April)
- 16 M.A.C.

Indian
- 15 I.G.H. section (100 beds)

On April 10, as the Axis force approached, Tobruk was subjected to severe aerial bombardment. 2/4 A.G.H. was hit and 35 of the staff and patients in the main building were killed. The beach section was also attacked and 35 of the staff and patients were killed or wounded. These attacks seemed to be deliberate.

On Good Friday, April 11, Tobruk was invested. Within the fortress there were at that time some 40,000 troops, including about 7,000 P.o.W. Quite a proportion of the troops, however, did not belong to first-line units and the ancillary units and personnel were far in excess of the garrison's needs. Before the end of the month some 12,000 Army and Royal Air Force personnel and P.o.W. had been evacuated by sea.

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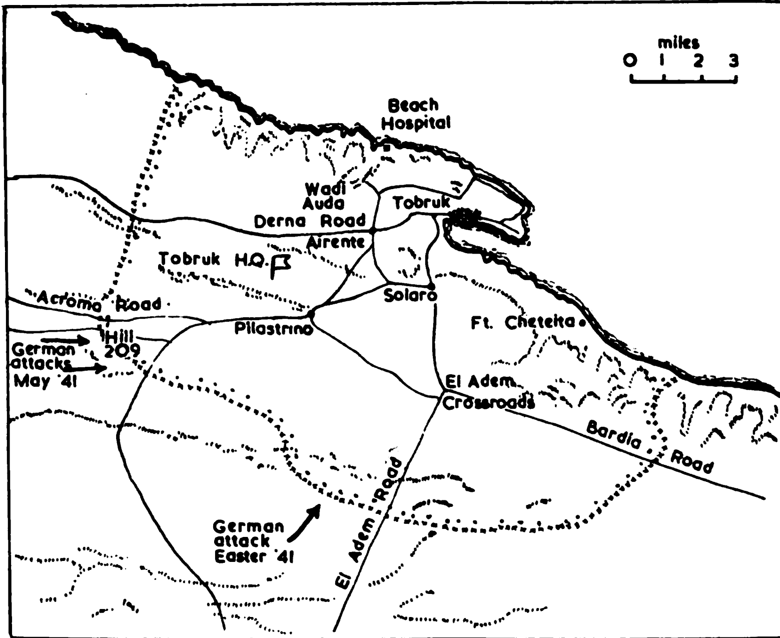

FIG. 41. Tobruk Fortress.

TOBRUK FORTRESS

The garrison town of Tobruk is built on a rocky headland which forms the northern shore of a harbour. The promontory is one and a half miles wide and extends for two miles eastwards. The town, a cluster of white buildings, extended for about a mile along the southern shore of the headland and for about half a mile inland. In peace-time it had accommodated some 10,000 troops, Italian and Libyan, together with about 1,000 civil servants and business people. Half a mile to the north of the town was a native village of some 9,000 inhabitants.

Tobruk had a large naval barracks, a Grand Hotel and two other inns, a restaurant, a school, a church, a mosque, a fine hospital, a power station, a refrigerating plant, two water distilleries producing 20,000 gallons daily and sub-artesian wells yielding another 20,000 gallons. It was not a natural fortress but had been converted into a stronghold because of the importance of its harbour. The Italians had constructed a perimeter some 32 miles in total length and enclosing about 220 square miles of land, mostly desert. This began at the shore, eight miles to the east of the harbour, and joined the coast again nine miles to the west of the harbour, having the general shape of a huge semicircle. There was a five foot high double belt of wire and, in front of this, minefields and in places an anti-tank ditch. There were also two rows of strong-points of the sangar type, the first row being amid the wire and

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the second about 500 yards behind. The headland had been extensively tunnelled to provide dug-outs, air-raid shelters, ammunition and petrol stores and the like.

Between the coast and the perimeter the ground rose in three steps or escarpments. The edges of these, as also the coastal cliffs, were serrated with many wadis in which there were occasional wells and small clumps of palms. At the bottom of these wadis there was brown soft earth and those in the cliffs led to pleasant beaches of white sand. Elsewhere the ground was exceedingly hard and stony and bore no vegetation.

The Italians had accommodated their troops in well-designed barracks within the town area and also in caves dug in the sides of the wadis. There was a 600-bedded hospital block to the north-west of the town, but the building had been damaged. In addition there were a number of tented camp hospitals well supplied with ward and operating tents, one at Fort Pilastrino and others grouped at a point 6 kms. from the town.

There were three sources of water supply within the area:

(*a*) Storage water. 7,000 tons of water brought from Italy were found in a reservoir near the harbour. This was the only good drinking water and was sparingly issued for drinking and cooking purposes only.

(*b*) Distilled water. The distillation plant had suffered only minor damage from attempts at demolition. It produced from sea water a somewhat brackish supply which was distributed to various convenient points.

(*c*) Well water. The wells at Sehel and Auda were shallow soakage wells, producing a hard and brackish, but drinkable water. A pumping station was built over the mouth of each well and afforded fair protection from surface contamination.

ITS DEFENCES

(1) The Red Line was the perimeter with its minefields and strong-points.

(2) The Blue Line, two miles behind the Red Line, consisted of strong-points with their wire and minefields and dug-in (Italian) tanks.

(3) Further back still were the field gun positions, the main barrier against marauding tanks.

(4) The mobile reserve, a motorised infantry brigade with its battalion at the El Adem crossroads (Kings Cross), at Pilastrino and at Airente, and also a mobile force of armoured cars and carriers for use against parachutists and sea-borne landings.

(5) The coastal defences of A.A. batteries and the two Italian coastal defence guns not destroyed by the Italians. For protection

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against danger from the sea the garrison relied upon the Royal Navy.

The composition of the garrison at the time of the investment of Tobruk on April 11 is shown in Appendix XVI. In general the Australians contributed the infantry component and the medical services while the armour, guns, machine-guns and labour were United Kingdom (U.K. troops and dilutees) and Indian units. Towards the end of the siege the Australian 9th Division and 18th Inf. Bde. of Australian 7th Division were replaced by 70th Division including the Polish Carpathian Brigade.

During the 262 days of the siege there was much reinforcement and replacement of the units of the garrison, so that the total numbers of the garrison and the actual units within it were not always the same. The numerical strength of the garrison varied as follows:

April 12, 1941	35,307
April 21	33,109
June 30	22,305
July 30	22,026
August 31	22,996
September 30	25,029

The composition of the garrison varied as follows:

	Australians	*U.K. and Indian*	*Poles*
April 21	14,817	18,292	—
June 30	14,326	7,979	—
August 31	12,400	5,775	4,821
September 30	7,716	12,441	4,872

The Palestinian and Cypriot labour units were soon replaced by 45 Gp. (Indian) Pioneer Corps, 1,200 strong.

THE SIEGE

AUSTRALIAN 9TH DIVISION PERIOD*

Since for the greater part of the time during which Tobruk was beseiged (April 11–December 10, 1941) the command of the fortress, the large infantry component of its garrison and its medical services were Australian, the narrative of the siege rightly belongs to the Australian Official Medical History. But since at all times during the siege there were many United Kingdom units included within the garrison, and since towards its end Australian 9th Division was replaced by 70th Division and A.A.M.C. units by R.A.M.C., the story must claim its place in this volume.

* For a more detailed account the Australian Official Medical History should be consulted.

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Aust. 26th Inf. Bde. was on the right astride the Derna road, Aust. 20th Inf. Bde. in the centre astride the El Adem road, Aust. 24th Inf. Bde. on the left astride the Bardia road and Aust. 18th Inf. Bde. was in reserve.

2/3 (Aust.) Fd. Amb. had its M.D.S. at the south end of the Wadi Auda in two stone huts, 2/8 (Aust.) Fd. Amb. was in two roofed tunnels near divisional H.Q. and 2/11 (Aust.) Fd. Amb. was near the El Adem corner off the Bardia road. A mobile section of one medical officer and six or more other ranks was with each battalion.

The Axis forces at once began to press against the perimeter. On April 12 they began to entrench about 400 yards from the perimeter on a 1,200 yard front while the Luftwaffe attacked the harbour. On the night of the 13th, the Axis infantry pierced the perimeter wire but were flung back by a bayonet charge. On the morning of the 14th, Axis tanks penetrated some two miles into the fortress but the Australian infantry, remaining in their perimeter positions, prevented the Axis infantry from following their armour. The British guns checked the Axis tanks and by 0700 hours all were outside the wire save 16 tanks that had been crippled, 110 dead and 254 prisoners. The garrison's losses were 26 killed and 64 wounded.

On this date H.Q. 'Cyrcom' was withdrawn from Tobruk to Mersa Matruh by sea to become the Western Desert Force and Tobruk Fortress became a separate command under G.O.C., Australian 9th Division.

H.S. *Vita* was deliberately attacked from the air as it was leaving the harbour with 422 patients aboard. Near misses caused considerable damage and it became necessary to transfer the patients to the destroyer *Waterhen* and to tow H.S. *Vita* back to Alexandria. H.S. *Dorsetshire* arrived and took off 352 patients, including 164 Germans and Italians. Now that it had finally been demonstrated that hospital ships were not to be protected in accordance with the terms of the Geneva Convention, it was decided that henceforward all evacuation of the sick and injured would be by night and in destroyers and sloops.

On April 15 and 16 the Italian infantry attacked, to be scattered by gunfire and to lose some 800 prisoners.

It was found necessary to close the Italian hospital and so the P.o.W. patients went either to 2/4 A.G.H. or else to the cages. This move involved 450 patients and 500 medical staff. Lt. Sec. 2/2 (Aust.) C.C.S. established a cave hospital with 70–90 beds under Admiralty House—'The Docks Hospital'. 2/3 (Aust.) Fd. Amb. established a gas treatment centre.

Again on April 17 Axis armour and infantry broke through the perimeter, only to be repulsed once more by the guns.

On the 24th the Italian infantry attacked again and again were repulsed with the loss of 107 prisoners. Throughout these days Stukas

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dive-bombed the harbour repeatedly. The Australians were not passive, for they engaged in frequent offensive raids. On April 26 the R.A.F. was obliged to withdraw the remnants of its small force from Tobruk. There were but five of the original thirty-two machines now still airworthy.

On April 30 the Axis forces launched a heavy assault upon the perimeter in the region of Hill 209. By 2115 hours they were one mile within fortress territory and by the following morning had captured seven strong-points and had established a bridgehead one and a half miles wide. Later in the day the Axis forces struck again to overwhelm eight more strong-points. The British guns ultimately checked the Axis armour, destroying 46 out of the 81 tanks, while the Australian infantry counter-attacked along the Acroma road.

During this time, so filled with incident, the medical services were successfully adapting themselves to the peculiar circumstances. In the beach hospital and other tented medical units the E.P.I.P. tents were erected in groups of five, each holding eight patients. The floors were sunk 18 inches and the walls sandbagged up to 4 feet. The beds were of the stretcher type but the legs were not used; the frames were supported on stones so as just to clear the ground. The centre tent was used as an office and the cruciform clusters were grouped in threes arranged in a triangle. These 96-bed clusters were spaced 150 yards apart. Slit trenches and air-raid shelters were provided. Evacuation from the R.A.Ps. was by night and usually in unit transport, though not uncommonly it was possible for the M.A.C. to go right forward to the R.A.P. itself. Because of the need to conserve man-power in the line instructions were issued to the effect that no man still able to fight was to be sent back from the R.A.P.

The hygiene sections were busily waging their own war upon flies, ticks in the caves and bugs in the forward concrete posts. The Engineers had restored the distilleries and water supplies had become satisfactory. The main supply was from the Wadi Auda* whence it was pumped and piped into the town. Chlorination was carried out as each water truck was filled and each receiving unit was expected to do its own detasting. The allowance for hospitals was now:

1½ gallons of well water per patient per day
1½ gallons of seaborne water per patient per day for drinking and surgical purposes.

By the end of April the health of the troops was satisfactory, though neurosis was beginning to cause anxiety. The rations were ample; bread of good quality was being produced by the field bakery and there was an ample store of marmite and ascorbic acid tablets.

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* *See* Plate XIV, Chapter 4.

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2/3 (Aust.) Fd. Amb. became a sorting centre for N.Y.D (N.) cases. 2/11 (Aust.) Fd. Amb. developed cave shelters at Sidi Mahmoud. A large central room led to a number of larger rooms, all concrete lined, dug into the side of a hill. Here a dental clinic was established. During an air raid on April 29 the beach hospital was hit; three patients were killed and seven wounded.

On May 3, Aust. 18th Inf. Bde. attempted to recapture the six square miles of ground that had been lost. This attack failed for the captured area was very strongly defended.

On May 4, during an air raid, the M.D.S. of 2/8 (Aust.) Fd. Amb. was hit and H.S. *Karapara* dive-bombed.

On May 13 the first attempt to relieve Tobruk was made. It failed. The casualties among the Tobruk garrison amounted to 115 killed or missing and 59 wounded. It was noted that consequent upon this abortive attempt at relief the incidence of neurosis rose very considerably.

Hy. Sec. 2/2 (Aust.) C.C.S. moved into the caves at Sidi Mahmoud alongside the M.D.S. of 2/11 (Aust.) Fd. Amb. 'Z' ward, a concreted cave, to hold 50 cases of neurosis, was opened near the town section of 2/4 A.G.H.

On May 18 H.S. *Aba* was attacked by dive-bombers and had to be protected by warships.

On June 15 the second attempt to relieve Tobruk was launched—Operation 'Battleaxe'. It also failed. Nevertheless there was no quiet at Tobruk. The loss of Hill 209 had seriously enlarged the length of the line to be defended by the Australian infantry and so repeated attempts were made to recapture the ground and shorten the line. But by July stalemate set in and both sides settled down to defensive activity with much patrolling, mine-laying and wire-repairing.

Then it was decided that the Australians should be pulled out of Tobruk to join the other two Australian divisions in Syria and Palestine. There had been an understanding that, whenever possible, these three Australian divisions should be used together under Australian I Corps and now the Australian Government made a direct request to the British War Cabinet that this should be done. On August 23, Aust. 18th Inf. Bde. with 2/5 (Aust.) Fd. Amb., British 51st Fd. Regt. R.A. and Indian 18th Cavalry Regt. were withdrawn and replaced by the Polish Carpathian Bde. Gp. with Polish field ambulances attached. On September 21, Aust. 24th Inf. Bde., together with 2/3 (Aust.) Fd. Amb. and a number of British units, was relieved by the 16th Inf. Bde. Gp. (with 173 Fd. Amb.) of 70th Division (formerly 6th Division in Syria). In October and November the remaining Australians were replaced by units of 70th Division (including 159 and 215 Fd. Ambs., 33 Fd. Hyg. Sec., 1 A.C.C. and 62 B.G.H.), with the exception of Aust. 2/13th Inf. Bn. which remained behind at the request of the commander of the garrison.

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MEDICAL ASPECTS OF THE SIEGE— AUSTRALIAN 9TH DIVISION PERIOD

When H.Q. Base Sub-area assumed duty the sanitary state of the town was indescribable. All premises had been fouled with excrement by the Italians and food scraps were everywhere. Most of the lavatories were clogged with faeces and the cutting off of the water reticulation made clearance a difficult problem.

Units in the town area at once began to construct trench latrines for the use of billeted troops, but digging was everywhere difficult and hygiene discipline had lapsed considerably. Conservancy and refuse-collecting systems were instituted and the clearance of the town was gradually effected, priority being given to the worst health hazards. Deep trench latrines were constructed wherever possible, together with a funnel urinal system. Where this was possible the pan system was used and the excreta removed daily to a sewage site for deep burial. This site was in a wadi about a mile from the town where the soft soil made adequate excavation possible. The flush pan system, even where present and operable, could not be permitted owing to the need to conserve water. Outside the town area the deep trench system was used for faeces, urine being disposed of in soakage pits.

The captured disinfectors and baths were put to use and it was possible to deal with large numbers of men and with their clothes simultaneously.

P.o.W. The presence of some 20,000 P.o.W. within the perimeter created difficult problems. To begin with there were no facilities for washing, the only latrines were shallow trenches which the majority of the P.o.W. did not use, and so it came about that in a matter of days the whole compound became indescribably foul.

2/4 (Aust.) Fd. Hyg. Sec., with the help of P.o.W. labour, was put in charge and an Italian medical officer was made responsible for the general supervision of the sanitary arrangements within the cage. On March 13 the P.o.W. were moved to another and far more suitable compound and it became possible to make more satisfactory sanitary arrangements.

The Health of the Garrison. The health of the garrison was well maintained, the daily admission rates remaining below 2 per cent. of the force per week.

Of all the infectious diseases notified during the period April–October by far the greatest number were due to the diarrhoeal infections; 1,106 cases were notified under the categories of dysentery, diarrhoea and enteritis. Most of the infections were of the Flexner type. Infective hepatitis increased in incidence during the later months of the siege. Relapsing fever was prevalent. Large numbers of cases of pyrexia of undetermined origin occurred. As time passed the nature of the illness

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changed. In May it resembled sandfly fever and dengue fever but later the predominant feature was upper respiratory tract involvement, even broncho-pneumonia.

Scabies was fairly prevalent and the lack of washing facilities increased the spread and the difficulty of treatment.

When once the filth had been cleared away Tobruk was a healthy place. In June and July the days were hot, but it was a dry heat and the nights were cool. The frequent dust storms made life completely miserable while they lasted and flies remained a pest. There were no mosquitoes, however, and the major complaint was dysentery, which continually called for strict measures of prevention and control.

For the first three months there were no fresh vegetables and the basis of the diet continued to be bully beef, biscuits and tea, only occasionally varied with M. & V., and supplemented with vitamin C tablets. By mid-July the rations improved, for the Navy brought in large quantities of tinned fruit and vegetables, lime juice, marmite, sugar and jam. The meagre water ration—½ gallon/day/man—was brackish and imparted its flavour to the tea. Beer was the rarest of pleasures.

Boredom, the precursor of ailment, was kept at bay, under a sky whose sun was a sword and from which fell nothing but the threat of destruction, by bathing, football, organised athletic sports, the publication of a daily newspaper 'Tobruk Truth', and concerts and theatrical shows staged in an underground ammunition chamber.

So it was that, as these men reacted to their knowledge that the eyes of the countries whence they came were focused upon them, their bodies grew tough and their spirit high. Dysentery and desert sore troubled them but did not impair their resolution which was sustained by, among other things, the regularity of the mail and the high priority that cigarettes claimed among the materialities conveyed by the Navy to the garrison.

Nevertheless, as would be expected, many men reached and passed the limits of their resilience. The incidence of acute fear states varied according to the branch of the service. During a period of three months the incidence in infantry units ranged from 3·0–0·2 per cent., artillery units averaged 1·4 per cent., in A/T units the incidence ranged between 2·5–1·1 per cent., the average among A.A.S.C. units was 0·6 per cent. while among A.A. units it ranged from 9·1–0·4 per cent. During July almost half the admissions to 2/4 A.G.H. were on account of S.I. wounds. The R.M.Os. and the M.D.S. of 2/3 (Aust.) Fd. Amb. did much good work in the field of preventive psychiatry.

The Navy, which succoured the garrison throughout the siege, took more than 34,000 men, 72 tanks, 92 guns and 34,000 tons of stores safely into the fortress and safely brought out almost as many troops,

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wounded and P.o.W. But though this event was perhaps the most dramatic of the services which the Navy performed, the 'destroyer ferry service' was the longest sustained. At the beginning of the siege there were in Tobruk supplies sufficient for four months at most. The siege lasted for eight months, yet there was never any danger of serious malnutrition, let alone starvation, although the run into Tobruk was always fraught with grave danger.

AUSTRALIAN CASUALTIES (*during the withdrawal from Cyrenaica and during the siege, April* 1–*November* 18, 1941).

Killed or died of wounds	Wounded	Missing	P.o.W.	Total
766	2,057	4	973	3,800

It was noted by 2/11 A.G.H. at Alexandria, which received these cases, that as the siege continued the rate of the healing of wounds became retarded, as did also that of the desert sore. A rise in the incidence of relapsing fever and jaundice also bore witness to the deterioration of the general vigour and vitality of the troops.

Numbers evacuated from Tobruk

By hospital ship	February 1941	1,482
	March	1,076
	April	1,637
	May	167
By destroyer and other vessels	June–October	9,235
		+ 1,075 P.o.W.

A very efficient system of embarkation was developed. Patients for evacuation were moved from 2/4 A.G.H. to the Docks Hospital between 1400 and 1900 hours. The naval authorities warned the Docks Hospital when a destroyer was expected. The patients were put on stretchers and loaded on to barges. When the destroyer docked the barge tied up to it and the stretchers were lifted aboard. The optimum load for a destroyer was 50 stretcher cases plus 150 walking wounded.

THE SIEGE—70TH DIVISION PERIOD

The principal component units of the garrison were now:

H.Q. 70th Division
14th Inf. Bde.
16th Inf. Bde.
23rd Inf. Bde.
32nd Tank Bde.
Polish Carpathian Inf. Bde.
Polish Carpathian Cavalry

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Aust. 2/13th Inf. Bn.
H.Q. 88 Sub-area
Medical units
173 Fd. Amb. with 70th Division
189 Fd. Amb. with 70th Division
215 Fd. Amb. with 70th Division
33 Fd. Hyg. Sec. with 70th Division
1 A.C.C. with 70th Division
62 B.G.H. with 88 Sub-area
15 I.G.H. Sec. with 88 Sub-area
5 Adv. Depot Med. Stores with 88 Sub-area
Polish Fd. Ambs.

The events that fall to be recorded during this period relate to the rôle played by the Tobruk garrison in Operation 'Crusader' in November–December which ended in the relief of Tobruk on December 10. They have already been described.

MEDICAL ASPECTS OF THE SIEGE—70th Division Period

62 B.G.H. (2,300 beds), which took over from 2/4 A.G.H. on October 22, was divided into five sections: (1) Town; (2) Dock; (3) Beach; (4) Sidi Mahmoud; and (5) P.o.W. The town or main section (820 beds) was situated in the barracks which had been used by the Italians as a hospital. Here there were two operating theatres plus six emergency operating tables, the X-ray department, a M.I. room, medical stores and dental centre. One ward of this section was in a cave in a hill behind the hospital building. The dock section (100 beds) was in a tunnel on the quayside. This was used only when casualties were being evacuated by sea to the base. The cases for evacuation were transferred to this section on the day prior to evacuation. The tented beach section (820 beds) was situated three miles from the town hospital. The E.P.I.P. tents were widely dispersed in clumps of four or five. These tents were clearly marked with the Red Cross emblem and in addition several large Red Cross signs were painted on beds of stones. The section of 15 I.G.H. was included in this beach section. V.D. and skin wards of 30 and 40 beds respectively were maintained. There were three underground kitchens, one for the R.A.M.C. personnel, one for the patients and one for the dysentery wards. A captured Italian lorry was converted into a laboratory. The Sidi Mahmoud section (160 beds) occupied four concrete-reinforced caves in the escarpment seven miles away from the town hospital. This section was used particularly during periods of operational activity. Surgical teams, transferred temporarily to this section, dealt with all urgent cases.

Two staff cars, seven lorries and ten ambulance cars had been taken over from 2/4 A.G.H. These were driven by personnel of 1 A.C.C.

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A R.A.M.C. corporal and six Italian P.o.W. staffed the laundry, which was situated in the town hospital. It was used three days a week for the hospital and four days for the rest of the garrison. Its water allowance was 750 gallons a day.

Water for the hospital was supplied daily by water cart by 33 Fd. Hyg. Sec. Chlorination was carried out at the water points by R.A.M.C. orderlies provided by 62 B.G.H. Fresh water was brought from Alexandria by ship for the use of the patients.

Patients water scale 1½ gal./man/day fresh water
1½ gal./man/day chlorinated
R.A.M.C. personnel 3/4 gal./man/day

TABLE 19

Summary of Admissions to Hospital, Discharges, Evacuations and Deaths. October 20–December 31, 1941

	Admissions		Discharges		Evacuation		Deaths	
	Sick	Wounded	Sick	Wounded	Sick	Wounded	Sick	Wounded
Oct. .	558	54	189	10	202	46	2	7
Nov. .	1,436	1,926	871	563	425	310	3	96
Dec. .	2,413	2,515	917	612	1,610	2,563	6	82
	4,407	4,495	1,977	1,185	2,237	2,919	11	185
	8,902		3,162		5,156		196	

TABLE 20

Principal Causes of Admissions to Hospital by reason of Disease. October 20–December 31, 1941

	Cases
Infective hepatitis . .	299
Dysentery, Sonné . .	224
Tonsillitis . . .	213
N.Y.D. (N) . . .	212
Sandfly fever . . .	205
N.Y.D. dysentery . .	153
Dysentery, Flexner . .	140
Colitis	134
Digestive disorders . .	131

During the period October 20–November 20 admissions were invariably received at the town hospital. Only in exceptional cases were direct admissions taken by other sections. Patients came from Tobruk Fortress troops, which included troops in forward areas on the perimeter, and 88 Base Sub-area troops. Direct admissions came *via* unit R.A.Ps. and indirectly through 173, 189 and 215 Fd. Amb. M.D.Ss.

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Tobruk was relieved on December 10. During the battle period, November 31–December 10, most admissions were indirect through M.D.S., 173 Fd. Amb., some *via* the Sidi Mahmoud section which was functioning during this period. A few came through the M.D.Ss. of 189 and 215 Fd. Ambs. Direct admissions, sick and wounded, were received as before from 88 Base Sub-area troops. During this period casualties were also received from Eighth Army troops as the relieving columns neared the fortress.

'A' Company, 173 Fd. Amb., moved forward into the dug-outs of battalion H.Q. of 2nd Queen's when this battalion went forward on November 20 to take part in the sortie. An operating room, resuscitation room and rooms for the accommodation of casualties were prepared. It was not long before casualties began to stream in, some from the R.A.Ps. and others direct from the battlefield. More than 200 were received on this day, the largest group from the Black Watch. Mortar wounds were common and no fewer than 19 Thomas' splints were required. The stream of casualties continued to flow steadily throughout the next two days and the company worked day and night without respite. Fortunately there was a lull on the fourth day. Then, without pause until the relief was final and complete, the company resumed its hectic activity.

After the relief, the company was despatched to Gambut, where a German tented C.C.S. was in great trouble. The fighting at Sidi Rezegh had exhausted all its dressings and drugs and it was full of battle casualties in a most pitiful state. The company helped the German medical staff to overcome the universal sepsis and then to evacuate the patients. This being done, the company returned to Tobruk, there to celebrate Christmas, to undertake ward duties in the hospital and to help in the embarkation of casualties.

(iii)

The Retreat

THE RETREAT TO THE GAZALA LINE

1st Armd. Division, newly arrived in the Middle East from the United Kingdom, began to relieve 7th Armd. Division at the beginning of the new year. At this time 1st Armd. Division, u/c XIII Corps, consisted of:

2nd Armd. Bde.	12 Lt. Fd. Amb.
1st Sp. Gp.	1 Lt. Fd. Amb.
22nd Armd. Bde.	2 Lt. Fd. Amb.
201st Gds. Bde.	5 Lt. Fd. Amb.

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In the forward area, also u/c XIII Corps, were Indian 4th Division and 'E' Force (part of Ind. 29th Inf. Bde.). In the rearward area around Capuzzo and Bardia was XXX Corps with u/c:

S.A. 1st Division . .	10, 11 and 15 (S.A.) Fd. Ambs.
S.A. 2nd Division . .	14, 16 and 17 (S.A.) Fd. Ambs.
1st Army Tk. Bde. . .	14 Lt. Fd. Amb.
Free French 1st Bde. Gp.	Gpe. Sanitaire

During the retreat to the Gazala Line there was much shuffling and regrouping of the formations and of the medical units of the two corps and much interchange between corps and Army.

The Agheila position wherein the Axis forces now sheltered was a very strong natural defensive line extending from the Mediterranean shore to the Libyan Land Sea. Its left flank rested on the sea east of Mersa el Brega where good water supplies were plentiful. It was covered by salt marshes and sand dunes and the roads leading through these had been heavily mined. The line itself covered the Marada road leading to the oasis of that name. Behind the line was an excellent airfield which later was to be known as Marble Arch.

For a little while there was a lull during which tired units were relieved and supplies replenished. 201st Gds. Bde. took over the forward positions between Mersa el Brega and Agedabia with the support group of 1st Armd. Division on its left. 2nd Armd. Bde. was in reserve about Saunnu, and 'Oases' Force, 'E' Force, lay some forty miles to the east of Agedabia at Riddota Terruzi. The shortage of transport was such that the forward troops were on half rations.

On January 21, 1942 the Axis forces made what was assumed to be a reconnaissance in force along the Agheila—Agedabia road. Dive-bombers and fighters attacked throughout the day. On the 22nd, 2nd Armd. Bde. was ordered forward to support the left flank but the Axis left column managed to pass through 201st Guards Bde. and moved swiftly up the Agedabia road. Inflicting heavy losses upon 2nd Armd. Bde., Axis columns occupied Antelat and Saunnu.

On the 24th the Axis columns halted and XIII Corps prepared to check any further advance on the general line Beda Fomm–Antelat–Saunnu. On the 25th the Axis columns, moving forward again with great speed, broke through. Indian 4th Division was then ordered to move to the south from Benghazi (Ind. 7th Bde.) and Barce (Ind. 5th Bde.), while 1st Armd. Division held on south-east of Charruba. The Polish Carpathian Bde. was sent to Mechili and S.A. 4th Armd. Car Regt. patrolled between Mechili and Charruba. 150th Inf. Bde. of 50th Division, with 150 Fd. Amb. attached, moving up from the east, was ordered to proceed from Bir Hacheim to Bir Tengeder.

The Axis forces were moving in two columns converging on Msus. On the 27th one column moved from Msus to Sceleidima and on the

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following day Ind. 7th Inf. Bde. advanced to meet it. The other Axis column swung north towards El Abiar and captured Er Regima. It was then decided to evacuate Benghazi. When Ind. 7th Inf. Bde. began to withdraw it was found that Axis forces had established a strong road-block at Coefia. All attempts to get past this failed and so Ind. 7th Inf. Bde. turned south with the intention of breaking through the encircling enemy between Mechili and Antelat.

At 1945 hours on January 28, Ind. 7th Inf. Bde. divided into three columns (H.Q., Gold and Silver) and each of these, proceeding separately, moved into the Desert. The H.Q. group passed through Soluch, between Antelat and Beda Fomm to the south-west of Saunnu, to reach Mechili and safety. Gold Group moved along the road to just north of Ghemines then left the road to make for nearby El Magrun. There it halted during the day. At 1730 hours on January 29 it crossed the Antelat–Agedabia and the Antelat–Saunnu tracks and by the evening of the 30th was within fifteen miles of Msus. Thence it trekked to Bir Tengeder. Silver Group reached En Nauuaghia on the Benghazi–Soluch railway by 2300 hours on the 28th. Thence it moved to Gob-es-Saeti and, brushing light Axis forces aside, reached Alem Bessanan at 1800 hours on the 29th. Thence it proceeded to Bir Tengeder.

Eighth Army was now called upon to hold the line Lamluda—a few miles west of Derna–Mechili–Bir Tengeder. While this was being prepared, delaying actions were to be fought on the Charruba–Barce and the D'Annuzio–Maraua lines. The first of these was held by Indian 4th Division until the afternoon of February 1, when it was given up and the second occupied. 1st Armd. Division, on the left of the D'Annunzio–Maraua line, was too crippled to hold it. It was necessary therefore for Indian 4th Division to withdraw further east to a position running between Slonta and Gaf Tartagu where it was joined by 'E' Force.

This position could not be held and Indian 4th Division came u/c XIII Corps and was instructed to withdraw in stages:

(*a*) to the general line Derna–Carmusa;
(*b*) to the general line Tmimi–Gabr el Aleima;
(*c*) to Acroma

On February 1, Derna was evacuated and under increasing pressure Indian 4th Division slowly withdrew to Tmimi, which it reached on February 3, and to Acroma where it arrived on the 4th. 150th Bde. with the Guards Bde. was at Bir Hacheim, S.A. 1st Bde. with the Polish Bde. at Gazala, the Free French Bde. at Alam Hamza and 1st Armd. Division in the gap between Alam Hamza and Bir Hacheim.

The Axis forces attacked on the 15th, but the attack was not pressed home. Both sides thereafter settled down to reorganise and refit. They

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had moved over 350 miles in seventeen hectic days and both were exhausted.

These events demonstrated in the clearest possible fashion the inter-relation between the Desert and island of Malta. Prior to this retreat German air squadrons based on Sicily had subdued the Royal Air Force in Malta. The Royal Navy had endured grave losses and for the time being was unable to dominate the sea route to Tripoli. Thus it was that General Rommel had been able to magnify his strength almost unhindered.

MEDICAL COVER FOR THE RETREAT TO THE GAZALA LINE

7 and 16 M.A.C. were allotted to XIII Corps. They cleared the M.D.Ss. in front to Mameli and Derna. The light field ambulances of 1st Armd. Division, with surgical teams and the N.Z. Mob. Surg. Unit, cleared to an advanced C.C.S. at Msus consisting of 14 Fd. Amb. plus Lt. Sec. 14 C.C.S. and thence by corps M.A.C. to 15 C.C.S. at Derna. From the M.D.Ss. of XXX Corps 2 M.A.C. cleared to 14 C.C.S.

The M.D.S. of Indian 4th Division were cleared by corps to 2 (Ind.) C.C.S. at Mameli and thence by 10 (S.A.) M.A.C. (Army) to 62 B.G.H. at Tobruk. A daily service of DH 86 ambulance aircraft was available from the Adv. C.C.S. at Msus to Tobruk. An air evacuation ward was established on the L.G. at Msus and a reception tent with a medical officer was provided at El Gubi L.G.

The withdrawal of XIII Corps medical units was facilitated by the following factors:

(*a*) Only the lightest and most mobile form of C.C.S. had been opened in the forward areas—Lt. Sec. 14 C.C.S. attached to the corps field ambulance, 14 Fd. Amb.

(*b*) The route of evacuation already established, Msus to Charruba, chanced to become the corps axis of withdrawal.

(*c*) Regular air evacuation had kept the Adv. C.C.S. at Msus free from serious cases.

(*d*) Corps H.Q. was at Msus so that D.D.M.S. was not only well informed but was at the very centre of medical arrangements.

During the early stages of the withdrawal the two surgical teams of 15 C.C.S. with the Adv. C.C.S. at Msus were returned to their unit at Barce. 'A' Company 14 Fd. Amb. was sent to Got Derva where the ambulance track to Maraua leaves the Charruba–Mechili track and the remainder of 14 Fd. Amb. and Lt. Sec. 14 C.C.S. packed up ready to move off at a moment's notice. These units were replaced by 1 Lt. Fd. Amb. and the N.Z. surgical unit. As soon as the attack on Msus opened on January 25, all corps medical units—Lt. Sec. 14 C.C.S., 14 Fd. Amb., H.Q. 16 M.A.C. and the section of 7 M.A.C.—were routed

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along the ambulance track to the staging post at Got Derva. An hour later they were followed by the light field ambulances of 1st Armd. Division and the N.Z. surgical unit, which had to abandon its tents.

On January 26, 1 Lt. Fd. Amb. opened an A.D.S. at Mechili with 12 Lt. Fd. Amb. (closed) alongside. 5 Lt. Fd. Amb. was opened in Charruba and 2 Lt. Fd. Amb. closed and in reserve. The corps medical units reached Tmimi. 16 M.A.C. were clearing between Charruba and Tmimi and 10 (S.A.) M.A.C. was clearing Tmimi to Tobruk.

On January 29, 12 Lt. Fd. Amb., with the N.Z. Surg. Unit opened a post at Tmimi in relief of 14 Fd. Amb. and Lt. Sec. 14 C.C.S., these moving to Ain Gazala. 16 M.A.C. strengthened its car post at Mechili in order to serve the Polish and Free French field ambulances which were then established there. The Hadfield Spears Unit was sent back to Tobruk from Tmimi, 1 Mob. Mil. Hosp. to Bardia and 14 C.C.S. to El Adem, there to await orders.

The distribution of the medical units of XIII Corps on February 7 is shown in Figure 42.

FIG. 42. XIII Corps. Evacuation Chain as at February 7, 1942.

On January 21 the forward medical units of Indian 4th Division were distributed as follows:

Coy. 14, 17, 19 (Ind.) Fd. Ambs., with Ind. 5th, 7th and 11th Inf. Bdes.
Coy. 17 (Ind.) Fd. Amb., S.P., 12 miles south of Benghazi
17 (Ind.) Fd. Amb., M.D.S., at Benghazi
M.D.S. and one Coy. 14 (Ind.) Fd. Amb., at Barce
H.Q. and one Coy. 19 (Ind.) Fd. Amb. (in reserve), at Barce
2 (Ind.) C.C.S., at Mameli.

On January 26 the withdrawal of the medical units began. The C.C.S. at Mameli moved back to Minqar el Zannan. 14 (Ind.) Fd. Amb. and

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H.Q. and one company of 19 (Ind.) Fd. Amb. went back to Giovanni Berta and 17 (Ind.) Fd. Amb. went back to Barce from Benghazi. On the 27th there was a slackening in the advance of the Axis forces and 17 (Ind.) Fd. Amb. was moved back again to Benghazi to open a M.D.S. A company of 14 (Ind.) Fd. Amb. established a staging post at Mameli and 19 (Ind.) Fd. Amb. moved forward to this place, there to open a M.D.S.

A.D.M.S. issued instructions that 17 (Ind.) Fd. Amb. was to provide medical cover for Ind. 7th Inf. Bde. in the Benghazi area and for Ind. 5th Inf. Bde. fighting between Benghazi and Barce, while 19 (Ind.) Fd. Amb. was to do the same for Ind. 11th Inf. Bde. in the Maraua area.

15 C.C.S. at Barce and 1 Mob. Mil. Hosp. at Benghazi came u/c Indian 4th Division. On January 28 the M.D.S. of 17 (Ind.) Fd. Amb. moved back from Benghazi to Barce and 14 (Ind.) Fd. Amb. proceeded to Martuba. By the 30th the withdrawal was in full swing. H.Q. 19 (Ind.) Fd. Amb. and one company withdrew from Mameli to Martuba; the M.D.S. and one company of 17 (Ind.) Fd. Amb. moved from Barce to Giovanni Berta.

Evacuation was from M.D.S. 17 (Ind.) Fd. Amb. at Giovanni Berta to the M.D.S. of 14 (Ind.) Fd. Amb. at Martuba and thence by M.A.C. to the M.D.S. of 14 Fd. Amb. at Tmimi and thence by M.A.C. to 62 B.G.H. at Tobruk. Indian medical personnel were attached to these British units to deal with Indian casualties. Evacuation from 2 (Ind.) C.C.S. at Minqar el Zannan was by ambulance car to the railhead at Misheifa and thence by train to the Delta.

On February 1, 14 (Ind.) Fd. Amb., less Lt. Sec., moved from Martuba to Gazala, the M.D.S. of 17 (Ind.) Fd. Amb. at Giovanni Berta withdrew to Tmimi and 19 (Ind.) Fd. Amb. moved from Martuba to Tmimi. By February 3 all the field ambulances, less one company of 17 (Ind.) Fd. Amb. presumed lost in the break-through from Benghazi, were back in the El Adem area. 15 C.C.S. was open in Tobruk.

On February 5 these units were distributed as follows:

14 (Ind.) Fd. Amb., A.D.S., to the east of Gazala
H.Q. and one coy. 14 (Ind.) Fd. Amb. at El Adem
17 (Ind.) Fd. Amb. scattered about Sidi Rezegh
19 (Ind.) Fd. Amb., A.D.S., near Acroma
19 (Ind.) Fd. Amb., M.D.S., in Acroma fort

The successive moves of these field ambulances are shown in Figure 43.

17 (Ind.) Fd. Amb. was much below strength and was withdrawn to Misheifa to refit. 21 (Ind.) Fd. Amb. with Ind. 29th Inf. Bde. came u/c Indian 4th Division. At this time all emergency surgery was carried out at 14 Fd. Amb. at El Adem and at 62 B.G.H. at Tobruk and evacuation from Tobruk was by hospital ship to the Delta.

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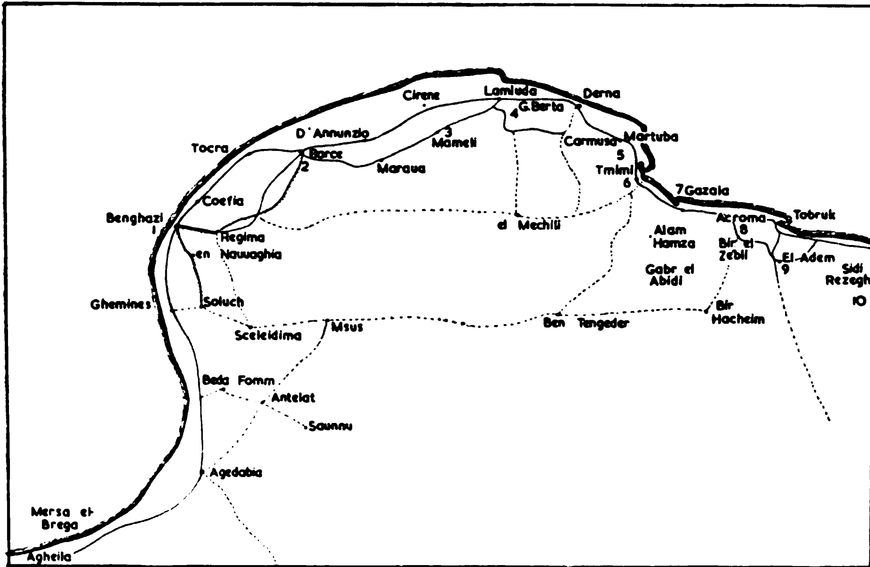

FIG. 43. The Retreat to the Gazala Line. Indian 4th Division. Medical Cover. January 21–February 5, 1942.

1. 17 (Ind.) Fd. Amb. M.D.S. Jan. 21–26 and . . . Jan. 27–28
   also one company staging on the Benghazi–Ghemines Road . . . Jan. 21–26
2. 14 (Ind.) Fd. Amb. M.D.S. . . . Jan. 21–26
   19 H.Q. and one company in reserve . Jan. 21–26
   17 M.D.S. Jan. 26 and Jan. 28–29
   At D'Annunzio 14 A.D.S. . . . Jan. 30
3. 2 (Ind.) C.C.S. . Jan. 21–26
   19 (Ind.) Fd. Amb. M.D.S. . . . Jan. 27
4. 14 M.D.S. . . Jan. 26
   19 H.Q. and one company . . . Jan. 26
   17 M.D.S. and one company . . Jan. 30
5. 14 M.D.S. . . Jan. 28
   14 one company . Jan. 30
   19 H.Q. and one company . . . Jan. 30
   14 Lt. Sec. M.D.S. . Feb. 1
6. 14 (Br.) Fd. Amb. M.D.S. . . . Feb. 1
   17 (Ind.) Fd. Amb. M.D.S. . . . Feb. 1
   19 (Ind.) Fd. Amb. . Feb. 1
7. 14 H.Q. less Lt. Sec. Feb. 1
   Rear M.D.S.
   To the east of Gazala 14 A.D.S. . . Feb. 5
8. 19 M.D.S. . . Feb. 5
   At Bir el Zebli 19 A.D.S. . . . Feb. 5
9. 14 M.D.S. and one company . . Feb. 5
10. 17 less one company captured . . Feb. 5

By February 12 the distribution of the forward medical units had become:

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One coy. 14 (Ind.) Fd. Amb. with 29th Bde.
One coy. 14 (Ind.) Fd. Amb. with 5th Bde.
One coy. 19 (Ind.) Fd. Amb. with 11th Bde.
One coy. 19 (Ind.) Fd. Amb. in reserve
17 (Ind.) Fd. Amb.) on the move to Misheifa
14 and 19 (Ind.) Fd. Ambs. M.D.Ss. on divisional axis

On February 21, Indian 4th Division was relieved by 50th Division and moved back to the area of Hamra. Evacuation from the Hamra box was by M.A.C. cars to 2 (Ind.) C.C.S. at Sollum.

During the first half of January 1942, S.A. 1st Division was employed on L. of C. duties in the Matruh–'Charing Cross'–Bir Thalata–Sidi Barrani area. At Mersa Matruh were the remains of S.A. 5th Inf. Bde., of 10 and 11 (S.A.) Fd. Ambs., the divisional field hygiene section and 2, 3, 5 and 7 (S.A.) F.D.Us. At Bir Thalata was S.A. 1st Inf. Bde., with 15 (S.A.) Fd. Amb. and 5 (S.A.) F.D.U., u/c XXX Corps. At Sidi Barrani was S.A. 2nd Inf. Bde. with 12 (S.A.) Fd. Amb. u/c S.A. 2nd Division. On January 15, 2nd Bde. moved to Matruh and reverted to the command of S.A. 1st Division.

When the Axis forces broke through at El Agheila on January 21 and XIII Corps was forced to withdraw to the Gazala Line, H.Q. S.A. 1st Division and S.A. 1st Bde. moved forward first to El Adem and then to Got Charruba, south of Gazala, where the Polish Carpathian Bde. and the Free French Bde. came under command. With the Free French were the Groupe Sanitaire and the Hadfield Spears Unit. The Polish brigade had its own field ambulance.

On February 10, S.A. 2nd Inf. Bde. with 12 (S.A.) Fd. Amb. moved to Acroma. On the 14th the Free French brigade went to Bir Hacheim and passed from the command of S.A. 1st Division.

On March 17, S.A. 2nd Inf. Bde. took over the Polish sector and its place was filled by S.A. 6th Inf. Bde. of S.A. 2nd Division with 14 (S.A.) Fd. Amb.

A divisional medical area was formed at El Mgarragh where the M.D.Ss. of 12 and 15 (S.A.) Fd. Ambs. were established. An A.D.S. was with each brigade. Evacuation was to 62 B.G.H. at Tobruk.

On March 22, S.A. 3rd Inf. Bde. with 16 (S.A.) Fd. Amb. moved to El Adem to come u/c XIII Corps, and on the 26th, S.A. 4th Inf. Bde. with 17 (S.A.) Fd. Amb. moved to Tobruk. S.A. 2nd Inf. Bde. engaged in offensive patrolling, being divided into a number of columns.

THE AXIS ASSAULT ON THE GAZALA LINE

By May 10 it had become clear that General Rommel was about to attack. To meet this attack General Ritchie made the following dispositions:

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XIII Corps

- 50th Division (69th, 150th and 151st Inf. Bdes. with S.A. 6th Armd. Car Regt. u/c)
- S.A. 1st Division (S.A. 1st, 2nd and 3rd Inf. Bdes. and S.A. 3rd Recce Bn.)
- S.A. 2nd Division.
- 1st Army Tk. Bde.
- Ind. 9th Inf. Bde. of Indian 5th Division.

S.A. 1st Division was holding the front from the coast, west of the Gazala inlet, to Alam Hamza, astride the Via Balbia and the approaches to Tobruk south of the coastal escarpment. 151st and 69th Inf. Bdes. of 50th Division were prolonging the line eastwards from the Alam Hamza salient to the point where it again turned southwards at Sidi Muftah. 150th Inf. Bde. of 50th Division was holding a detached strong-point at Sidi Muftah. Between Sidi Muftah and Bir Hacheim, twenty miles to the south, was a large 'mine marsh', a stout obstacle but undefended. 1st Army Tk. Bde. was divided between these two infantry divisions in a supporting rôle.

S.A. 2nd Division (S.A. 4th and 6th Bdes.) occupied the western part of the Tobruk defences, thirty miles to the east of the Gazala Line, and strong-points below the escarpment towards Gazala (e.g. Commonwealth Keep, Acroma Keep). The division was also providing a number of columns (e.g. Seacol, Stopcol). Ind. 9th Inf. Bde., less one battalion,

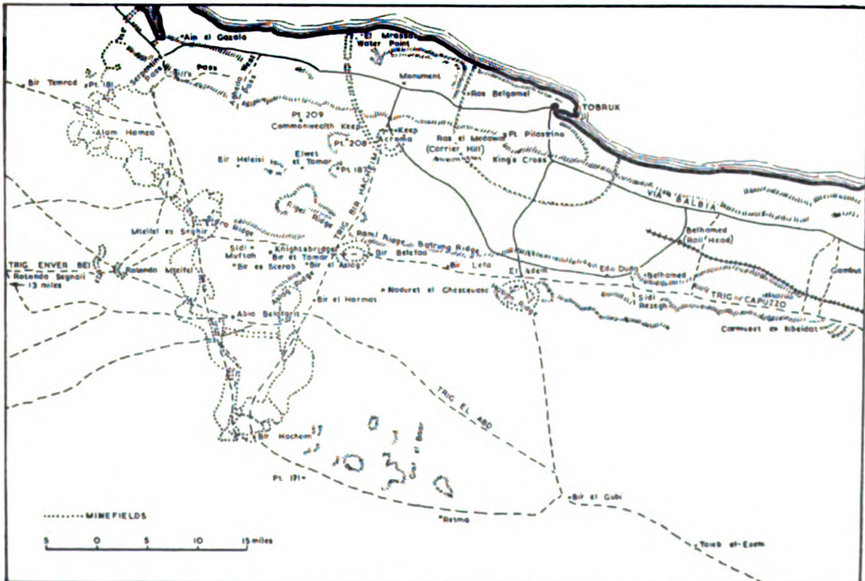

FIG. 44. The Gazala Line. May 1942.

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u/c S.A. 2nd Division was holding the eastern half of the Tobruk perimeter.

XXX Corps
- 1st Armd. Division
  - 2nd Armd. Bde.
  - 22nd Armd. Bde.
  - 201st Gds. Motor Bde.
- 7th Armd. Division
  - 4th Armd. Bde.
  - 7th Motor Bde.
  - S.A. 4th Armd. Car Regt. } u/c
  - K.D.G. } u/c
  - 12th Lancers } u/c
- Ind. 3rd Motor Bde. Gp.
- Ind. 29th Bde. Gp. of Indian 5th Division
- Free French 1st Bde. Gp.

Free French 1st Bde. Gp. was holding the detached strong-point at Bir Hacheim. Ind. 3rd Motor Bde. Gp. was preparing a defensive locality a few miles south-east of Bir Hacheim. Ind. 29th Bde. Gp. of Indian 5th Division was holding a defensive locality at Bir el Gubi. It had moved up from the frontier defences when relieved by Free French 2nd Bde. 1st Armd. Division was around Knightsbridge. 7th Armd. Division was to the south of Knightsbridge spread out on the open flank between Bir Hacheim and Bir el Gubi, its 7th Bde. holding a defensive locality between Ind. 3rd Motor Bde. Gp. and Ind. 29th Bde. Gp.

Adv. H.Q. Eighth Army was in the vicinity of Gambut, guarded by Ind. 10th Inf. Bde. of Indian 5th Division that, being relieved by Ind. 11th Inf. Bde. from Cyprus, had moved up from the frontier defences.

This Gazala position was a long solid minefield stretching some thirty-five miles inland from the sea. At intervals along this was a series of 'boxes', defensive localities, each of these a mile or more square and completely surrounded with mines and wire through which narrow lanes were left. The garrison of a box was a composite force, supplied to withstand a brief siege. The main boxes were at Gazala, Knightsbridge, Bir Hacheim, Bir el Gubi and Tobruk.

With 50th Division were 186, 150 and 149 Fd. Ambs., attached to 69th, 150th and 151st Bdes. respectively. Indian 5th Division, less one brigade, from Cyprus relieved Indian 4th Division in the Hamra area about the middle of April but it was not u/c Eighth Army. Of the brigades of Indian 4th Division, 7th went to Cyprus, 5th to Palestine and 11th remained in the Delta area. To the 9th and 10th Bdes. of Indian 5th Division, Ind. 29th Inf. Bde. was added. The medical units of Indian 5th Division were 10, 20 and 21 (Ind.) Fd. Ambs. and 7 (Ind.) Fd. Hyg. Sec.

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On May 4, 21 (Ind.) Fd. Amb., attached to Ind. 29th Inf. Bde., moved from Hamra to Sollum. When active operations began again 10 (Ind.) Fd. Amb., with Ind. 9th Inf. Bde., went to Tobruk and 7 (Ind.) Fd. Hyg. Sec. to Sollum from Hamra.

On May 17, 10 (Ind.) Fd. Amb. opened an A.D.S. for Ind. 9th Inf. Bde. in the El Adem area and on the following day a M.D.S. ten miles south of Tobruk. A detachment of 'A' Coy. was attached to 62 B.G.H. in Tobruk and 20 (Ind.) Fd. Amb., less one company, moved from Hamra to a site four miles east of Gambut, there to open a M.D.S. Casualties were evacuated to Tobruk and to 2 (Ind.) C.C.S. at Sollum.

As was always the case when a temporary equilibrium had been reached in the Desert, the antagonists busied themselves with the problems of reinforcement and the amassing of supplies. To facilitate the supply of the German-Italian Army in Africa the Axis powers now attempted to neutralise Malta. So it was that the valiant population of that sorely tried island came to be most inadequately fed, for the Mediterranean was closed to the convoys that would have brought succour. Undoubtedly the long and sustained aerial assault upon Malta made it possible for General Rommel to get the reinforcements and supplies he so urgently needed. Those for Eighth Army had to travel 12,000 miles round the Cape and then 300 miles across the Desert. Soon however, the railway had been extended to cut the frontier wire near Capuzzo and to reach Tobruk. The fresh water pipeline was likewise extended. By the middle of May 1942, Eighth Army's supply situation was satisfactory. Its armour was now much nearer the German in respect of quality than it had been. Some 160 Grant tanks with 75 mm. guns, many 6-pdr. A/T guns and a considerable number of tank recovery vehicles had arrived. Moreover, considerable advances had been made in the matter of co-operation between air and land forces.

On the afternoon of May 26, the Axis armour, 10,000 vehicles in all, starting from Rotonda Segnali and wheeling round Bir Hacheim, set out on a journey that was to end at Alamein. It moved northwards in three columns, Ariete Division on the left, 21st Panzer Division in the centre and 15th Panzer Division on the right. Every move they made was watched by the armoured cars and signalled back, but nevertheless it was not until the following morning that this move became known to General Ritchie, commanding Eighth Army. On this morning 7th Motor Bde. of 7th Armd. Division was scattered, H.Q. 7th Armd. Division was captured and serious losses inflicted upon 4th Armd. Bde. 7th Motor Bde. rallied at Bir el Gubi. Then Ind. 3rd Motor Bde. was dispersed, to rally later at Bir Hacheim. The Axis armour was checked by 22nd Armd. Bde. five miles south of Naduret el Ghesceuasc but soon the brigade, badly mauled, was forced to fall back towards Knightsbridge. Then 2nd Armd. Bde. and 1st Army Tk. Bde. attacked and

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disrupted the advance of the Axis armour. The German 90th Lt. Division, making a wide sweep, reached El Adem to capture a number of dumps. H.Q. XXX Corps was forced to take refuge in the El Adem box alongside H.Q. XIII Corps.

On May 28, 4th Armd. Bde. threw these columns back, and on the 29th, Ind. 29th Inf. Bde. moved from Bir el Gubi to take over the El Adem locality.

The hopes of General Rommel had not been realised. The minefield was still intact so that supplies for the Axis columns to the east of it had to travel far round to the south. The Axis army lying between the Gazala minefield and El Adem was surrounded and needed replenishments of petrol and water.

However, at 0300 hours on May 28 General Rommel resumed the attack, driving northwards. At 0800 hours 21st Panzer Division reached the escarpment and fired on columns and strong-points of S.A. 2nd Division. 4th Armd. Bde. attacked 90th Lt. Division near El Adem and drove it back to Naduret el Ghesceuasc. 1st Army Tk. Bde. attacked the Italian Division. During the night of May 28/29 the Italians attacked the position of S.A. 1st and 50th Divisions and were sternly repulsed. On the 29th 2nd Armd. Bde., advancing westwards from the Knightsbridge area, was heavily engaged by the German armour and 22nd Armd. Bde. had to be sent to its assistance. The Axis forces withdrew to the south-west against the line of the minefields. In spite of interference by 69th and 150th Inf. Bdes. Italian infantry succeeded in clearing two corridors through the minefield, one on the Capuzzo road and another ten miles to the south of this, one on either side of the box held by 150th Bde. In front of the eastern mouths of these corridors were placed screens of 88 mm. guns, these screens enclosing 150th Bde's. box. Through these corridors the Axis forward units could now be supplied. Into them the Axis armour could retire at will. In the area to the east of these corridors—the Cauldron—much confused fighting was to occur.

150th Bde's. box at Sidi Muftah was heavily attacked on May 31/June 1 and although 1st Armd. Division and 1st Army Tk. Bde. hastened to its assistance, 150th Bde. was overpowered. With this brigade was lost a considerable part of 1st Army Tk. Bde.

69th Bde. of 50th Division from the north and Ind. 10th Bde. from the east then attempted to secure the ridge Sghifet es Sidra but the attack failed completely. On June 4 a direct assault was launched upon the Axis bridgehead east of the minefield. 69th Bde. attacked from the north and Ind. 9th and 10th Bdes. from the east. 22nd Armd. Bde. was to pass through and close the corridors in the minefield and 32nd Army Tk. Bde. was to support 69th Inf. Bde. (Operation 'Aberdeen').

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The outcome of this attack was calamitous. Ind. 10th Bde. captured Aslagh ridge but 22nd Armd. Bde. ran into an anti-tank screen and was obliged to turn away. Then Ind. 9th and 10th Bdes. were driven back with heavy loss and 22nd Armd. Bde. was attacked and its support group destroyed. Tactical H.Q. Indian 5th Division and H.Q. Ind. 10th Bde. were overrun and scattered and severe losses inflicted upon 22nd Armd. Bde. 32nd Army Tk. Bde. ran on to a minefield and lost fifty of its seventy tanks.

This was the critical point in the battle. The initiative now finally passed to General Rommel and he exploited it to the full. He hurled the bulk of his armour north-eastwards towards Knightsbridge where it could menace Tobruk and set to work to reduce Bir Hacheim.

On June 6 an armoured battle around Knightsbridge began. Neither side could gain the advantage and after a time the fighting died down. On the 7th, S.A. 1st Division in the north made a large-scale raid. Meanwhile the assaults upon Bir Hacheim grew in intensity. By the 10th the situation there had become critical, for water supplies and ammunition were nearly exhausted. General Koenig managed to withdraw the garrison on the night of June 10/11 to safety. Then the Axis commander turned on Knightsbridge. To the aid of 2nd and 22nd Armd. Bdes. all the remaining tanks were sent. But the Axis armour was not to be halted and these armoured brigades were forced to give ground and endured further losses. 4th Armd. Bde. was driven off towards Tobruk. General Ritchie now decided that the Knightsbridge box garrison must be withdrawn and 201st Gds. Bde. moved back to Acroma on June 14. As a result of this, S.A. 1st Division and 50th Division became exposed to attack in the rear and so they too were withdrawn. S.A. 1st Division withdrew without much difficulty but 50th Division found its way back blocked. It therefore moved westwards, smashed its way through Italian formations, wheeled south to Bir Hacheim and then moved east.

A certain misunderstanding developed at this point. General Auchinleck understood that S.A. 1st and 50th Divisions, withdrawing from the Gazala Line, were to take up new positions on the general line Acroma–El Adem from which they could continue the battle. But G.O.C. Eighth Army had issued orders for these divisions to move back to the frontier. The question as to whether or not Tobruk should be held or abandoned then became acute.

On June 1 the much depleted 50th Division, now mustering no more than 6,500 altogether, was sent back to Amiriya where it took over from H.Q. X Corps the responsibilities formerly held by 'Deltaforce'. During the ensuing months under its command came:

Greek 1st Independent Brigade
Free French 2nd Group

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Indian 26th Inf. Bde. of Indian 6th Division from Iraq on July 15

Eighth Army's losses had been severe, but it was by no means beaten. Out of the five infantry divisions that had entered the battle there still remained three in good shape—S.A. 1st and 2nd and Indian 10th—the last of these now arriving in the Desert. Of the two infantry brigade groups there still was one intact—Ind. 11th Inf. Bde. 50th Division still had two brigade groups, Indian 5th Division one. A large part of Free French 1st Bde. remained. Moreover, H.Q. X Corps and New Zealand 2nd Division had been called forward from Syria. Of the three motor brigades, 201st Guards and 7th were still fighting vigorously and Ind. 3rd Bde. was being reorganised.

The most serious losses had been endured by the armoured brigades. 1st Armd. Division and 32nd Army Tk. Bde. had been reduced to about 30 and 24 tanks respectively. 4th Armd. Bde. still had about 60. Some 150 were undergoing repair in the workshops and 10th Armd. Division was on its way to the front. General Auchinleck considered that he was still sufficiently strong both to defend Tobruk and to maintain a mobile field force. General Klopper, who had assumed command of S.A. 2nd Division as recently as May 14, was appointed to command Tobruk fortress on June 15.

The positions at Belhamed, Sidi Rezegh and El Adem were important outposts of the defences of Tobruk. Ind. 29th Inf. Bde. was at El Adem u/c 7th Armd. Division and Ind. 20th Inf. Bde. at Belhamed and Sidi Rezegh. They were supported by 7th Motor Bde., S.A. 4th Armd. Car Regt. and the K.D.G.

General Rommel concentrated his striking force about El Adem and Sidi Rezegh. On June 16 Axis armour attacked Sidi Rezegh and at nightfall the remnants of 1/6th Rajputana Rifles were forced to withdraw to Belhamed. 90th Lt. Division attacked the El Adem box but was repulsed. However, since Ind. 29th Inf. Bde. could not be reinforced it was withdrawn during the night of June 16/17. On the 17th, 4th Armd. Bde. was driven back from Sidi Rezegh almost to Gambut, losing half its strength. Ind. 21st and Free French 2nd Bdes. were withdrawn from Gambut. On June 17/18, Ind. 20th Inf. Bde. was ordered to withdraw from Belhamed and break through to the frontier. It ran into Axis columns near Gambut and was destroyed.

The Axis forces then wheeled and advanced upon Tobruk.

THE FALL OF TOBRUK

The garrison in June 1942 is given in Appendix XVII.

The general situation in the Tobruk fortress was far from satisfactory. General Klopper had been with the division for only a very short time. The headquarters staff had, during this time, undergone many changes.

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The garrison had not had the time or opportunity to become welded into an integrated force. The defences were in very poor condition. Much of the wire and thousands of the mines had been removed for use elsewhere. Though minefields were marked it could not be assumed that they still contained live mines. Having no map, there was no knowing whether other minefields existed.

General Klopper received such a variety of information and advice that he must surely have been confused. He was informed by G.O.C. XIII Corps on June 14 that Tobruk was to be held as a pivot for the line Tobruk–El Adem–El Gubi. On the 16th G.O.C. Eighth Army told him that Tobruk, if invested, was to be held and advised him to pay particular attention to the defences of the western face of the perimeter. On the 17th Tobruk passed directly under Eighth Army while El Adem and Sidi Rezegh came under XXX Corps. But El Adem and Sidi Rezegh had been evacuated and Tobruk stood alone. There was no possibility of providing air cover for the garrison for with the loss of Gambut the R.A.F. had been compelled to withdraw to airfields far to the east.

Within the perimeter were about 36,000 troops, of whom some 10,000 belonged to administrative or transport units associated with the port. Supplies of food and ammunition were sufficient for ninety days. S.A. 6th and 4th Bdes. held the western and southern sectors of the perimeter, Ind. 11th Inf. Bde. the eastern. 4th R. Tks. was near King's Cross, the junction of the Bardia and El Adem roads. 7th R. Tks. was about Pilastrino while 201st Gds. Bde., consisting of the Bde. H.Q. and 3rd Coldstream Gds. with 1st Foresters and 1st Worcesters attached, held the inner perimeter between the El Adem road and Pilastrino.

At 0600 hours on June 20 the assault was launched. Artillery and Stukas pounded the sector held by Ind. 11th Inf. Bde. An hour later the Axis armour and motorised infantry broke through and under cover of a smoke-screen advanced on a narrow front towards King's Cross. At 0830 hours the Coldstream Guards moved to the west of King's Cross to take part in a counter-attack along with 4th R. Tks. But when the infantry battalion arrived it found that the armour was already committed, as was also 7th R. Tks. which had also been ordered to proceed to the threatened area. By 1300 hours all the British tanks were out of action. The Axis troops then advanced upon the field artillery and destroyed it gun by gun. By 1400 hours H.Q. Ind. 11th Inf. Bde. had ceased to function. By 1530 hours the Axis armour had reached Solaro and by 1800 hours was in the outskirts of Tobruk town. Other Axis armoured units were hotly engaged with 201st Gds. Bde. about Pilastrino. The Sherwood Foresters and H.Q. 201st Gds. Bde. were overrun.

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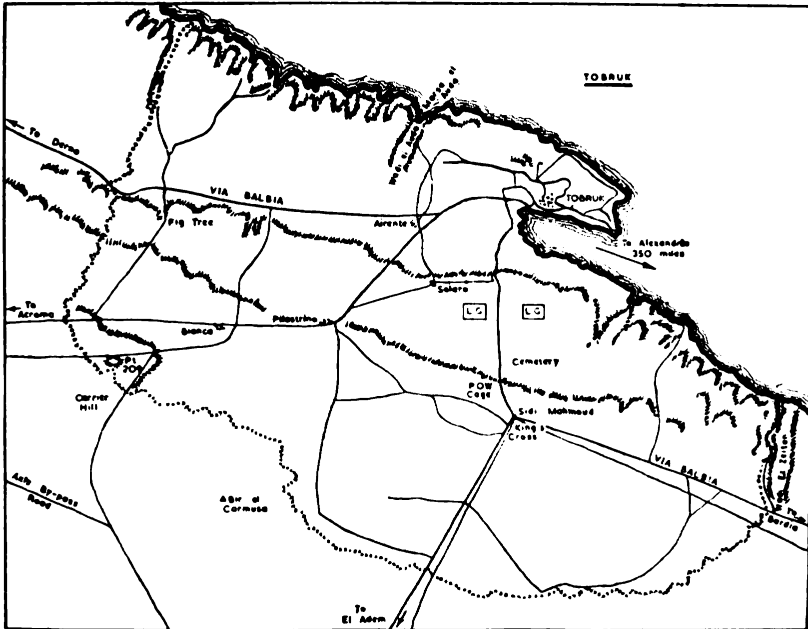

FIG. 45. The Axis Assault on Tobruk, June 20, 1942.

For the rest of the day the Axis forces were held. The western, eastern and most of the southern sectors of the perimeter were still intact. But the situation had become critical for the reason that so much of the ground within the perimeter was in enemy hands. It had become exceedingly difficult to preserve intercommunication between Fortress H.Q. and the various units; units were separated from the supply dumps; the use of transport was greatly impeded. XXX Corps was instructed to use 7th Armd. Division to advance on Tobruk. Elements of this division reached to within twenty miles of the fortress by dark.

In the early hours of the 21st, G.O.C. Fortress reported to G.O.C. Eighth Army and asked permission to fight his way out. He was authorised to do so and told that an attempt would be made to keep open a gap between El Adem and Knightsbridge. But very soon he reported again to say that since all his transport had been lost he was unable to break out. He received instructions to act upon his own judgment regarding capitulation.

At dawn a *parliamentaire* was sent out with an offer to surrender and at 0745 hours on June 21 the garrison capitulated. The news of this took a long time to spread through the area of the fortress. S.A. 4th and 6th Bdes., still full of fight, found it hard to believe and the Gurkhas and the Camerons, cut off from the rest, continued to fight throughout

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the day. Being warned by the Germans of the consequences of disregarding the general capitulation, the officer commanding the Camerons undertook to surrender next morning and demanded, and was conceded, the honours of war. The Camerons, headed by their pipers, duly marched to the prison cage.

19,000 British, 10,000 South African Europeans, 3,400 South African natives and 2,500 Indians were taken prisoner.* 199 officers and men of the Coldstream Guards and 206 South Africans managed to break away and reach the Egyptian frontier. A vast quantity of booty fell into the hands of the Axis forces, not in Tobruk itself but mainly from the huge dumps abandoned between Gambut and the frontier. In Tobruk the bulk of the weapons were rendered useless and transport, water and fuel tanks were destroyed.

The fall of Tobruk brought in its train a complete change in Axis policy. It had been decided, prior to this event, that when Tobruk had been captured the Axis forces should stand on the Egyptian frontier line while Malta was finally overwhelmed. But the magnitude of the success that had been gained was such that the assault upon Malta was postponed and General Rommel was authorised to exploit his victory and advance upon the Suez Canal.

THE RETREAT TO THE ALAMEIN LINE

While the tragedy of Tobruk was proceeding to its inevitable end, Eighth Army was reorganising in the frontier positions, the main features of which were the Sollum, Omars, Hamra and Playground boxes. The Sollum box covered Sollum and Halfaya Pass; the Hamra box (The Kennels) formed the southernmost position and could accommodate a whole division, being stocked with water, food and ammunition for three months. The Playground box lay across the rail and road to Egypt. The left flank of the position in the featureless desert demanded for its security an effective armoured force.

S.A. 1st Division took over the Hamra box on June 17. S.A. 2nd Bde. assumed responsibility for the minor passes of the escarpment. S.A. 1st and 50th Divisions formed four brigade groups for the purpose of operating in the El Adem area to harass the Axis forces investing Tobruk. But these groups did not function for the general situation had deteriorated. Indian 10th Division took over the Sollum box and was meant to proceed to the Omars box when Ind. 20th Bde. had fallen back from Belhamed and Sidi Rezegh. Ind. 5th Bde. was to occupy the

* (Lieut. Colonel J. C. Cameron Cooke, A.D.S.T. Tobruk; *Journ. of the R.A.S.C.*, April 1946.)
U.D.F. officers 560, O.Rs. 8,400; Cape Corps 380, Indians and Malay Corps 118; Native Military Corps 1,264. A total of 10,722 (8,960 European, 1,762 non-European). J. A. I. Agar Hamilton, L. C. F. Turner. *Crisis in the Desert*. O.U.P. 1952.

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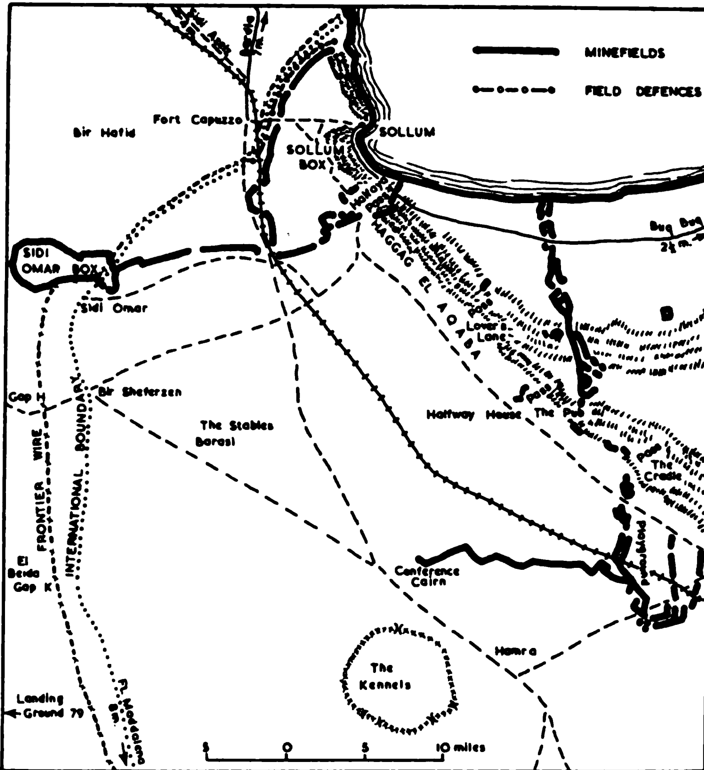

Fig. 46. The Frontier Defensive Positions.

Playground box while 1st Armoured Division, which had been stripped of all its tanks, and 50th Division were to reorganise at Buq Buq.

On the 18th, S.A. 1st Bde. took over the protection of the gaps in the frontier wire at Libyan Sheferzen and El Beida and S.A. 2nd Bde. the defence of L.G. 79 from which it was hoped to provide fighter cover for Tobruk.

A vigorous offensive against the Axis flank was now the only possible hope of saving Tobruk, and, on June 19, XIII Corps, divided into a striking and a holding force, assumed the responsibility for this while H.Q. XXX Corps undertook the organisation of the Matruh defences.

XIII Corps
- Striking Force
  - H.Q. 7th Armoured Division
    - 4th Armd. Bde.
    - 22nd Armd. Bde.
    - 7th Motor Bde. Gp.
    - Ind. 3rd Motor Bde. Gp.

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Holding Force
  50th Division, less 150th and 151st Bdes.
  Indian 10th Division
  S.A. 1st Division

Matruh garrison
  H.Q. XXX Corps
    Ind. 29th Inf. Bde. of Indian 5th Division
    151st Inf. Bde. of 50th Division
    N.Z. 2nd Division, arriving from Syria

Indian 10th Division, newly arrived from Tenth Army, consisted of Ind. 20th, 21st and 25th Inf. Bdes. With it were 26, 29 and 30 (Ind.) Fd. Ambs. and 1 (Ind.) Fd. Hyg. Sec.

By this time, however, all hope of saving the Tobruk garrison had been abandoned, and, on June 21, S.A. 1st Division was ordered to evacuate the Hamra box. S.A. 3rd Bde. moved by the desert route to Alamein.

The Axis forces occupied Bardia on the 22nd and on the 23rd gathered for thrusts to the south of Sidi Omar and across the area of the Hamra box. Indian 10th Division and 151st Inf. Bde. of 50th Division in the Sollum area began to thin out and S.A. 2nd Bde. withdrew towards Matruh *en route* for Alamein. 4th Armd. Bde., 8th R. Tks. and all the armour of 7th Armd. Division were ordered to proceed to Matruh. Only 7th Motor Bde., Ind. 3rd Motor Bde. and columns of 69th Inf. Bde. of 50th Division were now in contact with the enemy.

On the 24th the *Panzerarmee* reached the coast road 45 kms. west of Mersa Matruh. On June 23, H.Q. X Corps took over the command of Matruh and H.Q. XXX Corps went back to Alamein, there to organise the defensive positions. At Matruh the main defences took the form of a fortified perimeter round the town itself, a covering position to the west and a newly prepared strong-point about twenty miles to the south near Minqar Sidi Hamza el Gharbi covered by two minefields on the west along the road to Siwa. A deep minefield ran from the coast in front of the covering position southward to Charing Cross.

Responsibility for the defence of this line was divided between X and XIII Corps. X Corps with Indian 10th Division and the remains of 50th Division was in position to the east of Matruh. XIII Corps was on the high ground above the escarpment with Ind. 29th Inf. Bde.; all that remained of Indian 5th Division was at Sidi Hamza. Between the two minefields on the west was a gap of some six miles. On June 25 this was scantily filled by the Indian brigade and the New Zealanders who, less N.Z. 6th Bde. still at Amiriya, were concentrating at Minqar Qaim, twenty-five miles south of Matruh.

On June 25 General Auchinleck assumed responsibility for Eighth Army and decided not to risk getting any portion of the army shut up

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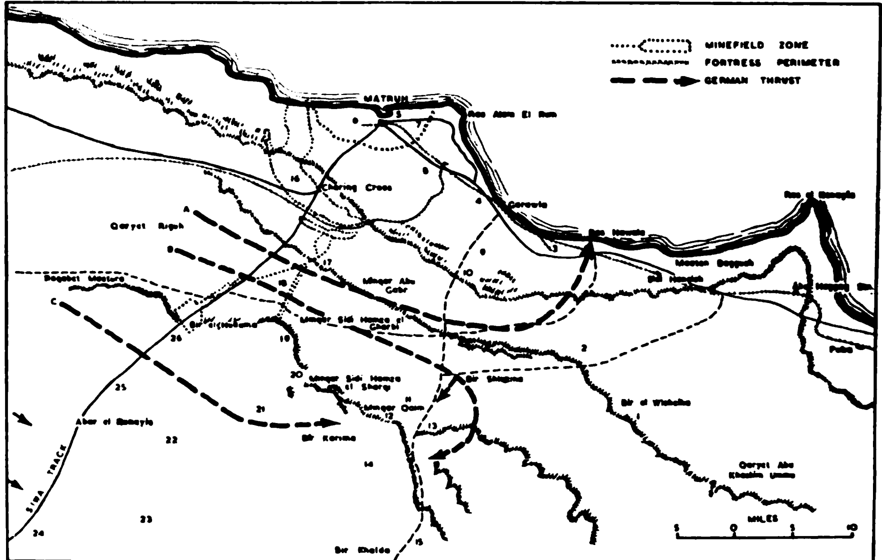

FIG. 47. The Battle of Mersa Matruh.

A. 90th Light Division
B. 21st Panzer Division
C. 15th Panzer Division

→ = points reached by the evening of June 27

1. XIII Corps
2. Indian 5th Division
3. 50th Division
4. X Corps
5. Indian 10th Division
6. Indian 21st Brigade
7. Indian 5th Brigade
8. S.A. 6th Armd. Car Regt.
9. 69th Brigade
10. 151st Brigade
11. N.Z. 2nd Division
12. N.Z. 5th Brigade
13. N.Z. 4th Brigade
14. 1st Armd. Division
15. N.Z. 21st Battalion
16. Indian 25th Brigade
17. 'Leathercol'*
18. 'Gleecol'*
19. Indian 29th Brigade
20. H.L.I.
21. 22nd Armd. Brigade
22. 4th Armd. Brigade
23. Ind. 3rd Motor Bde.
24. S.A. 4th Armd. Car Regt.
25. Royals
25. 7th Motor Brigade
26. 1/5th Mahrattas

* Each of these columns consisted of a battery of field artillery, a battery of A/T guns and two platoons of infantry of Ind. 29th Bde. of Indian 5th Division.

in Matruh, to keep the army fully mobile, and, if necessary, to abandon the Matruh position entirely.

Marshal Rommel's plan for the forthcoming battle was essentially the same as that which he had employed so successfully at Tobruk, Sidi Muftah, Bir Hacheim and El Adem. He intended to disperse and destroy the British armour between Matruh and Sidi Hamza and thereafter invest and storm Matruh. During June 26 the Deutsche Afrika Korps and 90th Light Division moved up to the gap between the two main minefields of Matruh, being heavily attacked from the air. The

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Italian divisions moved against the west face of Matruh fortress. 90th Light Division passed through the minefield and fell upon and destroyed 'Leathercol'. The German armour likewise passed through the minefields and destroyed 'Gleecol'.

At dawn on June 27, 90th Light Division overran 9th D.L.I. which on the previous evening had been moved to an area seventeen miles south of Matruh. 15th Panzer Division, advancing, met with strong opposition from 1st Armoured Division and was checked. 21st Panzer Division with its 16 tanks, for this is all that it now possessed, came under fire from the New Zealand guns at Minqar Qaim, but worked round to the east of this position. A series of infantry attacks supported by armour was made on N.Z. 4th Bde. and the N.Z. transport echelons were driven nine miles to the south. 1st Armoured Division sent 3rd County of London Yeomanry to engage 21st Panzer Division.

G.O.C. XIII Corps had by now reached the conclusion that the battle was lost and ordered 1st Armd. Division to withdraw, while Marshal Rommel acted on the assumption that it had already been won. He disengaged 90th Light Division and sent it to cut the coast road, which it did, and ordered 21st Panzer Division to pursue the enemy in the direction of Fuka. XIII Corps was already withdrawing and X Corps was ordered to conform. The independent withdrawal of XIII Corps had left X Corps in a difficult position; it had to fight its way back.

The New Zealand Division, encircled at Minqar Qaim, broke out in characteristic fashion. N.Z. 4th Bde. made a gap through the enemy lines to the east with the bayonet at 0145 hours on the 28th. The rest of the division followed in a solid column. 4 and 5 (N.Z.) Fd. Ambs. brought away with them between 300 and 350 wounded who were taken to 14 and 15 C.C.Ss.

At 0430 hours on the 28th, X Corps received orders from the Army to break out. In the afternoon the Axis attack on Matruh was launched. At 2100 hours the columns began to move out with instructions to go twenty miles due south before turning east to rendezvous at Fuka. Some of the column ran into trouble and suffered severely. It was assumed that XIII Corps would be standing at Fuka and that X Corps would pass through. But during the day the Afrika Korps had overwhelmed Ind. 29th Inf. Bde., which was acting as the right flanking formation of XIII Corps, and Axis patrols were scattered about the whole area between Matruh and Fuka. Thus it was that on the 29th, when the scattered elements of X Corps reached Fuka, many of them fell into the hands of the Afrika Korps. Eighth Army had endured heavy losses; the Axis forces had secured enormous supply dumps and airfields and had captured guns, transport and other war material in great quantity.

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El Alamein is the name of a railway station standing solitary among rolling dunes. To the north of it runs the coast road, two miles from the coast. To the south in a featureless uneven waste two low ridges, Miteiriya and Ruweisat, break the monotony. Beyond Ruweisat the surface becomes rougher and broken by sharp escarpments and flat topped hills, to reach a height of some 700 feet before plunging down into the Qattara Depression. The Alamein Line, occupying the forty miles between the sea and the Qattara Depression, consisted of three defended localities—Alamein, Bab el Qattara and Naqb Abu Dweis—spaced evenly over this gap. The Alamein box enclosed seven and a half miles of the coast road with a perimeter of fifteen and a half miles from coast to coast. It was overlooked by the Tell el Eisa mounds to the north-west.

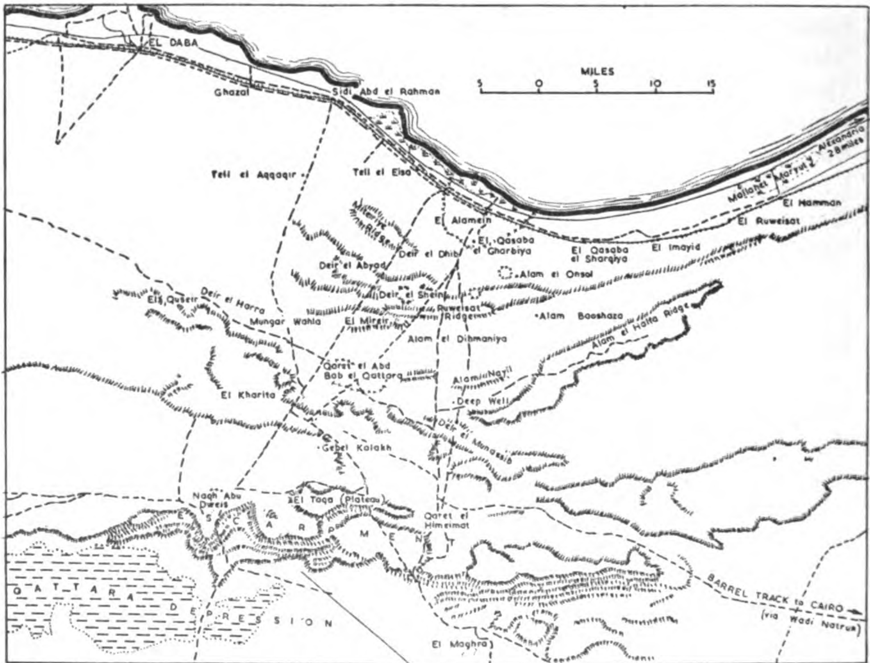

FIG. 48. The Alamein Position.

When S.A. 1st Division reached Alamein at the end of June it took over the northern part of the Alamein Line with Ind. 18th Inf. Bde. from Iraq under command at Deir el Shein.

N.Z. 2nd Division, regrouping after the withdrawal from Minqar Qaim, was in the vicinity of the Bab el Qattara box. Ind. 9th Inf. Bde. was occupying the box at Naqb Abu Dweis. The remains of 50th

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Division were organised into three mobile columns. Indian 5th Division, to the south at Qaret el Himeimat, was also forming battle groups.

H.Q. X Corps was back in the Delta organising defences round Alexandria, the last of all the lines in front of Cairo that could be defended.

On June 29, Eighth Army was not yet ready to withstand a serious onslaught. Alamein, Deir el Shein and Bab el Qattara had been garrisoned and two South African brigade groups were covering the six mile gap between Alamein and Deir el Shein. But 1st Armoured Division was in the vicinity of Fuka, fifty miles away, and the remnants of X Corps were scattered all over the desert between Matruh and Daba.

The Afrika Korps set out on the afternoon of the 29th, short of petrol and supplies, for an area twenty-five miles south of Daba, while 90th Light Division thrust along the coast road.On the 30th the desert between Fuka, Daba and the Qattara Depression was littered with Axis and British units all moving east. Marshal Rommel concentrated his armour opposite the northern half of the Alamein Line. On July 1, 90th Light Division advanced to Tell el Eisa. 1st Armoured Division, moving back to Alamein clashed with Italian and then with German formations, doing much damage. Divisional H.Q., 22nd Armd. Bde., 4th Armd. Bde. and 7th Motor Bde. reached the Alamein Line safely on June 30–July 1.

On July 1, 90th Light Division and the Italian Trento Division advanced against the South African positions while 15th and 21st Panzer Divisions attacked Ind. 18th Inf. Bde. positions at Deir el Shein and that of S.A. 1st Bde. further east. Ind. 18th Inf. Bde. had but newly arrived from Iraq and had been in the defended locality only three days. The 2/5th Essex, 4th Sikhs and 2/3rd Gurkhas had never been in battle. The assault opened at 1130 hours and bitter fighting was continuous until 1730 hours, when the support weapons had exhausted their ammunition and when all the A/T guns had been destroyed and the defenders were overrun. 12 of the Essex, 373 of the Sikhs and 592 of the Gurkhas got away under cover of darkness. This resistance on the part of Ind. 18th Bde., which was never reformed, enabled 4th Armd. Bde. and 1st Armd. Division as a whole to regroup.

Further north 90th Light Division and 7th Bersaglieri made several attempts to close with the South Africans, but these were fruitless and the South African artillery caused much havoc.

During the night of July 1/2, the Afrika Korps was continually bombed and its supply columns disorganised. At 0400 hours on the 2nd, 90th Light Division attempted to advance but was quickly checked. Marshal Rommel thereupon concentrated his armour around Deir el Shein and in the afternoon struck again along the Ruweisat Ridge. The Panzer Divisions clashed with 1st Armd. Division and were halted.

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N.Z. 2nd Division columns from Bab el Qattara and the remnants of Indian 5th Division from Naqb Abu Dweis encountered the Axis armour on Ruweisat Ridge.

On July 3 the Axis force attacked once more but were pinned down by artillery fire and aerial bombardment. N.Z. 19th Bn., moving up from Deir el Munassib, charged the Italian Ariete Division's position and for a loss of 2 killed and 20 wounded virtually captured the whole of the divisional artillery.

On July 4 General Auchinleck attempted to seize the initiative. He issued orders for XXX Corps to hold on to its positions while XIII Corps worked round the enemy's flank and thrust into his communications. Marshal Rommel withdrew 21st Panzer Division from the Ruweisat Ridge to counter New Zealand pressure at El Mireir and Alam Nayil. 15th Panzer and 90th Light Divisions had to spread out to fill the gap thus made. During the night of July 4/5, N.Z. 5th Bde. attacked at El Mireir, to score a modest success.

On July 5, N.Z. 4th Bde. was caught by dive-bombers south of the Bab el Qattara box as it was moving up to join N.Z. 5th Bde. and suffered heavily. Indian 5th Division advanced eastwards to the south of N.Z. 4th Bde. and 7th Motor Bde. took up a position between Bab el Qattara and Alam Nayil. XXX Corps held the Ruweisat Ridge with 1st Armd. Division, supported by Aust. 24th Bde. of Australian 9th Division newly arrived from Syria and by columns from Indian 10th and 50th Divisions. S.A. 1st Division remained in its position around Alamein.

On the night of July 7/8, Aust. 24th Bde. launched a successful raid against the German forces on the Ruweisat Ridge.

General Auchinleck now decided to modify his plan and to use the fresh Australian 9th Division for a thrust in the north and so N.Z. 2nd Division was withdrawn from Bab el Qattara to the east. On the 10th, Australian 9th and South African 1st Divisions attacked and secured the Tell el Eisa mounds west of Alamein. Between July 14–17 part of Ruweisat Ridge was gained by Ind. 5th Inf. Bde. and N.Z. 4th and 5th Bdes. On the night of July 21/22, 161st Inf. Bde. u/c Indian 5th Division, N.Z. 6th Bde. and 2nd and 23rd Armd. Bdes. unsuccessfully attempted to clear the rest of Ruweisat Ridge. On the 26th/27th further attacks were delivered by Ind. 9th Inf. Bde. and 69th Bde. but again without much success and at considerable cost.

Mobile warfare was giving place to static as the Axis forces organised defensive positions, finding themselves too weak to override the opposition facing them. Eighth Army attempted to defeat the Axis forces before these positions had been consolidated but did not succeed in doing so. These attempts had proved costly, for Eighth Army's losses during this critical month of July were of the order of 750 officers and

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12,500 other ranks, of whom some 4,000 were New Zealanders and 3,000 Indians. It had captured about 7,000 prisoners, 1,000 of these being German, and it had inflicted severe losses both in men and in armour. Through its exertions Eighth Army under General Auchinleck had made possible the victory that was to be won three months hence.

On August 13, General Auchinleck handed over M.E.C. to General Alexander. The command of Eighth Army was given to General Montgomery. Ninth and Tenth Armies, hitherto with Eighth under M.E.C., were separated therefrom to become 'Paiforce.'

MEDICAL COVER FOR THE RETREAT TO THE ALAMEIN LINE

FIG. 49. XIII Corps. Evacuation Chain prior to the Axis Assault on the Gazala Line.

The evacuation chain of XIII Corps prior to the Axis assault on the Gazala Line was as shown in Fig. 49. The medical arrangements east of Tobruk were as follows:

Tobruk	62 B.G.H.
Bardia	1 Mob. Mil. Hosp.
Sollum–Capuzzo	The Hadfield Spears Unit 2 (Ind.) C.C.S. Coy. 14 Fd. Amb.
Sidi Barrani	Coy. 200 Fd. Amb. S.P.
Matruh	8 (S.A.) C.C.S.
Gerawla	58 B.G.H.
Baqqush	11 I.G.H.
Fuka	12 Lt. Fd. Amb.
El Daba	200 Fd. Amb., less one coy. Coy. 14 (Ind.) Fd. Amb.
Gharbaniyat (Medical concentration centre halfway between Burg el Arab and Hammam)	14 C.C.S. 14 Fd. Amb., less one coy. Coy. 19 (Ind.) Fd. Amb.

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In the Desert
- Hamra Box . . . . . . 15 C.C.S.
- Minqar el Zannan . . . . . 14 C.C.S.

At the Base . . . . . . as in Appendix XIX

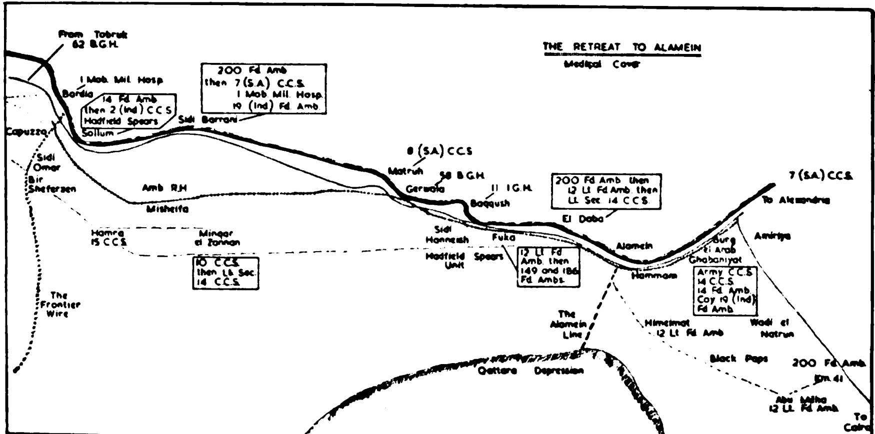

FIG. 50. Medical Arrangements at the Time of the Axis Assault on the Gazala Line.

When 7th Armd. Division moved once again into the Desert to take part in the withdrawal to the Alamein position it took over the area west of Bir Hacheim. It operated in the form of a number of mobile columns, each with a R.M.O. and two ambulance cars. An A.D.S. was attached to Bde. H.Q. Cases evacuated from these columns were brought back to the A.D.S. with 'B' echelon. 15 Lt. Fd. Amb., with the Greek Surg. Unit of 15 C.C.S. attached, opened in the area of Got Scerrara, east of Bir Hacheim, while 151 Lt. Fd. Amb., covering 4th Armd. Bde., was in the area Hagfet el Genadel.

On the night of May 26/27, 15 Lt. Fd. Amb. found itself directly on the line of the Axis advance and therefore moved back to join 151 Lt. Fd. Amb. on the El Gubi–El Adem track. 3 (Ind.) Lt. Fd. Amb. reached the area Got Scerrara at this time. It had no wireless set and was out of touch. This unit became involved in the confused fighting around Hagfet en Nezha. 15 and 151 Lt. Fd. Ambs., likewise involved, moved east rapidly, 151 leaving a certain amount of equipment on the ground. This was recovered during the following days when the Axis forces withdrew to the Knightsbridge area. These two units, with the Greek Surg. Unit, then opened at Hagfet en Nezha. The distance commonly travelled by casualties from the front to this M.D.S. was about 150 miles owing to the need to make wide detours in order to avoid the moving columns with which the Desert seemed to be filled.

Erratum. Fig. 50. For 10 C.C.S. Minqar el Zannan read 14 C.C.S.

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When, on June 5, 7th Armd. Divison and Indian 5th Division attacked in the area of the Cauldron, 2 and 151 Lt. Fd. Ambs. were moved forward, but quickly had to move eastwards again since there were constant threats by enemy columns coming up from the south. The bulk of the casualties were therefore evacuated to the north through the medical units of 1st Armd. Division which were on the Trigh Capuzzo and the El Adem road.

In the early phases of the battle wounded were evacuated from Bir Hacheim by 16 M.A.C. over a long and circuitous desert route since enemy concentrations denied more direct access to 62 B.G.H. in Tobruk.

When, on June 10, the Free French withdrew from the Bir Hacheim Box, 25 ambulance cars were sent forward to the vehicle park of 7th Motor Bde., twelve miles south-south-west of Bir Hacheim. 225 casualties were evacuated to the C.C.S. at Carmuset En Beidat and thence to 1 Mob. Mil. Hosp. in the Capuzzo–Sollum area.

A small number of wounded were evacuated from the Knightsbridge and the El Adem boxes when their garrisons withdrew on June 14 and 15. They passed through the A.D.S. with H.Q. 7th Armd. Bde. to 12 Lt. Fd. Amb.

On June 2, 21 (Ind.) Fd. Amb. moved from Sollum to El Adem u/c Ind. 29th Inf. Bde. On June 5 all the medical units of Indian 5th Division were directed to proceed to a rendezvous about four miles north of El Adem. For the counter-attack on the 5th H.Q. 20 (Ind.) Fd. Amb. opened a M.D.S. to the south of El Adem. To this M.D.S. 5 cars of the A.F.S. and a surgical team were attached. Evacuation was to 62 B.G.H. in Tobruk *via* a staging post of 20 (Ind.) Fd. Amb. sited halfway between the M.D.S. and the hospital.

By 2000 hours on the 5th, the M.D.S. had treated over 120 casualties. Moving back, 20 (Ind.) Fd. Amb. with its patients came under heavy fire. On June 6, 10 (Ind.) Fd. Amb. provided a light A.D.S. to serve stragglers from the brigades then withdrawing. H.Q. and reserve companies of 10, 20 and 21 (Ind.) Fd. Ambs. moved east to a medical area just south of the Tobruk–Bardia road, about thirty miles from Tobruk. Here H.Q. 10 (Ind.) Fd. Amb., with a surgical team attached, opened a M.D.S. A company of the same unit established an A.D.S. just outside the El Adem defensive locality. Evacuation was to 62 B.G.H. for serious cases and to 2 (Ind.) C.C.S. for the rest.

On June 9, H.Q. Indian 5th Division moved to the Sidi Rezegh area. H.Q. 21 (Ind.) Fd. Amb. opened a M.D.S. in the medical concentration area on the Tobruk–Bardia road while 10 (Ind.) Fd. Amb. moved with Ind. 10th Inf. Bde. to Buq Buq.

The movements of these medical units during the withdrawal are shown in Fig. 51.

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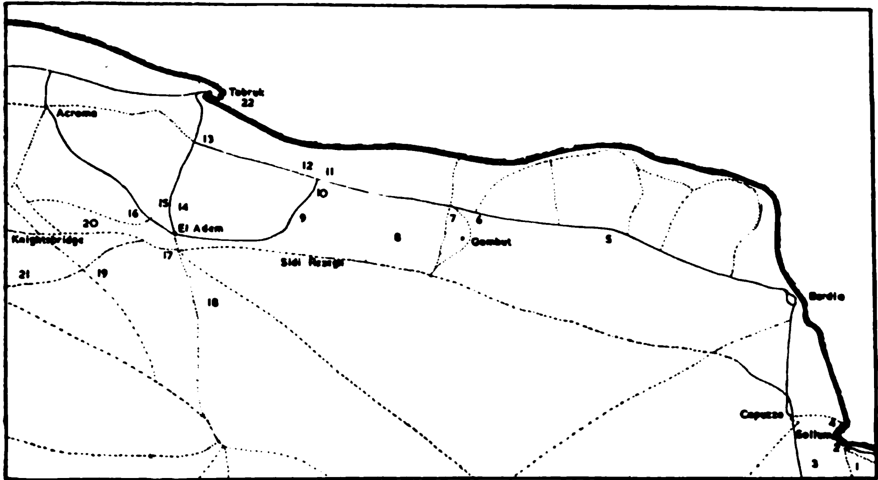

FIG. 51. Indian 5th Division. Medical Cover during the Withdrawal to the Alamein Position.

1. 2 (Ind.) C.C.S. . March 28
2. 19 (Ind.) Fd. Amb. . March 28
3. 19 (Ind.) Fd. Amb. Coy. . . . March 28
4. 21 (Ind.) Fd. Amb. . May 5
5. 20 (Ind.) Fd. Amb. Coy. staging section . June 6
6. 20 (Ind.) Fd. Amb. less 'A' Coy. M.D.S. May 24
7. 20 (Ind.) Fd. Amb. less 'A' Coy. M.D.S. May 17
8. 20 (Ind.) Fd. Amb. 'A' Coy. A.D.S. May 18–June 1
9. 10, 20 and 21 (Ind.) Fd. Amb. H.Qs. M.D.S. June 6–9
10. 21 (Ind.) Fd. Amb. H.Q. . . . June 2
11. 20 (Ind.) Fd. Amb. H.Q. and two coys. . June 9
12. 20 (Ind.) Fd. Amb. M.D.S. . . June 9–11
13. 10 (Ind.) Fd. Amb. M.D.S. . . . May 18
14. 20 (Ind.) Fd. Amb. M.D.S. . . . June 6
    10 (Ind.) Fd. Amb. 'A' Coy. detachment . June 1
    20 (Ind.) Fd. Amb. M.D.S. . . . June 1
15. 10 (Ind.) Fd. Amb. H.Q. in reserve
16. 10 (Ind.) Fd. Amb. A.D.S. . . . June 6-9
17. 21 (Ind.) Fd. Amb. two coys. A.D.S. . June 9
18. 10 (Ind.) Fd. Amb. 'A' Coy. A.D.S. . June 6
19. 10 (Ind.) Fd. Amb. detachment . . June 4
20. 20 (Ind.) Fd. Amb. M.D.S. . . . June 4
21. 10 (Ind.) Fd. Amb. 'B' Coy. A.D.S. . May 17
22. 62 B.G.H.

When enemy tanks overran 150th Bde. of 50th Division, 150 and 186 Fd. Ambs. were captured and their personnel, some wounded, all available transport and a considerable amount of medical equipment

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removed. Later, in the confusion, portions of these field ambulances were able to rejoin British forces. During the course of this engagement 150 Fd. Amb. was between opposing troops and acted as M.D.S. for both sides. The losses of 50th Division during this withdrawal had been so severe that its 150th Bde. ceased to exist while the other two were greatly depleted. The remains of 150 Fd. Amb. were distributed between 149 and 186 Fd. Ambs., only a cadre of 150 being retained.

Evacuation was maintained by both corps to 62 B.G.H., thence by Army, both by air from Gambut L.Gs. and by road, to 1 Mob. Mil. Hosp., 2 (Ind.) C.C.S. and 14 Fd. Amb. in the Capuzzo–Sollum area and thence, *via* the staging post at Sidi Barrani, to 8 (S.A.) C.C.S. at Matruh. Ambulance railheads were available at Capuzzo, Misheifa and Matruh for both daily ambulance coaches and ambulance trains to the Delta as required. Sea evacuation by hospital ship was maintained from Tobruk as required by D.M.S., G.H.Q.

During the withdrawal to Tobruk casualties were very light. 151 Lt. Fd. Amb. served 4th Armd. Bde. and 15 Lt. Fd. Amb. was u/c 7th Armd. Division during this phase. Since this field ambulance, still having no wireless set, could not be used independently, it was associated with 151 Lt. Fd. Amb.

The distribution of the medical units of XIII Corps during the defence of Tobruk prior to its investment is shown in Figure 52.

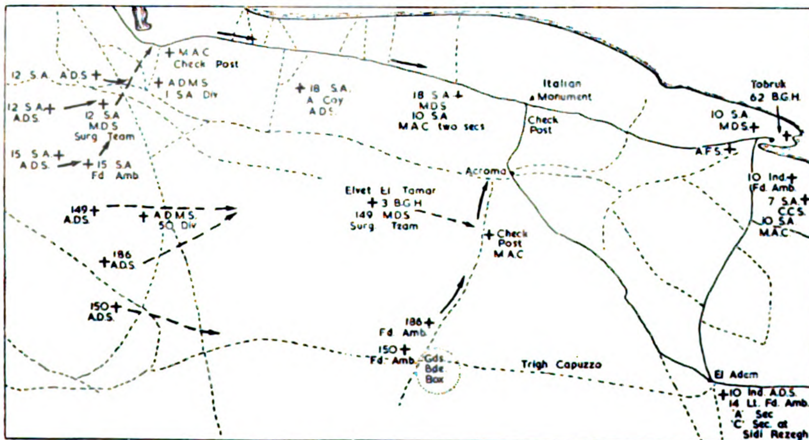

FIG. 52. XIII Corps. Medical Cover during the Defence of the Tobruk Perimeter prior to its Investment.

The practice of keeping the M.D.Ss. under wireless control by the A.D.M.S. and of placing the A.D.Ss. under the command of formations equipped with wireless, e.g. Bde. H.Q. or R.A.S.C. Coy., proved to be entirely satisfactory. Captured documents revealed a number of interesting facts. The German ambulance car then in use had proved to be

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most unsatisfactory; for medical supplies the German medical units relied to a considerable extent upon captured stores; the German drivers of ambulances lacked maps, binoculars and compasses; the transport of the medical units was utterly insufficient, having regard to the conditions and circumstances.

When Tobruk became threatened, plans for such a situation were put into force without delay. These involved the despatch of 14 C.C.S. from Gharbaniyat to Minqar el Zannan and the withdrawal of 7 (S.A.) C.C.S. and 1 Mob. Mil. Hosp. to the Sidi Barrani area. Both C.C.Ss. opened at once in their new sites and the hospital remained closed, available as required. This disposition put 14 C.C.S. on the desert axis, *via* Sheferzen, Hamra and Bir Thalata, at Minqar el Zannan, and 7 (S.A.) C.C.S. on the Sollum–Buq Buq–Sidi Barrani–Matruh road at Sidi Barrani.

In the forward area 62 B.G.H. remained in Tobruk, being cleared by H.S. *Llandovery Castle* (450 cases) by sea, and by road (300 cases) on June 14. On the 17th this hospital was cleared by H.S. *Aba* and again on the 18th by H.S. *Llandovery Castle*. The thirty-six sisters Q.A.I.M.N.S. were moved back by road on the 15th to Gerawla (58 B.G.H.) for the Delta. The hospital itself was lost when Tobruk was taken.

On June 14, Indian 5th Division was ordered to move to Hamra with Indian 5th Inf. Bde. of Indian 4th Division u/c. With main H.Q. Indian 5th Division went a company of 20 (Ind.) Fd. Amb.; with Ind. 5th Bde. was a company of 14 (Ind.) Fd. Amb. 15 C.C.S. was *en route* for Hamra. Rear H.Q. Indian 5th Division moved to Sofafi and with it went 20 (Ind.) Fd. Amb., less one company.

XXX Corps was responsible for the defence of the new frontier position, with 15 C.C.S. in the Hamra box and 2 (Ind.) C.C.S. in the Sollum box.

On June 17 services were informed that the Army Commander wished to establish a southern desert axis from El Adem in a south-easterly direction to the frontier wire at El Beida. No alteration in the medical plan was necessary as 15 C.C.S. was available in the Hamra area behind the frontier wire with 14 C.C.S. further east at Minqar el Zannan.

On June 18 it was evident that withdrawal to the frontier position was inevitable. XIII Corps was to hold this line with strong-points at Sollum, Hamra and the Giarabub garrison. These defended localities had medical establishments as follows:

In Sollum .	2 (Ind.) C.C.S. with 26 (Ind.) Fd. Amb. of Indian 10th Division.
In Hamra .	15 C.C.S. with the field ambulances of two S.A. Bdes.
At Giarabub	A small medical detachment with a surgeon.

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Evacuation from this line was by main road north through 7 (S.A.) C.C.S. at Sidi Barrani to 8 (S.A.) C.C.S. at Matruh and 58 B.G.H. at Gerawla, while on the desert axis 14 C.C.S. was available at Minqar el Zannan.

When, on June 18, Indian 5th Division and Ind. 29th Inf. Bde. were instructed to move to Sofafi East, 21 (Ind.) Fd. Amb., less a detachment, left with 15 C.C.S., proceeded to Sofafi and opened its M.D.S. Then on the 19th the division moved with its medical units to Baqqush. Ind. 29th Inf. Bde. with 20 (Ind.) Fd. Amb., was given the task of guarding the minefields south of Matruh. On June 26 the remnants of this brigade and ambulance moved back to Alamein, there to join Ind. 9th and 10th Inf. Bdes.

During these events the Indian field ambulances had become greatly depleted. 19 had been captured in Tobruk, 10 had lost a company and its equipment, 20 the equipment of one company and 21 had 3 officers and 108 O.Rs. taken prisoner.

The evacuation arrangements were working satisfactorily when, on June 21, it was decided that, owing to the loss of Tobruk and the virtual destruction of the British armour, there was no hope of defending the frontier position or of retaining Misheifa as a desert railhead, but that Matruh was to be held by X Corps, newly arrived, with the El Alamein position as a further defensive line should Matruh be threatened. Accordingly, on June 22 all medical units not immediately necessary were ordered to a medical concentration area well east of the El Alamein position at Gharbaniyat.

Road Sector: Evacuation was maintained as follows: Lt. Sec. 7 (S.A.) C.C.S. with one company of 19 (Ind.) Fd. Amb. at Sidi Barrani remained to clear cases to Matruh. 200 Fd. Amb. with one company of 14 (Ind.) Fd. Amb. was moved back to Daba for use there when required.

Desert Sector: Lt. Sec. 14 C.C.S. remained at Minqar el Zannan; Hy. Sec. withdrew to Gharbaniyat where Hy. Sec. 7 (S.A.) C.C.S. was also located.

As the corps medical units withdrew east, Lt. Sec. 7 (S.A.) C.C.S. closed and rejoined its H.Q. at Gharbaniyat. At the same time Lt. Sec. 14 C.C.S. withdrew to Daba where, together with a field ambulance and a company of an Indian field ambulance, it functioned as an advanced Army C.C.S. Hy. Sec. 14 C.C.S., likewise reinforced, became the rear Army C.C.S. at Gharbaniyat.

The Army had 1 M.A.C. and 66 cars of 'X' Coy. American Field Service to clear from Army C.C.S. XIII, XXX and X Corps had 16, 2 and 10 (S.A.) M.A.C., but the two latter units particularly had lost many vehicles.

By June 23 the undermentioned units had arrived at the medical concentration area at Gharbaniyat:

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14 C.C.S. (less Lt. Sec. with 200 Fd. Amb. at Daba)	3 Mob. Hyg. Lab. 14 Fd. Amb.
1 Mob. Mil. Hosp.	13 Fd. Hyg. Sec.
2 (Ind.) C.C.S.	One coy. 19 (Ind.) Fd. Amb.
7 (S.A.) C.C.S.	2 Lt. Fd. Amb. (incomplete)
1 Mob. Ophth. Unit	5 Mob. Bact. Lab.

Later all units except the rear Army C.C.S. and 13 Fd. Hyg. Sec. were cleared to different areas in the Delta.

When it was decided that Matruh was to be cleared at once of all non-essential personnel and any remaining units were to be thinned out to the bare minimum and preferably only mobile units retained, immediate steps had to be taken to evacuate and close 58 B.G.H. at Gerawla, 11 I.G.H. at Baqqush and 8 (S.A.) C.C.S. in Matruh and to hold the closed units ready for entrainment back to Amiriya area. The Hadfield Spears Unit* at Gerawla was emptied and ordered back to Amiriya area. Cases were cleared by road, air and rail. At this point N.Z. 2nd Division arrived in Matruh and took over medical sites occupied by 8 (S.A.) C.C.S. and the combined 10 and 11 (S.A.) Fd. Ambs., both of which units moved out. On June 25, N.Z. 2nd Division was relieved in Matruh by Indian 10th Division.

During the withdrawal from Matruh evacuation was by corps M.A.Cs. to the advanced Army C.C.S. at Daba and thence by Army A.F.S. Ambulance Unit and 1 M.A.C. to Alexandria until June 26, by which time the rear Army C.C.S. was opened at Gharbaniyat. At this time 12 Lt. Fd. Amb., detached from XXX Corps, provided a staging post at Fuka until the 27th when, relieved there by 149 and 186 Fd. Ambs. of 50th Division, it withdrew to Daba to play a similar rôle when the advanced Army C.C.S. at Daba withdrew to Gharbaniyat.

2 (Ind.) C.C.S., being without transport, could not be utilised. D.M.S., G.H.Q., had arranged for drivers and transport for the C.C.S. but in the inevitable confusion the transport did not arrive. During this stage 15 C.C.S., with 2 M.A.C., u/c D.D.M.S. XIII Corps, was moving back across the desert as the situation demanded, clearing to Fuka, then Daba, then Gharbaniyat.

On June 28 the Army Commander ordered the immediate organisation of an Army desert axis from the south flank of the El Alamein position *via* Himeimat along the Barrel Track through Black Paps and Abu Milha to join the main Alexandria–Cairo desert road at Km. 46, east of Wadi Natrun. The following arrangements were made:

* The Hadfield Spears Unit was a voluntary organisation raised and administered by Mrs. Hadfield Spears (Mary Borden). It was completely and elaborately equipped. Its staff included several French medical officers, radiographers, 8 nurses and 8 women ambulance drivers.

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(1) 12 Fd. Amb. would provide staging posts at Himeimat, Black Paps and Abu Milha.
(2) XIII Corps, on withdrawing to Army Reserve, would transfer 15 C.C.S. and 2 M.A.C. to XXX Corps to operate on the desert axis.

Experience showed this axis to be impracticable, and on June 30 its formation was counter-ordered. Two convoys—approximately 100 cases in all—passed through staging posts to the main road on this axis, after which all evacuation was switched to Gharbaniyat for Alexandria.

When, on the 21st–22nd and again on the 26th–27th, Eighth Army attempted to secure the Ruweisat Ridge, 2 M.A.C. with XIII Corps and 16 M.A.C. with XXX Corps evacuated to the Army C.C.S. at Gharbaniyat. It was also possible to clear XIII Corps M.D.S., to which were attached the Greek Surgical Unit from 15 C.C.S. with XIII Corps, three surgical teams and 6 F.T.U., by DH 86 ambulance aircraft. This allowed suitable serious cases, both pre-operative and post-operative, to be flown from the Corps M.D.S. to 9 B.G.H. at Heliopolis in some ninety minutes, as against the normal tedious and uncomfortable journey by M.A.C. over bad desert tracks to the Army C.C.S. Many cases were airborne to the Delta from this M.D.S. by transport planes until two of these (fortunately without patients) were destroyed by enemy action near the M.D.S.

Air evacuation from XXX Corps in the north was not possible as no suitable landing grounds were available, but the evacuation line from this corps to 14 C.C.S. was along the main road and was much shorter than the desert road from XIII Corps. At Gharbaniyat the Army C.C.S. was composed of 14 C.C.S., 14 Fd. Amb. (for minor wounded and daily sick wastage) and a company of 26 (Ind.) Fd. Amb., Indian battle casualties being treated in the operating theatre of 14 C.C.S. Also in this Army medical centre were two field surgical units and 3 F.T.U., a mobile dental centre, 1 Mob. Ophth. Unit and H.Q. of the Army M.A.C. (1 M.A.C.). From Gharbaniyat cases were routed by road (1 M.A.C.) to hospitals in Alexandria; by ambulance train from Amb. R.H. at Gharbaniyat to hospitals in the Canal area, and by air to Cairo, ambulance aircraft (two DH 86) and empty returning transport planes (Bombays) being available from L.G. 28 adjacent to the C.C.S. to fly cases to Heliopolis. Minor sick and cases of physical exhaustion, which represented 90 per cent. of so-called N.Y.D. (N), were side-tracked from Gharbaniyat to the Army rest station (200 Fd. Amb.) at Ikingi Maryut, near Eighth Army transit camp, to which cases were discharged for return to units. Forward filters for minor sick were established in XXX Corps area near the sea by field ambulances of Australian 9th, S.A. 1st and Indian 5th Divisions. These units, with 200 Fd. Amb., materially helped to prevent undue sick wastage.

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On June 7, Indian 10th Division had reached Gambut. Ind. 21st Inf. Bde. went to the Sollum–Halfaya–Capuzzo area, 25th Bde. to the aerodromes at Gambut and 20th Bde. to Belhamed–Sidi Rezegh. The field ambulances were brigaded, 26 with 20th Bde., 30 with 25th Bde. and 29 with 21st Bde. Evacuation from their M.D.Ss. was to 62 B.G.H. at Tobruk or to 2 (Ind.) C.C.S. at Sollum and 200 Fd. Amb. at Sidi Barrani.

On June 17/18 all these medical units withdrew into the Sollum box. On the 22nd they moved on to Matruh. On the 27th, 29 (Ind.) Fd. Amb. moved back to Alamein. 26 and 20 accompanied the division in its break-through from Matruh to Alamein past the road-block at Gerawla on the 29th.

By July 1 these medical units were at Amirya and with the whole division at Mena Camp on the 3rd.

The Order of Battle, South African non-divisional medical units as at June 2, 1942, is given in Appendix XVIII.

On June 14, N.Z. 2nd Division in Syria received orders to move forthwith for Egypt. The thousand mile move was conducted with the greatest secrecy. N.Z. 4th and 5th Bdes. proceeded to Matruh, reaching there on June 21 and 22. On the 25th they moved to the escarpment at Minqar Qaim, where they took up a defensive position. They were heavily bombed on the 26th. On the 27th they were repeatedly attacked and finally surrounded. At dusk N.Z. 4th Bde. cleared a way with the bayonet and the rest followed to reach Alamein.

During the action at Minqar Qaim the A.D.Ss. of 4 and 5 (N.Z.) Fd. Ambs. were with their respective brigades. Twenty miles to the east the M.D.Ss. of these field ambulances were established. Early on the morning of the 27th, 70 men wounded during the bombing raid on the previous evening were evacuated to the M.D.S. of 5 (N.Z.) Fd. Amb. but the ambulances were unable to get back to the A.D.Ss., the way being blocked by Axis forces. During the afternoon the A.D.Ss. moved closer to the Main Divisional H.Q. Later a convoy of 7 of the A.D.S. cars and 10 A.F.S. cars managed to reach the A.D.Ss. by a southern route. They were loaded but could not get away, for by this time Minqar Qaim was surrounded. For the break-out all patients (some 300–350) and medical staff were crowded on to the available transport. During the break-out four N.Z. and two A.F.S. ambulance cars and two trucks were disabled and 15 men of 5 (N.Z.) Fd. Amb. and three A.F.S. drivers were taken prisoner.

During the action the G.O.C. N.Z. 2nd Division was wounded in the neck. He was brought out safely and on the 28th was evacuated by air from Daba to 1 N.Z.G.H. at Helwan. The rest of the casualties were sent on to 14 C.C.S. at El Hammam. On the 30th, 6 (N.Z.) Fd. Amb. joined the others and established its M.D.S. in the

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Kaponga box and 4 (N.Z.) Fd. Amb. its M.D.S. some fifteen miles to the east.

In the Delta the New Zealand Base became involved in the growing anxiety occasioned by the approach of the triumphant Axis army. Units in Maadi Camp were organised into a formation and given the name of N.Z. 6th Division and the camp hospital became 28 (N.Z.) Fd. Amb. The N.Z. sisters and nurses were ready to move out of the country at a few hours notice.

For the attack by N.Z. 4th and 5th Bdes. on Ruweisat Ridge on July 14/15 the A.D.Ss. were with their brigades. During the 15th the A.D.S. of 4 (N.Z.) Fd. Amb. admitted 103 New Zealand and 12 U.K. patients and that of 5 (N.Z.) Fd. Amb. 159 New Zealanders in addition to many U.K., Indian and P.o.W. wounded.

For the attack at El Mreir by N.Z. 6th Bde. on July 18, 'B' Coy. 6 (N.Z.) Fd. Amb. moved with the brigade. 'A' and 'B' Coys. supplied S.B. parties to N.Z. 24th and 25th Bns. The Germans were surprised and casualties were few. These were taken back to a car post. But then came the counter-attack by German armour and the two battalions were overrun and scattered. Casualties began to pour into the A.D.S. of 6 (N.Z.) Fd. Amb. and continued to stream in throughout the night. Evacuation was to the M.D.S. of 4 (N.Z.) Fd. Amb. and to the A.D.S. of 4 (N.Z.) Fd. Amb. two miles to the east of the A.D.S. of 6 (N.Z.) Fd. Amb. Help was given to the M.D.S. of 4 (N.Z.) Fd. Amb. by 1 and 151 Lt. Fd. Ambs. and by two surgical teams from 15 C.C.S. and a F.S.U. On the 22nd, 632 patients were admitted to the M.D.S. of 4 (N.Z.) Fd. Amb. and 394 were evacuated to 14 C.C.S. at Gharbaniyat and over 300 were held overnight. On the 23rd, 438 casualties were admitted and evacuation proceeded throughout the day. On the 24th admissions dropped to 150. Evacuation of serious cases by air had begun on July 19, the returning aircraft bringing medical stores and transfusion supplies. On July 28, 6 (N.Z.) Fd. Amb. took over the M.D.S. from 4 (N.Z.) Fd. Amb.

The total sick and wounded admitted from June 27 to July 31 by 4 (N.Z.) Fd. Amb. was 3,202, by 5 (N.Z.) Fd. Amb. 1,460 and by 6 (N.Z.) Fd. Amb. 561.

1 (N.Z.) C.C.S. on its arrival in Egypt from Syria was opened on a site west of Burg el Arab and a few miles inland, and 2 N.Z.G.H. from Nazareth at El Gallah, south of Kantara three miles from the Suez Canal and near the Sweet Water Canal. 1 N.Z.G.H. had remained at Helwan since it had returned from Greece and Crete. 3 N.Z.G.H. was in Beirut.

During August, as a precautionary measure, XIII Corps prepared an alternative maintenance axis eastward along Grid 87 Northing to join the main Alexandria–Cairo road near Km. 136 where were located

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a company of 200 Fd. Amb. and two sections of 151 Lt. Fd. Amb. as staging units for cars of 16 M.A.C. Onward evacuation was by Army ambulance cars to hospitals in Alexandria. A further stop was available in 15 C.C.S. (which had been resting and re-equipping in Alexandria) near Km. 51, toward Mena on the above-mentioned road.

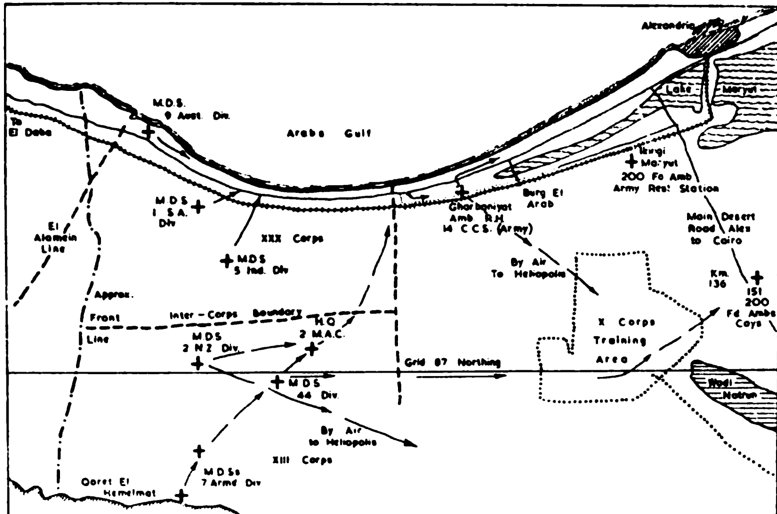

FIG. 53. XIII Corps. Evacuation System. July–September, 1942.

During the months of July and August 1942, 7th Armd. Division was occupied in observing and harassing the enemy. It took part in no major engagement. On the night of July 18/19, 69th Inf. Bde. of 50th Division, but u/c 7th Armd. Division, attacked the eastern end of the El Taqa Plateau. Its casualties were evacuated to the A.D.S. of 186 Fd. Amb. at Himeimat and thence to the M.D.S. of 15 Lt. Fd. Amb. at Mirbet Aza. The lack of a surgical team at this M.D.S. was much felt.

An order issued by 15th Panzer Division about this time revealed the serious troubles that were besetting the German medical services. The evacuation of sick personnel was proving to be so difficult that men suffering from dysentery had to remain the responsibility of forward medical units. Water shortage was acute.

MEDICAL ARRANGEMENTS AT THE BASE (*See* Appendix XIX)

Before the withdrawal of Eighth Army to Alamein there was much movement of units in B.T.E. 3 N.Z.G.H. left Helmieh and B.T.E., 1 Pol. G.H. and the Polish section attached to 3 B.G.H. left Alexandria and 54 B.G.H. left El Ballah. Into B.T.E. from G.H.Q. Reserve came 11 and 58 I.G.Hs., 11 Br. S.S. and 18 I.S.S. From Syria into B.T.E. came a Free French hospital, to become attached to 3 N.Z.G.H. at

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Alexandria. 58 I.G.H., a section of 11 I.G.H., 18 I.S.S. and 2 V.D.T.C. went to Gerawla, 11 I.G.H. to Baqqush, 11 Br. S.S. to Ikingi and 11 I.S.S. to Alamein.

The following expansions occurred:

8 B.G.H. increased by 300 beds
41 B.G.H. increased by 200 beds
58 B.G.H. increased by 100 beds
63 B.G.H. increased by 300 beds
3 B.G.H. reappropriated 250 beds of the Polish section
6 B.G.H. reappropriated 500 beds of the P.o.W. section
27 B.G.H. reappropriated 200 beds of the 2 V.D.T.C. Section

As part of the withdrawal to Alamein the following moves took place:

58 B.G.H. to Moascar
11 I.G.H. (less two secs.) to G.H.Q. Reserve
11 I.G.H. (two secs.) to Geneifa
11 I.S.S. to G.H.Q. Reserve
11 Br.S.S. to G.H.Q. Reserve
18 I.S.S. to G.H.Q. Reserve
2 V.D.T.C. to Moascar
102 S.A. (N.E.)G.H. to Qassassin
2 B.G.H., 3 B.G.H., 4 S.A.G.H., 30 I.G.H. } were closed ready to move back

Later, the Free French Hospital and 10 C.C.S. (recently arrived) left B.T.E. and 2 N.Z.G.H. and 7 A.G.H. entered it, the former to go to Kantara and the latter to Buseili. 102 S.A. (N.E.)G.H. opened in Cairo.

It was decided that Palestinian A.T.S. should replace O.Rs. R.A.M.C. wherever possible, 65 A.T.S. to replace 55 O.Rs. R.A.M.C. in each 1,200 bedded general hospital and 39 A.T.S. to be posted to each 600 bedded general hospital.

(iv)

The Health of the Troops October 1, 1941 – June 30, 1942

The health of the troops remained good, remarkably good, throughout these three quarters. During October–December the daily admission rate never rose above 0·18 per cent. During the operational period in January 1942 it was 0·17 per cent. and during March 0·14 per cent. In February the after-effects of the operational period raised the rate to 0·20 per cent. During the period April–June 1942, it was 0·14 per cent.

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The disruption caused by the retreat to Alamein disorganised the maintenance of records.

CLIMATIC CONDITIONS

October–December 1941

Two features were notable: The occurrence of a heavy rainfall in the coastal area on the first day of the offensive which so flooded the enemy's landing grounds that none of his aircraft was able to take off, and exceptionally cold and wet weather in Cyrenaica during the last week of the year which was the cause of considerable hardship to the troops but did not appear to affect the incidence of disease.

January–March 1942

Extreme cold was experienced during January and February. In the Gebel Akhdar there were very heavy rains and elsewhere almost continuous dust storms. Fortunately most troops in the Gebel were able to obtain the cover of buildings, but the adverse weather conditions were reflected in a sharp rise in the incidence of respiratory diseases during the latter part of January and the early part of February. In the area occupied by XIII Corps heavy rainstorms in March were followed by floods which interfered with communications and caused the destruction of rations in field service depots. From the middle of February to the end of March the weather was generally fine and pleasant.

April–June 1942

Throughout the early part of April there were occasional hot southerly winds accompanied by dust storms, the temperature remaining surprisingly low. A record of temperature maintained at Rear Army H.Q. at Buq Buq from May 22 to June 17 showed a mean maximum shade temperature of 80·7° F. The highest recorded maximum temperature was 100° F. on June 2 and the lowest, 75° F. on June 7.

PRINCIPAL DISEASES

Dysentery

An alarming increase in the rate during November 1941 was ascribed to the following factors:

(*a*) Continuance of hot weather produced a third fly season at the time when many troops were moving into the forward areas and had little or no facilities for the protection of food and the construction of fly-proof latrines.

(*b*) Many units new to desert conditions arrived and showed a standard of discipline much below that required.

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With the arrival of cold weather the rate became very low again.
The rate of admissions continued to fall, but did not entirely disappear.

Malaria

With the exception of certain cases among troops of the South African brigade which was in Siwa during the malarial season, all cases were infected outside the area. In Siwa troops who arrived before October 10 took suppressive quinine, but those entering after that date did not. It is of interest to note that 1st Worcesters, who relieved South African troops about December 10 and did not bring nets, long trousers and long-sleeved shirts, did not have many cases as compared with the South African brigade. Whether this was due to the ending of the infective season or to the anti-malarial work carried out by the South African personnel could not be decided.

Diphtheria

This disease continued to appear sporadically. Immunisation of the 1st R. Sussex had been completed shortly before the end of the first quarter and no further cases occurred in the Oases Group where this regiment had been stationed.

Isolated sporadic cases continued to appear. One investigation of 20 cases could trace no relation between any of them except for two brothers in one unit. With the advent of warm weather admissions dropped to negligible proportions.

Desert Sores

While scarcely affecting the sick admission rate, because few cases were admitted to hospital, desert sores were a large source of disability and had a bad effect on morale. Treatment by immediate protection of any injury with elastoplast proved satisfactory but did not meet the problem of prevention.

There was an almost complete disappearance of the sores as soon as winter clothing, which protected the skin, was issued.

Infective Hepatitis

The incidence of this disease fell off rapidly with the onset of winter. In December only 19 cases occurred as compared with 40 in October and 62 in September. It was now recognised that the disease had a late summer and early autumn high incidence.

The decrease was still more marked during the cold weather.

Pediculosis and Scabies

These conditions appeared at the end of January and during February reached a high incidence which did not begin to drop much before the end of March. Investigation brought to light two facts:

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(1) Many cases of pediculosis and of other abnormal conditions of the skin were incorrectly diagnosed as scabies.

(2) Many medical officers were apparently ignorant of the habits of *Pediculus corporis* and failed to examine clothing for eggs.

The main source of infestation among British troops appeared to be men travelling, but it could not be established where the infestation took place. Most of the cases, however, were among native labour units.

Difficulty was experienced in effecting disinfestation. Although bath units had been allotted to Eighth Army, it was not easy to persuade 'Q' to utilise them properly. Shortage of water was also a trouble, and another was the loss of two disinfestors by enemy action.

One battalion, the 3/2nd Punjab Regt., was withdrawn to the base on medical recommendation in February. The men were almost 100 per cent. infested and were suffering from the effects of ill-nourishment and exposure during the 'E' Force operations. From Siwa and Giarabub this force travelled across the desert to Agedabia and was separated from the base for a long period. The advisability of employing Indian troops, who must be fed on their special ration, on this type of operation was considered to be unwise.

The principal causes of admission during April–June were accidental injuries, dysentery and diarrhoea, and N.Y.D.(N). A large number of the cases of accidental injuries were burns. The increase in N.Y.D.(N) caused some anxiety. Poor discipline, a low standard of training, lack of information, poor leadership and lack of leave to the U.K. were all regarded as factors in its production.

The incidence of dysentery rose steadily and remained high.

A number of cases of relapsing fever occurred in the Tobruk and Gambut areas, the R.A.F. being principally affected in Gambut. Investigation into the fauna of the caves there was prevented by the retreat.

A small outbreak of murine typhus occurred among the civilian Bedouin employees of the N.A.A.F.I. at Capuzzo. These men had all come from the Hammam area. Four other cases occurred, only one of which was typical and which was traced to a source in Alexandria.

Several cases of fresh malaria were diagnosed, obviously incorrectly, as there were no anopheles in the areas inhabited by Eighth Army troops. These patients must all have been infected elsewhere, probably the previous autumn.

One case of heatstroke and a number of cases of heat exhaustion were reported. The latter were nearly all from troops who had been prisoners in enemy hands and had been relieved or had escaped.

Evacuation of the sick was mainly to 62 B.G.H. and thence they were returned to duty or evacuated to the Delta by hospital ship. From the

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L. of C. the sick were either treated at 1 Mob. Mil. Hosp. at Capuzzo or evacuated by road or rail from field ambulances to 8 (S.A.) C.C.S. or to the general hospitals at Matruh.

Two Army convalescent camps were established at Sollum and Sidi Bengalad respectively. These held up to 300 men each and proved of the greatest value. Several hundred men who would otherwise have been evacuated were held for periods of 7–10 days and then returned to their units. A mobile dental unit at each camp enabled all men passing through to be made dentally sound. Many N.Y.D.(N) cases held here were found to need only seven days' rest and feeding.

At the beginning of operations formations then in Eighth Army were nearly all fully inoculated.

DISEASES PREVALENT AMONG THE CIVIL POPULATION IN THE GEBEL AKHDAR REGION

Dysentery, both amoebic and bacillary, was very common. Typhoid was endemic and the public aqueducts polluted. Relapsing fever was endemic in the Barce area and undulant fever in the Derna area. Typhus, mainly of the murine type, was endemic in the whole area. Malaria was very prevalent and there was a high incidence of venereal diseases among the population.

SANITARY CONDITIONS OF CAMPS AND SURROUNDINGS

Among seasoned troops these were good, but they were deplorable among those new to active service conditions.

The conditions of P.o.W. camps caused trouble. It appeared to be the custom for the Royal Engineers to construct wire cages and expect the P.o.W. to dig latrines. As the cages were frequently sited in places where digging was impossible, and since the prisoners arrived in a demoralised, fatigued mob, the results of this procedure were deplorable. Field hygiene sections were fully employed in some instances in trying to deal with the situation.

The staffs of R.T.Os. at railway stations, in transit camps and at field maintenance centres were all short of sanitary personnel.

The value of really active anti-fly measures and propaganda was demonstrated at Matruh, where flies were reduced from a plague to almost negligible numbers.

The conditions at Giarabub gave rise to much anxiety. There had been considerable fighting over the area and it was occupied either by the enemy or by 'British' troops throughout the year. The result was a veritable plague of flies. It is interesting, however, to observe that the incidence of dysentery in this area was not high, and it was noted that a large number of the flies were *Fannia*.

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Conditions remained poor during January–March 1942. In organised formations some appreciation of sanitation developed, but among administrative troops in sub-areas and along the L. of C. conditions were frequently deplorable. The situation was complicated by the presence of numbers of native labour units, often occupying partially wrecked houses, and the tendency of commanding officers to consider that once a field hygiene section was allotted to an area all responsibility for sanitation became vested in the medical services. The difficulties of area and other commanders were fully appreciated, and it was felt that the time had arrived for reconsidering the methods for carrying out sanitary work in back areas under war conditions.

A very great improvement was shown by all troops in sanitary discipline up to the time active operations began. The sanitary improvement in Tobruk was most striking. Equally striking was the complete neglect of all sanitary precautions once the battle had commenced.

CONSERVANCY

Except in certain fairly small areas night soil was disposed of in deep trench latrines. Where a bucket system was introduced units disposed of their own night soil. This was done almost entirely by burial, a method less satisfactory than incineration.

During the active operations temporary expedients were necessary, and in such rapidly moving warfare with the necessity for concealment shallow trenches were frequently the only possible method of disposing of excreta. Whenever possible, use was made of the 'petrol-tin incinerator' latrine during active phases and in sites where digging was impossible. In permanent camps deep trench latrines were used wherever possible, otherwise a dump system was in use. The need for a more portable type of latrine top was very apparent.

Refuse disposal presented a great problem and efforts were made to encourage the building and use of incinerators wherever circumstances permitted.

At Matruh and Tobruk a system of sea tipping was introduced which was entirely satisfactory for the disposal of excreta but not for that of other refuse. Incinerators were subsequently installed at these tips in order to burn as much as possible of the refuse before tipping. The presence of a tip also encouraged units to get rid of their refuse by bringing it to the tip and not carrying out incineration in their own lines.

WATER SUPPLIES

There were two main sources, one from the aqueducts in Baqqush and Birbeita, the other from the water point at El Daba. From the Baqqush and Birbeita aqueducts the water was pumped into underground reservoirs, chlorinated and then distributed. The El Daba supplies

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were from the municipal water main system of Alexandria piped to El Daba.

During the last quarter of 1941, this line was extended to Bir Misheifa and great difficulty was experienced in filling the line before the beginning of operations. Water was pumped from a number of wells in the El Daba and Fuka areas which were of doubtful bacteriological purity. This water also had to be taken into use as soon as the pipe line was full and it was extremely dirty and full of sand. The opening of the pipe line and the commencement of operations coincided and no filtration plant was installed.

Units far out in the Desert were supplied by motor convoys carrying water from the Charing Cross point.

Five Elliot mobile water purifiers were obtained towards the end of November and did excellent work on the pipe line. After December, 20 of these purifiers were moved forward and were allotted to troops in the forward area where water was being drawn direct from *birs* and wells and they proved invaluable. At this time troops were entering towns in the Gebel area where the local water supplies were found to be intact.

Except for a short period at the end of December, troops in Cyrenaica were strictly limited to three-quarters of a gallon of water per head per day in order to conserve the supplies and enable the pipe line to be filled. This amount did not allow troops to wash properly and was barely sufficient for cooking and drinking. In spite of the very low ration of water and the very dirty water issued during the end of November and early December, no disease occurred that could be attributed to the water supplies.

In addition to the pipe line supplies very large quantities were brought to the forward areas by train and ship in various containers. This water was itself satisfactory, but trouble was experienced with the containers. There were three main types used—a twelve-gallon galvanised tank, the two-gallon petrol tin and a four-gallon petrol and oil container. No difficulty was experienced with the twelve-gallon tank, but both the other types gave trouble. The two-gallon container had been coated internally with paraffin wax which tended to flake off. This type produced water which, while not injurious, was bad tasting, especially if it were used for tea. The four-gallon containers were coated internally with bitumen dissolved in benzine. Most of these were badly prepared, the tins having been filled before the thick coating had had time to dry, thus rendering the water unusable. These tins were cleaned by baking and washing off the resultant dried flakes with high pressure jets of water. Later it was discovered that appreciable plumbo-solvency took place in these tins.

Nearly all water from the pipe line from Alexandria being required for use in locomotives, troops were obliged to depend on supplies from

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aqueducts and wells at Tobruk, Bardia and Buq Buq. These supplies were all saline to various degrees, that at Tobruk being the highest at about 350 parts per 100,000. It was planned to dilute this supply by 200 tons per day of distilled water from the condensing plant. The ration during most of the period was three quarters of a gallon per day, but towards the end was increased to one and three quarters gallons. The heavy rains filled many of the *birs* and wells and troops learned to find these and use them to supplement their ration. When Eighth Army reached the Gebel Akhdar water was derationed, as abundant supplies became available from the water mains of the different towns. In the Alamein line water was supplied directly from Alexandria by pipe line.

Later considerable development was carried out in the Buq Buq aqueducts where an excellent non-saline supply was obtained. The salinity of the Bardia supply was also considerably reduced by further development in aqueducts. A large distillation plant was instilled at Tobruk shortly before the port was lost.

Up to the middle of May the ration was three-quarters of a gallon per head per day. This was increased first to one gallon and later to one and a quarter gallons per head.

RATIONS AND MEDICAL COMFORTS

While the troops were on the field service scale of rations there was no cause for anxiety, provided that they received ascorbic acid tablets when not receiving fresh foods. Many troops, however, were solely on the Battle Ration for periods up to six weeks continuously. The undesirability of this was strongly represented and it was recommended that, for operations of the nature of those recently carried out under the climatic conditions prevailing, the Battle Ration be increased by the addition of oatmeal, margarine and bacon (or ghee for Indian troops). This increased the calorie value, provided Vitamin B1 and helped to balance the carbohydrate and fat. The necessity for such a change was important, as various factors prevented the issue of the full field service scale during operations.

The distribution of medical comforts was at times difficult owing to destruction by enemy action of field service depots. A further shortage of medical comforts for those units based on Tobruk was caused by the fact that no reserve had been built up before the relief.

The field service scale was in force throughout the period January–June with minor exceptions. In general the ration was excellent, but troops in the forward areas suffered from lack of fresh food owing to the shortage of transport and the peculiar supply system necessitated by the long L. of C. Insulated vans for carrying fresh or frozen meat from railhead proved of great value.

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The supply of medical comforts was good. At one time forward units of XIII Corps were unable to obtain any owing to transport difficulties but arrangements were made to send up supplies by returning ambulance aircraft from Tobruk.

CLOTHING

Battle dress was worn throughout the period October–March and proved satisfactory. A few complaints that skin irritation was caused disappeared as soon as troops became used to wearing serge material in place of drill.

The issue of long shorts in place of long trousers to troops in the desert was regarded as most unfortunate. These garments are nowhere satisfactory and in the desert are entirely unsuitable.

M.E. F.S. summer scale was in use from the beginning of April and was most satisfactory. Sun helmets were not issued generally. Units drew 10 per cent. for men engaged in special duties and men who appeared to be unduly sensitive.

MEDICAL EQUIPMENT

The medical stores situation was satisfactory, though difficulty was experienced in getting stores up to forward units. At first 7 Adv. Depot Med. Stores at Baqqush supplied all medical units of Eighth Army with all medical stores except vaccines and sera, of which a small stock was stored at 8 (S.A.) C.C.S. Until the beginning of active operations all medical stores were collected from the depot by the units themselves. For the first week of the fighting units were supplied from dumps of medical stores at the three forward bases established by the Army, each dump being supervised by a sergeant and one O.R., R.A.M.C., except in the case of 3 Forward Base in the Oases Group which was looked after by 21 (Ind.) Fd. Amb. These stores were issued on demand to M.A.C. cars which delivered them to the units. Although it was with a certain amount of trepidation that large amounts of medical stores were entrusted to two O.Rs. without any 'store' training, the dumps were, in fact, very successful, largely owing to the good work of the men concerned.

Thereafter the drugs were replenished from 7 Adv. Depot Med. Stores, and meanwhile 7 (Ind.) Med. Stores moved to Matruh, where it opened at the beginning of December and took over the supply of all medical units. As soon as the Indian depot opened instructions were given to the advanced depot to close and prepare to move to the railhead, where it opened in the middle of December.

After the beginning of active operations all medical stores were forwarded by returning ambulance cars of M.A.Cs.

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A new responsibility of the medical stores was the storing of fresh blood and dried plasma and the arrangements for transport of these materials by ambulance plane. For the storage of blood two six-cubic-feet-capacity oil-burning refrigerators were added to the equipment of 7 Adv. Depot Med. Stores, with a member of the Friends' Ambulance Unit attached to supervise temperature control and storage of the blood. The blood was flown from base to the nearest R.A.F. landing ground. Air transport of whole blood to forward units was not as successful as had been hoped; it worked satisfactorily in the early stage while the L. of C. was short, but as this lengthened blood could not be flown to forward units owing to the uncertain times of departure of planes. It was therefore decided to concentrate on sending dried plasma forward to field ambulances and other units, and citrate solution so that unit donors could be bled.

Large amounts of enemy drugs and dressings and small amounts of medical equipment were collected and evacuated to base in January. In order to supply the requests of the forward medical units, A.D.M.S. 91 Sub-area was instructed to maintain a store of captured drugs, dressings, etc. A similar store was formed at Barce.

During the withdrawal from the Gebel instructions were given for all valuable equipment in 5 Adv. Depot. Med. Stores to be evacuated and for the store to hold mainly a supply of expendable items.

Medical stores and equipment were of good quality and ample in quantity. No attempt was made to re-equip to scale those units which had suffered heavy losses.

SAMPLE STATISTICS

Tables 21–46 illustrate some of the activities of the medical units of the Eighth Army during the various phases of General Auchinleck's Campaign in Libya. They derive from Quarterly Reports.

TABLE 21

Sick admitted to the Medical Units of Eighth Army. Quarter ending December 31, 1941

Mth.	Aust.	Czech.	French	Indian	N.Z.	Poles	S.A.	U.K.	R.N. and R.A.F.	Totals
Oct. .	25	—	—	530	1,234	—	1,892	3,135	54	6,870
Nov. .	54	61	—	939	958	184	943	3,676	64	6,879
Dec. .	26	54	7	339	367	224	540	2,764	114	4,435
Totals	105	115	7	1,808	2,559	408	3,375	9,575	232	18,184

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TABLE 22

Sick Evacuated from Eighth Army. Quarter ending December 31, 1941

Mth.	Aust.	Czech.	French	Indian	N.Z.	Poles	S.A.	U.K.	R.N. and R.A.F.	Totals
Oct.	23	—	—	559	293	—	555	1,478	33	2,941
Nov.	31	3	—	584	126	33	303	1,632	35	2,747
Dec.	34	43	2	376	305	178	301	1,758	55	3,052
Totals	88	46	2	1,519	724	211	1,159	4,868	123	8,740

During the first two months there were no large-scale operations and only one C.C.S. was open. The majority of the sick were treated in the field ambulances and returned to their units *via* divisional rest camps. When active operations were started the sick in these field medical units were at once evacuated to the rear.

TABLE 23

Admissions to the Field Medical Units of Eighth Army. All Causes. Quarter ending December 31, 1941

Month	Average strength of Eighth Army	Admissions per 1,000 per month	Admissions per 1,000 per day
October .	125,712	54·66	1·76
November .	128,751	53·40	1·76
December .	94,903	45·79	1·38

TABLE 24

Diseases responsible for Admissions into the Field Medical Units of Eighth Army. Quarter ending December 31, 1941

Disease	Indian			New Zealand			South African			U.K.		
	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.
Diarrhoea . .	24	18	7	79	40	17	111	52	26	150	376	156
Dysentery . .	62	94	59	31	56	69	55	35	46	137	379	268
I.A.T. . . .	54	56	21	130	52	33	117	64	31	268	293	302
Local injuries .	34	67	26	89	65	34	103	83	51	199	279	180
Tonsillitis . .	7	16	—	103	47	9	95	37	16	360	235	146
Scabies . . .	27	31	12	5	1	1	10	9	3	37	98	117
Infective jaundice .	3	9	2	33	50	18	37	22	15	77	129	180
Malaria . .	24	9	—	12	29	—	101	56	20	49	160	28
V.D. . . .	39	43	8	30	8	5	71	20	11	83	86	87
Diphtheria . .	—	—	—	1	—	1	—	—	—	27	13	16
Sandfly fever . .	—	—	1	19	2	1	28	13	—	21	36	9
Respiratory system .	34	47	22	65	12	8	60	28	4	62	78	105

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TABLE 25

Prisoners-of-War Admitted and Evacuated through Medical Channels. Quarter ending December 31, 1941

Month	Admitted	Evacuated
November .	16	0
December .	181	83
	197	83

TABLE 26

Battle Casualties admitted to C.C.Ss. and General Hospitals of Eighth Army. Quarter ending December 31, 1941

Mth.	Aust.	Czech.	French	Indian	N.Z.	Poles	S.A.	U.K.	R.N. and R.A.F.	Totals
Oct.	4	—	—	3	6	—	17	17	2	49
Nov.	28	7	—	189	405	63	217	1,723	6	2,638
Dec.	25	2	2	618	1,281	143	748	1,507	34	4,360
Totals	57	9	2	810	1,692	206	982	3,247	42	7,047

TABLE 27

Battle Casualties evacuated from Eighth Army Area. Quarter ending December 31, 1941

Mth.	Aust.	Czech.	French	Indian	N.Z.	Poles	S.A.	U.K.	R.N. and R.A.F.	Totals
Oct.	4	—	—	3	2	—	6	10	2	27
Nov.	2	1	—	137	123	15	145	1,002	2	1,427
Dec.	46	8	2	494	1,242	140	455	1,337	15	3,739
Totals	52	9	2	634	1,367	155	606	2,349	19	5,193

(U.K. includes Cypriots and other dilutees.) 62 B.G.H. in Tobruk did not come u/c Eighth Army till November 1. The excess of admissions over evacuations is explained by the facts that 62 B.G.H. evacuated very few cases until late in December, that large numbers of minor wounds were admitted, that cases evacuated to 2 N.Z.G.H. are not shown as evacuated from Eighth Army area until December 15 and that all cases shown as admissions, with very few exceptions, were evacuated either from 70th Division field ambulances to 62 B.G.H. or from forward units as far as Matruh or Gerawla.

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TABLE 28

Wounded P.o.W. in Eighth Army Medical Units. Quarter ending December 31, 1941

Month	Admitted	Evacuated
October .	—	—
November .	409	—
December .	1,108	602
	1,517	602

TABLE 29

Numbers of Sick and Wounded evacuated from the Western Desert and from the Ports of Egypt by Ambulance Train November 18, 1941–January 7, 1942

14,383

TABLE 30

Numbers Evacuated from the Western Desert by Air. November 21, 1941–December 17, 1942

Lying	Sitting	Battle casualties	Sick	R.A.F.	Army	P.o.W.	Total
581	237	663	155	63	722	33	818

TABLE 31

Sick and Wounded passing through the Field Ambulances of Indian 4th Division November 18, 1941–January 31, 1942

Month	Indian		U.K.		Others		P.o.W.	
	Wounded	Sick	Wounded	Sick	Wounded	Sick	Wounded	Sick
Nov. .	216	120	254	232	71	59	—	—
Dec. .	547	150	253	168	146	63	306	36
Jan. .	36	203	171	690	64	112	5	—
	799	473	678	1,090	281	234	311	36
	1,272		1,768		515		347	
	Grand total 3,902							

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TABLE 32

Sick admitted to the Medical Units of Eighth Army. Quarter ending March 31, 1942

Month	Aust.	Czech.	French	Indian	N.Z.	Poles	S.A.	U.K.	Force unknown	R.N. and R.A.F.	Totals
Jan. .	22	55	55	495	81	281	599	2,481	419	183	4,671
Feb. .	15	70	127	685	93	236	1,236	3,268	—	114	5,844
March	5	43	141	535	43	98	1,131	3,123	—	93	5,212
Totals .	42	168	323	1,715	217	615	2,966	8,872	419	390	15,727

TABLE 33

Sick Evacuated from Eighth Army. Quarter ending March 31, 1942

Month	Aust.	Czech.	French	Indian	N.Z.	Poles	S.A.	U.K.	Force unknown	R.N. and R.A.F.	Totals
Jan. .	15	47	47	354	103	270	475	1,619	154	128	3,212
Feb. .	2	37	62	464	35	172	870	2,748	—	38	4,428
March	2	14	43	320	70	45	905	1,890	—	22	3,311
Totals .	19	98	152	1,138	208	487	2,250	6,257	154	188	10,951

TABLE 34

Admissions to the Field Medical Units of Eighth Army. All Causes. Quarter ending March 31, 1942

Month	Average strength of Eighth Army	Admissions per 1,000 per month	Admissions per 1,000 per day
January .	88,000	53·0	1·71
February .	101,000	56·5	2·02
March .	122,000	43·40	1·40

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TABLE 35

Diseases responsible for Admissions into the Field Medical Units of Eighth Army. Quarter ending March 31, 1942

Disease	Indian			South African			United Kingdom		
	Jan.	Feb.	March	Jan.	Feb.	March	Jan.	Feb.	March
Diarrhoea and dysentery	26	8	11	47	17	21	143	150	96
I.A.T.	23	20	36	14	18	20	198	164	138
Local injuries	105	80	51	88	107	189	343	344	365
Tonsillitis	—	4	23	4	18	22	138	98	113
Scabies	33	54	28	10	10	14	175	351	244
V.D.	17	15	11	12	22	67	63	84	144
Diphtheria	—	—	—	2	1	—	30	25	2
Respiratory system and pneumonia	58	72	10	32	55	55	48	149	83
Infective jaundice	15	1	—	5	5	—	18	17	6
Diseases of the eye	17	26	19	14	57	76	96	134	150

TABLE 36

P.o.W. Admitted and Evacuated through Medical Channels. Quarter ending March 31, 1942

Month	Admitted	Evacuated
January	203	66
February	6	7
March	2	2
	211	75

TABLE 37

Battle Casualties admitted to the C.C.Ss. and General Hospitals of Eighth Army. Quarter ending March 31, 1942

Mth.	Aust.	Czech.	French	Indian	N.Z.	Poles	S.A.	U.K.	R.N. and R.A.F.	Totals
Jan.	15	5	4	25	22	17	436	487	18	1,029
Feb.	8	2	23	76	13	49	134	241	15	561
March	1	10	14	253	60	1	110	609	25	1,083
Totals	24	17	41	354	95	67	680	1,337	58	2,673

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TABLE 38

Battle Casualties evacuated from Medical Units of Eighth Army. Quarter ending March 31, 1942

Mth.	Aust.	Czech.	French	Indian	N.Z.	Poles	S.A.	U.K.	R.N. and R.A.F.	Totals
Jan.	5	47	4	17	20	28	324	461	18	924
Feb.	5	1	14	58	11	55	85	194	14	437
March	—	10	11	189	45	1	81	490	8	835
Totals	10	58	29	264	76	84	490	1,145	40	2,196

TABLE 39

Sick Admitted to the Medical Units of Eighth Army. Quarter ending June 30, 1942

Mth.	Aust.	Czech.	E.A.	French	Indian	N.Z.	S.A.	U.K.	Others	R.N. and R.A.F.	Totals
April	—	16	259	152	517	31	1,544	2,518	263	91	5,391
May	7	—	165	159	441	29	721	2,456	157	—	4,135
June	—	—	118	33	820	71	754	3,140	18	—	4,954
Totals	7	16	542	344	1,778	131	3,019	8,114	438	91	14,480

TABLE 40

Diseases responsible for Admissions into the Field Medical Units of Eighth Army. Quarter ending June 30, 1942

Disease	Indian			South African			United Kingdom		
	April	May	June	April	May	June	April	May	June
Diarrhoea and dysentery	9	21	76	14	21	184	74	173	216
I.A.T.	31	21	38	20	20	17	165	187	137
Tonsillitis	2	1	3	35	5	8	82	109	42
Scabies	24	19	18	6	4	—	80	78	56
V.D.	41	30	29	19	36	—	60	54	19
Diphtheria	—	—	—	1	—	—	—	2	1
Infective jaundice	3	1	1	—	1	—	16	11	5
Diseases of the eye	42	29	28	111	29	12	129	166	56
Accidental injuries	86	109	59	240	243	31	539	516	212
N.Y.D.(N.)	8	2	74	109	19	13	157	48	128
Diseases of the skin	17	23	20	62	50	41	166	219	94

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TABLE 41

Admissions into the Field Medical Units of Eighth Army. All Causes. Quarter ending June 30, 1942

Month	Average strength of Eighth Army	Admissions per 1,000 per month	Admissions per 1,000 per day
April . .	124,000	43·5	1·45
May . .	126,000	32·8	1·06
June . .	100,000	49·5	1·65

TABLE 42

Battle Casualties admitted to C.C.Ss. and General Hospitals of Eighth Army. Quarter ending June 30, 1942

Mth.	Aust.	E.A.	French	Indian	N.Z.	S.A.	U.K.	Others	R.N. and R.A.F.	Totals
April	—	4	19	86	33	96	237	44	116	635
May	1	9	2	63	2	140	765	17	—	999
June	—	37	218	311	210	419	2,410	—	—	3,605·
Totals	1	50	239	460	245	655	3,412	61	116	5,239

TABLE 43

U.D.F., M.E.F. Principal Diseases affecting the Troops. July–September 1941 (*expressed as a proportion of* 1,000)

Septic conditions, including desert sores .	159
Febrile conditions, including sandfly fever, P.U.O. and influenza	150
Ear, nose and throat conditions . . .	95
Accidental injuries	73
Dysentery and enteritis	61
Malaria	57
Chest conditions	37
Skin conditions	29
Venereal disease	29
Abdominal conditions (peptic ulcer, etc.) .	29
Eye conditions	25
Arthritis and synovitis	19
Jaundice	18
Appendicitis	15
Myositis and fibrositis	12
Haemorrhoids	11
Heart conditions (including effort syndrome)	9
Varicose veins	7
Hernia	7
Other conditions	158
	1,000

Venereal disease: admission rate 1·9 per month per 1,000.
Battle casualties: 8 admitted direct to 8 (S.A.) C.C.S.

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TABLE 44

U.D.F., M.E.F. Average Duration of Stay in 1 *(S.A.) Convalescent Depot. January–March* 1942

	U.D.F.			Non-U.D.F.		
	Number discharged	Total days	Average stay	Number discharged	Total days	Average stay
January .	233	6,852	29	327	13,057	40
February	420	9,791	23	92	4,683	51
March .	560	13,790	25	57	2,970	52
	1,213	30,433		476	20,710	
	Average stay per man . .		25·0			43·5

It is necessary to note that the non-U.D.F. figures include a considerable proportion of British orthopaedic cases, necessarily long-term in respect of treatment and rehabilitation.

TABLE 45

U.D.F., M.E.F. The Incidence of Certain Diseases. Weekly Average per 1,000. *January–March* 1942

Disease	European	Non-European
Syphilis . . .	·023	·074
Gonorrhoea . .	·081	·082
Soft sore . . .	·041	·058
Sandfly fever . .	—	—
Dysentery . . .	·173	·201
Enteric and diarrhoea .	·259	·211
Malaria . . .	·485	·061
Typhoid . . .	—	—
Urethritis . . .	·255	·065
Tuberculosis . .	·017	—
Cerebro-spinal meningitis	·035	—
Pneumonia . .	·032	·015
Influenza . . .	·856	·212
Scabies . . .	·149	·078
Pediculosis . . .	—	—

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TABLE 46

10 (S.A.) M.A.C. December 1941–January 1942. Number of Patients Carried and Mileage covered

		Patients carried	Mileage covered
December .	Quassassin Section	3,498	14,513
	El Ballah „	1,952	6,675
	Geneifa „	1,491	3,750
		6,941	24,938
January .	Quassassin „	4,485	19,384
	El Ballah „	2,351	5,273
	Geneifa „	848	4,394
		7,684	29,051
		14,625	53,989

REFLECTIONS UPON THIS PHASE OF THE CAMPAIGN

Much was endured by the medical services during this phase of the campaign and from their experience much was learnt, later to be applied. There was no front and no rear in the forward areas. The battle surged hither and thither in a vast expanse of desert. The forward medical units were commonly uncovered; at one moment they could be remote from the fighting, then suddenly they could find themselves in the very centre of a fierce encounter. At one time evacuation could be simple and orthodox along a well defined and protected axis; at another evacuation was impossible and the unit was obliged to hold overwhelming numbers of patients and forced by circumstances to undertake surgical work of a kind usually regarded as being beyond the capacity of the staff of a unit of this kind.

An investigation into the difficulties of forward medical work was undertaken by G.H.Q., M.E.F., and recommendations were made with the object of ensuring that these units should be used to the best advantage.

It was concluded that the infantry field ambulance was neither sufficiently mobile nor flexible, and recommended that it should be capable of holding and treating a considerable number of patients. A reduction in the number of stretcher-bearers and the elimination of some of the G.1098 equipment was suggested. The company should be capable of division into two sections and some duplication of equipment was required to allow of this. The H.Q. company should be enlarged by absorbing one officer from each company and the other companies also reduced by 8 O.Rs. The number of ambulances should be increased up to 14.

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It was considered that when a field ambulance was called upon to function as part of an independent brigade group a surgical team should be attached consisting of a surgeon, an anaesthetist, an operating room assistant, a nursing orderly and batman with its own transport and equipment. A 3-ton truck should suffice. One officer at least in a field ambulance should be capable of undertaking major emergency surgery in case a surgical team was not attached. This would entail the provision of surgical instruments sufficient for this purpose. A better design of pannier was suggested. The provision of sterilised dressings in waterproof containers was recommended.

Wireless was deemed desirable for inter-communication in the forward areas. A complete list of modifications in I.1248 and G.1098 was given by the committee. Penthouses were recommended for four of the 3-ton trucks. Many of these recommendations were implemented.

(v)

The Work of Certain Forward Medical Units

The ways in which the forward medical units adapted themselves to the unprecedented circumstances that, at this time, obtained in the Western Desert can, perhaps, be well illustrated by a brief reference to the work of the New Zealand and Indian field ambulances and to the medical component of the Long Range Desert Group.

A REVIEW OF THE WORK OF THE NEW ZEALAND FORWARD MEDICAL UNITS*

FIELD SURGERY

The arrangements made for the treatment of the casualties were based on the attachment of an A.D.S. to each brigade to carry out the first-aid treatment whenever the brigade might be engaged in the very mobile form of warfare. At the M.D.S. arrangements were made to carry out the more elaborate forward surgery. To enable this to be done the newly formed mobile surgical unit (M.S.U.) was attached to the active M.D.S. with the rôle of operating on specially selected cases such as abdomens, chests and heads. It had very elaborate equipment, similar to that of the head and chest units in Britain, which had been brought from England by the second echelon, and to this instruments were added for abdominal and general surgery. A truck had been specially outfitted in Cairo to contain the equipment as well as special

* Adapted from the account given in the New Zealand Official Medical History. (Provisional narrative.)

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lighting plant, suction and tanks to hold extra water. The unit was self-contained.

In the field ambulances themselves there were many competent and experienced surgeons. It was fortunate that this was so, as in the circumstances of the battle, the division had to undertake the full responsibility of the forward surgery. The field ambulance surgical teams dealt with the routine wounds and the M.S.U. had referred to it specially selected cases. This arrangement, however, only lasted a very short time, as it was found that in the rush it was impossible to restrict the work of the M.S.U. and, as had happened in France in 1914–18, the specialist teams in the forward areas had to deal with far more general than special cases. The surgeons were in any case general surgeons and so were well able to adapt themselves to the varying conditions.

At that period wound treatment consisted in the surgical cleansing of the wound, the local application of sulphonilamide, the dressing with vaselined gauze and the use of enclosed plaster splints. This treatment was carried out in the M.D.S.; generally no further forward surgery was necessary and the patients were staged along their journey to Egypt in the different units, being fed and bedded and having their dressings changed as required, though with the plaster technique change of dressings was infrequent.

The prolonged journey, however, was very exhausting to the more serious cases and the constant shifting aggravated any infection that might be present. The first part of the journey by ambulance or truck across the desert to railhead was particularly trying and was associated with the constant danger of interference by enemy mobile columns. The surface was rough and at times the convoys had to be speeded up. The nights were cold and at times there were insufficient blankets available. The adequate resuscitation of the serious cases was gravely interfered with by lack of water, especially during the period when the M.D.Ss. were captured. Some blood had been sent up to the forward areas but not to the divisional areas. Plasma, however, had been supplied and citrate solution for locally drawn blood. There was also supplied a quantity of distilled water for use with the plasma, but the supply of this was somewhat restricted. Plasma was given in the M.D.S. and the M.S.U. and some blood was given from local donors. Morphia was available and fresh supplies were obtained from captured enemy stores.

The nature of the work performed in the A.D.S. is shown in a very valuable report of the A.D.S. of 4 (N.Z.) Fd. Amb. This A.D.S. treated altogether 448 casualties, 360 being New Zealanders. There were 15 deaths and casualties in the A.D.S. itself were 1 killed and 9 wounded. The O.C. stated that he limited his treatment to the ligation of arteries, amputation of shattered limbs, splinting of fractures, suture of sucking wounds of the chest and aspiration of haemothorax. At times when

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casualties had to be retained for 24–48 hours, more extensive surgical procedures were carried out, such as excision of wounds, drainage of infected wounds and removal of obvious foreign bodies. Treatment of shock was difficult owing to shortage of water and hot water bottles.

There was often a shortage of acriflavine lotion and at one time of morphia. Cramer wire splinting proved very valuable. Supplies of this ran short but were replenished from captured enemy equipment. The majority of the cases dying in the A.D.S. were badly shocked on admission and practically all suffered from great loss of blood. Only one plasma infusion was given and it was impossible to give transfusions after dark.

In the majority of instances the anaesthetic given was sodium pentothal. The cases could be classified as under:

(*a*) Total numbers:

Extremities	289
Head	28
Face and Neck	32
Chest	44
Abdomen	19
Buttocks	23
Lumbar region	15

(*b*) Complications and deaths:

Extremities	45 had fracture 2 deaths (both traumatic amputations with marked shock and blood loss)
Head	9 had fractured skull 3 of these died
Face and Neck	4 fractures of facial bones 2 involving air passages, died; in one case the great vessels were severed
Chest	6 sucking wounds, of which one died 5 other deaths from extensive damage
Abdomen	15 had intra-abdominal damage, several with portions of viscera extruding from the wound 2 died in the A.D.S.
Buttocks	3 had intra-abdominal damage 1 of these died
Lumbar region	All wounds superficial

Twenty-two severely wounded Germans left behind by General Rommel were treated. Two of these, having had tourniquets on for three days, required amputation of the legs. All the cases had been wounded two or three days before and had received little, if any, medical attention. The Germans concentrated on the minor casualties so as to fit them for further service and neglected the severe cases. The

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German column which overran this A.D.S. had very few medical officers attached and no field ambulance.

The reports of the work of the M.S.U. gave a clear picture of the conditions under which forward surgery was carried out during the campaign. During the period of capture water was cut down to a pint per head and the lack of water undoubtedly increased the mortality, especially of the abdominal cases. An enemy filter was used for the theatre water which was re-used indefinitely. No patients were washed and no linen was cleaned. Only once in a fortnight was water drawn and without the unit reserve work would have been impossible.

Supplies of kerosene and spirit were in very short supply and both sterilisation and heating became difficult. There were insufficient blankets for the large numbers of wounded and this caused some distress as the weather was cold. Selection of cases became impossible and few wounded were admitted less than twenty-four hours old, and many were three days old. Nevertheless fulminating infection was rare. Very few abdominal cases were seen. Shortage of ether, morphia and plaster-of-paris was serious. Food consisted of vehicle battle rations and lack of water made the use of Red Cross comforts difficult. Evacuation to the C.C.S. after the relief necessitated twelve hours actual desert travelling.

Altogether the unit operated on 132 out of a total of 190 cases admitted. There were 45 deaths, but only 9 of these cases had been operated on. Two cases of gas gangrene occurred, both involving the arm. One was saved by amputation, the other, a fulminating case, died rapidly.

In the M.D.S. in the Wadi esc Sciomar area a great deal of the operative treatment was carried out by a surgical team from the ambulances' own personnel. Its commanding officer described the difficulties, especially stressing the lack of water. He stated on December 4 that some wounds were showing evidence of severe infection. Moreover, the elastoplast extensions applied to fractured femur cases peeled off in 8–9 days and had to be replaced by a piece of wire inserted in front of the tendon achilles above the ankle. On December 5 he stated that patients were becoming desperate for water, some developing projectile vomiting and being unable to keep down even sips of water. There was no intravenous glucose-saline left and insufficient water for rectal drips. Some patients developed swollen and cracked tongues which were extremely painful and also sores of the lips.

At that date there were only 30 gallons of water left for the 860 casualties as well as the medical personnel. It was also noted that on December 4 the water and food situation was desperate and patients began to die rapidly from dehydration. Several patients seemed to die of cold as the supplies of kerosene failed. Bed sores were common with

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no means of washing the patients' backs or blankets. (The relieving convoys arrived on December 6 with food and water.)

Behind the divisional area the medical centre of Minqar el Zannan dealt with cases as they were evacuated from the forward areas, but the urgent surgical treatment had already been carried out at the M.D.S. level and it was only the cases unfit for further evacuation that needed to be dealt with. Otherwise the C.C.S. there acted as a staging and sorting post and sent cases back to the general hospitals either at Matruh or further back in Egypt. At 2 N.Z.G.H., sited at Gerawla, only 228 casualties were admitted, 180 of them in one convoy. It was noted that 57 of these were profoundly exhausted and dehydrated. There had been insufficient transfusion of blood given in the forward areas and the majority of the serious cases required blood transfusions on arrival. Infection was common and at times severe. The amputation stumps which had been sutured were unsatisfactory. The plaster spicas had caused bad sores. There had been serious delays in evacuation from the forward areas. No abdominal cases were seen.

Reports were obtained both from the New Zealand base hospitals in Egypt and from the British hospitals to which the large majority of New Zealand casualties were primarily admitted.

In summarising the treatment of casualties in this phase of the Libyan campaign it can be stated that, as far as the N.Z. 2nd Division was concerned, primary surgery was carried out in the field ambulances and in the M.S.U. Wound débridement was done, with the wound dusted with sulphonilamide and left open and, if necessary, drained. Plaster splints were applied to fractures of the leg and forearm. Thomas' splints were applied to the thigh fractures and the upper arm largely treated in simple splints with a sling.

The M.S.U. dealt with the abdomens, the chests, the heads and many of the amputations. Early evacuation of all cases was aimed at, but circumstances prevented this and the majority of the wounded were captured and immobilised for eight days, when they suffered severely from lack of water. Eventually the casualties were evacuated by many stages to Alexandria and the Canal Zone and finally transferred to the hospitals in Cairo.

2 N.Z.G.H., sited on the L. of C., dealt with very few cases, but many of them serious, and a section of 3 N.Z.G.H. at Alexandria fulfilled a very valuable function, intercepting many New Zealand cases and also keeping touch with the New Zealand cases in the British hospitals in that area. The other New Zealand hospital dealt with very few of the casualties till they were transferred from the British base hospitals.

There had been a large proportion of very serious wounds and the unsettled condition of the divisional area and the prolonged and many-staged evacuation had resulted in a rather heavy mortality, and severe

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infection, largely streptococcal, in many of the cases. Conditions in the forward areas undoubtedly prevented early surgical débridement in the large majority of the cases. Although the primary mortality of the abdominal and chest wounds was not heavy, as recorded by the M.S.U., it was noted that no abdominal cases were seen at the Base and very few chest cases. It can therefore be surmised that there was a heavy mortality in these cases during evacuation.

The performance in the forward areas of 'sites of election' amputations with suture was noted to give rise to serious infection and disastrous results at the Base. Neglect of skin traction in unsutured stumps was also common.

Splinting in the forward areas was excellent. The Tobruk plaster for fractured femurs had proved its value, though the Thomas' splint also gave good results. The limited blood transfusions available had been of great value under the difficult conditions. The mobile surgical unit had completely justified itself in saving the lives of many severely wounded men and the surgical treatment in the forward areas had been soundly carried out.

TRANSPORT

Motor ambulance cars proved desert-worthy, but it was apparent that, when operating over such a wide area, more than eight cars to each field ambulance were required. Twelve were considered to be a more suitable establishment, and all should be marked with large Red Crosses. Stretcher-carrying appliances in 3-ton trucks proved invaluable.

EVACUATION OF WOUNDED

Events made it quite clear that, if the evacuation of wounded was to be carried out satisfactorily, either the complete L. of C. should be secure or else ambulance cars should be despatched with an adequate escort of armoured forces to protect them. Moreover, if wounded could not be safely evacuated but were held at M.D.Ss. the field ambulance necessarily became more and more immobilised and more vulnerable to attack.

Further, in warfare on the open desert, it was considered that evacuation should be carried out in daylight only. If evacuation by night was attempted, the wounded suffered unnecessarily from the rough going and there was a greater likelihood of the motor ambulances convoys being shot up by enemy columns operating in the rear.

The possibility of evacuating casualties from forward areas by Bren-gun carriers was thought worthy of further investigation as, when under fire, some R.M.Os. found this the method of choice.

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COMMUNICATIONS

The lack of wireless communication produced serious complications. In what amounted to an enormous no-man's land no other means of communication was practicable. Contact between the different medical units was often lost and an A.D.S. sometimes did not know the location of the M.D.S. The M.D.S. also was often out of touch with the administrative officer either of the division or the corps. The plight of the captured medical units would have been much less serious if they had been able to inform divisional H.Q. of their difficulties.

LOCATION OF A.D.M.S.

Theoretically it was normal for A.D.M.S. N.Z. 2nd Division to be located at rear divisional H.Q., but in actual practice it was nearly always necessary for him to be at Adv. H.Q. In this case the D.A.D.M.S. was left at Rear H.Q.

A REVIEW OF THE WORK OF THE INDIAN FORWARD MEDICAL UNITS*

TACTICAL HANDLING OF MEDICAL UNITS IN THE FIELD

By the middle of 1942 medical services in the Western Desert had a wide experience of desert warfare in all its forms. The tactical handling of medical units had evolved into a definite pattern based on the lessons learnt from the fluctuating campaigns that were conducted in the Western Desert. It was possible, therefore, by this time to rectify earlier mistakes, avoid lapses and make up deficiencies in tactical handling. The over-all pattern that emerged from this wide experience therefore deserves full description.

Axis of Advance. The primary principle was that all medical units should be located on or within easy reach of an axis of advance. The siting of medical units on the flanks, with the exception of R.A.P. and A.D.S.—the latter under brigade command and located within visual range of the brigade H.Q.—had been discontinued unless there was some peculiar local condition which necessitated such a departure. In confined country where roads existed, a particular road was selected as the axis of advance, while in wide open areas like the Western Desert the axis of advance was marked and all concerned were informed. All medical units and formations in the forward areas moved along this axis and therefore valuable time was saved in trying to locate the units. It was usually the practice to follow the division's axis of advance and any deviation from that axis was notified to the divisional H.Q.

Collection of Casualties—Forward of R.A.Ps. The collection of casualties forward of R.A.Ps. was done exclusively by the regimental stretcher-bearers. No S.Bs. were provided by the field ambulance forward of

* Adapted from the account given in the Indian Official Medical History. (Provisional Narrative.) *See* Plates XXVI—XXX.

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R.A.Ps. When the casualties were dispersed over a wide area, there were demands from units for S.Bs. from medical units to operate beyond R.A.Ps., but in most instances these could not be met. Recommendations were made from the medical branch to increase the proportion of stretcher-bearers in combatant units.

Collection of Casualties from R.A.P. to A.D.S. During the campaign this was performed by (1) S.Bs. solely and (2) by S.Bs. and motor transport.

In areas where vehicles could move and where the tactical situation permitted it was possible to clear the R.A.P. by motor ambulances when a sufficient number of ambulances was available. Where the ambulance cars were too few to meet the needs of a busy R.A.P., only lying cases were evacuated from the R.A.P. by ambulance to A.D.S.; the sitting cases in such instances were carried by ordinary unit transport.

Two methods were employed by Indian 4th Division in the Western Desert for clearing R.A.Ps. by ambulance cars:

(1) by allotting ambulance cars to each R.A.P. before the battle actually started;

(2) by allotting all the ambulance cars to the A.D.S. and sending them forward to collect casualties as and when required by R.M.Os.

In the wide spaces so characteristic of the Western Desert, where means of communication were difficult and uncertain, considerable delay was experienced in following the arrangement of pooling ambulance cars in the A.D.S. It was therefore the accepted policy to attach one or two ambulance cars to each R.A.P. before the battle began. This was found to be eminently successful. It was not always possible to foretell whether ambulance cars would be required beyond the A.D.S. In such cases a decision was made on the spot by assessing the local situation, the number of units in action, their dispersal, their liability to air attack and, in general, their vulnerability to casualties and the facilities available for the collection of these casualties.

In areas where transport could not operate, such as very rough *wadi* country or very soft sandy areas, collection from R.A.P. to A.D.S. could only be done by stretcher-bearers.

With a field ambulance on the Indian establishment working with 8 ambulance cars in desert areas, many anxious moments arose, particularly when the division was advancing rapidly with frequent engagements with the retreating forces. In such cases the medical units (unless they could clear the casualties with the utmost speed) were liable to lag behind and hence fail in their primary duty of following

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the advance. From the R.A.P. to the A.D.S. was found to be the most difficult stage of evacuation in mobile warfare. Casualties converged on the A.D.S. from R.A.Ps. spread out all over the front. It was from the A.D.S. that these had to be collected quickly, both in order to save life and to clear the area.

It was here that ambulance cars played their major rôle in desert warfare. It was agreed therefore that the Indian field ambulances for such mobile warfare should be re-organised on a 14 ambulance car basis. Ordnance in the Western Desert converted the 15 cwt. trucks into 2-stretcher ambulance cars, but these were found to be unsatisfactory. The absence of L.A.D. (light aid detachments) for attending to defective vehicles immediately and putting them on the road again was keenly felt in these operations. The remedy suggested was either to attach a L.A.D. to the field ambulance or to give a high priority for ambulance repairs in brigade or divisional workshops.

THE ADVANCED DRESSING STATION

It had been the practice to attach one company of the field ambulance to the brigade before the actual operations commenced. It came under command of the brigade and moved with it on all occasions and established an A.D.S. where and when brigade commander desired one. This A.D.S. was responsible for clearing R.A.Ps. of all sick and wounded in that particular brigade group and was in most instances located within visual range of brigade H.Q. It was found impracticable for the divisional A.D.M.S. to exercise any control over the attached company in mobile warfare. Only brigade, with its exact knowledge of the locations of troops and local details, could site the A.D.S. in a position of optimum convenience. The company selected for attachment to the brigade was usually the immobile company of the field ambulance. Brigade provided for its transport from troop-carrying transport companies allotted to them from the division. It might appear that this was not the most economical use of the transport companies' resources, but it was easier for the transport companies to provide transport in bulk rather than fritter away their resources in small detachments. Before handing over the company to the brigade it was customary to inform the D.A.Q.M.G. of the brigade of the transport that the company would require. This company was also provided with two trucks of 8 or 15 cwt. from its own H.Q. and the balance of vehicles required to render the company mobile was usually about four 3-ton lorries. When the company was u/c of the brigade it came under brigade H.Q. for all purposes, with the exception of matters relating to 'A' Branch and purely medical technicalities. Had it been possible to replace the vehicles of a field ambulance of Indian establishment by 3-ton lorries the whole field ambulance would have become mobile. This change was recommended.

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The company remained attached to the brigade for the whole operation. Any attempt to change it over with a second company of the field ambulance was usually strongly resented by the brigade. After a company got to know the local detail, where everybody was and what was required of it, to change it for another company was to begin over again with a consequent fall in efficiency. The standard teaching of leap-frogging companies in an operation was not adopted.

AMBULANCE CARS

The second company of the field ambulance was used as a staging post behind the M.D.S. When required, evacuation of casualties from the battle M.D.S. was by M.A.C. cars and it was possible to send as many as all the eight ambulance cars of the field ambulance forward to the main A.D.S. for collecting casualties and evacuating them to the M.D.S. The proportion of cars used in each of these centres was decided by the officer commanding the A.D.S. who was in a better position to assess the needs of each sector. The policy of keeping a certain number of ambulance cars of the field ambulance at the M.D.S. necessarily involved their immobilisation and was not recommended. It was safe to give the A.D.S. of the brigade going into action one ambulance car for every R.A.P. on the brigade front and two more to cover any unforeseen demands.

There was a definite understanding that no M.A.C. cars would be used in advance of the M.D.S. This was a very controversial point, and even in the best regulated evacuation scheme this understanding had of necessity to be modified to meet changing circumstances and on the basis of experience in the Western Desert. The following conditions required additional help from M.A.C. units:

(*a*) During an advance, when casualties were very heavy and could not be cleared from the battlefield fast enough to allow the R.A.P. to keep up with the advance.

(*b*) Where breakdown or destruction of ambulance cars occurred (as the field ambulances were working with the bare minimum number of cars).

(*c*) During a withdrawal where casualties had to be evacuated with the utmost speed to allow the fighting troops freedom of movement, for example in the withdrawal from Benghazi.

TACTICAL HANDLING OF THE REMAINDER OF THE FIELD AMBULANCE AFTER THE BRIGADING OF ONE COMPANY

An attack of a highly mobile force with continued pursuit and fluidity of the front raised many problems in evacuation of casualties. Various methods of tactical handling were tried and the final one which

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evolved was the outcome of the experience gained and was considered satisfactory. The basic principle to be kept in bold relief is the rapid clearance of the battle area by the establishment of an advanced M.D.S. and a rear M.D.S. from which clearance is not so pressing and which in no way interferes with the forward tactical problems. The H.Q. of the field ambulance which moved with the advanced divisional H.Q. was usually selected as the advanced M.D.S. and was located on the divisional axis itself within visual range of the advanced divisional H.Q. This advanced M.D.S. was responsible for collecting the casualties from the entire divisional area, which usually comprised two brigades groups. The H.Q. of a second field ambulance was selected as the rear M.D.S. and was located alongside rear divisional H.Q., while the H.Q. of a third field ambulance and one company were kept in reserve and moved with the advanced M.D.S. When the advanced divisional H.Q. moved it was usually the practice for the advanced M.D.S. to move with them and open up in the new area. The reserve M.D.S. usually moved, closed and in reserve, and opened up only in cases where the advanced M.D.S. found it impossible to move forward with advanced divisional H.Q. The routine leap-frogging of one M.D.S. over the other was given up and one M.D.S. usually remained closed during a series of bounds. As the L. of C. lengthened two A.D.Ss. were detailed to open along the axis as staging posts at intervals of approximately 20 miles over bad country. This left one M.D.S. and one company at the advanced M.D.S. as a divisional reserve to cover any sudden unforeseen commitments.

This scheme of evacuation is represented below:

Direction of Evacuation

Adv. M.D.S. (one M.D.S. and one coy. Fd. Amb. in reserve near Adv. Div. H.Q.) . . . 20 Miles . . . Staging Post one coy. Fd. Amb. . . . . . 20 miles . . . . . Staging Post one coy. Fd. Amb.

. . . 20 miles . . . Rear M.D.S. near Rear Div. H.Q.

According to this scheme the divisional units were stretched over a distance of 60 miles. The presumption was that when the divisional advance exceeded this limit the next highest medical formation would step in and enable the rear M.D.S. to move forward. In case this failed to materialise and the advance continued, it would be possible to lengthen the medical axis by another 40 miles by an intermediate M.D.S. opened by the reserve M.D.S. and a staging post opened by the reserve company. The scheme would then be as follows:

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Direction of Evacuation

Adv. M.D.S. (no reserve)		Staging Post one coy. Fd. Amb.		Staging Post one coy. Fd. Amb.	
	... 20 miles ...		... 20 miles ...		... 20 miles

Intermediate M.D.S.		Staging Post one coy. Fd. Amb.		Rear M.D.S.
	... 20 miles ...		... 20 miles ...	

This would mean committing the entire medical resources of the division and leaving no reserves. Over good terrain the distances between detachments could be increased, but it was agreed that 20–30 miles was the optimum distance.

It was usual, however, for the rear M.D.S. to be relieved by a corps medical unit before these extreme limits were reached. When relieved, the rear M.D.S. would move forward, releasing as many links in the chain as possible. The main principle was therefore to have a continuous chain unrolling in front, moving along a definite axis and constantly rolled up behind as medical commitments in the rear areas were taken over by corps units. This scheme was the complete answer to the collection and evacuation of casualties in a divisional area and in support of a rapidly advancing divisional front.

The principle of having a rear M.D.S., into which casualties could be evacuated from forward medical posts and which was not expected to clear casualties to keep pace with an advancing division, proved extremely successful.

While holding semi-static positions like Gazala, however, one M.D.S. was sufficient for the whole division. A second M.D.S. was detailed for 'B' Echelon area, which was always subject to air raids. The remainder of the medical units were held as divisional medical reserve.

ADMINISTRATION

Usually the D.A.D.M.S. of the division was with the A/Q at Adv. Admin. Divisional H.Q. and this officer controlled the movements of all units and issued orders direct. When the chain became too lengthy for effective control orders were issued by the A.D.M.S. with rear divisional H.Q. Close liaison through A/Q with all 'G' plans was an essential pre-requisite for the success of medical evacuation. Communication was by LO/DRLS/Hand and by W/T or L/T where such facilities were available. Wherever possible field ambulances attached their own despatch riders to the medical branch of divisional H.Q.

OPERATING TEAM

During the advance into Cyrenaica a detachment from 14 C.C.S. was provided by Corps H.Q. and came under command of Indian 4th Division. This was capable of division into a light and heavy section.

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The light section, a mobile and self-contained surgical team, was attached to the advanced M.D.S. and always moved with it. The heavy section, which, though mobile, was cumbersome to operate in front, was attached to the rear M.D.S. to look after routine surgical work arising during the course of the battle. The extent of its work was clear cut and definite. Only life-saving operations were performed in the advanced M.D.S.; the remainder was left to the rear M.D.S. Here again another distinction arose. Only those cases that could not be evacuated without operation were dealt with by the Rear M.D.S.

The evacuation of casualties operated upon in the advanced M.D.S. presented some difficulties. The advanced landing fields were usually located behind the advanced M.D.S. and the post-operative cases had to be evacuated over bad roads to the aerodrome for evacuation to rear areas by ambulance planes. Surgical specialists in forward areas doing major operations recommended that these cases should not be evacuated from the advanced M.D.S. before forty-eight hours had elapsed. This was far too long an interval in mobile warfare. The siting of these advanced operating teams demanded careful consideration of the tactical situation and its potentialities. It was evident from experience that the best procedure was to perform life-saving operations at the advanced M.D.S. even if a withdrawal was imminent, as the chance of survival for the casualty was brighter than if he had been left without the operation. If, however, professional opinion considered that evacuation to rear areas was possible without surgical operation, no surgical interference was undertaken in forward areas.

THE MEDICAL SERVICE OF THE LONG RANGE DESERT GROUP*

THE LONG RANGE DESERT GROUP

In 1940, though the Italians in Libya and the British in Egypt were for the most part tied to the coastal belt with its ports, roads and rail, the Inner Desert came to claim considerable military importance for the reason that in Italian Somaliland, Eritrea and Abyssinia there were 200,000 Italians under arms. Between them and the Italian Army in the north-east lay the Sudan with its defence force of some 9,000 British and Sudanese troops, and beyond this the Inner Desert of Libya. The way from Eritrea and Abyssinia to the north was along the Nile through Wadi Halfa with its dockyard and railway workshops. Three days run from Wadi Halfa, due west, lies 'Uweinat with its water and airfield. Another three days run to the north-west of 'Uweinat is the oasis of Kufra, well within Libya, with plentiful water and good communications to the coast in the north and to Hon in Tripolitania, the facilities of which could supply the needs of a considerable force. From Kufra too

* An account of the L.R.D.G. in its earliest days, when the great majority of its personnel were New Zealanders, is given in the Official New Zealand Medical History.

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runs the way to the south-west to Fort Lamy in the Chad province of French Equatorial Africa.

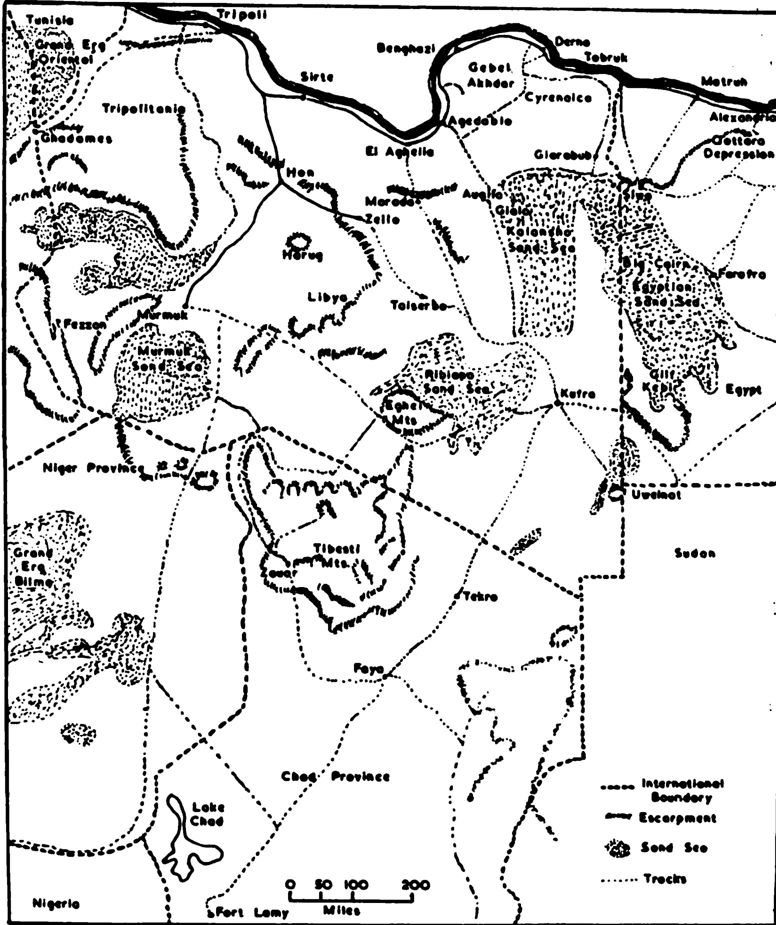

FIG. 54. The Territory of the Long Range Desert Group.

It thus became necessary for General Wavell to inform himself of what the Italians were doing or were proposing to do in the matter of cutting the communications between Egypt and the Sudan and between Egypt and French Equatorial Africa. At this time the Italians had six or seven mechanised Saharan Companies, designed for patrol work in the desert. General Wavell, on the other hand, had no unit under his command capable of reaching Kufra from the Nile valley.

But it so happened that between 1932 and 1938 Major R. A. Bagnold of the Royal Corps of Signals, then stationed in Cairo, had, together with some fellow enthusiasts, explored and mapped some of the southern Libyan desert, using light cars and other mechanised vehicles. When

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Italy entered the war he submitted to General Wavell plans for the organisation and utilisation of a self-contained mechanised unit capable of operating in the desert for long periods of time. These plans were approved and so the Long Range Desert Group came into existence.

To begin with the L.R.D.G. consisted of two fighting patrols, each composed of thirty O.Rs. and two officers, all New Zealanders and volunteers from their divisional cavalry, 27th M/G Bn. and A/T Regts.; a transport patrol of the same strength; a signals section; a small ordnance group; a Q.M. and his staff and a medical officer, a New Zealander. By May 1943 the L.R.D.G. had become considerably expanded and now consisted of more than 300 all ranks divided among a group H.Q. with a large signals section; a light aid detachment from R.E.M.E.; a comprehensive 'Q' store; a heavy transport section; a survey section; a small medical group including R.A.M.C. orderlies; a H.Q. squadron divisible into six patrols; an independent squadron of four patrols and a sabotage patrol. An Indian squadron of four patrols was attached to the H.Q. squadron for several months.

A patrol normally consisted of one officer and fifteen men with five 30-cwt. trucks.

The L.R.D.G. came to possess two small aircraft and with them formed its own air wing.

It is of importance to note that the officers of this unit were most carefully selected by the officer commanding and that as far as possible the officer commanding a patrol chose his own men.

The prime task of the L.R.D.G. was to collect operational and topographical intelligence by long range penetration behind the enemy's lines. At times patrols were employed on sabotage or in conjunction with other units in attacks on the enemy's rear installations. The unit was designed and trained to operate in small parties widely dispersed.

As a general rule main H.Q. would move out some 200–600 miles into the desert and at some selected spot, usually an oasis, establish itself. Then the advanced H.Q. and the patrols would go their several ways out into space to do that which they were required to do and much more.

The Inner Desert of the L.R.D.G. was not the semi-desert, the Western Desert, of the W.D.F. It was composed of clean sand and not clay and limestone trodden into dust. There were no flies and exceedingly few human beings and its quiet was the intense silence of an empty cathedral at dusk. But its hot wind when it blew was infinitely worse than those of neighbouring lands. It could be borne only because to its blowing there came an end.

THE MEDICAL COMPONENT

The final medical establishment was one medical officer, two corporals, ten orderlies (either R.A.M.C. or N.Z.A.M.C.) together with three

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PLATE XXVI. Derna.

[*Indian Historical Section*

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PLATE XXVII. A stretcher case at an Advanced Dressing Station.

[*Indian Historical Section*

PLATE XXVIII. Loading an Ambulance Car at an Advanced Dressing Station.

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PLATE XXIX. A Forward Main Dressing Station.

[*Indian Historical Section*

PLATE XXX. Awaiting evacuation from a Main Dressing Station.

[*Indian Historical Section*

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sanitary orderlies. All these, being carefully chosen, were such as could and would tackle any kind of job willingly and efficiently. Their value was such that, whoever had to be left behind when adventure was afoot, a medical orderly was sure of a place in the patrol.

As a rule the medical officer remained with main H.Q. where he established a 12-bedded 'hospital' associated with his M.I. room. In this hospital, in order to prevent wastage, cases of malaria, jaundice, pneumonia and the like were retained and nursed. At this main H.Q. were facilities for major surgical operations, for blood transfusion and also for somewhat rough dental treatment. As time passed the medical officer's equipment was augmented by a captured Italian microscope and accessories and also by Italian dressings, which were in certain respects preferable to the British type in that, though more bulky, they were individually wrapped.

With each squadron went a corporal or lance-corporal R.A.M.C. or N.Z.A.M.C. who held his own sick parades and in his own M.I. room nursed his squadron's sick. He was not only nursing orderly but also cook, and his only help was a native boy. With each patrol went an orderly who held his own sick parades and escorted his more serious cases back to the nearest squadron M.I. room. He also was the patrol's hygiene specialist. The medical officer and squadron and patrol orderlies were in touch by wireless, by means of which advice and instruction were sought and given.

Since success and safety alike depended almost entirely upon the mechanical perfection of the vehicle, the medical officer, like everybody else, had to learn all about truck maintenance, driving, desert navigation, the intricacies of machine guns, and above all else, the art and science of living under conditions which were familiar to only a handful of Europeans in the whole world.

The medical officer's M.I. room was a 15-cwt. truck. In the early days of the L.R.D.G. it quickly became manifest that the monkey-box and the medical pannier were by no means sufficient to meet the medical officer's requirements and so a truck was built which, in addition to carrying the standard load of 28 gallons of water, 16 jerry-cans of petrol and the personal kit of the medical officer and his driver, could take all the M.I. equipment and drugs. A 15-cwt. Indian pattern Chevrolet was built up to 4 ft. 6 in. from the floor with wood and provided with an iron and canvas superstructure, so that its total height was 4 ft. 9 in. when travelling and 6 ft. when stationary and in use. The floor space was 6 ft. square and all the equipment and drugs were neatly fitted into sorbo-padded boxes, which could easily be unbolted and transported to a permanent building when this happened to be available for use as a M.I. room and hospital. Against the near side wall of the truck and low down there was a folding stretcher with its handles removed bolted to the wall, against which it could be folded. Above this there was:

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(1) a hanging box converted into a stationery cabinet with a hinged lid that, being lowered, formed a writing desk. For use at this there was a folding stool. (Plate XV.)

On the front wall there were:

(2) a wooden rack holding 24 elastoplast tins, for tablets, and nine 2 oz. tobacco tins, for ointments. (These last were not very satisfactory because of the high temperature);

(3) alongside this and at the same level, a box with a hinged lid forming a cupboard with compartments for instruments, anaesthetics, prepared dressing, plaster-of-paris and the steriliser;

(4) below this, another box with a hinged lid and forming a set of 21 pigeonholes each containing a Gordon gin bottle. In these the liquid stocks were kept.

On the other side wall there were:

(5) a 12 gallon water tank, with tap, which hung on the wall, and

(6) a cupboard for splints and nursing appliances bolted to the wall nearer the back on the floor.

Each orderly in 'medical charge' of a patrol took with him a patrol kit consisting of the items specified in Table 47:

TABLE 47

The contents of the Patrol Medical Kit

1 stretcher	Ointments:	
1 Thomas' splint	Vaseline c sulphonamide (1 tube)	2 oz.
3 pieces Cramer splinting	Vaseline (1 tube)	
1 or 2 water bottles	Antiseptic (usually H.A.D.)	2 oz.
4 extra gallons of water	Healing (Zn. oxide)	2 oz.
1 pr. stretcher-bearer scissors		
2 prs. Spencer Wells forceps	Boric Powder (for eye baths)	
1 tourniquet	Argyrol (and dropper)	$\frac{1}{2}$ oz.
1 2 c.c. hypodermic syringe	Iodine	2 oz.
1 thermometer	Mag. Sulph. crystals	4 oz.
1 eyebath	Water purifying tablets and detasters	1 tin
Bandages:		
6 each of 1-in., 2-in., 3-in.,	Tablets:	
(12 in the autumn)	Aspirin	50
2 each of 4-in., 6-in.	Dover	12
4 triangular	No. 4	50
1 3-in. flannel	No. 8	12
1 Many tail	No. 9	12
	M & B 693	25
Plaster:	Sulphonamide	40
Elastoplast (1 roll 3-in.)	Acriflavine	1 bottle
Zn. Oxide (1 roll 1-in.)	Lysolats	1 tin
	Quinine	100
Shell dressings (6)	Bismuth	30
Cotton wool (4 oz. +)	Morphia (gr. $\frac{1}{4}$)	30
Gauze		
Lint (4 oz.)	Ampoules:	
Jaconet (1 sq. ft.)	Morphia (gr. $\frac{1}{4}$)	10

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together with a set of notes concerning actions to be taken in the case of emergency of different kinds. The tablets were kept in the standard aluminium A/G ointment tins and these, together with the instruments and assorted dressings, were wrapped in a canvas roll. The orderly made or acquired a wooden box in which to transport his patrol kit, of a size that would fit into the truck in which he was to travel.

MILITARY MEDICINE AS PRACTISED IN THE L.R.D.G.

Medicine and the profession of medicine, in the opinion of the members of this closed community, the L.R.D.G., were just what their medical officer was and did. The opportunities for doing good work were exceptional, but so also was the medical officer's load of responsibility, for this he could not share. He was no 'R.A.M.C. attached'; he was, and was accepted as, an essential member of a closely knit group and was continually called upon to make decisions of a medical kind that, in their repercussions, affected the whole organisation and the conduct of its desperate adventures. In the records of the L.R.D.G. there is to be encountered abundant evidence which shows that this unit attracted to itself medical officers who did much to gain for the profession of medicine as a whole the sincere respect and the affectionate regard of those whom they so devotedly served.

Service with the unit was a pleasant experience, for there were no returns to be submitted to higher authority and no scales of stores and equipment. The reputation of the unit was so high that medical officer and quartermaster were always given all they asked for and more. But it was medical practice of a unique kind. Doctor and patient could be separated by 1,000 miles. Differential diagnosis and the prescription and therapy were often matters for discussion by wireless between medical orderly and medical officer. The latter therefore had to train his orderlies to an exceptional degree of knowledge and skill, and between them and him there had to be developed a very perfect understanding. They, like himself, had to be capable of improvisation. It is recorded that one of them successfully used a motor truck grease-gun for the purpose of giving an enema!

The decision as to whether a sick or wounded man should be sent down the line rested with the commander of the patrol, guided by the advice of his medical orderly who, if in doubt, sought that of the medical officer. This decision was often such that, as the result of it, the work of the patrol was halted, the flow of information back to G.H.Q. interrupted and the life of a man or of a whole S.A.S. patrol that was to be contacted and supplies endangered. If a man had to be evacuated two out of the five trucks had to remain behind or travel back with him, for it was the unbreakable rule that no truck should move alone.

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When these patrols were out on a raid together and when heavy casualties were to be expected, it was the custom of the medical officer, when he could be spared from main H.Q., to go forward with them.

Evacuation itself was usually a project beset with great difficulty. The desert surface varied so greatly in the course of a lengthy journey. The trucks had to pass over vast sand seas out of which they continually had to be dug and over which they could only move yard by yard over the steel trays which they carried. There were stretches of rough limestone and only exceptionally belts of firm smooth sand. For the hale a journey was a period of gross discomfort; for the sick and the injured it was an agony. It was found that if a truck was filled with soft sand until the springs were almost flat and if the patient was about a quarter buried in this, he travelled fairly comfortably. A compound fracture of the leg was sent back over 1,000 miles and a lobar pneumonia over 450 in this way without hurt.

As a general rule diphtheria, severe gunshot wounds and cases demanding surgical attention far beyond the facilities at Main H.Q. were evacuated, either by road or by air. If by air, then the patients were taken to some suitable point well away from the site of operations where a landing ground was made and marked. Then either O.C., L.R.D.G., being informed by wireless, would go forward with or without his medical officer, in one of the small L.R.D.G. aircraft, or else the R.A.F. would be asked to send a plane. The L.R.D.G. planes could take two sitting cases plus the pilot. Stretcher cases demanded the larger planes of the R.A.F. Exceptionally, however, serious cases which in their own interests should have been sent back had to be retained, treated and nursed in unit lines for several days. Minor cases were usually transferred from their own patrols to the H.Q. section, there to be kept and treated.

THE HEALTH OF THE TROOPS

The unit was no ordinary one; everybody in it was an eager volunteer who, on his own merit, had won his place in the face of fierce competition. Everyone was a specialist of one kind or another and on what he did and on the manner in which he did it, depended the success of enterprises and the safety of his comrades. The work they did was interesting in itself, it was of acknowledged importance and it was frequently exciting.

For the L.R.D.G., working far away from G.H.Q. and its formations, there were no inspections, parades, guards and fatigues for the advantage or satisfaction of others. Everything that the L.R.D.G. did in respect of these matters was done in its own interests, to ensure efficiency and continued survival. Moreover, its rations were the best in the M.E. No wonder then that in this unit sickness did not take the form of

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dramatised discontent and that its records support the contention that the higher the morale of a unit the lower will be its morbidity rate.

TABLE 48

L.R.D.G. Admissions to Hospital, January–December 1941

Desert sores	285	Impetigo	14
Sepsis other than desert sores	155	Urethritis (non V.D.)	13
Cuts, abrasions	95	Pediculosis	12
Minor medical	95	Bronchitis	11
Malaria	66	Jaundice	11
Tonsillitis and pharyngitis	64	Piles	11
Conjunctivitis and blepharitis	60	Otitis media	10
Sprains and bruises	45	Bacillary dysentery	10
Dyspepsia and constipation	48	Fractures	8
Diarrhoea (about 1 day)	47	Urethritis (V.D.)	7
Rashes, mainly sweat rash	37	Diphtheria	6
Lumbago and myositis	31	Heat exhaustion	3
G.S.W.	28	Pleurisy	3
Sinusitis	23	Epidermophytosis	3
Burns	23	Haematuria (renal stone)	3
Wax in ear	21	Pneumonia	2
Foreign body in eye	15	Blast injury	2
Furunculosis	15	Appendicitis	2

Average strength	275 (range 100–450)
Deaths	4
Treated in L.R.D.G. Hospital	162
Evacuated	75
Cases dealt with in M.I. Room	1,076
Total treatments	3,008

These figures are too small to warrant the application to them of statistical techniques for the discovery of such phenomena as seasonal incidence, mean sickness rate and annual sickness rate. They will serve, however, to indicate in a general way what the major medical problems in the L.R.D.G. were.

Desert Sore was commonest in the autumn. While trauma appeared to be the only constant factor in its aetiology, the impression was formed that this unit which, between patrols, returned to an oasis base, there to enjoy regular rest periods, facilities for washing and plentiful fresh food, suffered less severely than did similar units which had their bases out in the sand.

Malaria, most frequent in May and June, was the most troublesome form of illness. During the bouts of fever, without shade or rest from rough going, vomiting was severe and intractable. In attempts to cool the patient, clothes soaked in (drinking) water were laid on him and he was then fanned as he lay in the shelter of his truck. During the cool of the night it was often possible for the patient to tolerate the quinine.

Pain in the right iliac fossa was the orderly's nightmare and usually meant a day's halt for the patient and also for two trucks. The medical

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officer's therapy by radio took the form of 'keep in sitting position, knees slightly raised; small drinks of water or weak tea with sugar only; water bottle filled with hot water to right side; no, repeat no, aperient; Dovers for pain, morphia if bad; if condition deteriorates send patient back here in two trucks'. So, according to the patient's condition, on the following day the trucks and the patient would either rejoin the patrol or else go back towards main H.Q.

Bacillary dysentery, venereal disease and jaundice were rare and nearly always followed upon leave or visits to the rear for supplies. Diphtheria was treacherous in that 'sore throats' on patrol developed paresis on return to camp or even later on the next patrol.

Epidermophytosis was exceedingly rare. This undoubtedly was the result of the wearing of 'chapplies' (the North-West Frontier of India pattern sandals). It was noted that among S.A.S. personnel with their rubber soled boots the complaint was very common.

Conjunctivitis of a mild degree was common and appeared to be as much due to wind as to glare. Heat exhaustion and sunstroke were rare and when they occurred some unusual factor was present—for example malarial pyrexia, long exposure and lack of water among the survivors after a patrol had been attacked. Thus in January 1942, ten men, left behind when a patrol was shot up near the coast, walked 200 miles in eight days. All they had were four gallons of water salvaged from a destroyed truck and a few dates and snails given to them by friendly Arabs. On arrival at camp their feet, ankles and knees were much swollen. The men were dehydrated, exhausted and all were suffering from acute gastritis. On another occasion four men set out to walk back 200 miles. One of them, already wounded, died on the way of exhaustion, two others collapsed but were fortunately picked up by trucks moving along the route. The fourth was likewise picked up while he was still painfully plodding along after a ten days' trek during which he had travelled 210 miles.

Toothache claimed its victims. The medical officer was called upon to extract and to make temporary stoppings, for a visit to a real dentist meant at least three days' absence from the unit. On two occasions a mobile dental team spent two or three weeks with the unit and raised the dental state of the unit to a high level.

During a period of fifteen months there were 41 wounds out of 1,271 new cases requiring treatment. These were almost exclusively the results of bombing and machine-gun fire from aircraft or of encounters with mines. Out of eight deaths in the same 15 months, seven were due to wounds and one to pneumonia.

Rations. A scale derived directly from the experiences of the founders of the L.R.D.G. and was approved by M.E.C. The quartermaster of an ordinary unit in the Western Desert drew his rations daily, sending

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TABLE 49

The L.R.D.G. Ration Scale

Item	Amount	Item	Amount
Bacon	2 1/3 oz.	Milk (tinned)	2 oz.
Bread	16 oz.	Mustard	1/100 oz.
Biscuits	12 oz.	Oatmeal or flour	2 oz.
Cheese	1 1/3 oz.	Onions	2 oz.
Chocolate	2 oz.	Pepper	1/100 oz.
Curry Powder	1/8 oz.	Potatoes (tinned)	3 oz.
Fruit (dried)	4/7 oz.	Salt	3/4 oz.
Fruit (tinned)	4 oz.	Salmon (tinned)	1 oz.
Herrings	1 1/2 oz.	Sardines	1 oz.
Jam, Marmalade or Golden Syrup	1 1/3 oz.	Sausages	1 oz.
Lime Juice	1/16 bottle	Sugar	3 1/3 oz.
Margarine	1 1/3 oz.	Tea	3/4 oz.
Meat	6 oz.	Vegetables (tinned)	4 oz.
Pickles	1 oz.	Ascorbic acid tablets	1 tab.
Chutney	1/2 oz.	Marmite	3/28 oz.
Meat Loaf or Ham and Tongue	1 1/2 oz.	*Rum	1 oz.
Meat and Vegetable ration (M. & V.)	2 oz.		

Tobacco or cigarettes	2 oz. per week
Matches	2 boxes per week
Total daily weight (less containers)	4 lbs. 2 oz.
(with containers)	5 lbs.

* To be issued only under the authority of a divisional or equivalent commander. (This was interpreted as meaning a commander of a patrol.)

his own transport back to the nearest detail issue depot. It was unlikely that he had to go more than 20 or 30 miles for most of the things he needed. The quartermaster of the L.R.D.G. commonly had to go 300 miles. At Kufra the R.A.S.C. brought food and petrol from Wadi Halfa. For Siwa stores had to be fetched from Matruh. For many things the L.R.D.G. had to send to Cairo, 1,000 miles away.

On patrol the diet consisted entirely of dried or tinned items. Back in camp every effort was made to obtain plenty of fresh fruit and vegetables by barter. At H.Q. cooking was done by army cooks; on patrol each truck crew did its own cooking once during the day. Marmalade was used extensively as a thirst quencher. The rum and lime powder, served as a long drink in the late afternoon, banished weariness and irritation and made a further 2–3 hours travel endurable. The lime alone did not have this effect.

Water. Contamination of the deep oasis wells was avoided by using only one fenced well for drinking water. From this the supplies were taken by patrols when setting out on their journeys. There is no evidence that water purifying tablets were ever used.

The ration on patrol was six pints a day, one in the breakfast tea, one in the lime juice at lunch, two in the evening tea and two in the water bottle to be drunk at will.

Clothing. In winter the wearing of battledress (more or less) made for a certain uniformity, but in summer there was a great variety, the

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most fashionable being a pair of shorts and a pair of 'chapplies'. To begin with the unit had been issued with topees, but these were at once discarded in favour of the Arab headdress of kafiya and aqal. Soon the novelty wore off and then most of the men in summer and in winter donned the 'cap comforter'. But in a group of any size there would be found the Arab headdress, the cap comforter and, as these became available, the German peaked cap with neck shield. It was the general opinion that of these the German cap was the best of all.

Sun glasses worn against glare were only effective in preventing conjunctivitis if they were fitted with wide side-pieces to protect the eye against the wind as well as the light.

Latrines. After many unsuccessful attempts to make fly-proof latrines for Main H.Q. out of petrol boxes, this being the only source of wood, the men were taught to squat. A flat latrine top, approximately 6 ft. × 3 ft. 6 in. with three hinged lids, was made. This could be carried between the cab and the body of a 3-tonner. On patrol the drill was to dig a hole and then to fill it in, as did the Hebrews 2,000 years before.

Anti-Malarial Measures. When based on an oasis, as was usually the case, the medical officer and his orderlies were responsible for malaria control, not only in unit lines but in the district, and quite large labour forces (60 in Siwa) were employed for the clearing and oiling of the water courses.

APPENDIX XIII

EIGHTH ARMY ORDER OF BATTLE. JULY 1941 (abbreviated)

XIII Corps

- Indian 4th Division
  - Ind. 5th, 7th and 11th Inf. Bdes.
- N.Z. 2nd Division
  - N.Z. 4th, 5th and 6th Inf. Bdes.
- 1st Army Tk. Bde.

XXX Corps

- 7th Armoured Division
  - 7th Armd. Bde.
  - 22nd Armd. Bde. (arrived from the U.K. in October)
  - 7th Sp. Gp.
- 4th Armd. Bde. Gp.
- South African 1st Division
  - S.A. 1st, 2nd and 5th Inf. Bdes.
- 22nd Guards Motor Bde. (soon to be renumbered 201st)

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Tobruk Garrison

70th Division
14th, 16th and 23rd Inf. Bdes.
32nd Army Tk. Bde.
Polish Carpathian Inf. Bde.

Oases Force

S.A. 6th Armd. Car. Regt.
Ind. 29th Inf. Bde., a battalion group

Army Reserve

South African 2nd Division
S.A. 4th and 6th Inf. Bdes.

MEDICAL UNITS OF EIGHTH ARMY

Army

43 B.G.H.
2 (N.Z.)G.H.
1 Mob. Mil. Hosp.
8 (S.A.) C.C.S.
14 C.C.S. (Hy. Sec.)
1 Mob. Ophthalmic Unit
2 Mob. Hyg. Lab.
5 Mob. Bact. Lab.
3 (S.A.) Mob. Bact. Lab.
3 (S.A.) Mob. Dental Unit
(N.Z.) Mob. Dental Unit
5 F.T.U.
10 (S.A.) M.A.C.
6 (Ind.) M.A.S.
9 (Ind.) M.A.S.
18 (Ind.) M.A.S.
200 Fd. Amb.
12 (S.A.) Fd. Amb.
18 (S.A.) Fd. Amb.
31 Fd. Hyg. Sec.
48 Fd. Hyg. Sec.
18 (Ind.) Staging Sec.
7 Adv. Depot Med Stores

XIII Corps

14 C.C.S. (Lt. Sec.) (with the 'Robin Line' Surgical Unit attached)
2 (Ind.) C.C.S.
(N.Z.) Mob. Surg. Unit
2 F.T.U.
3 F.T.U.
14 Fd. Amb. (Corps Fd. Amb.), less one company
7 M.A.C.

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14 Fd. Amb. (coy.) with 1st Army Tk. Bde.
4 (N.Z.) Fd. Amb. with N.Z. 2nd Division
5 (N.Z.) Fd. Amb. with N.Z. 2nd Division
6 (N.Z.) Fd. Amb. with N.Z. 2nd Division
4 (N.Z.) Hyg. Sec. with N.Z. 2nd Division
14 (Ind.) Fd. Amb. with Indian 4th Division
17 (Ind.) Fd. Amb. with Indian 4th Division
19 (Ind.) Fd. Amb. with Indian 4th Division
15 (Ind.) Fd. Hyg. Sec. with Indian 4th Division

XXX Corps

7 (S.A.) C.C.S.
15 C.C.S. (with the 'Greek' Surgical Unit attached)
1 F.T.U.
4 F.T.U.
16 M.A.C.
2 Lt. Fd. Amb. with 7th Armd. Division
13 Lt. Fd. Amb. with 7th Armd. Division
151 Lt. Fd. Amb. with 7th Armd. Division
7 Lt. Fd. Hyg. Sec. with 7th Armd. Division
15 Lt. Fd. Amb. with 4th Armd. Bde.
10 (S.A.) Fd. Amb. with S.A. 1st Division
11 (S.A.) Fd. Amb. with S.A. 1st Division
15 (S.A.) Fd. Amb. with S.A. 1st Division
12 (S.A.) Fd. Amb. with S.A. 1st Division
1 (S.A.) Fd. Dental Unit with S.A. 1st Division
Divisional Fd. Hyg. Sec. with S.A. 1st Division
5 Lt. Fd. Amb. with 22nd Gds. Bde.
14 (S.A.) Fd. Amb. with S.A. 2nd Division
16 (S.A.) Fd. Amb. with S.A. 2nd Division
17 (S.A.) Fd. Amb. with S.A. 2nd Division
18 (S.A.) Fd. Amb. with S.A. 2nd Division
10 (S.A.) Fd. Dental Unit with S.A. 2nd Division
Divisional Fd. Hyg. Sec. with S.A. 2nd Division

Oases Group

9 Lt. Fd. Amb.
21 (Ind.) Fd. Amb.
11 M.A.C. 'C' Sec.

Tobruk Fortress

173 Fd. Amb. with 70th Division
189 Fd. Amb. with 70th Division
215 Fd. Amb. with 70th Division
33 Fd. Hyg. Sec. with 70th Division
Polish Fd. Amb. with Polish Bde.
Polish Fd. Hyg. Sec. with Polish Bde.
62 B.G.H. with 88 Sub-area
Detachment 15 I.G.H.

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5 Adv. Depot Med. Stores
36 Fd. Hyg. Sec.
1 A.C.C.

Matruh Fortress

8 (S.A.) C.C.S. with 91 Sub-area
2 (S.A.) Dental Unit with 91 Sub-area

APPENDIX XIV

REGROUPING OF EIGHTH ARMY: DECEMBER 1941

XIII Corps

70th Division
- 14th, 16th and 23rd Bdes.
- 32nd Army Tank Bde.
- Polish Carpathian Bde. Gp.
- N.Z. 18th and 19th Inf. Bdes.
- Aust. 2/13th Inf. Bn.
- Czechoslovak 11th Bn.

S.A. 2nd Division
- S.A. 3rd and 6th Inf. Bde. Gps.
- N.Z. 5th Inf. Bde. Gp. (attached)
- 1st Army Tk. Bde. (attached)

XXX Corps

7th Armoured Division
- 4th Armd. Bde.
- 7th Sp. Gp.

Indian 4th Division
S.A. 1st Inf. Bde. Gp.
Five armoured car regiments

Rear Areas

N.Z. 2nd Division
- N.Z. 4th and 6th Inf. Bdes.

S.A. 5th Inf Bde.

Matruh Fortress

S.A. 2nd and 4th Inf. Bde. Gps.

APPENDIX XV

THE DISTRIBUTION OF MEDICAL UNITS AT THE BASE AS AT THE END OF DECEMBER 1941

By the end of 1941 further expansions had occurred at the base. The Red Sea Sub-Area had been developed at Safaga, 150 miles south of Suez. In this sub-area the medical provision was as follows:

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Red Sea Sub-Area
- Mil. Hosp. (50 beds) at Safaga
- C.R.S. (20 beds) at Qena
- C.R.S. (10 beds) at Ras Ghemsa
- C.R.S. (6 beds) at Abu Zanina

83 Sub-Area had come under B.T.E.
- 2 (N.Z.)G.H. (600 beds) at Gerawla
- 43 B.G.H. (600 beds) at Gerawla (closed)
- 14 C.G.H. (one sec.) at Gerawla
- 18 (S.A.) Fd. Amb. Baqqush

Medical units u/c H.Q., B.T.E., or working in B.T.E. area were now:

Cairo Area

Unit	Attached units
9 B.G.H.:	Surg. Team for chest surgery (attached) 2 Max.-Facial Surg. Team (u/c G.H.Q.) (attached)
15 B.G.H.:	2 Orthopaedic Centre 2 B.T.U. (u/c G.H.Q.) Neurosurgical Team (attached)
63 B.G.H.:	1 Venereal Disease Treatment Centre (V.D.T.C.) 2 Orthopaedic Centre (attached)

- Mil. Fam. Hosp.
- Central Path. Lab. u/c G.H.Q.
- 2, 9, 16, 21 A.D. Centres
- 1 A.D. Lab.
- 36 Fd. Hyg. Sec.
- 1, 2, 4 Reception Stations
- 1 (N.Z.)G.H. (u/c G.H.Q.)
- 3 (N.Z.)G.H.
- 5 (S.A.)G.H.
- 2 (S.A.) Mob. Lab.
- 37 (S.A.) Mob. Dental Unit
- 12 (S.A.) L. of C. Fd. Dental Unit
- 15 I.G.H.
- 2 Ind. Fd. Lab.

Alexandria Area

Amirya Sub-Area

83 L. of C. Sub-Area

Unit	Attached units
64 B.G.H.:	4 Orthopaedic Centre (attached)
8 B.G.H.:	8 V.D.T.C. (attached) 1 Max.-Fac. Surg. Team (u/c G.H.Q.) (attached) Sec. I.G.H. (attached)

- 58 B.G.H.
- 3 B.G.H.
- 48 Fd. Hyg. Sec.
- 15, 17, 23 A.D. Centres
- 3 Reception Station

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2 (N.Z.)G.H.
1 (N.Z.) Con. Depot
(N.Z.) Mob. Dental Unit
4 (S.A.)G.H.
S.A. Con. Depot
18 (S.A.) Fd. Amb.
2 L. of C. (S.A.) Fd. Hyg. Sec.
11 (S.A.) M.A.C.
8 (S.A.) C.C.S.
30 I.G.H. 1 Ind. Mob. X-ray unit attached
14 C.G.H. (one sec.)
6 M.A.S.
11 I.S.S.
1 Pol. G.H.

Canal Area

Moascar Sub-Area
Qassassin Sub-Area
Geneifa Sub-Area
Suez Sub-Area

Moascar Sub-Area
1 B.G.H. 5 V.D.T.C. (attached)
18 B.G.H. u/c G.H.Q.
42 B.G.H. u/c G.H.Q.
54 B.G.H. at El Ballah
2 Con. Depot u/c G.H.Q.
5 Con. Depot u/c G.H.Q.
2 Mob. X-ray Unit u/c G.H.Q.
56 Fd. Hyg. Sec. u/c G.H.Q.
5 A.D. Lab.
3, 10, 22 A.D. Centres
Reception Station. Port Said and Port Fouad
10 I.G.H.
7 (Ind.) Fd. Lab.

Qassassin Sub-Area
2 B.G.H. 3 V.D.T.C. (attached)
6 B.G.H. 4 V.D.T.C. (attached)
27 B.G.H. 3 Orthopaedic Centre (attached)
9 Fd. Hyg. Sec.
3 A.D. Lab.
4, 5, 8, 11, 12 A.D. Centres
101 (S.A.) (non-European) G.H.

Geneifa Sub-Area
19 B.G.H. 1 Psychiatric Centre (attached)
4 A.D. Lab.
14 C.G.H. (less one sec.)
2 (Ind.) Con. Depot.

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Suez Sub-Area
- 13 B.G.H., 6 V.D.T.C. (attached)
- 1, 7 A.D. Centres
- Reception Station. U.D.F. Native C.R.S. Port Tewfik (attached)
- 14 C.G.H. (sec.)
- 13 (Ind.) Fd. Hyg. Sec.
- 17 (Ind.) Fd. Hyg. Sec.

APPENDIX XVI

THE TOBRUK GARRISON. APRIL 1941 (abbreviated)

Australian

H.Q. Australian 9th Division
- Aust. 20th Inf. Bde.
- Aust. 24th Inf. Bde.
- Aust. 26th Inf. Bde.
- Aust. 18th Inf. Bde. of Australian 7th Division together with attached troops including a variety of A/A, A/T, Engineer and Pioneer units

United Kingdom

3rd Armd. Bde.
- 1st R. Tks.
- 7th R. Tks.

Composite Armd. Regt.
- 3rd Hussars
- 1st K.D.G.

1st R.N.F.

4th Durham Survey Regt.

together with a wide variety of R.A., A/A, A/T, S/L, Coast Defence Transport, Camouflage, Ordnance, Docks Operating and suchlike units

Indian

18th Cavalry. Regt. of Ind. 3rd Motor Bde.

R.A.F.

73rd Squadron

102 *Military Mission*

Libyan refugee battalions

APPENDIX XVII

TOBRUK. JUNE 1942.

Order of Battle. South African 2nd Division as at June 20, 1942

H.Q. South African 2nd Division

H.Q. S.A. Artillery

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H.Q. S.A. Engineer Corps
H.Q. S.A. Corps of Signals
H.Q. Q Services
H.Q. T Services

H.Q. S.A. 4th Inf. Bde.
2nd Durban Light Infantry
Umvote Mounted Rifles
The Kaffrarian Rifles
Blakegroup (a composite battalion ex S.A. 1st Division)

H.Q. S.A. 6th Inf. Bde.
1st S.A. Police
2nd S.A. Police
2nd Transvaal Scottish

Divisional Troops

Infantry
Die Middellandse Regt. (M/G)

Armour
7th S.A. Recce Bn.

Artillery
S.A. 2nd Fd. Regt.
S.A. 3rd Fd. Regt.
S.A. 6th A/T Bty.
S.A. 2nd Lt. A.A. Regt.

Engineers
S.A. 4th Fd. Coy.
S.A. 10th Fd. Coy.

Signals
S.A. 2nd Divisional Signals Coy.
S.A. 4th Bde. Signals Coy.
S.A. 6th Bde. Signals Coy.
S.A. 2nd Divisional Artillery Signals Coy.

Q Services
S.A. 2nd Divisional Troops Coy.
S.A. 4th Bde Coy.
S.A. 6th Bde. Coy.
S.A. 2nd Divisional Mobile Laundry
S.A. 2nd Divisional Mobile Bath Unit

Medical
14 (S.A.) Fd. Amb.
17 (S.A.) Divisional Dental Unit
1 (S.A.) Divisional Dental Unit

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10 (S.A.) F.D.U.
4 (S.A.) F.D.U.
6 (S.A.) F.D.U.
2 (S.A.) Divisional Hygiene Section

T Services
S.A. 2nd Divisional Workshops
S.A. 4th Bde. Workshops
S.A. 6th Bde. Workshops
S.A. 2nd Divisional Q and T Stores Park

Provost
S.A. 3rd Field Provost Coy.

Postal
S.A. 2nd Divisional Field Postal Unit

Salvage
S.A. 2nd Divisional Salvage Unit

'Beer' Group (a composite battalion ex S.A. 1st Division) was u/c Ind. 11th Inf. Bde.

S.A. 2nd Fd. Bty. was u/c 25th Fd. Regt. R.A.;
20th Fd. Pk. Coy., S.A. Engineer Corps, was u/c C.R.E. 88 Sub-Area.

The Garrison other than South African 2nd Division

H.Q. 88 Sub-Area

32nd Army Tank Bde. u/c S.A. 2nd Division
H.Q. 32nd Army Tk. Bde.
4th R. Tks.
7th R. Tks.

201st Guards Bde. u/c S.A. 2nd Division
H.Q. 201st Guards Bde.
3rd Coldstream Guards
1st Sherwood Foresters
1st Worcestershire Regt.

Ind. 11th Inf. Bde. u/c S.A. 2nd Division
H.Q. Ind. 11th Inf. Bde.
2nd Cameron Highlanders
2/5th Mahratta Light Infantry
2/7th Gurkha Rifles
'Beer' Group (a composite battalion ex S.A. 1st Division)
Ind. 11th Bde. Medium Machine Gun Company

Medium Artillery
H.Q. Medium Artillery Group
67th Medium Regt. R.A.
68th Medium Regt. R.A.

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Field Artillery
25th Fd. Regt. R.A.
S.A. 2nd Fd. Bty. } u/c
287 Fd. Bty. R.A. }
A.A.
4th Fd. Bde. R.A.
A.T.
95th A/T Bty. R.A.
Ind. 11th Bde. A/T Bty.
Engineers
H.Q. C.R.E. 88 S.A.
20 Fd. Pk. Coy. S.A. Engineer Corps u/c
18 Fd. Coy. Royal Bombay Sappers and Miners u/c Ind. 11th Inf. Bde.
Signals
32nd Army Tk. Bde. Signals Coy.
201st Guards Bde. Signals Coy.
K Signals Section R.C.S.
Air Support Tentacle R.A.F.
R.A.S.C.
H.Q. A.D.S.T. 88 S.A.
3rd Transport Column
49th General Transport Coy
113th General Transport Coy.
918th General Transport Coy.
32nd Army Tk. Bde. Coy.
4th Guards Bde. Coy.
2nd A.A. Bde. Coy.
Ind. 11th Bde. Transport Coy. R.I.A.S.C.
12th Base Supply Depot
21st Detail Issue Depot
21st Fd. Bakery
Petrol Depot
R.A.M.C.
62 B.G.H.
9 Fd. Amb., sec. (attached 32nd Army Tk. Bde.)
19 (Ind.) Fd. Amb.
R.A.O.C.
503rd Army Ordnance Workshops
32nd Army Tk. Bde. Ordnance Coy. with a detachment of 1st Army Tk. Bde. Ordnance Coy.
1st Army Tk. Bde. Recovery Section
4th A.A. Bde. Workshops
68th Hy. A.A. Workshops Section
500th Adv. Ordnance Depot, detachment
501st Adv. Ammunition Depot
18th Fd. Workshops Coy. Indian Army

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APPENDIX XVIII

SOUTH AFRICAN NON-DIVISIONAL MEDICAL UNITS IN THE MIDDLE EAST AS AT JUNE 2, 1942

Medical

Unit	Location
10 (S.A.) Fd. Amb.	Baqqush
11 (S.A.) Fd. Amb.	Matruh
16 (S.A.) Fd. Amb.	Sollum
7 (S.A.) C.C.S.	El Daba
8 (S.A.) C.C.S.	Matruh
10 (S.A.) M.A.C.	Qassassin
11/16 (S.A.) M.A.C.	Alexandria
4 (S.A.)G.H.	Buscelli
5 (S.A.)G.H.	Helmieh
106 (S.A.)G.H.	Qassassin
101 (S.A.)G.H. (N.E.)	Tahag
102 (S.A.)G.H. (N.E.)	Amiriya
1 (S.A.) L. of C. Coy.	Helwan
28 (S.A.) M.D.U.	Helwan
36 (S.A.) M.D.U.	Amiriya
11 (S.A.) L. of C. F.D.U.	Helwan
12 (S.A.) L. of C. F.D.U.	Helwan
3 (S.A.) Mob. X-ray Unit	Baqqush
2 (S.A.) Mob. Bact. Lab.	Helwan
3 (S.A.) Mob. Bact. Lab.	Matruh
1 (S.A.) Con. Depot	Alexandria
1 (S.A.) L. of C. Fd. Hyg. Sec.	Helwan
2 (S.A.) L. of C. Fd. Hyg. Sec.	Amiriya
1 S.A. Base Depot Med. Stores	Alexandria

APPENDIX XIX

THE DISTRIBUTION OF MEDICAL UNITS AT THE BASE AS AT THE END OF MARCH 1942

By the end of March 1942 the following medical staff and units were under command H.Q., B.T.E., or were working in B.T.E. Area:

Cairo Area

Unit	Attached
H.Q. Cairo Area	D.D.M.S.
9 B.G.H.	Surgical team for chest surgery (attached) 2 Maxillo-Facial Surg. Team (attached)
15 (Scottish) G.H.	1 Orthopaedic Centre (attached) 2 B.T.U. u/c G.H.Q. (attached) Neuro-surgical team (attached)

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63 B.G.H.	1 V.T.D.C. (attached) 2 Orthopaedic Centre (attached)
5 (S.A.)G.H.	
15 (I.)G.H.	
1 (N.Z.)G.H.	u/c G.H.Q.
3 (N.Z.)G.H.	u/c G.H.Q.
Military Families and Women's Hospital	
1, 2 and 4 Reception Centres	
2, 6, 9, 16, 21 and 24 Army Dental Centres	
1 Dental Lab.	
36 Fd. Hyg. Sec.	
2 (Ind.) Fd. Lab.	
56 Fd. Hyg. Sec.	
2 (S.A.) Mob. Lab.	
12 (S.A.) L. of C. Fd. Dental Unit	
37 (S.A.) Mob. Dental Unit	
Central Path Lab.	u/c G.H.Q.
102 S.A.G.H. (N.E.)	

Alexandria Area

H.Q. Alexandria Area	D.D.M.S.
H.Q. Amiriya Sub-Section	A.D.M.S.
H.Q. 83 L. of C. Sub-Area	A.D.M.S.
64 B.G.H.	4 Orthopaedic Centre (attached)
8 B.G.H.	8 V.D.T.C. (attached) 1 Maxillo-Facial Surg. Team (attached)
58 B.G.H.	One section I.G.H. (attached)
3 B.G.H.	
1 Polish G.H.	
30 I.G.H.	1 (Ind.) Mob. X-ray Unit (attached)
2 (N.Z.)G.H.	
4 (S.A.)G.H.	
14 C.G.H., one section	
1 (N.Z.) Con. Depot	
1 (S.A.) Con. Depot	
18 (S.A.) Fd. Amb.	
2 L. of C. S.A. Fd. Hyg. Sec.	
6 M.A.S.	
11 (S.A.) M.A.C.	
8 (S.A.) C.C.S.	
11 I.S.S.	
15, 16, 17 and 23 Army Dental Centres	
N.Z. Mob. Dental Unit	
3 Reception Station	

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10 (S.A.) Fd. Amb. detachment
3 (N.Z.)G.H. detachment
11 British Staging Section

Canal Area

H.Q. Canal Area	D.D.M.S. (brigadier)
H.Q. Kantara Sub-Area	A.D.M.S. (colonel)
H.Q. Qassassin Sub-Area	A.D.M.S. (colonel)
H.Q. Geneifa Sub-Area	A.D.M.S. (colonel)
H.Q. Suez Sub-Area	A.D.M.S. (Lt. colonel)
Kantara Sub-Area	
1 B.G.H.	5 V.D.T.C. (attached)
54 B.G.H.	
10 I.G.H.	
42 B.G.H.	u/c G.H.Q.
5 Con. Depot	u/c G.H.Q.
2 Con. Depot	u/c G.H.Q.
7 (Ind.) Fd. Lab.	
3, 10 and 22 Army Dental Centres	
2 Mob. X-ray Unit	u/c G.H.Q.
5 Dental Lab.	
Reception Station, Port Said	
Reception Station, Port Tewfik	
41 B.G.H.	
8 Malaria Fd. Lab.	
Qassassin Sub-Area	
2 B.G.H.	3 V.D.T.C. (attached)
6 B.G.H.	4 V.D.T.C. (attached)
27 B.G.H.	2 V.D.T.C. (attached)
106 (S.A.)G.H.	3 Orthopaedic Centre (attached)
101 (S.A.)G.H. (N.E.)	
9 Fd. Hyg. Sec.	
3 Dental Lab.	
4, 5, 8, 11 and 12 Army Dental Centres	
Geneifa Sub-Area	
19 B.G.H.	1 Psychiatric Centre (attached)
14 C.G.H.	
2 (Ind.) Con. Depot	
4 Army Dental Lab.	
Suez Sub-Area	
13 B.G.H.	6 V.D.T.C. (attached) U.D.F. Native Camp Reception Station (attached)
13 and 17 Fd. Hyg. Secs.	
1 and 7 Army Dental Centres	
Reception Station, Port Tewfik	

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CHAPTER 6

THE CAMPAIGN IN EAST AFRICA*

June 10, 1940 – November 29, 1941

Précis

On July 12, 1940, the British Government officially recognised Abyssinia as an ally and promised her liberation should the war end in victory. The Emperor Haile Selassie left Great Britain in the same month for the Sudan where he became the nucleus of resistance and rebellion in Abyssinia.

On December 2, 1940, General Wavell allotted to General Platt, commanding the forces in the Sudan, and to General Cunningham, commanding those in East Africa, both of these being steadily reinforced, the limited tasks he required them to undertake. General Platt, in the north, was to foster revolt in Abyssinia by all possible means and to be prepared to retake Kassala in February, while General Cunningham in the south was to maintain pressure on Moyale and then, when the rains were over in May or June, to advance on Kismayu, near the mouth of the Juba river.

In the event, however, these limited objectives were soon replaced by a military operation that ended in the complete destruction of Italian military power in East Africa by a gigantic pincer movement. The northern arm of this pincer consisted of the forces in the Sudan under General Platt. The core of these was formed by Indian 4th and 5th Divisions. The southern arm consisted of the forces in Kenya, South African 1st and 11th and 12th African Divisions, under General Cunningham. Each of these divisions included an East African Brigade and 11th and 12th African a West African brigade also.

General Platt, finding that the Italians had evacuated Kassala on January 18, 1941, pursued them, overtook them at Agordat and defeated them on January 31. He pursued them again and came against the immensely strong natural defensive position at Keren. Here very severe fighting occurred and it was not until March 27 and at a cost of nearly 4,000 casualties that General Platt was able to force his desperate way on to the Keren plateau. On April 1 Asmara itself was entered, as was Massawa three days later. Thence the force turned south on Amba Alagi in Abyssinia.

* For more detailed accounts of this campaign the Official Indian Medical History should be consulted.

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On January 24, a thousand miles to the south, General Cunningham began his advance and on February 18 crossed the Juba into Italian Somaliland and took Kismayu. Encouraged by General Wavell he then headed for Mogadishu, 275 miles to the north-east. A motorised brigade group reached this port on February 25 to find intact vast stores of petrol and aviation spirit. The resistance had been so negligible that General Cunningham was encouraged to advance without pause on Harar in Abyssinia by way of Jijiga, 774 miles to the north of Mogadishu. To aid him and to shorten his communications General Wavell arranged that Berbera in British Somaliland should be re-occupied by a small force based on Aden. This was easily accomplished. East Africa force set out from Mogadishu on March 1. Jijiga was entered on the 17th and Harar on the 25th. In thirty days this force had covered 1,054 miles at an average speed of 35 miles a day. The Emperor Haile Selassie had crossed the border into his own country in January and under the protection of 'Gideon' Force was now about to enter Debra Markos. Meanwhile General Cunningham continued his advance on Addis Ababa which was occupied on April 6. The Emperor re-entered his capital on May 5.

General Cunningham was next instructed to attack Dessie, 250 miles to the north of Addis Ababa, in order to open up the road from Asmara to Addis Ababa so that troops might pass into Egypt *via* Massawa. On April 13, South African 1st Brigade set out for Dessie. On the way it successfully fought a five days battle in the Combolcia Pass and entered Dessie on the 26th.

140 miles to the north lay Amba Alagi where remnants of the Italian forces were entrenched and under attack from Indian 5th Division. The Sudan, East African and patriot forces converged upon this stronghold and on May 18 the Italians surrendered unconditionally. Local and spasmodic resistance continued for some time to the south of Addis Ababa, to the west of the Lakes and especially at Gondar, but with the surrender of Amba Alagi the campaign virtually closed. Gondar was stormed by patriot troops and 25th and 26th E.A. Bdes. on November 27. Thus the dream of a modern empire was shattered and an ancient empire was restored. The Suez Canal was made safe from attack from the south and the Red Sea was opened.

But before these dramatic events could occur there had to be much preparation both in the Sudan and in Kenya. In the beginning it was the Italians who invaded British territory; indeed it was here that the Italians enjoyed their only victory, the conquest of British Somaliland. But they allowed the initiative to fall from their hands and thereafter encountered naught but humiliation and disaster.

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(i)

The Invasion of Abyssinia by way of Eritrea

STRATEGIC AND OTHER CONSIDERATIONS

The campaign in East Africa was closely interlocked with that in the Western Desert. Both of them had for their object the safeguarding of the Suez Canal and thus of Egypt itself. Both were grand gestures of firm opposition to the Italian desire to consolidate and extend their dominion in Africa. But the East African campaign had yet another purpose, that of safeguarding the supply-routes to the Middle East, that *via* Aden and the Red Sea to Suez and that which linked Takoradi in Nigeria in the west to Khartoum and Nairobi in the east. If these were cut, it would be doubtful whether Egypt could be held and certain that the whole pattern of the war would become different and disadvantageous to the Allies.

MEDICAL PLANNING: WEST AND EAST AFRICA

Before the fall of France most of the British garrisons abroad were maintained at a strength but little, if at all, above normal peace establishments. With the entry of Itály into the war and the prospect of her seizing what must have appeared a unique opportunity to attempt further territorial acquisition in the Middle East, it became imperative to increase the forces stationed in the Mediterranean, in Egypt, and in East Africa. The ensuing interruption, and even partial suspension, of sea communications through the Mediterranean necessitated the adoption of the alternative route to the East by way of the Cape of Good Hope and thus entailed arrangements for the protection of the vital convoy port of Freetown, and, in view of the doubtful situation in regard to the French African dependencies, for the defence of British possessions in West Africa generally.

At the time, the four territories of British West Africa, the Gambia, Sierra Leone, the Gold Coast and Nigeria, were virtually undefended, for although two brigades of African troops had been formed, one in Nigeria and one in the Gold Coast, both soon departed for service in East Africa. With the primary object of defending Freetown, reinforcements to the extent of one brigade were despatched to West Africa. This brigade was accompanied by a medical component consisting of a field ambulance, a field hygiene section and a British general hospital, all of which units were staffed entirely by British personnel in the normal way. Meanwhile, steps were being taken to enlist and train recruits to form a large force of African troops for the protection of these territories. This development involved the creation of a new military service from front to base since the resources of the colonial medical organisation,

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adequate to meet military demands in peace-time, were totally unable to supply the personnel, transport and equipment now required. In addition to the difficulty of providing these requirements in the circumstances obtaining at the time, the task was rendered the greater by the fact that the four territories were all widely separated from one another and had no means of direct communication between them except by sea; each therefore required to be made self-supporting and independent of the rest. Consequently, no pooling of staffs, hospital beds, transport or stores was possible. Moreover, the hyper-endemicity of various tropical infectious diseases, and indeed the general unhealthiness of the climate, necessitated a relatively high scale of medical provision. For example, it was represented by the medical authorities in West Africa and agreed by the War Office that, in order to ensure a reasonable margin of safety against various contingencies, hospital accommodation must be supplied in the ratio of 13 per cent. of strength in respect of Europeans (15 per cent. in Sierra Leone) and 10 per cent. of Africans. An even higher scale was at first contemplated but subsequently considered excessive.

The field force in West Africa was organised in brigade groups and, owing to the vast distances involved, it was necessary to give each brigade group a medical service which was self-sufficient even if only for a short time. In the early stages, two field ambulances were raised in Nigeria and staffed by medical officers and subordinate personnel of the territory, a light casualty clearing station and small improvised motor ambulance convoys were evolved and existing civil hospitals were expanded to the maximum. Apart from these expedients, all medical units required for service in West Africa were provided by the War Office from its resources in the United Kingdom. In order to reduce the heavy demands for British personnel, a system was devised for the replacement of Europeans in the lower ranks by Africans. As all previously existing reserves of trained African personnel had been exhausted by the force sent to East Africa, a recruiting campaign was opened and recruits sought among Africans who had reached a reasonable standard of elementary education in the government schools. They were then taught nursing duties and other R.A.M.C. trades. In less than three years some 5,000 Africans were enlisted and trained under a programme of training initiated, and for some time conducted, solely by the West African Medical Service, but subsequently undertaken by personnel of the R.A.M.C. As soon as there was available a sufficient number of trained Africans, medical units for service in West Africa were despatched from the United Kingdom with only a nucleus of British personnel, viz. officers, nursing sisters and senior non-commissioned officers, the establishments being completed after arrival by the inclusion of African medical orderlies. Special war establishments were

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promulgated to cover medical units staffed in this manner. The despatch of medical units to West Africa, as indeed to any other part of the world at that time, was generally subject to long delay on account of the prevailing shortage of shipping. Not only was it a matter of great difficulty to obtain the allocation of accommodation and space sufficient for the personnel and equipment awaiting embarkation, but, owing to the urgent need for reinforcements, non-combatant units and stores were placed low in the order of priority for despatch and on more than one occasion were entirely excluded from convoys so as to make room for fighting troops.

As the result of developments in the political and military situation in the Middle East and in North Africa, the prospect of active operations in West Africa became more insistent. The forces there were accordingly strengthened to permit their assuming the offensive if necessary, the ultimate total for which provision was to be made being estimated at 30,000 Europeans, including the Royal Air Force, and 140,000 Africans. Moreover, the trans-continental air route between West African ports and the Middle East was now carrying a large and ever-increasing traffic, while the territories themselves had become the source from which many thousands of Pioneer labourers were recruited for service in other theatres of war. These factors made still further demands upon the medical services and called for the provision of yet more medical units. By October 1942, when the peak was reached, there was in West Africa a total of 50 medical units comprising seven field ambulances, five field hygiene sections, ten motor ambulance convoys, seven casualty clearing stations, four hospital trains, twelve general hospitals, three base depots of medical stores and two field malaria laboratories. When in the following year the defeat of the enemy in Tunisia put an end to active operations on the Continent of Africa, many of the medical units enumerated above became available for service in other theatres of war; some remained with the West African forces on their departure to the Far East, others were transferred elsewhere.

The safety of East Africa was a matter with which the Union of South Africa was closely concerned and for which the Union Government was prepared to accept a large measure of responsibility. Defence of British East African dependencies and offensive operations against the adjoining Italian colonies were therefore undertaken by the Union Defence Force and by African Colonial troops. Medical services were provided by units of the South African Medical Corps and by units raised within the East and West African territories and staffed mainly by personnel of the Colonial Medical Services. Here, as in West Africa, the system of training Africans for employment as subordinate personnel in medical units was fully developed. After the campaign in Abyssinia, the South African forces moved on to the Middle East, and the supply of medical

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reinforcements for the East African theatre of operations became a further commitment to be met by the War Office from their general resources.

THE GARRISONS OF THE SUDAN, KENYA AND BRITISH SOMALILAND, JUNE 1940

When Italy entered the war and France collapsed, a common frontier of some 1,700 miles separated some 250,000 Italian and native troops in the Italian East African possessions of Abyssinia, Eritrea and Italian Somaliland from the minute British garrisons in the Sudan, Kenya and British Somaliland.

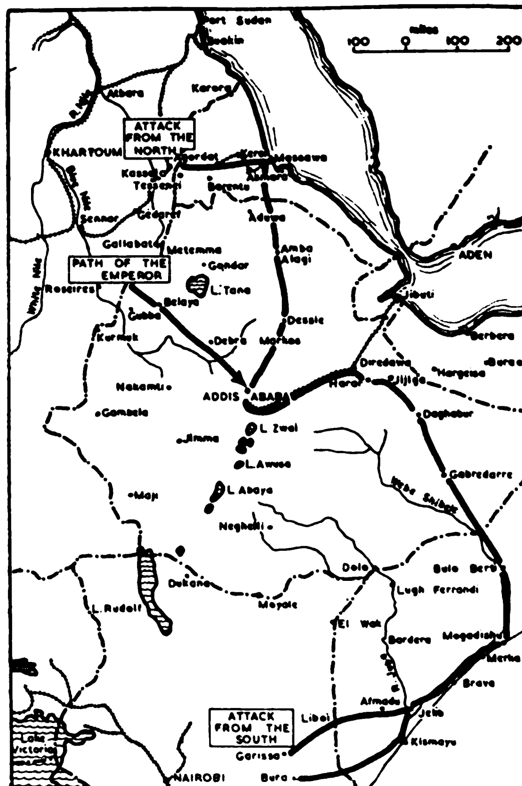

FIG. 55. East Africa.

In the Sudan there were three English battalions—2nd West Yorkshire, 1st Essex and 1st Worcestershire—and units of the Sudan Defence Force (S.D.F.),—mounted infantry companies of the Western Arab Corps and infantry companies of the Eastern Arab and Equatorial Corps. The total strength was about 9,000 of which some 7,000 were fighting troops. There were also three bombing squadrons and one

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fighter flight, R.A.F. In Kenya there were 21st and 22nd East African Brigades and two light batteries of artillery, some 8,500 altogether. In July, South African 1st, 23rd Nigerian and 24th Gold Coast Brigades arrived.

In British Somaliland there were Headquarters and five companies of the Somaliland Camel Corps and 1st Northern Rhodesia Regiment (K.A.R.), some 1,475 altogether. These were shortly to be reinforced by 1/2nd Punjab Regiment (July 1), 2nd K.A.R. (July 12), 1st East African Light Battery, R.A. (July 12), 3/15th Punjab Regiment (August 1) and 2nd Black Watch (August 7).

MEDICAL SERVICES IN THE SUDAN

Khartoum .	A British Military Hospital (90 beds), (its O.C. being S.M.O. British Troops in the Sudan); 3 R.A.M.C. officers; 4 Sisters Q.A.I.M.N.S.; 34 O.Rs. R.A.M.C.; R.M.O. Yorkshire Regt.; 2 M.Os., R.A.F.; 3 motor ambulances; 2 R.A.F. motor ambulances and 6 months' reserve of medical stores.
Atbara .	A Reception Station (9 beds); R.M.O. Essex Regt.; 2 O.Rs. R.A.M.C.; An ambulance train composed of stock converted by the Sudan Railways and held by them. It had theatre and kitchen facilities and could accommodate 52 lying cases and 1 month's reserve of medical stores.
Gebeit .	A Reception Station (6 beds); R.M.O. Worcester Regt.; 3 O.Rs. R.A.M.C.; 1 ambulance car and 1 month's reserve of medical stores.
Port Sudan .	A Reception Station (6 beds); a civil surgeon (Sudan Medical Service); 3 O.Rs. R.A.M.C.; 1 ambulance car and 1 month's reserve of medical stores.

There were civil hospitals at Khartoum, Atbara and Port Sudan, which were able and prepared to place X-ray and laboratory facilities at the disposal of the military and also to accept a limited number of military cases. A close liaison was maintained with Voluntary Civil Detachments (the equivalent of the V.A.Ds. in Britain) which had been raised and trained in Khartoum, Atbara and Port Sudan.

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THE TERRAIN, CLIMATE AND COMMUNICATIONS

The vast battleground over which this campaign was fought consisted of the great plateau of Abyssinia (Ethiopia) and its extensions into Eritrea in the north, in the Anglo-Egyptian Sudan in the west, into Uganda and Kenya in the south-west and south and in the Somalilands, Italian, British and French, in the east.

The Abyssinian plateau itself has an average altitude of 8,000 feet and falls abruptly towards the Red Sea and more gradually towards the Nile. In Abyssinia there are mountain ranges that rise to 14,000 feet and deep valleys—for example, that of the canyon of the Blue Nile—which are 4,500 feet deep. Erosion has produced strange flat-topped, sheer-sided mountain peaks known locally as 'ambas'.

A few rivers remain rivers throughout the year, for example, the Omo flowing south into Lake Rudolf, the Awash flowing north-east from Addis Ababa towards Jibuti in French Somaliland, the Webe Shibele flowing from the area of Shashmana southwards to become lost in the coastal desert below Mogadishu in Italian Somaliland, the Juba flowing from the hills south-east of Addis Ababa to the sea ten miles north of Kismayu near the Italian Somaliland–Kenya frontier, and the Uaso Nyiro and the Tana in Kenya, the former running from the northern slopes of Mount Kenya to become lost in the Lorien swamps near Habaswein, the latter traversing the length of Tanaland to enter the sea at Kipini. During the rainy seasons all these and many more are in full spate, but during the dry seasons the majority of rivers are represented by nothing more than sandy beds.

From the end of March to September the rains fall. Though the annual rainfall is little more than 30–40 inches in the hills, as much as 10 of these can fall within twenty four hours. In the coastal deserts of the Somalilands the rainfall varies between 0–9 inches annually. Here the shores are arid with only a few scattered thorn bushes to break the monotony of the drifting scorching sand. In the foothills come undulating plains of coarse grasses, and higher, between 1,000 and 7,000 feet, plateaux with grass, acacias and giant euphorbias.

Over most of Abyssinia the climate is temperate, for though the country lies wholly within the Tropics its nearness to the equator is counterbalanced by its elevation. In the deep valleys conditions are torrid, but on the uplands the air is bracing and the nights even bleak. The range of temperature is from 60°–80° F. In the higher mountains the climate is Alpine. In the coast zone of the Somalilands the heat and humidity are excessive during most of the year, June, September and October being the hottest months. At Massawa the mean temperature is 86° F. but it rises frequently to 120° F. in the shade.

Abyssinia, being an inland country, had no port. Massawa in Eritrea was the best port in the region. Jibuti in French Somaliland

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and Mombasa in Kenya were also good. Kismayu in Italian Somaliland had a small sheltered harbour, while at Mogadishu the anchorage was exposed. The small harbour at Berbera in British Somaliland was landlocked.

In Eritrea a railway, 3 feet 1⅜ inches gauge, ran from the port of Massawa to Biscia, 217 miles inland, by way of Asmara, Keren and Agordat. At Asmara the grade was such as to make this the steepest non-funicular railway in the world. From the French port of Jubiti a railway ran south-west to Addis Ababa, the capital of Abyssinia. In Kenya there was a line from Mombasa to Nairobi and thence to Nanyuki, Kitale and Kisumu on Lake Victoria. A narrow-gauge line from Mogadishu ran northwards for about 80 miles.

In Abyssinia the Italians had built two fine roads, one from Diredawa to Addis Ababa and another from Asmara to Addis Ababa. In Kenya the roads as far north as Isiolo and Kitale were good. From Mogadishu a 30 ft. Strada Imperiale ran north. It had been completed as far as Belet Uen and thereafter degenerated into a difficult track leading to Daghabur and Jijiga.

The total population of Abyssinia was estimated to be about ten millions, that of Eritrea about half a million, that of Italian Somaliland about 1,300,000 and of British Somaliland about 300,000.

MEDICAL INTELLIGENCE

Public health matters were the concern of the Inspectorate General of Health in the Italian Ministry of East Africa. Under the Governor General at Addis Ababa was a Superior Inspectorate of Health. The Italian health authorities were not active save in the control of epidemic disease. Hospitals, laboratories and quarantine stations had been established but little had been done to improve the health of the native population.

Diseases of the greatest military importance were malaria, typhus, venereal diseases and the enteric group. Less common were epidemic meningitis, relapsing fever, dengue, leishmaniasis, tuberculosis, leprosy, brucellosis, myiasis, tropical ulcer, smallpox, trachoma, diphtheria, worm infections and rabies.

Insect vectors of importance were mosquitoes, lice, fleas, ticks and the common housefly.

Malaria occurred principally in the foothill areas, in the valleys and in the plains. The zone of chief intensity was from sea level to about 3,000 feet. Italian authors reported that *vivax* infection was hyperendemic in the western plains from July to September while *falciparum* infection was hyperendemic on the eastern plains from January to March. Asmara was reported to be non-malarious, Agordat, Barentu and Tesseanei to be highly malarious and Keren mildly so.

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It was reported that some 80 per cent. of the native population had either syphilis, gonorrhoea or soft chancre, the first being the commonest.

Typhoid, paratyphoid, bacillary dysentery and amoebic dysentery all occurred, dysentery more frequently than typhoid.

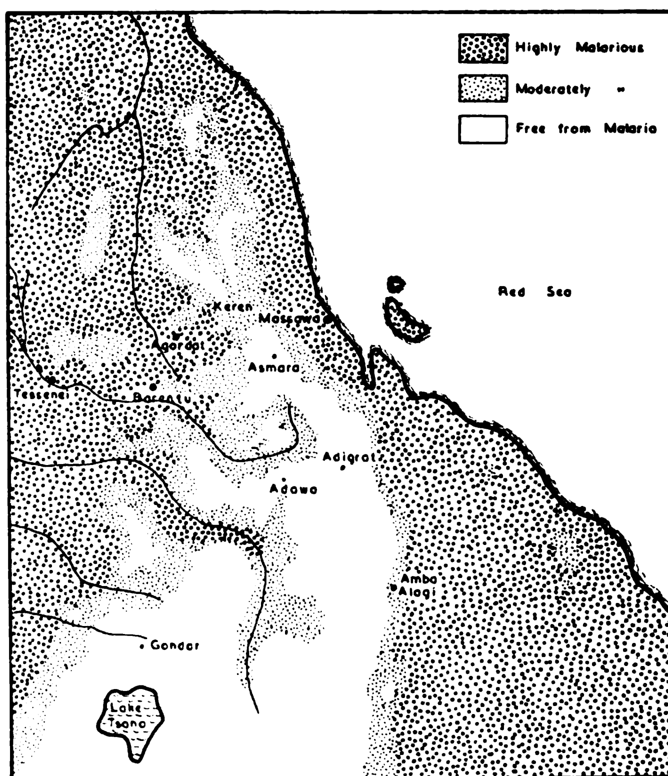

FIG. 56. The Malarious Zones of Eritrea and Abyssinia.

In 1937 it was reported that on the basis of hospital figures 21 per cent. of the Eritreans were tuberculous and that 16–50 per cent. had hookworm disease. Ascaris and enterobius infections were almost universal throughout the whole of Italian East Africa.

It followed therefore that all anti-malarial precautions should be enforced, that troops should be kept away from native villages, that protective immunisation must be undertaken, that campaigns of education and prophylaxis should be launched to enable the troops to protect themselves against venereal disease, that all local supplies of food and water should be regarded as suspect and that the strictest attention should be given to sanitary measures of all kinds.

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THE LOSS OF KASSALA AND GALLABAT IN THE SUDAN AND OF BRITISH SOMALILAND

Immediately following upon the entry of Italy into the war the small British force in the Sudan began to raid Italian posts and to occupy strategic points across the border. But it was inevitable that, just as soon as the Italian Command had marshalled its forces, these would bludgeon their way into British territory. They occupied Kassala and Gallabat on July 4, Kurmuk on July 7 and then halted. A month later they moved ponderously into British Somaliland, deploying no less than 3 Italian and 23 native battalions of infantry, a half company of medium, a squadron of light tanks, some armoured cars, 5 groups of irregulars and 57 aircraft in support.

At the time of the outbreak of war with Germany the garrison of British Somaliland consisted solely of the Somaliland Camel Corps of two Camel Companies, which included two Pony Troops, and a Rifle Company, some 14 British officers and 550 Somali and Nyasaland O.Rs. altogether. Shortly afterwards a reinforcement of 17 officers and 20 W.Os. and N.C.Os. from Southern Rhodesia arrived. At this time the defence of French and British Somaliland was considered as a single problem and the defensive plan adopted was a composite one. Berbera and Jibuti were to be protected by a defensive line on a crescent of hills which separated the coastal plain from the upland plateau. On May 15, 1940 1st Northern Rhodesia Regt. reached Berbera from Kenya. On July 1, 1/2nd Punjab Regt. arrived from Aden and on the 12th, 2nd K.A.R. and 1st East African Light Battery from Kenya.

On July 27 the French authorities in French Somaliland transferred their loyalty to the Vichy Government and the French troops holding the French sector of the common defensive line were withdrawn.

On August 7 and 8 1/2nd Punjab Regt. and 2nd Black Watch arrived at Berbera from Aden. The modified defensive plan was to hold the two principal defiles south of Berbera, at Sheikh and Tug Argan. (Tug = a dry sandy riverbed). In the Tug Argan position were 1st N.R. Regt., 2nd K.A.R. and 3/15th Punjab Regt. Holding the Sheikh Pass was 1/2nd Punjab Regt. and at Laferug, in reserve, was 2nd Black Watch.

The Italians crossed the border on August 3, captured Hargeisa, the hill station of the Protectorate, on the 6th and on the 11th began their assault upon the Tug Argan position. For four days they were checked but in the end their numbers were too great to be resisted and the front too wide to be held and so the defenders were forced to withdraw.

Permission was given by G.H.Q. Middle East to General Godwin-Austen to evacuate the Protectorate. On the night of August 15/16, while the Black Watch held the Barkasan Ridge, the defenders of Tug

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Argan withdrew to Berbera for embarkation. The Italians did not follow up so that the 16th was a quiet day. On the 17th a company of 3/15th Punjabis, thought to have been cut off and lost, made its way back through the Black Watch after having fought a successful rearguard action. Then, by stages, the Black Watch fell back on Berbera to be taken aboard H.M.A.S. *Hobart* and S.S. *Chaklata* and to reach Aden on the 19th.

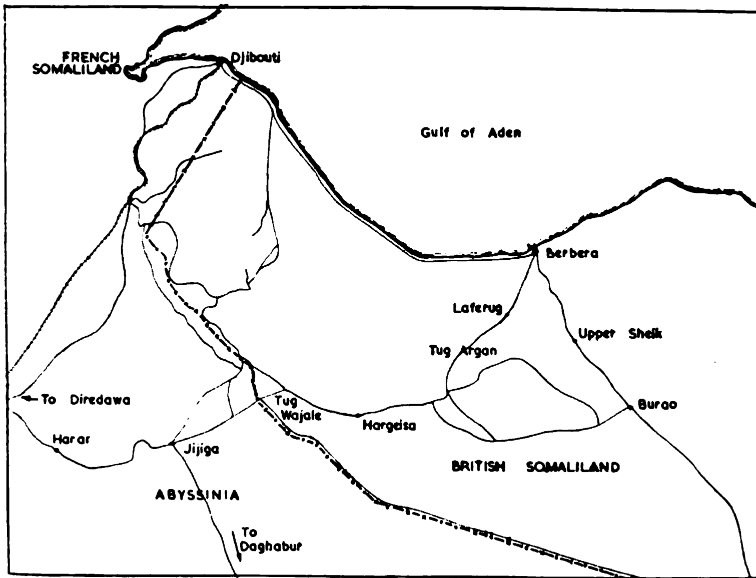

FIG. 57. British Somaliland.

MEDICAL COVER: BRITISH SOMALILAND

Serving with the Somaliland Camel Corps were Somali and Nyasaland medical orderlies. Military patients were admitted to the nearest civil hospitals. In August 1939 six of the medical officers of the Medical Department of the Protectorate were given commissions in the Army. On September 4 A.D.Ss. were established at Darburuk, on the road between Hargeisa and Berbera and at Hudisu at the bottom of the Sheikh Pass on the road between Berbera and Burao. An A.D.S. was staffed with a medical officer, an assistant surgeon and medical orderlies.*

During the period of actual fighting the A.D.S. remained at Darburuk and a M.D.S. was opened half way between Darburuk and Berbera.

* Since the affairs of the military and civil medical services were so intertwined, the Civilian Health and Medical Services, Volume II, Chapter 5, British Somaliland, should be consulted.

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Evacuation therefrom was to Berbera Hospital and thence by hospital ship.

Casualties

	Killed	*Wounded*	*Missing (presumed killed)*
British Officers . .	8	4	4
British O.Rs. . . .	8	18	17
Indian and African O.Rs. .	22	80	99
	38	102	120

A total of 260 or little more than 5 per cent. of the force. (The Official Indian Medical History—provisional narrative—gives 38 killed, 71 wounded and 49 missing.)

EARLY EVENTS IN THE SUDAN

During this period a squadron of the R.A.F. moved to the Red Sea Hills near Gebeit in the Sudan. The reception station at Gebeit was therefore increased to 18 beds and two ambulance carriers, each capable of taking 36 stretcher cases, were provided on the railway at Gebeit. The ambulance train itself was stabled at Ed Damer and arrangements were made whereby cases could be ferried across the river should the railway bridge at Atbara be destroyed by enemy attack.

In July a company of the West Yorkshire Regt. was sent from Khartoum to Gedaref. As this was in a very malarious area the regimental medical officer went with this company and all anti-malarial precautions were enforced.

At the end of August the Military Hospital at Khartoum was moved by water to Wad Medani, some 20 miles down the river. This hospital was dismantled, packed, moved together with its 60 patients and opened on its new site in four days by its R.A.M.C. personnel with the aid of native labour. It now became 53 B.G.H. (50 beds) and its nursing staff was increased to 10. At Khartoum a reception station was established to deal with the local sick. It was combined with the M.I. Room of the West Yorkshire Regt. and staffed by the R.M.O. of this battalion and two O.Rs. R.A.M.C. from the hospital. Cases for admission to hospital were conveyed to Wad Medani by motor launch.

THE ARRIVAL OF INDIAN 5TH DIVISION

During September, Indian 5th Division (Ind. 9th, 10th and 29th Inf. Bdes.), from India, disembarked at Port Sudan and to each of its brigades one of the British battalions already in the Sudan was posted. Divisional headquarters and Ind. 9th and 10th Inf. Bdes. moved to the

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Gedaref–Butana Bridge area while 29th Bde. remained about Port Sudan and Gebeit. Detachments were sent to Khartoum, to the Sennar Dam on the Blue Nile and to Atbara.

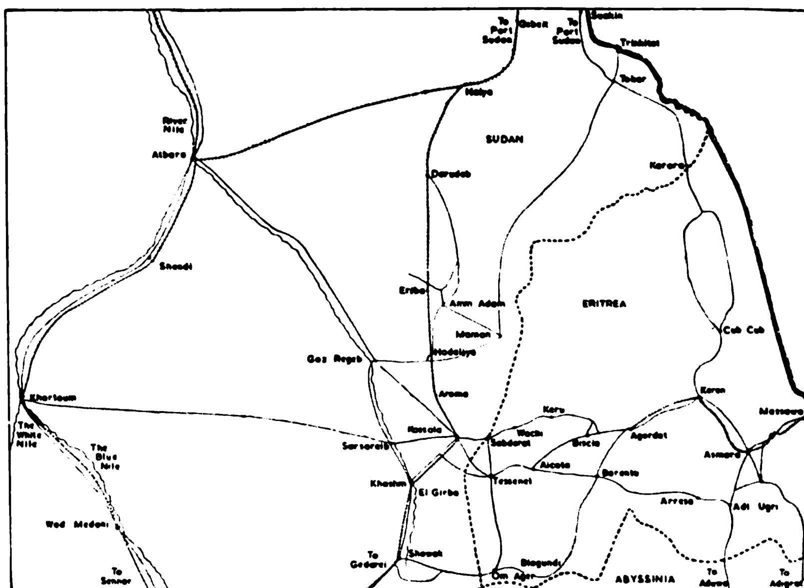

Fig. 58. The Sudan and Eritrea.

Indian 5th Division Order of Battle is shown in Appendix XX. With this division came the following medical units:

10, 20 and 21 (Ind.) Fd. Ambs.
7 (Ind.) Fd. Hyg. Sec.
together with or soon to be followed by
12 (Ind.) Fd. Hyg. Sec.
3 (Ind.) C.C.S.
10, 11 and 30 I.G.Hs.
14 and 16 (Ind.) Combined General Hospitals
11, 12 and 19 (Ind.) Staging Sections
11 (British) Staging Section (B.S.S.)
7 (Ind.) Depot Med. Stores
1 Mob. and 4 Indian X-ray Units
2 (Ind.) Field Laboratory
1 and 2 (Ind.) Anti-malaria Units (A.M.U.)
3 and 6 (Ind.) Motor Ambulance Sections
10 (Ind.) Con. Depot

The Indian troops at once began to harass enemy outposts and convoys and it was not long before the Italians were content to remain

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within the shelter of their defences at Kassala, Um Hagar (in Eritrea) and Gallabat. A squadron of 6th Royal Tank Regiment and 170 Lt. Fd. Amb. also reached the Sudan.

'Gazelle' Force, a highly mobile force, was built around Skinner's Horse and the S.D.F., and based upon the Gash Delta north of Kassala. To this force 170 Lt. Fd. Amb. was attached.

By the end of October the medical units that had so far arrived were distributed as under:

Port Sudan . .	11 I.S.S.
Gebeit . . .	14 C.G.H. less detachment (450 beds)
	2 (Ind.) Fd. Lab.
	1 (Ind.) Mob. X-ray Unit
	6 M.A.S.
	7 (Ind.) Depot Med. Stores
Wad Medani . .	14 C.G.H. detachment (150 beds)
	53 B.G.H. (now 200 beds)
Gedaref „ .	3 (Ind.) C.C.S.
	11 Br. S.S.
	10 (Ind.) Fd. Amb. H.Q.
	20 (Ind.) Fd. Amb. (closed)
	7 (Ind.) Fd. Hyg. Sec.
	1 (Ind.) A.M.U.
Sennar . . .	2 (Ind.) A.M.U.
Khashm-el-Girba .	10 (Ind.) Fd. Amb. 'B' Coy.
Showak . . .	10 (Ind.) Fd. Amb. 'A' Coy.
Haiya . . .	21 (Ind.) Fd. Amb.
	3 M.A.S.
Atbara . .	12 I.S.S.
	12 (Ind.) Fd. Hyg. Sec.
With 'Gazelle' Force .	170 Lt. Fd. Amb.
	11 M.A.C. one sec.

Evacuation System. Transportation in the Sudan is almost entirely confined to the railway and the river. Though in the dry weather it was generally possible to drive anywhere, in many parts the tracks were quite unsuitable for ambulance cars. It soon became manifest that a second ambulance train was required, and this was formed. The two ambulance carriers (coaches with dressing theatre and kitchen) were used in front of the two ambulance trains, carrying cases either to the M.D.S. or to the C.C.S. Both ambulance trains were based on Khartoum. As Kassala was in Italian hands all evacuation from the southern area had to be effected by rail to Wad Medani, Khartoum and thence to Gebeit. From the northern area evacuation was *via* Haiya to Gebeit.

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The policy was to keep the forward medical units clear and so it was that large numbers of cases which otherwise would certainly have been held were evacuated to the base.*

THE ATTACK ON GALLABAT

Gallabat, a village with a fort 100 miles south-west of Gedaref and on the Sudan–Abyssinia frontier, is separated from Metemma, another small village with a fort and on the Abyssinian side of the frontier line, by a dry watercourse known as the Boundary Khor. The approach to Gallabat from Gedaref was along a 90 mile rough track through a country covered with elephant grass 6–12 feet high. Halfway along this track was the small village of Doka.

The attack was undertaken by Ind. 10th Bde. together with a squadron of 6th R. Tks. and was made on November 6. It was opened at 0530 hours and within an hour and a quarter Gallabat had fallen to 6th R. Tks., 3/18th Royal Garhwal Rifles and 1st Essex Regt. But then this force was subjected to heavy air attack and suffered many casualties and heavy tank losses. The attack on Metemma was therefore abandoned and the troops withdrew to positions which permitted them to deny Gallabat to the Italians. Following this action 1st Essex was replaced in the brigade by 2nd H.L.I.

MEDICAL COVER FOR THE ATTACK ON GALLABAT

Casualties were estimated at 150 lying, 150 sitting and 300 wounded P.o.W. They were, in fact, 42 killed and 125 wounded. Medical units were distributed as follows:

A.D.S. 10 (Ind.) Fd. Amb. near Signal Hill, 3½ miles N.W. of Gallabat.

M.D.S. 10 (Ind.) Fd. Amb. at Khor Yodrub, 2½ miles behind the A.D.S. and near a water point. 12 ambulance cars were available.

Lt. Sec. 3 (Ind.) C.C.S. and 20 ambulance cars at Doka in I.P. tents 45 miles away from the M.D.S. 20 ambulance cars operated in front of the C.C.S.

3 (Ind.) C.C.S. less Lt. Sec. 6 amb. cars and lorries with Berridge equipment† at Gedaref, 45 miles behind Doka. 6 amb. cars and a number of lorries connected the Lt. Sec. with the C.C.S. itself.

14 C.G.H., less detachment, at Gebeit.

14 C.G.H. detachment at Wad Medani.

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* This policy is one which calls for very careful consideration in circumstances in which huge distances are involved. The tendency is to keep forward units clear in expectation of a heavy influx of cases, which seldom if ever occurs. Large numbers of 'slight' cases are therefore moved vast distances to their own detriment. Moreover, the loss to the forward units in respect of man-power imposes a serious strain on 'A' Branch reinforcement programmes. The policy of 'forward holding' with augmented facilities for nursing and treatment has much to commend it and possesses but few disadvantages. W.Es. of field medical units might well embody this policy.

† See footnote on p. 201.

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16 C.G.H. detachment (later reinforced by two sections from 15 I.G.H. in Egypt) at Khartoum, partly opened with 200 beds.
Ambulance trains running between Gedaref, Wad Medani, Khartoum and Atbara to Gebeit. P.o.W. casualties to the civil hospital at Abu Ushar, midway between Wad Medani and Khartoum.

All the wounded, including Sudanese and P.o.W., were evacuated to 3 (Ind.) C.C.S. at Gedaref by the evening of November 10. 82 sick were also evacuated from the light section of this C.C.S. at Doka between November 6–9.*

PREPARATIONS FOR AN ATTACK ON KASSALA

Early in November 'Gazelle' Force carried out a reconnaissance in force in connexion with preparations for an attack on Kassala. 170 Lt. Fd. Amb. and a detachment of 10 (Ind.) Fd. Amb. were attached to this force. On November 4, 10 (Ind.) Fd. Amb. established a car post north of Yodrub Hill while 170 Lt. Fd. Amb. opened an A.D.S. at Javal Rored, 8 miles from the car post and a M.D.S. at Mekali, 40 miles to the rear of the A.D.S. and adjacent to the railhead.

On the 7th the car post was attacked by Italian aircraft and it was found necessary to withdraw the post to Mekali Wells. On the 9th the car post returned to its original site and on the way accepted the surrender of a detachment of Italian colonial cavalry. On the 11th, after successfully attacking the Italian positions north and south of the eastern end of Khor Yodrub road, 'Gazelle' Force withdrew.

THE ARRIVAL OF INDIAN 4TH DIVISION

Indian 4th Division (Ind. 5th, 7th, 11th Inf. Bdes.) with divisional troops and services reached the Sudan from the Western Desert between December 31, 1940 and January 6, 1941. Its 7th Brigade, disembarking at Port Sudan on December 31, moved to the Gebeit area.

Indian 4th Division Order of Battle is shown in Appendix XX.

With this division came 14, 17 and 19 (Ind.) Fd. Ambs., 15 (Ind.) Fd. Hyg. Sec. and 2 (Ind.) C.C.S. This division was part of General Wavell's strategic reserve. It was switched to the Sudan immediately after the battle of Sidi Barrani. About this time too units of the Free French and Belgian forces reached the Sudan as did also 16 and 32 B.G.Hs., 4 Ind. Depot Med. Stores and 8 Ind. Adv. Depot Med. Stores.

The arrival of a division in the Sudan usually entailed a great deal of preparatory work to safeguard the newcomers from malaria. But it so happened that Indian 4th Division was to be stationed in one of the few non-malarious areas in the country, so that the normal precautionary measures were unnecessary. Indian 5th Division had arrived at the end of the malarial season, but since it was to be stationed in an intensely

* For an account of the psychiatric aspects of this action see Army Medical Services. Campaigns, Volume II, Chapter 7.

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malarious area extensive precautionary measures had to be taken. An anti-malaria organisation was provided by the civil medical service and this was augmented by the anti-malaria units of the division when they arrived. Much educational work was carried out among the troops and comprehensive anti-malarial activity was undertaken.

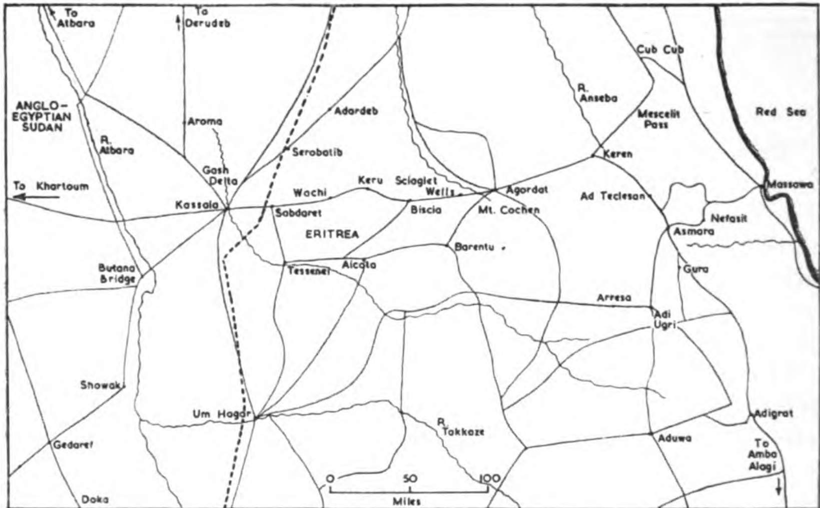

FIG. 59. The Invasion of Eritrea.

THE INVASION OF ERITREA

TO KERU AND AICOTA

In early January 1941, evidence had accumulated which indicated that the Italians were preparing to vacate the Kassala–Sabdaret–Tessenei triangle. It was therefore decided to advance the date of the attack on Kassala from February 8 to January 19.

On January 12, Ind. 11th Inf. Bde. (4th Division) was instructed to be ready to move to Aroma, Ind. 29th Inf. Bde. (5th Division) towards the Jebel Ibrahim Tau and 'Gazelle' Force to the east of Sabdaret. But on the 18th it was confirmed that the Italians had pulled out and Kassala was re-occupied together with Tessenei.

Indian 4th and 5th Divisions were then instructed to pursue the retreating Italian force, Indian 4th Division to move *via* Sabdaret, Wachai and Keru, Indian 5th Division by way of Aicota, and thereafter to exploit towards Biscia or Barentu. On January 21, Indian 4th Division reached the outer defences of Keru and Indian 5th Division occupied Aicota without opposition. On the 22nd 4/11th Sikhs of 'Gazelle' Force u/c Indian 4th Division stormed the Italian positions in the Keru gorge and moved into Keru itself on the 23rd. A large portion of the retreating

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Italians was trapped and captured by 10th Bde. of Indian 5th Division which had moved up in their rear from Aicota on the Barentu road.

MEDICAL COVER OF THE ADVANCE ON KERU AND AICOTA

Indian 4th Division Sector. On January 18, prior to the advance:

1. 170 Lt. Fd. Amb. opened a forward M.D.S. at Mekali.
2. 11 M.A.C., three sections, operated between Mekali and the railhead at Aroma.
3. 14 (Ind.) Fd. Amb. opened a rear M.D.S. at Aroma.
4. Lt. Sec. 2 (Ind.) C.C.S. and a S.D.F. hospital of 200 beds opened at Aroma.
5. 2 (Ind.) C.C.S., less Lt. Sec., was open at Derudeb.

Casualties were evacuated from the M.D.S. at Mekali by M.A.C. to Aroma and thence by ambulance carrier or train to Derudeb and Gebeit.

By January 21, the medical units were distributed as follows:

1. 170 Lt. Fd. Amb., M.D.S., at Wachai;
   4 Sec. with 'Gazelle' Force.
2. 19 (Ind.) Fd. Amb. at Tehamiam.
3. 17 (Ind.) Fd. Amb., M.D.S., 4 miles east of Sabdaret;
   'A' Coy. A.D.S. at Wachai;
   'B' Coy. at Jebel Mokram.
4. 14 (Ind.) Fd. Amb. at Aroma;
   Lt. Sec. 2 (Ind.) C.C.S. at Aroma;
   Ambulance carriers at Aroma.
5. 2 (Ind.) C.C.S., less Lt. Sec. at Derudeb.

On the 23rd the M.D.S. of 17 (Ind.) Fd. Amb. moved to a site a few miles beyond Wachai and 170 Lt. Fd. Amb. moved its M.D.S. into Keru itself on the 24th.

Indian 5th Division Sector.

1. 21 (Ind.) Fd. Amb. established its M.D.S. at Khashm el Girba.
2. Lt. Sec. 3 (Ind.) C.C.S. opened at Khashm el Girba where 6 M.A.S. had two ambulance cars.
3. 11 (Br.) Staging Section
19 (Ind.) Staging Section
20 (Ind.) Fd. Amb. H.Q.
17 cars 6 M.A.S.
Medical Railhead } were at El Hagiz.
4. 2 Amb. Carrier
Hyg. Sec. 3 (Ind.) C.C.S. } were at Gedaref.
5. Ambulance trains were on call for evacuation behind Gedaref. Casualties were evacuated by M.A.C. to El Hagiz and thence by ambulance carrier or train to Gedaref and Khartoum. Casualties evacuated between January 22 and 24, numbered 112.

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TO AGORDAT AND BARENTU

On January 24, Indian 4th Division occupied Biscia and on the evening of the 25th its leading elements began to press against the Italian positions to the west of Agordat. On the following day 'Gazelle' Force attempted to get behind the town from the north, but owing to the difficulties of the terrain failed to do so. On January 27, Ind. 5th Inf. Bde. joined the division. Meanwhile, Ind. 11th Bde., attempting to circumvent the town from the south, had been attacking the formidable feature of Mt. Cochen. The battle continued without pause until the 31st when Ind. 5th Bde., reinforced by 'I' tanks, attacked up the central plain. The Italians then fled. Agordat was occupied on February 1 and Barentu on the following day after a converging and strongly resisted attack by 10th and 29th Bdes. of Indian 5th Division. (Plate XXXI shows the type of country in which the troops had to operate.)

MEDICAL COVER FOR THE ADVANCE ON AGORDAT

Indian 4th Division.

1. 170 Lt. Fd. Amb. established its M.D.S. at Keru.
2. Lt. Sec. 2 (Ind.) C.C.S. and 14 (Ind.) Fd. Amb. were open at Aroma, 110 miles to the west.
3. When Biscia was taken on January 24, 17 (Ind.) Fd. Amb., with eight M.A.C. cars moved to Biscia and opened its M.D.S. 'B' Coy. of this Ambulance with 11 I.S.S. and two M.A.C. cars opened a relay post at Wachai. The M.D.S. of 170 Lt. Fd. Amb. at Keru then closed.
4. 19 (Ind.) Fd. Amb. reached Keru.
5. Hy. Sec. 2 (Ind.) C.C.S. was at Derudeb under orders to move to Kassala.

Indian 5th Division.

1. Following the capture of Aicota 20 (Ind.) Fd. Amb. had its M.D.S. at km. 306 on the Aicota–Barentu road.
2. H.Q. 21 (Ind.) Fd. Amb. opened another M.D.S. at Tessenei to serve the rear area.
3. Lt. Sec. 3 (Ind.) C.C.S. was open at Khashm el Girba.
4. 11 (Br.) and 19 (Ind.) S.Ss. were stationed at El Hagiz.

THE BATTLE OF KEREN

The Italians had fallen back to Keren, there to stand and protect Asmara, the capital of Eritrea. Keren is a superb example of a natural fortress. The approach to it along the Agordat–Keren road runs through a deep valley guarded by precipitous mountains on either side. Opposite Mount Dologorodoc the road turns sharply north across the valley to enter the Dongolaas Gorge, therein to climb to the higher plain of Keren itself. On Mount Dologorodoc stood

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PLATE XXXI. Eritrean Bush Country. A Patrol of Indian 9th Infantry Brigade.

[*Imperial War Museum*

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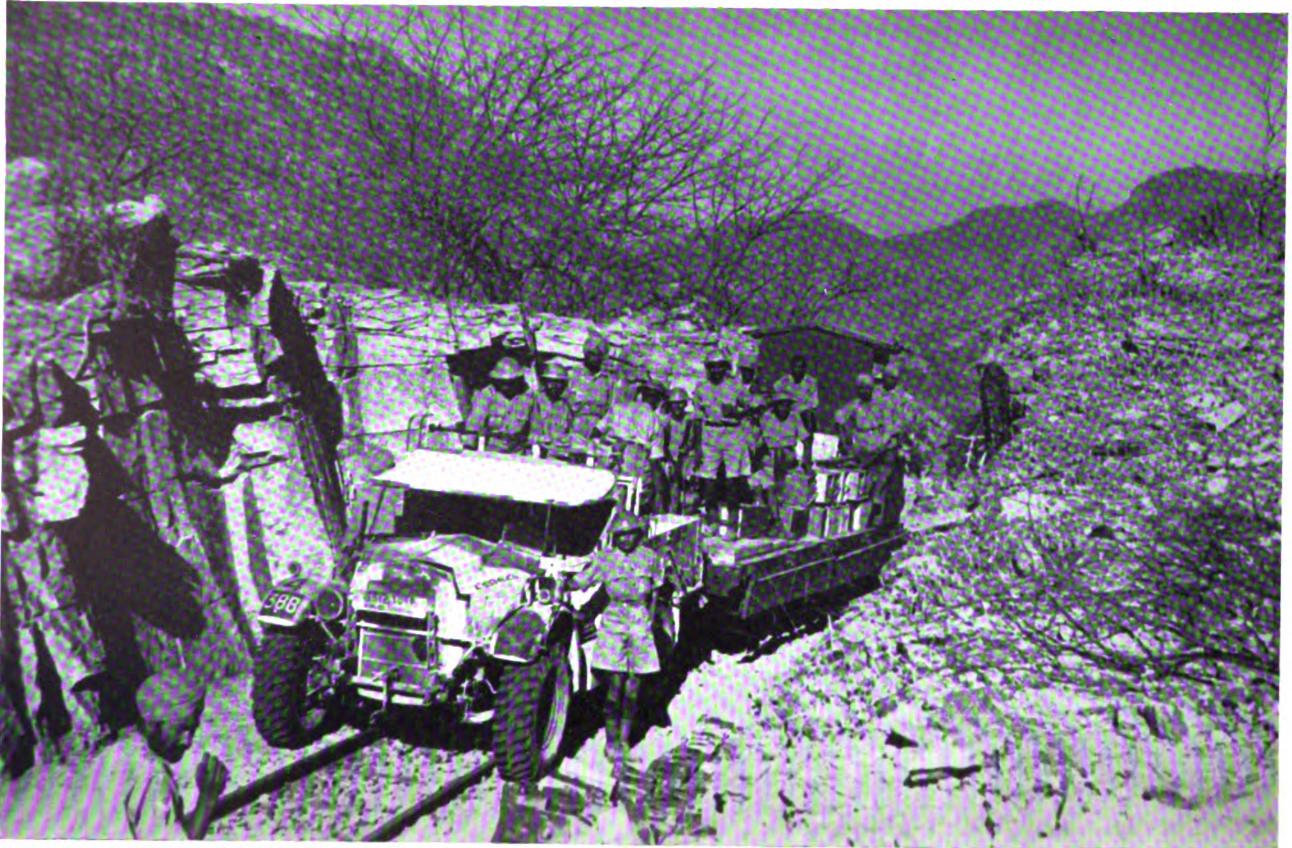

PLATE XXXII. The Battle of Keren. The Railway 'Flats' that brought up Supplies and took back Casualties.

[*Indian Historical Section*

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a sentinel fort which was overlooked on the east by Mount Falestoh, on the north-east by Mount Zeban and on the north-west by Mount Sanchil.

Overlooking the Agordat–Keren road lies a series of great peaks on the north-west. This included a number of features which severally came to be known as Brig's Peak, Hog's Back, Flat Top and Mole Hill. Still further to the north were the masses of Mount Samanna and Mount Amba. Along the face of this mountain wall, at a higher level than the road itself, ran the railway from Agordat through Keren to Asmara and Massawa. The line passed through a tunnel as it entered the Dongolaas Gorge. (Plate XXXII illustrates the 'Flats' used on the railway for the transport of supplies for the troops.)

Below Fort Dologorodoc and to the east of the road is a great amphitheatre which came to be known as Happy Valley. In the north wall of this valley is a gap—the Acqua gap. On the right of this gap stands Mount Zelale which came to be known as the Sphinx.

On February 2, Ind. 11th Inf. Bde. moved up from Agordat behind 'Gazelle' Force and on the following day captured a hill feature, which came to be known as Cameron Ridge, to the south-west of Mount Sanchil. On February 4/5, 3/14th Punjabis captured Brig's Peak and a part of Mount Sanchil itself. But the Italians at once counter-attacked and drove the Punjabis off both of these positions. By nightfall on the 5th, 2nd Camerons and 1/6th Rajputana Rifles were on Cameron Ridge.

On the 6th the Italians counter-attacked throughout the day but without avail.

It was then decided to attempt to break into the Italian positions by an attack through the Acqua gap. Ind. 5th Inf. Bde. moved up to Happy Valley on February 7/8 and assaulted the gap in the early hours of the 8th. But the position was too strongly and stoutly held and the attack failed, although Rajputana Ridge was held and consolidated. 'Gazelle' Force relieved Ind. 5th Inf. Bde. on February 8/9 and Ind. 11th Inf. Bde. captured Brig's Peak and Sanchil on February 10 but was quickly counter-attacked and driven off. Then Ind. 11th Inf. Bde. attacked again and the Peak was retaken, only to be lost again on the 12th. On February 12, Ind. 5th Inf. Bde. with 'Gazelle' Force u/c once more attacked the Acqua gap, but after a whole day's bitter fighting had to be withdrawn. 'Gazelle' Force was now disbanded.

It was now accepted that a different plan must be adopted and that both divisions would be necessary for the capture of Keren. While Indian 4th Division clung on to Cameron Ridge, Indian 5th Division was withdrawn so that its transport could be used to build up supplies and ammunition. The railway line from Agordat was repaired and forward supply dumps established.

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THE REVISED TACTICAL PLAN

Indian 4th Division.

(*a*) to operate west and north of the Agordat–Keren road;
(*b*) to capture the general line Sanchil–Brig's Peak–Hog's Back–Flat Top–Mount Samanna;
(*c*) to give artillery support to Indian 5th Division;
(*d*) to exploit towards Mount Amba and Mogareth.

Indian 5th Division.

(*a*) to operate east of the road;
(*b*) to capture Fort Dologorodoc and Mount Zeban;
(*c*) to exploit towards Keren;
Zero hour to be 0700 hours on March 15.

THE ATTACK

Indian 4th Division attacked and everywhere encountered stubborn opposition. By dusk on March 15 the lower features of Mount Sanchil, a portion of Brig's Peak, Flat Top and Hog's Back and also of Mount Samanna had been taken.

At 1030 hours on the 15th, Ind. 9th Inf. Bde. of Indian 5th Division launched its attack from behind Cameron Ridge, and by 0615 hours on the 16th had captured Fort Dologorodoc and held it against counter-attack.

Ind. 29th Inf. Bde. on March 17 then passed through to attack towards the crossroads Falestoh–Zeban from Fort Dologorodoc. Much ground was gained but the positions were all overlooked and exposed to M/G fire. In the afternoon the brigade withdrew behind Fort Dologorodoc. While Fort Dologorodoc was held against repeated counter-attacks plans were made to repair a road block and attack up the Gorge itself.

Then on the 25th, Indian 5th Division attacked again, and this time successfully. At 0445 hours Ind. 10th Inf. Bde. attacked and thrust its way to the north of the road block between Dologorodoc and Sanchil while Ind. 9th Inf. Bde., moving down the western slopes of Dologorodoc, cleared the defences to the south of the road block. The Sappers and Miners cleared the block and by evening of the 26th the road into Keren was open. On the 27th, Ind. 29th Inf. Bde. attacked Mount Zeban and occupied the feature without opposition. During the night of March 26/27 the Italians had withdrawn and Keren was taken.

MEDICAL COVER FOR THE BATTLE OF KEREN

Period February 4–7.

1. 170 Lt. Fd. Amb. two secs. (with Ind. 11th Bde. and 'Gazelle' Force) opened its M.D.S. about 25 miles from Keren where the river Boggo Baraca crosses the main road.

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2. 19 (Ind.) Fd. Amb. (two companies) established a relay post to the west of Agordat.
   19 (Ind.) Fd. Amb. (two companies) opened an A.D.S. at Acqua for Ind. 5th Bde.
3. A surgical team was sent to the Italian civil hospital at Agordat.
4. 17 (Ind.) Fd. Amb. opened an A.D.S. for Ind. 11th Bde.
5. 14 (Ind.) Fd. Amb. remained in reserve as did also two sections of 170 Lt. Fd. Amb.
   270 casualties were evacuated through the M.D.S. during this period.

Period February 8–13.

1. 170 Lt. Fd. Ambs. M.D.S. remained open at Boggo Baraca until the 10th when 14 (Ind.) Fd. Amb. established a M.D.S. at Km. 110 which received casualties from A.D.Ss. of 17 (Ind.) Fd. Amb., 19 (Ind.) Fd. Amb. and 170 Lt. Fd. Amb. with Ind. 11th Inf. Bde. and 'Gazelle' Force respectively and evacuated them by M.A.C. to Agordat.
2. An advanced stretcher-bearer post with 60 stretchers was established at the bottom of Mount Sanchil.
3. After the attack on the Acqua gap had failed 14 (Ind.) Fd. Amb. moved back to Km. 120.

Casualties to the number of 221, including 58 sick, passed through the M.D.S. on February 8 and 9. On the 12th, 340 casualties were evacuated.

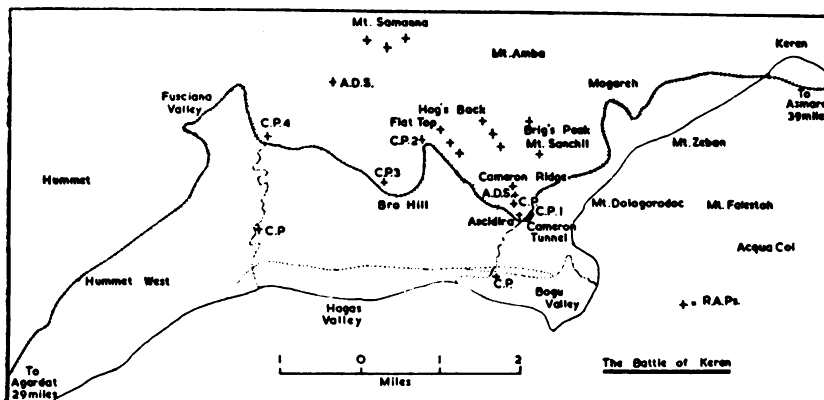

FIG. 60. The Battle of Keren. The Evacuation Chain.

Period March 5–27.

The demands now made upon the personnel of the field medical units were almost overwhelming. The L. of C. had become extended to over 100 miles of exceedingly difficult country. Medical detachments had to be provided by the field ambulances all along the length of the Kassala–Agordat road. It was well that the Italian hospital at Agordat

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was found to be so well stocked. 19 (Ind.) Fd. Amb. provided a detachment for this hospital and here all cases were held until they were fit to travel. Light cases were held at the relay post of 19 (Ind.) Fd. Amb. near Agordat or else sent on to 'B' Coy. 17 (Ind.) Fd. Amb. at Km. 271·5 on the Agordat–Barentu–Tessenei road.

By February 17, 3 (Ind.) C.C.S. had taken over the civil hospital in Agordat and 19 (Ind.) Fd. Amb. thus relieved, moved to Km. 120 in reserve. At the same time 11 I.S.S. relieved 'B' Coy. 17 (Ind.) Fd.Amb. at Km. 271·5.

The evacuation was as follows:

Indian 4th Division Sector.

By stretcher-bearers from R.A.P. to relay post to A.D.S. to collecting posts on the railway, each of these being staffed by a company of a field ambulance.

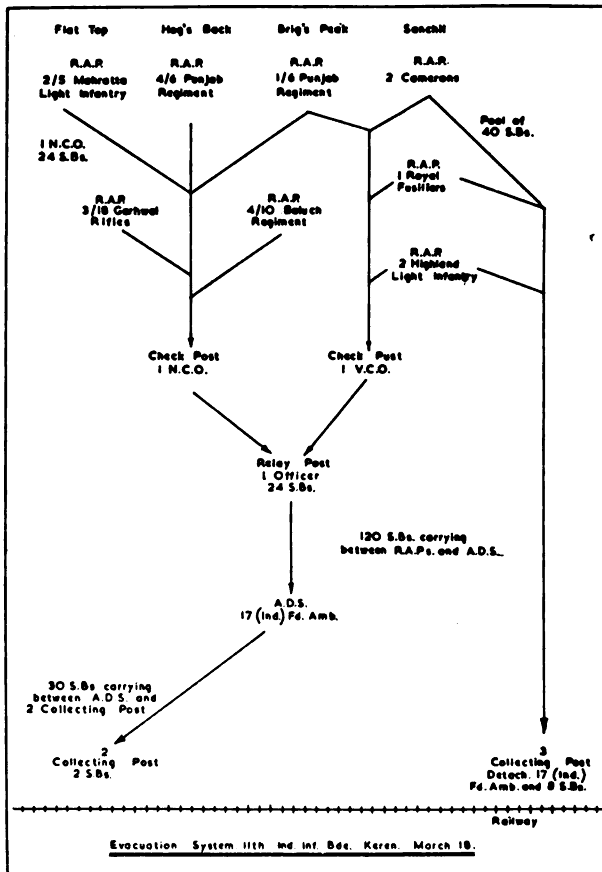

FIG. 61. The Battle of Keren. Medical Cover for Indian 11th Infantry Brigade.

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The terrain was such that between the R.A.P. and the A.D.S. relay posts had to be established every few hundred yards. The personnel of the three field ambulances of the division were pooled to provide a total of 240 stretcher-bearers. 180 of these stretcher-bearers were allotted to Ind. 11th Inf. Bde. and 60 to Ind. 5th Inf. Bde. The exact disposition of medical personnel varied from day to day. Figures 61 and 62 show this distribution as on March 18.

Over 900 casualties were evacuated from this sector during the period March 15–17.

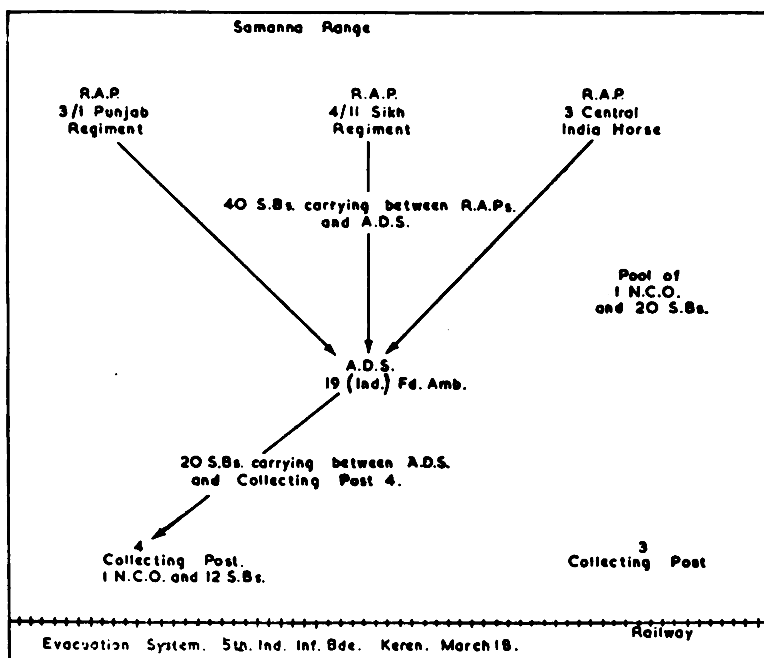

FIG. 62. The Battle of Keren. Medical Cover for Indian 5th Infantry Brigade.

Every available man among the field ambulance personnel was employed as a S.B. About 300 casualties were evacuated from this sector during the period March 15–17. The average time between injury and admission to the M.D.S. was six hours.

When on March 16, Flat Top had been occupied it became possible to make use of the railway for evacuation purposes. Trolleys taking three stretcher or ten sitting cases and pulled by mules were readily made available. These travelled from collecting posts 1 and 2 to 3 at Bro Hill, two miles along the line. Here three large goods wagons, 'flats', each carrying nine stretcher or thirty sitting cases and hauled

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by a Diesel engine, conveyed them to C.P. 4 and thence to the Railhead at Hummet West, where 14 (Ind.) Fd. Amb. had an A.D.S. Thence ambulance cars conveyed the casualties to the M.D.Ss. of 17 and 19 (Ind.) Fd. Ambs. at Km 120. Here an advanced operating centre (a surgeon, an anaesthetist, a radiologist and an ophthalmologist) was established (only four miles away from the front line).

Against the possibility that evacuation by rail might become impossible, two car posts, one at the foot of Cameron Ridge and the other below Samanna Ridge, were provided. A medical officer, four ambulance cars and four 30-cwt. lorries were stationed at each of these posts.

Indian 5th Division.

For the attack by Indian 5th Division on Fort Dologorodoc on March 15, a company of 10 and a company of 20 (Ind.) Fd. Ambs. were placed u/c Ind. 9th Inf. Bde. and two companies of 21 u/c Ind. 29th Inf. Bde. 21 (Ind.) Fd. Amb. established its M.D.S. at Km. 120 on the Agordat–Keren road. 10 (Ind.) Fd. Amb. established an A.D.S. at Ascidira and a car post at truckhead. By 0930 on the 15th some 200 casualties had accumulated in the A.D.S. and from reserve (H.Q. 10 (Ind.) Fd. Amb. and 20 (Inf.) Fd. Amb. less one company) ambulances and personnel were rushed forward under the direct orders of A.D.M.S. Indian 5th Division.

During this period the divisional medical resources were strained to the utmost. The main difficulties were:

(*a*) Advanced dressing stations and car posts were under constant shell and mortar fire and had perforce to remain at the sites originally selected, no other suitable sites being available.
(*b*) Long carries from R.A.Ps. to A.D.Ss. over extremely difficult hill tracks under constant small arm, mortar and shell fire.
(*c*) Difficult carry from A.D.S. through bearer relay post to car post.
(*d*) Difficulty in collecting casualties from Sapper units working on the road block at Km. 105. This was done during the hours of darkness and entailed a carry of about 2 miles to the car post. Most of this time stretcher-bearers were under shell fire. During one night alone 22 cases were cleared.
(*e*) Difficulties of supplying equipment, medical comforts and water to A.D.S. in Fort Hill area.
(*f*) Loss of stretchers and other medical equipment through enemy action.
(*g*) Number of casualties dealt with. These totalled 1,500 wounded and 990 sick.
(*h*) Excessive number of casualties among medical personnel—47 wounded and 8 killed.

When Fort Dologorodoc fell, the road was freed and ambulance cars could proceed right up to the foot of Cameron Ridge. The C.P. under Samanna Ridge was therefore transformed into a W.W.C.P.

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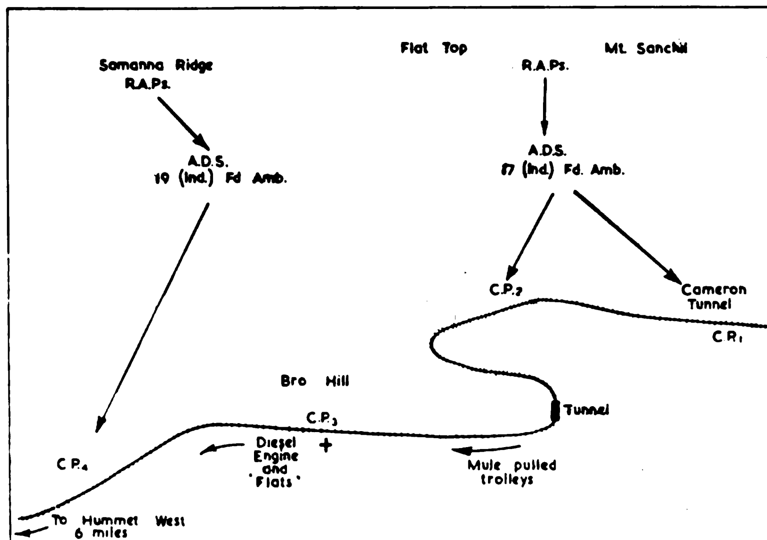

FIG. 63. The Battle of Keren. The Evacuation Chain following the Capture of the Flat Top Feature.

On March 16, 20 (Ind.) Fd. Amb. established a C.P. at Km. 98 to deal with casualties that had been incurred on the southern slopes of Mount Dologorodoc. When the Fort fell, an A.D.S. was at once established on the Fort Hill by 21 (Ind.) Fd. Amb. To help here all B.O.Rs. and I.O.Rs. of 7 (Ind.) Fd. Hyg. Sec. were employed.

On March 20 the field medical units were distributed as follows:

10 (Ind.) Fd. Amb.	H.Q. and C.P. at Km. 98. 'B' Coy. at Fort Hill ('A' Coy. back at Gallabat).
20 (Ind.) Fd. Amb.	H.Q. (less detach.) and 'A' Coy. at Km. 119 resting. Detach. at C.P. in Happy Valley. 'B' Coy. at Fort Hill.
21 (Ind.) Fd. Amb.	H.Q. and 'A' Coy. at Km. 120 resting. 'B' Coy. at C.P. at Km. 98.

During the final attack on March 25–27, evacuation from Ind. 9th and 29th Inf. Bdes. was from R.A.Ps. to the A.D.S. on Fort Hill and thence to the C.P. at Km. 98 by S.Bs. From the C.P. motor ambulance evacuated to the M.D.S. of 21 (Ind.) Fd. Amb. at Km. 120. During this period the base hospitals receiving casualties were:

		Indian	*British*
Gebeit	53 B.G.H. . . .	—	300
	16 B.G.H. . . .	—	800
	14 C.G.H. . . .	900	100
	10 I.G.H. . . .	900	

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		Indian	British
Gebeit	30 I.G.H.	700	
	British Con. Depot	—	1,000
	10 (Ind.) Con. Depot	500	
Khartoum	32 B.G.H.	—	800
	S.D.F. Hospital (250 beds)		
	16 C.G.H.	900	
Tessenei	11 I.G.H.	400	100 (from 16 C.G.H.)
Gadaref	S.D.F. Hospital (100 beds)		

Towards the middle of March, 11 I.G.H. at Tessenei was overcrowded and so the more serious cases were taken by air from Agordat to Khartoum. The total casualties during the battle of Keren were 536 killed and 3,229 wounded.

TO ASMARA AND MASSAWA

After the battle of Keren was won Indian 4th Division, less Ind. 7th Inf. Bde, returned to the Western Desert, leaving Indian 5th Division to press on to Asmara and Massawa and thus complete the conquest of Eritrea.

Asmara, the capital, stands on a plateau about 7,000 feet high. The road from Asmara to Keren falls very steeply from Ad Teclesan to the level of Keren and is carved out of the hillsides.

The retreating Italians were followed by 'Fletcher' Force (a squadron less a troop of 4th R. Tks. and about 50 Bren carriers of Indian 4th and 5th Divisions) with Ind. 29th Inf. Bde. close behind. Ind. 7th Inf. Bde. of Indian 4th Division which had approached Keren from the north *via* Karora and Cubcub was concentrating, preparatory to moving on Massawa along the Red Sea littoral. At Ad Teclesan the Italians had constructed road-blocks covered by artillery and machine-gun fire. Ind. 29th Inf. Bde. stormed two of these while Ind. 10th Inf. Bde. threatened the Italian flank. Ind. 9th Inf. Bde. passed through 29th Bde. and cleared the third and thus opened the road to Asmara on the morning of April 1. Italian emissaries met the advancing troops, informed them that resistance had ceased and requested that Asmara should be regarded as an open city. Leading elements of Indian 5th Division entered the capital at 1315 hours on April 1.

Indian 5th Division then moved on Massawa and on April 5 the Italian commander asked for terms. A truce was imposed until 1100 hours on April 6. The terms offered were refused and hostilities began again at 1300 hours on April 7.

Ind. 7th Inf. Bde. u/c Indian 5th Division, attacked from the north, Ind. 10th Bde. and the Free French Brigade from the south-west, Ind. 7th Bde. was checked but Ind. 10th Bde. advanced steadily. After a show of resistance the garrison surrendered at 1410 hours on April 8. The conquest of Eritrea was now complete.

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The Italian Eritrean Army had been destroyed. Over 40,000 P.o.W. and 260 guns had been taken. The Italian colonial troops had deserted in their tens of thousands. The main supply dumps had been captured. The Italian Red Sea fleet and the Regia Aeronautica in East Africa had been obliterated.

MEDICAL COVER FOR THE ADVANCE ON ASMARA AND MASSAWA

(*a*) *Asmara*

Companies of 20 and 21 (Ind.) Fd. Ambs. with Ind. 10th and 29th Inf. Bdes.
10 (Ind.) Fd. Ambs. M.D.S. at Keren.
H.Q. 20 and 21 (Ind.) Fd. Ambs. in reserve at Keren.

(*b*) *Massawa*

170 Lt. Fd. Amb. with Ind. 7th Inf. Bde.
'A' and 'B' Coys. 20 (Ind.) Fd. Amb. + 16 motor-ambulances at Km. 95 on the Asmara–Massawa road.
H.Q. 10 (Ind.) Fd. Amb. + 4 M.A.C. cars at Dongolo, Km. 61 on Asmara–Massawa road.
20 (Ind.) Fd. Amb. M.D.S. at Asmara.

103 casualties were received by the M.D.S. of 20 (Ind.) Fd. Amb. during the fighting. They were evacuated by M.A.C. to 3 (Ind.) C.C.S. at Agordat. Immediately Asmara was occupied 3 (Ind.) C.C.S. (Agordat), 53 B.G.H. (Gebeit), 11 I.G.H. (Tessenei) with the British section of 16 C.G.H. (Khartoum) moved to the capital. When Massawa was taken casualties were evacuated by a hospital carrier with a capacity of 100 stretcher cases from Massawa to Port Sudan and thence to Gebeit.

INTO ABYSSINIA TO AMBA ALAGI

Indian 5th Division next turned to the south to deal with the Italian forces that had collected at Amba Alagi.

Amba Alagi, 235 miles south of Asmara, is the central peak of a range of mountains which forms a barrier of great natural strength. From the north three roads led towards it. The Strada Imperiale from Asmara wound through the Toselli Pass, guarded by Toselli Fort. From this there led two approaches to Amba Alagi, to the east *via* the Stretta do Meyda and the Falaga Pass; to the west *via* goat tracks over Sandy Ridge. From the south the road to Amba Alagi was the same Strada Imperiale from Dessie. Road blocks had been constructed by the Italians on the Toselli and Falaga roads. Along the Sandy Ridge approach there was a series of features which were called respectively Pyramid, Fin, Whale Back, Elephant, Middle Hill and Little Alagi. Set back to the south-west were Castle Ridge and Castle Hill on another spur. Continuing beyond Amba Alagi, the other side of the Toselli Pass were Triangle, Twin Pimples, Gumsa and Tongue, overlooking the

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Marda Pass. On the approach to Falaga from the north were two features, Commando Hill and Wireless Hill.

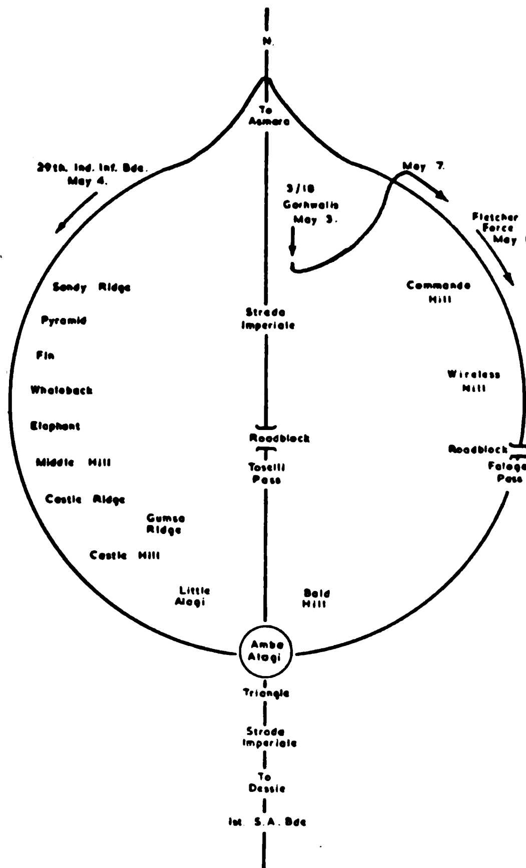

FIG. 64. The advance on Amba Alagi.

THE ASSAULT ON AMBA ALAGI

'Fletcher' Force moved up the Falaga Pass road to take Commando Hill on May 1 and Wireless Hill on the 2nd. On the 3rd an indecisive action was fought in the Pass itself. On the 3rd also, 3/18th Garhwal Rifles pressed along the Strada Imperiale towards Amba Alagi. On the 4th, Ind. 29th Inf. Bde. moved along Sandy Ridge to secure and hold Middle Hill. On the 8th, Castle Ridge was occupied. 3/18th Garhwal Rifles were then switched to the Falaga Pass. 'Fletcher' Force, reinforced by 3/18 Garhwalis and 3/12th Frontier Force, now became Ind. 9th Inf. Bde. On the night of the 8/9th, 9th Bde. captured Falaga Pass and Gumsa Ridge.

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On April 13, S.A. 1st Bde. had moved out of Addis Ababa along the Strada Imperiale for the north. Its first check was at the Combolcia Pass near Dessie. It took the brigade five days to drive the Italians out of their strong positions. Aided by Abyssinian patriots of Campbell's Scouts the South Africans (1st Royal Natal Carabineers, 1st Transvaal Scottish and 1st Duke of Edinburgh's Own Rifles) then burst through to occupy Dessie on the 26th. On May 1 the brigade moved on from Dessie towards Amba Alagi. On arrival it was given the task of assaulting 'Triangle' on the opposite side of the Toselli Pass from Amba Alagi. By the evening of the 14th, Triangle was taken and the investment of Amba Alagi became complete. The Italian garrison, some 5,000 troops, the remnant of the forces in Eritrea, Addis Ababa and Dessie, promptly surrendered.

MEDICAL COVER FOR THE ASSAULT ON AMBA ALAGI

For the attack on Amba Alagi the Indian medical units were distributed as follows:

(*a*) 21 (Ind.) Fd. Amb., 'A' and 'B' Coys. and 10 (Ind.) Fd. Amb. 'B' Coy. . . .	u/c Ind. 29th Inf. Bde.
at Sandy Ridge (to serve Ind. 29th Inf. Bde.) . . .	Bearer Relay Post
at Picket Village . . .	A.D.S.
midway between this village and Km. 357¼ . . .	Bearer Relay Post
at Km. 357¼ . . .	Car Post
(*b*) 10 (Ind.) Fd. Amb. 'A' Coy.	u/c 'Fletcher' Force
at Commando Hill (to serve 'Fletcher' Force) . .	A.D.S., Car Post and S.B.s
at Mai Messie, Km. 351 .	u/c Indian 5th Division. Combined A.D.S. for 'Fletcher' Force and Ind. 29th Inf. Bde.
at Quiha, Albergo Hotel .	M.D.S. 21 (Ind.) Fd. Amb. 'A' Coy. 4 A.C.C. sec.
at Adigrat Italian Military Hospital	M.D.S. 10 (Ind.) Fd. Amb., 11 M.A.C. sec. with 25 cars
at Asmara	H.Q. 20 (Ind.) Fd. Amb., 3 (Ind.) C.C.S. and 16 C.G.H., one sec. 100 beds for Br. casualties.

The first stage of evacuation was attended by much difficulty. It could take as long as two days to get a casualty back from the firing-line to road level. It could require no less than four relays of stretcher-bearers, 16 in all, to carry a casualty for so long a distance and over such country. The A.D.Ss. had to be prepared to retain cases overnight.

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Once the road was reached evacuation was speedy though the way was long, some 225 miles to Asmara. For this evacuation 62 ambulance cars and two requisitioned buses, capable of holding 35 sitting cases apiece, were available. Life-saving surgery was undertaken at the M.D.S. at Quiha. Thence evacuation was to the M.D.S. at Adigrat and on to the C.C.S. at Asmara, with a short rest at Adi Caieh.

After the capture of the Pyramid and Elephant features on May 5th the A.D.S. and C.P. with Ind. 29th Inf. Bde. moved to Elephant Hill and Km. 364½ respectively.

On May 22, Ind. 29th Inf. Bde. took over command of the Quiha–Messie area. 10 (Ind.) Fd. Amb. moved to Adigrat and Toselli Fort, 20 (Ind.) Fd. Amb. to Asmara and 21 (Ind.) Fd. Amb. to Quiha and Dessie.

By the end of June Indian 5th Division began to leave East Africa and by July had reached the Western Desert.

(ii)

The Invasion of Abyssinia by way of Italian Somaliland

EARLY EVENTS IN KENYA

In Kenya, as in the Sudan, shortly after the entry of Italy into the war there was much offensive patrolling on the part of the garrison, followed after an interval by an Italian invasion which ceased when the Italians had occupied a few points of some strategic importance. A company of the King's African Rifles held off the attack of an Italian brigade at Moyale for five days before it withdrew. There was much skirmishing between Moyale and Buna and some stiff fighting west of Lake Rudolf and up to the river Omo by elements of the K.A.R. and Abyssinian patriot bands. Kenya farmers and their trucks and cars, transmogrified by war into the East African Reconnaissance Squadron, harassed the enemy continually.

THE ARRIVAL OF SOUTH AFRICAN 1ST AND 11TH AND 12TH AFRICAN DIVISIONS

General Cunningham arrived in Nairobi on November 1, 1940 to take command of a force which consisted of S.A. 1st Division and 11th and 12th African Divisions. S.A. 1st Bde. was attached to 12th African Division. Irregular companies were formed out of Somalis and Abyssinian refugees.

The Order of Battle of East Africa Force on January 1, 1941, was as follows:

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	Medical Units
South African 1st Division	6 (S.A.) Fd. Hyg. Sec.
S.A. 2nd Inf. Bde.	12 (S.A.) Fd. Amb.
S.A. 5th Inf. Bde.	11 (S.A.) Fd. Amb.
25th E.A. Inf. Bde.	6 (U.) Fd. Amb.
11th African Division	3 (E.A.) Fd. Hyg. Sec.
21st E.A. Inf. Bde.	2 (Z) Fd. Amb.
23rd N. Inf. Bde.	3 (N.) Fd. Amb.
12th African Division	2 (E.A.) Fd. Hyg. Sec.
S.A. 1st Inf. Bde.	10 (S.A.) Fd. Amb.
22nd E.A. Inf. Bde.	1 (T.) Fd. Amb.
24th G.C. Inf. Bde.	4 (G.C.) Fd. Amb.

A. = African: E.A. = East African: G.C. = Gold Coast: K. = Kenya: N. = Nigerian: S.A. = South African: T. = Tanganyika: U. = Uganda: Z. = Zanzibar.

At the end of May, 1940, the Director-General of the Medical Services of the Union of South Africa was appointed D.M.S. East Africa. He was to be responsible for all medical services in the East African theatre of operations. In June he established his H.Q. at Nairobi with a staff which included R.A.M.C., South African Medical Corps (S.A.M.C.) and East African Army Medical Corps (E.A.A.M.C.) officers. In the same month he submitted his recommendations concerning requirements in respect of medical units:

	Totals		*Totals*
Field Ambulances	7	Motor Ambulance Convoys (75 cars and 45 trailers)	4
Casualty Clearing Stations	5	Mobile X-ray Units	3
General Hospitals (European) 1,400 beds	3	Ambulance Trains	2
General Hospitals (African) 1,400 beds	2	Field Hygiene Sections	2
Mobile Field Laboratories	3	Convalescent Depots	2
		Mobile Dental Units	5

By the end of 1940 the following units were at his disposal:

Field Ambulances	10, 11, 12, 15 (S.A.) 1 (T.) 2 (Z.) 3 (N.) 4 (G.C.) 5 (K.) 6 (U.)
Casualty Clearing Stations	1 (T.) 2 (E.A.) 5, 6 and 7 (S.A.) 10 Belgian Congo

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Motor Ambulance Convoys	1 (T.) 2 (K.) 10 and 11 (S.A.)
General Hospitals (G.H.)	1 E.A.G.H. 1,000 African at Nairobi 2 S.A.G.H. 600 European at Nairobi 3 E.A.G.H. 600 African at Nyeri 4 S.A.G.H. European at Nyeri
Mobile X-ray Units	1, 2 and 3 (S.A.)
Mobile Laboratories	1 and 2 (S.A.) 1 (E.A.)
Mobile Dental Units	1, 2 and 3 (S.A.)
Field Hygiene Sections	1, 2 and 3 (E.A.) 6 (S.A.)
Adv. Depot Med. Stores	S.A. Adv. Depot Med. Stores
Base Depot Med. Stores	S.A. Base Depot Med. Stores Nairobi
Also on Strength	
M.A.C.	3 (U.), 15 (S.A.)

Motor Transport Company, London Ambulance Unit
The Lady Moore Military Hospital (40 beds, European) Nairobi
The Soroti–Juba Coy.* S.A.M.C.

Each battalion of a S.A. brigade had two regimental medical officers and each battalion of an African brigade had one. Each S.A. battalion had on its strength one S.A.M.C. hygiene officer.

The Order of Battle of East Africa Force is given in Appendix XXI.

THE RAID ON EL WAK

The first offensive operation of any considerable magnitude to be undertaken in Kenya was the raid on El Wak on the Kenya–Italian Somaliland border. El Wak was a group of villages, an Italian defended position and a landing strip. The raid was undertaken by 12th African Division, using S.A. 1st Bde. and 24th G.C. Bde. with S.A. 1st Lt. Tk. Coy. and mechanised transport and with 4 (G.C.), 5 (K.) and 10 (S.A.) Fd. Ambs. and 10 (S.A.) M.A.C. These brigades moved by night (December 15/16, 1940) from Wajir and proceeded 115 miles northwards through boulder-strewn bush country. The raid was completely successful, the Italian outpost was razed to the ground and its garrison flung back to the line of the Juba river. The raiding force withdrew during the night of the 17/18th.

* An improvised unit formed to provide the staffs of the medical installations in this area.

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The real enemies in this affair were the terrain and the climate, and out of this experience much was learnt that was to shape the tactics of much that followed. The temperature neared 120° F. and there was no breeze. The troops had no more than four to seven hours sleep during the forty hours before the action began. During the approach march from Wajir the vehicles raised great clouds of choking dust. No wonder then that there were nineteen cases of heat exhaustion.

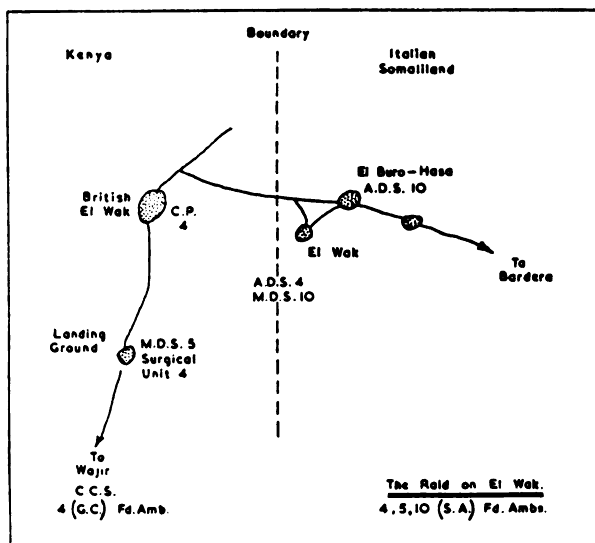

FIG. 65. The Raid on El Wak. Medical Cover.

The medical arrangements made were as follows:

1. H.Q. Coy. 5 (K.) Fd. Amb. opened its M.D.S. at the landing ground;
2. Lt. Sec. 'A' Coy. 4 (G.C.) Fd. Amb. formed a collecting post at British El Wak;
   Hy. Sec. 'A' Coy. 4 (G.C.) Fd. Amb. formed a surgical unit near the M.D.S. at the landing ground;
3. 'B' Coy. 4 (G.C.) Fd. Amb. opened an A.D.S. to the south of El Wak. This company was responsible for the carriage of water and surgical supplies from the M.D.S. to the A.D.S.;
4. H.Q. Coy. 10 (S.A.) Fd. Amb. formed a M.D.S. near this A.D.S.;
   'A' Coy. 10 (S.A.) Fd. Amb. formed an A.D.S. in El Buro Hasa when this village was taken. Later 'A' Coy. moved into El Wak itself;
   Detachment 10 (S.A.) Fd. Amb. formed a staging post at Habaswein;
5. H.Q. Coy. 4 (G.C.) Fd. Amb. formed a temporary C.C.S. at Wajir;
6. Two Valencia aircraft were available at Arbo. These were to come up to the landing ground as required by signal and evacuate casualties to the C.C.S. at Wajir;
7. Base general hospitals at Nyeri (350 miles away) and Nairobi (420).

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The circumstances were such that it was accepted that the medical services could not attempt to provide anything beyond first aid and rapid evacuation back to the M.D.Ss. where well trained nursing orderlies, lorries, ambulance cars, 50 blankets and 100 gallons of water had been sent. The surprise was so complete and the attack so overwhelming, however, that the casualties, expected to be about 500, were less than a score. The ambulance cars were able to get right up to the R.A.Ps. and the casualties were evacuated to Wajir by air on the 17th.

Out of this experience emerged these lessons:

1. Ambulance cars should have four-wheel drive and high clearance.
2. The 3-ton lorry with stretcher fittings was of great usefulness.
3. Every vehicle, including the ambulance, should carry pick and shovel and each light aid detachment (L.A.D.) a block and tackle.
4. There was need for a forward blood transfusion unit.
5. A water ration of 5 gal./patient/day was quite insufficient. Ample water in containers must be carried with the A.D.S.
6. The strictest water discipline must be enforced if the water ration is to be 1 gal./man/day under such conditions, otherwise efficiency must quickly deteriorate.
7. Inter-communication is ensured if the M.D.S. is near the debussing point on the brigade axis and the A.D.S. near brigade H.Q. with R/T communication between brigade H.Q. and battalion H.Q. O.C. Fd. Amb. at brigade H.Q. can then co-ordinate all medical arrangements.

THE INVASION OF ABYSSINIA. ISIOLO–MEGA–MOYALE

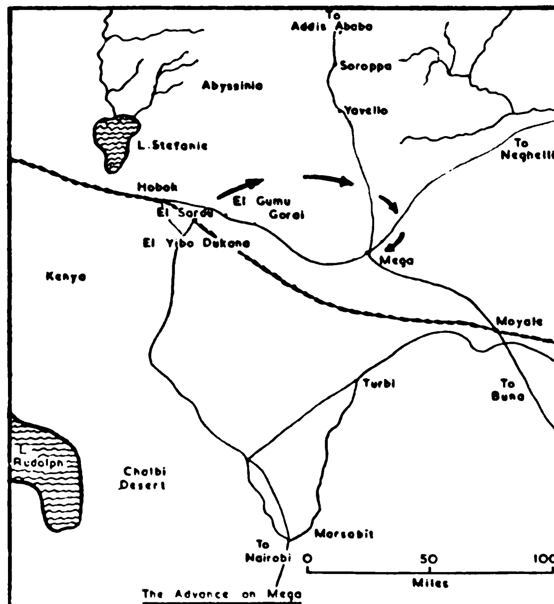

FIG. 66. The Advance on Mega.

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The first large scale attack upon Italian territory was directed to the north-east of Lake Rudolf.

On December 1, S.A. 1st Division (2nd and 5th Inf. Bdes.) took over from 12th A. Division the Isiolo–Marsabit area in the north-west frontier region of Kenya. During January plans were made for an advance over the frontier and the development of a left hook through Mega and Moyale, which would clear the Italians out of this part of southern Abyssinia. On December 30, 25th E.A. Bde. came under command of S.A. 1st Division and held the area to the west of Lake Rudolf.

From Marsabit two roads of a kind run into Abyssinia, one north-east to Moyale and one due north through Dukana. The latter was known to be bad. It ran through the white sand of the Chalbi Desert and through the blistering volcanic wastes about Rudolf and then on into desolate bush. But it could be used to turn the Moyale–Mega escarpment.

On January 30, S.A. 2nd and 5th Inf. Bdes. moved out in two parallel columns from Dukana. Next morning they cut the Hobok–Gorai road and then swung right and left, against El Gumu and Hobok and against Gorai respectively. On February 1, El Gumu was captured by S.A. 5th Inf. Bde. and Gorai by 2nd Bde. The two brigades then combined to move on Mega, 5th Bde. attacking from the north-west and 2nd Bde. from the south-east. By 1725 hours on the 18th its garrison had surrendered. On February 2 a patrol of Abyssinian patriots entered Moyale which had been abandoned by the Italians. Meanwhile on March 4, 21st E.A. Bde., u/c S.A. 1st Division, reached Yavello and on the 24th occupied Neghelli. H.Q. S.A. 1st Division and S.A. 5th Bde. now left this area for the Western Desert and S.A. 2nd Bde. went to British Somaliland.

The main problems of these operations were those created by the great length of the L. of C. and by the climatic conditions. Railhead was at Nanyuki, 150 miles away from Marsabit, while from Marsabit to Dukana was another 150 miles of extremely bad desert track. Mega was 150 miles away from Dukana, the two being joined by very poor roads. So that when the division had reached Moyale it was well over 500 miles from railhead along the divisional axis.

Climatic conditions were exceedingly trying. To begin with there had been the heat and dust of the hot lava bed of which the country up to Gorai was composed and then, when the fight for Mega began, 'the little rains' came with their bitter cold to turn the black cotton soil into cloying mud.

MEDICAL COVER FOR THE ADVANCE ON MEGA AND MOYALE

In order that complete treatment should be offered as far forward as possible it was decided that:

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1. 12 (S.A.) Fd. Amb. should be brigaded with S.A. 2nd Inf. Bde.
   11 (S.A.) Fd. Amb. should be brigaded with S.A. 5th Inf. Bde.
   6 (U.) Fd. Amb. should be brigaded with 25th E.A. Inf. Bde.
   2 (Z.) Fd. Amb. should be brigaded with 21st E.A. Inf. Bde.
2. Each of these units should be given additional equipment so that each of their companies could provide field theatre facilities:
3. Two companies of 15 (S.A.) Fd. Amb., reinforced by 3 (S.A.) Mob. Bact. Lab. and 1 (S.A.) Mob. X-ray Unit and 3 (S.A.) Field Dental Unit and additional equipment, should function as a light C.C.S.
4. 10 and 11 (S.A.) M.A.Cs. should evacuate rearwards.
5. 15 (S.A.) Fd. Amb. should provide a staging post.

These arrangements worked smoothly and at no time were the medical services extended. The light C.C.S. was opened at Dukana and 10 (Belgian) C.C.S. joined the division to open at Lodwar.

During the attack on Mega twenty-one cases of exhaustion due to the bitter cold were admitted to the field medical units. The total number of admissions was 2,533 during January–February, of which sixty-six were battle casualties from the S.A. brigades and twenty-four from 25th E.A. Bde.

THE INVASION OF ITALIAN SOMALILAND

THE CROSSING OF THE JUBA RIVER

Tactical Plan.

1. A sham offensive opposite Bardera
2. 12th A. Division (S.A. 1st, 22nd E.A. and 24th G.C. Bdes.) would move forward from Garissa *via* Liboi, Haweina, Beles Gugani and Afmadu. Then 24th G.C. Bde. would attack Bulo Erillo and threaten Jelib on the further bank of the Juba River. S.A. 1st Bde. would swing south-east and take Gobwen, thus cutting off the retreat of the Italians in Kismayu.
3. 11th A. Division (21st E.A. and 23rd N. Bdes.) would move from Bura across the frontier on Kismayu.

22nd E.A. Bde., of 12th A. Division, moved on Garissa through Liboi (January 24), Haweina (27th), Beles Gugani (February 4), to enter Afmadu on the 11th. Thence S.A. 1st Bde., u/c 12th A. Division, moved down the Wajir–Afmadu–Kismayu road to capture Gobwen, which it entered on February 14. At the same time 24th G.C. Bde. (12th A. Division) continued to press along the Afmadu–Jelib road and took Bulo Erillo on the 13th. The stage was now set for the crossing of the river, which at this season constituted a formidable obstacle. The Italian garrison of Kismayu, thus threatened, withdrew eastwards across the Juba on February 13 and the port was occupied on the following day by 22nd E.A. Bde. of 12th A. Division, then moving up from Afmadu, since 11th A. Division was too far back for this purpose.

The Juba, near Jelib, forms two channels, the more westerly being known as the Dry Juba, the more easterly as the Wet Juba. Bulo Erillo

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was to the west of the Dry Juba. Jelib, held in considerable strength by the Italians, was to the east of the Wet Juba. Midway between these two places and on the road which joins them and thus crosses the island contained between the two channels of the river, was the village of Alessandra, still in Italian hands.

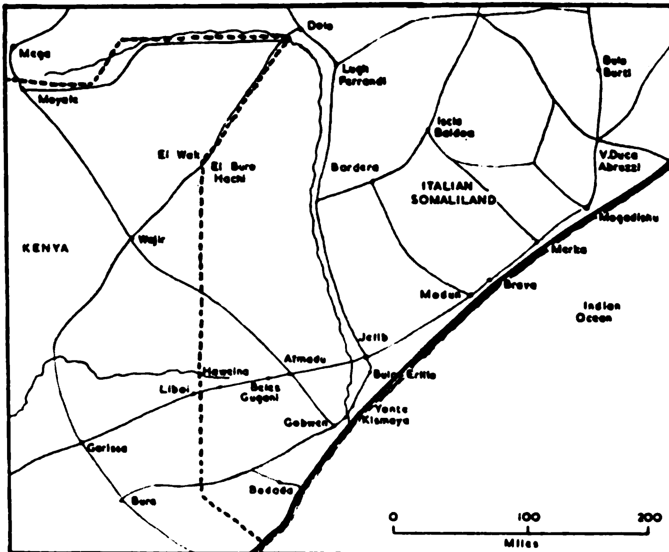

FIG. 67. The Advance on Mogadishu.

S.A. 1st Bde. (12th A. Division) setting out from Gobwen, made a wide detour of some 15 miles up the west bank of the river to Yonte and there crossed the river, in the face of opposition, on the 17th. At the same time the Gold Coast Brigade (12th A. Division) moved north from Bulo Erillo to Mbungo and there forced its way across on the 19th. Then 22nd E.A. Bde. (12th A. Division) passed through and plunged into the bush to move, parallel with the river, to the south-east to cut the Jelib–Mogadishu road about sixteen miles beyond Jelib.

S.A. 1st Bde. from Yonte, also moving parallel to the river northwards, occupied Giumbo on February 20 and entered Jelib on the 22nd a few minutes before 24th G.C. Bde. advancing from the north.

Italian resistance in this area at once crumbled, the Italians themselves surrendering, their native troops deserting and fleeing into the bush.

Without pause, 22nd E.A. Bde., now u/c 11th A. Division, pushed on through Jelib to reach Modun, 150 miles along the road to Mogadishu, on the 23rd and to enter Brava on the 24th. 23rd Nigerian Brigade (11th A. Division) then took the lead and passed on to Merka, fifty miles further on, on the 25th and on the evening of this day to enter Mogadishu

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itself. The Nigerian brigade group had covered 235 miles between 0600 hours on February 23 and 1700 hours on the 25th.

While these astonishingly rapid advances were being made, 12th A. Division, consisting of 24th G.C. Bde. only, turned inland at Jelib to move parallel to the river as far as Bardera, which was duly occupied by 24th G.C. Bde. on February 26. Thence the column moved on Iscia Baidoa, which was entered on the 28th and then along the Merka–Dolo road to Lugh Ferrandi (March 3) and to Dolo itself which was occupied on March 5. Shortage of water and supply difficulties played havoc with the Italian units which became isolated by the rapid advance of East Africa Force.

MEDICAL COVER FOR THE CROSSING OF THE RIVER JUBA

On February 20, the forward medical units were distributed as follows:

2 (E.A.) Fd. Hyg. Sec. was with 12th A. Division, 3 (E.A.) Fd. Hyg. Sec. with 11th A. Division;
1 (T.) Fd. Amb. was with 22nd E.A. Bde. which had come u/c 11th A. Division;
2 (Z.) Fd. Amb. was with 21st E.A. Bde. and thus not involved;
3 (N.) Fd. Amb. was with the 23rd Nigerian Bde.;
4 (G.C.) Fd. Amb. was with the 24th Gold Coast Bde. in the Mbungo area;
5 (K.) Fd. Amb. was established in the local hospital at Kismayu, having taken over from 3 (N.) Fd. Amb.;
10 (S.A.) Fd. Amb. was with S.A. 1st Bde. in Gobwen;
Lt. Sec. 2 (E.A.) C.C.S. was still at Afmadu;
Hy. Sec. 2 (E.A.) C.C.S. was at Garissa;
1 (T.) M.A.C. was at Kismayu.

When S.A. 1st Bde. had occupied Yonte 'A' Coy. 10 (S.A.) Fd. Amb. established an A.D.S. there while 'B' Coy. had a staging post at Andaref for onward evacuation to Lt. Sec. 2 (E.A.) C.C.S. at Afmadu. When on February 18, the brigade moved from Yonte towards Giumbo and Jelib casualties were ferried across the river to ambulance cars stationed on the west bank. Late that day a pontoon bridge was completed, but the Gobwen–Afmadu road became impassable and so evacuation from the M.D.S. at Gobwen was switched from Afmadu to Kismayu. Forty-six Europeans and eighteen Africans were thus evacuated on February 19, and eighteen cases were sent by air to Nairobi. On February 20, the M.D.S. moved up to Yonte and 'A' and 'B' Coys. moved across the river, 'B' Coy. opening in Margherita and also in Jelib and 'A' Coy. establishing its A.D.S. on the Margherita–Jelib road about ten miles south of Jelib. When the pontoon bridge was moved to

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the vicinity of Giumbo the M.D.S. moved from Yonte to Giumbo where large quantities of medical stores were discovered. Later the M.D.S. moved to Margherita where on February 22 it admitted 29 cases, on the 23rd, 41 and on the 24th, 89. Evacuation therefrom was to Kismayu where 7 (S.A.) C.C.S. had arrived on the 23rd.

'A' Coy. 10 (S.A.) Fd. Amb. moved with the column heading for Mogadishu. It established dressing stations at Modun and Brava. In the hospital at Brava sixty Italian patients were found and captured Italian medical officers were placed in charge.

The number of cases dealt with by 10 (S.A.) Fd. Amb. during the period February 14–28 was:

TABLE 50

	British Commonwealth	P.o.W. and civilian	Totals
Battle casualties .	65	126	191
Sick . . .	234	29	263
Totals . .	299	155	454

The field ambulances of 11th A. Division, 3 (N.), 5 (K.) and 2 (Z.) Fd. Ambs. were arranged in echelon. The A.D.M.S. decided that as far as possible casualties should be held in the field ambulances so that when Kismayu had been occupied they could be evacuated by sea. Casualties of 12th A. Division incurred during the crossing of the Juba river were evacuated to 1 (T.) Fd. Amb. at Afmadu.

The road from Kismayu to Afmadu was so bad in places that the evacuation of the seriously wounded or sick by road was out of the question. They were therefore evacuated by air; they were fortunately very few in number. Kismayu was found to be in an indescribably insanitary state and the presence of large numbers of Somalis bent on looting made matters considerably worse.

At this stage there appeared in 12th A. Division a mild form of dysentery which, while having no marked effect on the progress of operations, was the source of considerable trouble to the medical services. In a campaign of such rapid movements it was of the greatest importance that field ambulances should not be encumbered with large numbers of patients, and there was at one time danger lest detachments should be immobilised in camps containing many men who were wholly or partially recovered, while the combatant units to which they were attached had moved perhaps fifty or a hundred miles ahead. There was a shortage of all forms of transport, but the danger was averted by the initiative of medical officers in utilising every kind of

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transport they could lay hands on,* by the co-operation of the supply and transport services and by fairly large scale air evacuation. In spite of this it was found necessary to leave a camp of these semi-convalescents in charge of a field hygiene section. This was unavoidable but entailed the misuse of an essential unit.

While the columns and their attached medical units were heading for Mogadishu and for Dolo at breakneck speed, those field medical units that remained behind were busily occupied. Lt. Sec. 2 (E.A.) C.C.S. at Afmadu was soon holding about a hundred sick, while 5 (K.) Fd. Amb. at Kismayu was attempting to cope with a rapidly increasing accumulation of casualties, including some sixty South Africans, large numbers of Europeans and African sick from the two divisions, a motley crowd of banda (enemy native irregulars) and civilians. It was fortunate that on the evening of February 22, H.S. *Tirea* arrived with 7 (S.A.) C.C.S. aboard. This unit at once took over the Kismayu hospital and the situation became at once greatly eased. Many of the casualties were evacuated by sea to Mombasa or Durban.

At Mogadishu there was an Italian depot of medical stores and from this the medical units were able to replenish and indeed to expand their own stocks and also to receive at last a satisfactory allowance of water; during the advance the allowance had been but 1 gal./man/day for all purposes.

On February 28, Adv. Force H.Q. reached Mogadishu and took over all the local administration. European casualties were thereupon accommodated in the principal European hospital in which 5 (K.) Fd. Amb., from Kismayu, was installed with 100 beds. African patients were first admitted to the Italian native hospital but this was found to be in such an appalling state that 3 (N.) Fd. Amb. was given the almost impossible task of cleansing it, and African troops of 11th A. Division were transferred to a new native civil hospital just outside the town.

On March 1 the distribution of the field medical units was as follows:

Mogadishu . .	3 (N.) Fd. Amb.
	5 (K.) Fd. Amb. H.Q. Coy.
Merka . .	1 (T.) Fd. Amb.
Modun . .	10 (S.A.) Fd. Amb. H.Q. and 'B' Coy.
Brava . .	10 (S.A.) Fd. Amb. 'A' Coy.
Jelib . . .	2 (E.A.) C.C.S. Hy. Sec. (closed)
	Lt. Sec. (open)
	1 Mob. Fd. Lab.

* This point is here emphasised because of its frequent importance in many types of warfare, so that particular attention may be paid to it during training and medical exercises. In these days of national armies, medical personnel, coming from civil employment, who are probably quite unaccustomed to improvisation and to the needs of transportation of their patients, will require careful training.

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	2 Mob. X-ray Unit
Kismayu . .	7 (S.A.) C.C.S.
	5 (K.) Fd. Amb. 'A' Coy.

TO JIJIGA AND INTO ABYSSINIA

Mogadishu itself was 800 miles from railhead at Nairobi. Now the Nigerian Brigade (11th A. Division) was to move further away by some 50 miles each day as it pushed along the Strada Imperiale through the

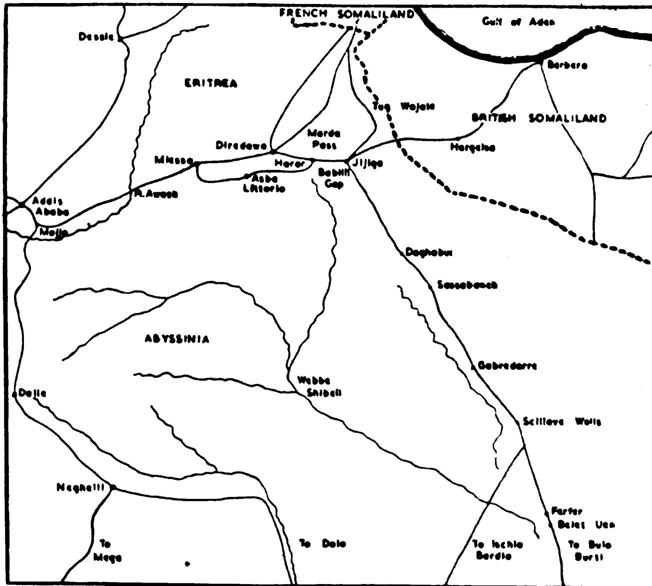

FIG. 68. The Advance on Jijiga and Addis Ababa.

hot bush. The brigade set out on March 1 and passed through Villagio Duca degli Abruzzi and Belet Uen to reach Ferfer on the 4th and the Scillave Wells on the 6th. The thirty-foot wide macadam of the Strada Imperiale there gave way to a track which made its humble way across featureless white sands. The brigade pressed on without pause to Daghabur, which was reached on the 10th, and thence out on to the broad green plain, on which Jijiga stands. Jijiga was occupied on March 17. The brigade had travelled 744 miles in 17 days, as had also the unresisting Italians, in the fastest pursuit in history. The other two brigades now u/c 11th A. Division—S.A. 1st and 22nd E.A. Bdes.—were unable, because of supply difficulties, to operate forward of Daghabur until March 21 and 26 respectively. On March 25 Adv. Force H.Q. reached Jijiga, remaining there until April 1.

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MEDICAL COVER FOR THE ADVANCE TO JIJIGA

5 (K.) Fd. Amb. established a series of staging posts along the road at Belet Uen, Gabredarre and Daghabur. At the first of these places it was found that the Somalis' passion for destruction had been unleashed. The well-equipped little hospital had been ransacked. However, a company of 3 (N.) Fd. Amb. (with 23rd Nigerian Inf. Bde.) managed to salvage much and to re-establish the hospital which was taken over by a Lt. Sec. of 5 (K.) Fd. Amb.

Because of the absence of serious opposition on the part of the Italians it became the policy to get sufficient field ambulance personnel with equipment well forward in order to cope with any initial surgery that might be required. Evacuation was not to the rear but forward into enemy territory as this was occupied, since there was usually a hospital of some kind a day's march ahead.

THE RE-OCCUPATION OF BRITISH SOMALILAND

This headlong rush of the Nigerian brigade had brought it near the frontier of British Somaliland. The position of the Italian garrison thus became threatened and so it began to withdraw towards Abyssinia. This abrupt departure was speeded by the arrival off Berbera of two Indian battalions and attached troops from Aden which landed and seized the capital on March 16.

The Nigerians moved too quickly for the Italians from British Somaliland, for they reached Jijiga first. The Italian force thereupon literally disintegrated. Tug Wajale was occupied and elements of the Nigerian brigade pushed on to Hargeisa, there to make contact with the troops that had landed at Berbera.

It had been intended that in this re-occupation S.A. 2nd Bde. should take part. It moved north partly by sea from Mogadishu and partly by road. But before it reached its destination the force from Aden was already in possession. The South African brigade therefore undertook temporary garrison duties.

'A' and 'B' Coys. 12 (S.A.) Fd. Amb. accompanied the sea party. They took over the hospital in Berbera and also established a M.D.S. at Hargeisa. H.Q. Coy., which went with the road party, moved from Afmadu to Mogadishu along the Strada Imperiale in the wake of the Nigerian brigade and thence to Hargeisa, reaching there on April 3, fourteen days after British Somaliland had been cleared of the enemy. Later it opened a M.D.S. about four miles out of Harar on the Harar–Diredawa road and evacuated its cases to 2 (E.A.) C.C.S. when this unit had opened at Diredawa.

On June 1–3 the companies of 12 (S.A.) Fd. Amb. congregated at Berbera and sailed for the Western Desert.

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THE ADVANCE TO ADDIS ABABA

The occupation of Jijiga marked the end of the fighting in flat bush country and the beginning of hill warfare. Beyond Jijiga on the road to Harar, the Italians held the tops of a range of hills on either side of the Marda Pass. The four most prominent peaks in this range came to be known as Observation Hill on the left of the road and on the right the left and right peaks of Marda and the Camel Saddle.

On March 21 the Nigerians attacked the Camel Saddle while the Italians on Observation Hill were kept under artillery fire. During the night the Italians withdrew and the formidable Marda Pass was clear.

The next action took place at the Babilli Pass, which was forced on March 24 by the Nigerians and the Royal Natal Carabineers of S.A. 1st Inf. Bde. Harar was entered on the 25th after a short final action on the Bisidima river.

S.A. 1st Bde. now passed through the 23rd Nigerian Bde. and pressed on towards Diredawa along a road greatly damaged by demolition. Diredawa was entered unopposed by 1st Transvaal Scottish on March 29.

From Diredawa two roads run west to Miesso, the more northerly through the plains beside the railway, the more southerly from the top of the escarpment above Diredawa through the hills. By April 1 the Duke of Edinburgh's Own Rifles had reached Asba Littorio along the southern road and the rest of the South African brigade had fought its way along the northern road to Miesso. Then the Italians attempted to stand along the line of the Awash river, the bridges having been destroyed. 22nd E.A. Bde., passing through S.A. 6th Bde., forced the river crossing on April 5 and pressed on to Adama and thence towards the capital. Ten miles out of Addis Ababa the chief of the Italian police awaited them to ask for help in maintaining order in the city. The formal entrance was postponed until the following day in order that all the units, and not only a few, might be represented in the ceremony.

Following the occupation of Addis Ababa the formations of the East Africa Force were distributed as follows:

H.Q. S.A. 1st Division and S.A. 5th Bde. .	*en route* for Egypt
S.A. 2nd Bde.	at Berbera, *en route* for Egypt
11th A. Division	around Addis Ababa
S.A. 1st Bde.	
22nd E.A. Bde.	
23rd N. Bde.	
12th A. Division	
21st E.A. Bde.	in Mega, Yavello and Soroppa

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24th G.C. Bde.	one battalion in Neghelli, remainder in Italian Somaliland
25th E.A. Bde.	moving on Maji

MEDICAL COVER FOR THE ADVANCE TO ADDIS ABABA

3 (N.) Fd. Amb. served 23rd Nigerian Bde. In the action at the Marda Pass it opened its M.D.S. in Jijiga and its A.D.S. well forward in the line of the artillery positions. Ambulance cars operated far forward and the casualties were quickly brought back. Casualties were few, 33 in all. Of the wounded brought into the M.D.S. only one died of wounds.

In Harar, the second city of Abyssinia, there were two large hospitals containing most of the surviving Italian casualties from Marda and elsewhere. These hospitals were taken over, as were also the very considerable quantities of medical stores, looted as usual by the local inhabitants. The courtyard of the main store and also the square in which it stood were knee-deep in medical supplies of all kinds—splints, syringes, surgical instruments, dressings, millions of tablets of quinine, ampoules of water sterilising powder and of every imaginable kind of therapeutic drug, creosol blocks, methylated spirits, the Italian brand of insecticide in carboys—and everywhere there was great profusion and even greater confusion. The smaller stores had, in the short twenty-four hours between the relaxation of Italian control and the resumption of authority, been similarly ransacked. However, order was quickly established and the stores were sorted, packed and distributed.

At Diredawa there were five hospitals, but of these three adjoining the railway had been wrecked by the Air Force and the attacking artillery. A detachment of 3 (N.) Fd. Amb. was installed in one of the undamaged, though looted, ones while 1 (T.) Fd. Amb. and later 2 (E.A.) C.C.S. assumed responsibility for the medical service of the city. The C.C.S. functioned as a general hospital and so, since Diredawa was an important nodal point, being on the Jibuti–Addis Ababa railway and also on the main road from Berbera and Mogadishu, the medical tactics were now changed. Field ambulances were no longer required to act as retaining units or to shed small detachments at many points along the line of advance.

During the advance of S.A. 1st Bde. from Harar to Miesso, 10 (S.A.) Fd. Amb. had little to do save move with the brigade and provide services for the sick. It opened an A.D.S. in Jijiga, which was later handed over to the C.C.S., and a M.D.S. on the slopes outside Jijiga. Then while H.Q. Coy. established a M.D.S. in Diredawa the others opened A.D.Ss. in Deder, for enemy casualties, and in Miesso. Finally the unit congregated in a camp outside Addis Ababa. 1 (T.) Fd. Amb.

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accompanied 22nd E.A. Bde. when this passed through the South Africans at Miesso.

The occupation of the capital presented the medical services with a number of acute problems. All the hospitals and all the medical stores in the city were promptly taken over. On April 7 D.D.M.S. inspected the medical facilities of the city and prepared plans for their utilisation. 3 (N.) Fd. Amb. was moved into the city as a first step in the provision of adequate hospital accommodation for the troops. Next the Duca degli Abruzzi Hospital, staffed mainly by Sudanese with Ethiopian assistants, was set aside for the Ethiopian patriots. Its laboratory was restored and was soon actively producing vaccines again. The municipal health services had broken down and so 1 (E.A.) Fd. Hyg. Sec. was brought up and placed in charge, not only of the city but also of the troops and of the P.o.W. It was known that there was typhus in the city; it became necessary to disinfest all P.o.W., and these were pouring in, both at the time of the surrender and at frequent intervals thereafter. The Italian mobile bath units were brought into service. It redounds greatly to the credit of this field hygiene section, that, at this time when disorder abounded, among this huge and mixed population of civilians, troops, P.o.W. and evacuees only two or three cases of typhus occurred.

The material captured in Addis Ababa exceeded in quantity even that which had been taken in the Italian Somaliland ports. The medical stores alone were conservatively valued at over a million pounds. The sheds containing them occupied an area with a circumference of two kilometres and employed a staff of a hundred and seventy. These stores were of the greatest usefulness, since they not only enabled the medical units involved in this campaign to discharge their functions more efficiently, but also provided the medical units in the Western Desert and elsewhere with much needed replenishment.

The policy had been adopted whereby U.D.F. troops were evacuated by sea to Mombasa or Durban. H.S. *Tirea* and *Amra* made frequent trips up and down the coast. The treatment of Africans was carried out to completion in East Africa itself. An African convalescent depot was established on April 1, 1941, at Ndurugu on the Nairobi–Thika road.

THE ADVANCE TO AMBA ALAGI

On April 13, S.A. 1st Bde. (11th A. Division) left Addis Ababa for Dessie and the north. On the 17th it caught up with the Italians at the Combolcia Pass covering Dessie. After five days of hard fighting in cold wet weather and in most difficult country the Pass was forced with a loss of 8 killed and 29 wounded. Dessie was entered on the 26th. On May 10 the brigade reached Mai Ceu, twenty-five miles to the south of Amba Alagi. As has already been recounted in the first part of this

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chapter, the South Africans were set the task of assaulting the 'Triangle'. This they did successfully on May 14. They had indeed played a notable part in the destruction of Italian political and military power in East Africa.

MEDICAL COVER FOR THE ADVANCE TO AMBA ALAGI

The action at Combolcia Pass presented difficult problems for 10 (S.A.) Fd. Amb. The casualties, fortunately very few in number, had to be evacuated from hill country through which vehicles could not pass. An A.D.S. was established on the road about three miles behind brigade H.Q. and a rear A.D.S. was opened at Giarra, thirty-two miles further back. The R.A.Ps. were at times six to eight miles in front of the forward A.D.S. and so additional regimental S.Bs. were provided and a staging post set up. From the forward A.D.S. evacuation was by 3-ton lorry to the rear A.D.S. in a road house at Giarra and thence to Addis Ababa, 200 miles away, by 1 (T.) M.A.C. with a staging post at Debra Sina.

On May 1 the unit opened a M.D.S. in the hospital at Dessie and later in Mai Ceu. On May 11 an A.D.S. was opened on the road ten miles south of Amba Alagi and on the following day dealt with more than 200 P.o.W. and patriot casualties, the aid of captured Italian medical officers being enlisted.

During the attack on the Triangle a series of staging posts was established between the R.A.Ps. and an A.D.S. on the road about fifteen miles north of Mai Ceu. The European casualties were evacuated therefrom to Dessie, the Ethiopian casualties to Mai Ceu.

Finally, the unit closed, moved into rest camp at Gura and prepared for its journey to the Western Desert with S.A. 1st Bde.

TABLE 51

Admissions to the M.D.S. during the period April 13–May 18

	British Command			Ethiopian patriots			P.o.W.		
	Battle casualties	Sick	Totals	Battle casualties	Sick	Totals	Battle casualties	Sick	Totals
Debra Sina	8	50	58	—	—	—	—	—	—
Mille Miglia	10	91	101	13	1	14	21	1	22
Dessie and Mai Ceu	2	73	75	132	15	147	93	3	96
Totals	20	214	234	145	16	161	114	4	118

THE BATTLE OF THE LAKES

Running for two hundred miles from north to south in the southern half of Abyssinia is a chain of lakes which forms a barrier impenetrable to mechanised traffic save immediately north and south of Lake Awusa.

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Into this region had withdrawn the remnants of the Italian forces in the north following the fall of Addis Ababa. At Wadara and Giabassire, south-east of this chain of lakes, were two Italian divisions.

It has been recounted how 21st E.A. Bde. of 12th A. Division had occupied Yavello on March 4. 24th G.C. Bde. advancing from Dolo occupied Neghelli on the 24th. These two brigades together with 22nd E.A. Bde. of 11th A. Division, coming down from Addis Ababa, were now to round up the Italians in this region.

Between April 6 and 21, 22nd E.A. Bde. attempted to reach Shashamana by the road from Addis Ababa *via* Adama, over the River Awash at Ponte Malcasa, Aselle and Bocoggi. But at this time the rains fell continually and the road quickly became a bog. The brigade was obliged to

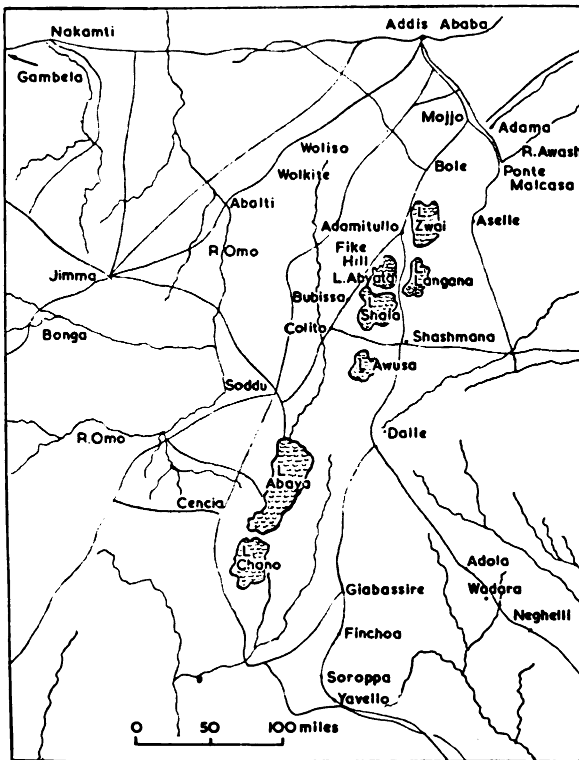

FIG. 69. The Battle of the Lakes.

retrace its steps to Mojjo. Thence it took the other road to the south *via* Bole, Adamitullo and thence between Lakes Abyata and Langana towards Shashamana, while a detachment made its way from Adamitullo, west of Lake Abyata, by Fike Hill to Colito.

On April 29 this detachment stormed a strongly held position at Fike, meeting with unexpected success. The main body of the brigade, now

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reinforced, promptly attacked the Italian positions on the east and the west sides of Lakes Abyata and Shala, crossed three rivers and flung the Italians out of Shashamana and Dalle on May 14 and 17. Without pause the brigade pushed on westwards along the Soddu road, forcing the Italians out of their position along the Billate River, repaired the blown bridge and swept on to Soddu where some 5,000 Italians surrendered.

During these events 12th A. Division was pressing up from Dolo through Neghelli towards Wadara. The struggle before Wadara lasted three whole weeks but in the end the Italians were routed. At the same time 21st E.A. Bde. was pressing northwards from Yavello, Soroppa, Finchoa and Giabassire, meeting with but little opposition.

The only organised group of Italian troops now left in south-west Abyssinia was around Jimma. Two roads converge upon Jimma from the east, one from Addis Ababa, the other from Soddu. These roads cross the River Omo sixty miles apart. The crossings were made during the period May 31–June 5 in the face of very great difficulties, for the river had risen to become a raging torrent. Then the columns moved on to Jimma which quickly surrendered with some 8,000 prisoners and vast quantities of booty, including large stocks of medical supplies.

With the fall of Jimma all fighting on any considerable scale ceased.

On September 15, 1941, East Africa Force, as part of the Middle East Command, was abolished. It was replaced by East Africa Command, directly under the War Office. This command was divided into four areas—Eritrea; Ethiopia and British Somaliland; Italian Somaliland, Uganda, Kenya, Zanzibar and Tanganyika; and Nyassaland and Northern Rhodesia. 12th A. Division covered the Ethiopia and British Somaliland Area and 11th A. Division the Italian Somaliland, Uganda, Kenya, Zanzibar and Tanganyika Area. In August 1941, 23rd Nigerian Inf. Bde. left East Africa for West Africa, to be followed shortly afterwards by 24th Gold Coast Bde. It may be noted here that in March 1942, 21st E.A. Bde. left East Africa for Ceylon and that in June, 22nd E.A. Bde. went to Madagascar.

MEDICAL COVER FOR THE BATTLE OF THE LAKES

With 11th A. Division from Addis Ababa went 1 (T.) Fd. Amb. reinforced by a company of 5 (K.) Fd. Amb.

For a whole month flooded rivers and ubiquitous mud made evacuation to the rear impossible. Later 1 M.A.C., with a staging post half way between the front line and Addis Ababa, cleared casualties to Addis Ababa. As the front moved the length increased, so that toward the end of this operation the total distance to be covered was as much as 250 miles. Indeed during the final advance on Jimma the distance became 275 miles. The staging post was then at Gheddo.

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During the three weeks' battle of Wadara a total of 125 battle casualties were admitted to the divisional field ambulances and surgical operations were performed on 53 of them.

The following extract from a report on the collection of wounded men at one stage of the battle of Wadara may be quoted:

> 'A special difficulty for which provision was not made beforehand presented itself on April 22 when a number of casualties occurred in the ridged country in the vicinity of French Hill. To avoid the exposed motor road, the return journey had to be made further east up the low but steep escarpment which separated the scene of action from the main body of our troops, and it was with great difficulty that lying cases could be brought up this steep alone on stretchers. Following on this day's experience the engineers devised a "miners" stretcher on which the patient could be strapped. It consisted of a board, wide at the shoulders and narrow at the foot. It was provided with a shield, placed at right angles to the head of the board, to protect the crown of the patient's head, four grips (two on each side) for carrying, cords for strapping the patient and a tow rope by means of which the stretcher could be dragged up short heights if necessary.'

In spite of cold nights and rain the health of the troops was, on the whole, remarkably good. Mild respiratory affections were frequent, but there was very little pneumonia, six cases only being reported between April 20 and May 10 among the troops engaged, including the motor transport companies.

GONDAR

The last 34,000 Italian troops were now congregated in the area of Gondar, in Chelga, Wolchefit, Amba Giyorgis and Gorgora around Lake Tana. For a time they were safe from assault because of the rains which prevented all campaigning.

As long ago as November 1940, as has been recounted, there had been active operations in this area. After Ind. 10th Inf. Bde. had retaken Gallabat the Italians found it desirable to abandon Metemma in January 1941. As they withdrew they were hurried on by the Indian brigade which occupied the fort at Wahni, halfway between the frontier and Gondar, on February 7 and thereafter moved on to Chelga. The brigade then moved north to join its division for the invasion of Eritrea but left one battalion behind. This in turn moved north when it was relieved by units of the S.D.F. Then came the rains to bring all activities to an end.

Units of the S.D.F. had participated in this invasion of Abyssinian territory; 4 Mobile Field Hospital of the S.D.F. Medical Corps opened at Surewa, with 100 beds, on the motor track between Gallabat and Gondar. A staging post with 50 beds was formed at Gallabat and

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M.D.Ss., with surgical facilities and 50 (stretcher) beds, were established further forward. Evacuation from the Mob. Fd. Hosp. was to Gedaref and thence by ambulance train to S.D.F. hospitals in Khartoum. When Chelga was occupied the M.D.S. with Force H.Q. moved up and opened there. Gallabat was evacuated because of the prevalence there of kala azar.

At the same time patriot Ethiopian forces had been organised to the south, west and east of Wolchefit, while Skinner's Horse, forming the nucleus of more patriot units, had been moving into this area from Dessie and occupying Magdala, Debra Zebit and Debra Tabor in succession.

When the rains ceased the movement of these various bodies against the Italians was resumed and on September 22, 1941, the task of clearing this area was allotted to 12th A. Division.

Gondar is approached by two roads, one from the north and the other from the south. Both were used during the attack. The northern road was much the better and also much the longer, 900 miles to Addis Ababa. The heavy and prolonged rains had made the southern road unfit to carry the necessary amount of traffic. But, as will be recounted, a sixty-five mile road was built which enabled a large portion of the column moving along the northern road to be switched to the approach from the south.

12th A. Division had relieved 11th on this front but 1 (T.) and 6 (U.) Fd. Ambs. and 1 (T.) M.A.C., u/c of 11th A. Division, had been transferred, together with 22nd E.A. Bde., and remained with 12th Division, which now consisted of 25th and 26th E.A. Bdes. With it were a field ambulance, new to this theatre, 7 Northern Rhodesia (N.R.) Fd. Amb. and 3 (U.) M.A.C.

TACTICAL PLAN

(1) 25th and 26th E.A. Bdes. would concentrate at Amba Giyorgis to the north-east of Gondar;

(2) 'Southforce', consisting of two battalions and a battery of medium guns, supported by dummy tanks and large quantities of wireless sets belonging to non-existent units, would move along the Dessie–Debra Tabor road.

THE ATTACK ON GONDAR

On November 11, 2nd Ethiopians moved round to the west of Lake Tana, took Gianda and contained a large body of Italians in Gorgora while a S.D.F. column from Chelga invested Ghindi Merea.

On November 13, 'Southforce', with patriot units, assaulted the Italian positions at Kulkaber and Feroaber, and converted a track into the semblance of a road.

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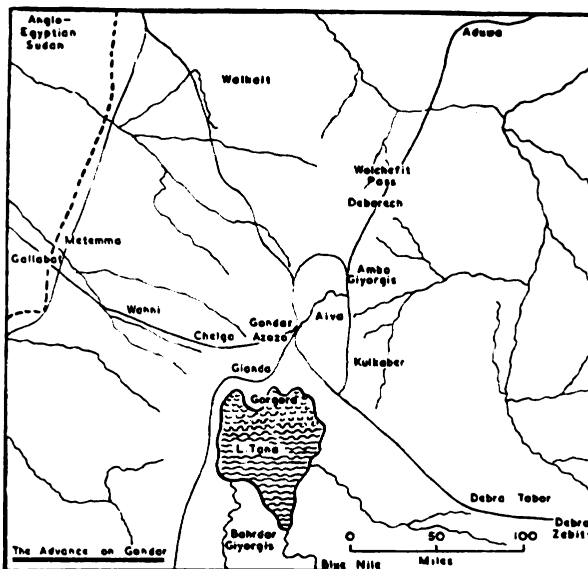

FIG. 70. The Advance on Gondar.

On November 21, 25th E.A. Bde. (12th A. Division) from the north, 'Southforce' from the south and patriot units from the south-east attacked Kulkaber and thus cleared the way for the assault on Gondar itself. Meanwhile 26th E.A. Bde. (12th A. Division) moved to Aira and crossed the River Megech to assault the Defletcha ridge. Then 25th E.A. Bde. pressed along the main road towards Azozo, took this place and moved on Gondar. But patriot units got there first. 1st A. and S.H. were the only British troops to take part in these operations.

Gondar surrendered with 10,000 Italian and 12,000 native troops. As was usual, vast quantities of stores of all kinds were thus made available for unintended purposes.

The 'British' losses in the attack on Kulkaber totalled 99; in the capture of Gondar 32 killed, 182 wounded and 6 missing.

MEDICAL COVER FOR THE OPERATIONS ABOUT GONDAR

Before the switch to the southern approach was made the medical plan was as follows, from front to rear:

Northern column: Two A.D.Ss. were planned—one for the Argyll and Sutherland Highlanders and 26th E.A. Inf. Bde., and one for 25th E.A. Inf. Bde. As the terrain was extremely bad and would involve a hand-carry of about four hours, a surgeon with equipment was allotted to each. The stretcher-bearers were given hard training—about six hours a day carrying loaded stretchers up and down the mountain sides —for a week. The daily task was split into three equal spells and the

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men became very tough, but even so it was thought essential to carry the surgery right forward. One M.D.S., formed by the H.Q. 6 (U.) Fd. Amb., was placed on the main road about seven miles back and was prepared with everything necessary to receive large numbers of casualties. From the A.D.S. to the M.D.S. might take anything up to twelve hours or more owing to the difficulty of getting casualties to a road.

H.Q. 7 (N.R.) Fd. Amb. was held in reserve with the intention of pushing it into the main hospital of Gondar on the fall of the town and thereupon of directing the flow of casualties forward instead of back.

The stretch between the M.D.S. and Adowa, some 230 miles in length, was to be worked by 3 (U.) M.A.C. with a staging post at Adi Arcai about halfway. This staging post was to be ready to hold some 150 light cases in transit, and 300 beds were prepared at Adowa. From Adowa to Asmara was to ply an Italian section of 1 (T.) M.A.C. in large diesel-driven ambulances taking up to twelve stretcher cases each. At Asmara, D.D.M.S. Eritrea had agreed to take any cases sent. In a large village close to the front was arranged accommodation for wounded patriots.

Southern column: It was originally planned to evacuate this brigade's casualties by 1 (T.) M.A.C. through Debra Tabor to Dessie, where a well equipped hospital had 300 beds available. Rain having made this road impassable, 1 (T.) Fd. Amb. had to hold its patients and eventually took them forward to Gondar.

The big switch mentioned above caused the sudden transference of most of 25th Bde. to the south where, with the column already there, it engaged in very heavy fighting. Two companies of 6 (U.) Fd. Amb. were sent with it to reinforce 1 (T.) Fd. Amb.; the 65-mile road across the front being quite unfit for the transport of wounded men, the column was unable to send any casualties to the M.D.S. of 6 (U.) Fd. Amb. They were held by 1 (T.) Fd. Amb. in the M.D.S. established by that unit until Gondar was entered.

The rôle of 26th Bde. was, of course, altered on account of the switch. It was given an objective further south, in country so bad that there was no hope of getting wounded men back. The only thing to be done was to put the whole of 7 (N.R.) Fd. Amb. right forward under the very rifles of the enemy. No wheels could reach within miles of the proposed spot, and, after fruitless attempts to employ mule transport, all essentials, together with ample blankets, food and comforts, were made into loads for the men to carry.

On November 28, 6 (U.) Fd. Amb. took over the main hospital in Gondar where about 1,000 Italian casualties were found. A medical service for the town was established and 6 (U.) Fd. Amb. was detailed to remain with 25th E.A. Bde. and maintain a good hospital. A number

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of serious casualties were evacuated by air to Addis Ababa and to Nairobi.

The policy of putting the whole field ambulance with all its resources right forward had worked well, and, though 7 (N.R.) Fd. Amb. had been obliged to retain fifty-five casualties for several days on the hillside, because immediate full-scale surgery was available, only two of these died.

(iii)

The Health of the Troops

A. THE SUDAN FORCE*

After the outbreak of war the civil authorities in the Sudan had made surveys and analyses of water supplies, had inspected suitable camping sites and had prepared maps and reports describing the climatology and physiography and the distribution of endemic and epidemic diseases. The food resources of the Sudan were examined and a number of analyses made with a view to the substitution of local products for rations brought from overseas. The civil public health staffs in areas likely to be occupied by troops were augmented and sanitary measures extended in these areas.

The major operations took place during the winter months and by the time the hot weather came the troops had moved forward to higher altitudes. But that part of the Sudan in which the troops assembled and in which the earliest operations took place was notoriously unhealthy. Malaria and leishmaniasis were known to be endemic therein and the roads and tracks joining the Sudan with Eritrea and Abyssinia were the very channels along which smallpox and relapsing fever travelled.

1940 was an exceptionally dry year, so that not only was the mosquito density much lower than the average but also the number of carriers was much reduced. Because this was a war of rapid and continuous movement, the likelihood that dysentery in its incidence would reach epidemic proportions was greatly reduced.

STATISTICS

Few detailed statistics covering a period of sufficient duration are available, but the following figures are of interest:

1941	Strength	Deaths		Mortality
British and Indian Troops	26,800	56	4·7	2·16 per 1,000
Sudan Defence Force	13,789	121		8·77 per 1,000

Sudan Defence Force figures are higher because units operating were stationed in exceptionally unhealthy areas for long periods during the

* The Official Indian Medical History should be consulted.

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worst seasons of the year. Twenty deaths were due to kala azar and many to pyrexia of uncertain origin, probably kala azar. Units operated under exceptionally strenuous and exhausting conditions in the Gojjam campaign with little to eat and in a climate particularly adverse to Sudanese. Units stationed in the plateau of Eritrea were also affected by the climate, particularly as regards respiratory diseases.

TABLE 52

Admissions to Hospital (Sudan H.Q.)
January 18 *to March* 15, 1941

Hospitals	British Officers		British Other Ranks		Indian Officers		Indian Other Ranks		P.o.W.	
	S.*	W.†	S.	W.	S.	W.	S.	W.	S.	W.
32 B.G.H.	63	28	964	138					2	4
53 B.G.H.	19	17	404	116			2		1	14
16 B.G.H.	32	22	823	225						
10 I.G.H.					15	5	723	353	60	27
11 I.G.H.	1		33	4	5	2	229	68	1	
14 C.G.H.	32	6	225	64	33	38	656	439	28	45
16 C.G.H.		1	3		17	2	1,028	315	152	215
30 I.G.H.	5		38				2,545	1,641		
1 Con. Depot	3	3	435	49						
1 (Ind.) Depot					2	1	453	373		
	155	77	2,925	596	72	48	5,636	3,189	244	305

* S. = Sick. † W. = Wounded.

TABLE 53

Admissions to Hospital (Sudan H.Q.)
March 16 *to April* 1, 1941

Hospitals	British Officers		British Other Ranks		Indian Officers		Indian Other Ranks		P.o.W.	
	S.*	W.†	S.	W.	S.	W.	S.	W.	S.	W.
32 B.G.H.	21	43	406	249						
53 B.G.H.	8	7	121	132					4	5
16 B.G.H.	10	20	269	284						
10 I.G.H.							276	487	23	3
11 I.G.H.	41	59	614	556	4	40	738	1,048	46	201
14 C.G.H.	13	3	194	47	11	10	277	268	3	2
16 C.G.H.					10	22	236	537	75	22
30 I.G.H.							138	596		
1 Con. Depot	6	6	372	123						
1 (Ind.) Depot					7	7	178	266		
	99	138	1,976	1,391	32	79	1,843	3,202	151	233

* S. = Sick. † W. = Wounded.

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TABLE 54

Casualties. Indian 4th and 5th Divisions

	Officers	N.C.Os.	Other Ranks	Totals
Sudan and Eritrea				
Killed . .	15	24	685	724
Wounded .	76	89	3,851	4,016
Missing . .			7	7
P.o.W. . .			1	1
Died . .	2	3	67	72
	93	116	4,611	4,820
Somaliland				
Killed . .			9	9
Wounded .		1	27	28
Missing . .				
Died . .	2		5	7
	2	1	41	44

TABLE 55

Admissions to M.D.S. during the Battle of Keren
March 15–27, 1941

	British Officers	Other Ranks	Indian Other Ranks	P.o.W.	Totals
Battle casualties	44	326	1,111	10	1,491
Sick . .	12	246	292	40	590
	56	572	1,403	50	2,081

TABLE 56

Principal Causes of Sickness in Indian 4th and 5th Divisions.
March 15–27, 1941

Diarrhoea and Dysentery .	203
Inflammation of areolar tissue .	103
N.Y.D. fever	63
Neurosis*	47
Mumps	15
Venereal diseases . . .	14
Skin diseases	9
Other causes	136
	500

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TABLE 57

Distribution of Wounds among 552 Casualties in Indian 4th and 5th Divisions. March 15–27, 1941

	Percentage
Wounds of:	
Chest	1·47
Abdomen . . .	8·15
Upper limb . .	46·3
fingers . . .	12·1
hand* . . .	34·0
forearm* . . .	45·3
upper arm . .	8·5
Lower limb . .	37·1
Multiple wounds . .	16·5

PRINCIPAL DISEASES

As the strengths were constantly changing, accurate ratios per 1,000 cannot be given, but approximate strengths in 1941 were 50,000 troops. The period covered is November 1940–March 1941.

Malaria. 625 cases occurred among British troops, 646 among Indians—a total of 1,271 cases in four months.

Malaria infection in the Sudan was confined to the Gedaref–Gallabat–Butana Bridge area where mosquitoes were still prevalent in the early stages of the campaign. At first mosquito nets were not always used. The reason given was that it was not possible to erect nets in tents. The solution was to sleep outside. Bivouac mosquito nets would have been useful at this stage. Many infections also must have been contracted *en route* to this area as the railway passes through intensely malarious districts. The protection of troops in trains is a different problem—inevitably windows are opened at stations, where infection is most likely to take place. The use of nets is impracticable. The measures advocated were the liberal use of anti-malarial cream, the control of breeding places in station areas and the spraying of railway premises and troop trains.

The bulk of the remaining cases of malaria were contracted in occupied enemy territory. Little attention appears to have been paid by the Italian health authorities to the control of breeding, and mosquitoes were still very prevalent in towns and villages vacated by the enemy, even though the dry season was advanced.

Dysentery. Dysentery cases numbered 422 in British, 535 in Indian troops.

There appeared to be a higher proportion of cases in standing camps and base areas than among troops on the move. In no instance did the disease assume epidemic proportions, though a sharp outbreak occurred

* The figures for neurosis in Table 56 and for wounds of the hand and forearm in Table 57 invite attention.

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in an R.A.F. camp at Port Sudan. Many cases were infected outside the Sudan and developed the disease on arrival in the country.

Venereal Disease. British troops 404 cases, Indian troops 600 cases.

There were no controlled brothels in the Sudan but prostitution was rife. This was especially so near the eastern border where there was a large population of Abyssinian women, notoriously promiscuous. There was a sharp rise in incidence when troops arrived in towns in Eritrea. Control of venereal disease must remain very much a unit matter and much depends on the energy and personality of medical and regimental officers. Incidence and control measures varied greatly in different units. Where interest and keenness were shown by officers and where the recognised preventive facilities were provided, the incidence remained low.

HYGIENE AND SANITATION

Forward area. The standard of sanitation generally was not high. It is true that the conditions in which the campaign was fought were unfavourable, but even so the hygiene officers had good reason to think that in many instances much more could have been done had the importance of sanitation in the maintenance of efficiency been better appreciated. Units differed markedly in respect of their standards and, as is always the case, those which had experienced medical officers with initiative who could impress their views upon commanders were able to attain a high standard of sanitation.

The disposal of refuse presented a serious difficulty. The digging of pits was commonly impossible because of the rocky nature of the ground and for tactical reasons incineration was not allowed.

L. of C. areas. Again the standard was not high and with far less excuse. Units temporarily occupying camping sites seemed to be allowed to please themselves. The result was that large areas were fouled and flies bred freely.

Base areas. In base areas, with the assistance of the civil public health service and hygiene sections, a reasonable standard of sanitation was attained. But here again lack of knowledge and of sense of responsibility in sanitary matters was apparent and there seems to have been often too great a tendency to rely on hygiene sections and other sanitary personnel to carry out measures which are the responsibility of unit personnel.

In consultation with the Chief Engineer a standard design of camp structures was evolved and circulated.

Disposal of Waste Water. Owing to the high temperature and to the nature of the ground grease traps were not satisfactory.

In one or two instances tanks for chemical precipitation were installed but units proved incapable of exercising the necessary supervision and the method had to be abandoned.

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The area of the Sudan occupied by troops was mostly dead flat and the soil impervious. Soakage pits, however deep, filled up rapidly and were soon useless. There was little or no fall to allow of drainage so that the only method of disposal of waste was by means of evaporation beds. Large areas were plotted out and used in rotation. Great care had to be exercised to exclude grease and solids from the beds which otherwise quickly became foul smelling. This method was quite impracticable in the rainy season.

Water Supplies. At no time did the force experience any serious lack of water. Well supplies were surveyed before the commencement of operations. Orders were issued regarding the routine sterilisation of all drinking water and generally these were carried out. No sickness directly attributable to contaminated water occurred.

Rations. Rations were generally considered to be adequate and of good quality. Supplies were well maintained even during the most difficult period of operations. A comparison of ration scales in use in both Forces is given later.

Ample fresh vegetables and fruit were provided locally, but transport and distribution were difficult and fresh supplies often reached forward areas in poor condition. Vitamin 'C' concentrates were only occasionally used.

Except in one company of the Sudan Defence Force there were no cases of scurvy.

Clothing. Clothing issued appeared suited to the varying conditions and calls for no particular comment. Troops stripped to the waist during the heat of the day and became deeply tanned. No untoward result was reported. The pullover provided the additional protection required at night in the higher altitudes.

Accommodation. Standard plans were drawn up and the recommendations incorporated in a technical instruction and included the general lay-out of camps, with special reference to the disposal of waste water and sanitation.

Fly-proofing of cook-houses and preparation rooms was limited owing to lack of materials.

Hygiene Sections. During the period of active operations three hygiene sections were provided. Two were posted to divisional troops, one on lines of communication. Even with the latter split up into three sub-sections this provision proved inadequate to cope with the area to be covered and in many places it was necessary to call on the assistance of the civil public health authorities.

Hygiene sections were of great value but their usefulness was greatly impaired by the unsuitable type of men employed.

In Khartoum a demonstration of approved sanitary appliances was prepared and arrangements made for courses of instruction for regimental officers.

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OBSERVATIONS BY A.D.M.S. INDIAN 4TH DIVISION

'The idea of an advanced operating centre as far forward as the M.D.S., located in this Division usually within 10 miles of the front line, had been mooted since the early days of the Western Desert campaign, but it was not until the capture of Agordat that an operating team really came into our administrative sphere. Here with the acquisition of hospital accommodation, forward operative elements of 3 (Ind.) C.C.S. were moved up and the chance we had been waiting for, of getting an operating team under command, had arrived.

'It is our contention that the place for the experienced surgeon with clincial discriminative ability is not in the general hospital but in the forward area where he can see his patient within anything up to 6–8 hours of the onset of injury ; and where he can utilise his discriminative powers to differentiate between who must be operated upon immediately as an urgent life-saving measure and who can safely travel further back to the C.C.S. The junior surgeon, lacking in experience and discrimination, is more valuable in the backward area.

'The great length of the L. of C. demanded the institution of facilities for life-saving operative intervention well forward.

'It can be said very decidedly that apart altogether from the strictly surgical aspect of the problem, the psychological effects on the fighting soldier of the knowledge that such surgical facilities were available in addition to the M.D.S. were indeed very great.

'The experiment in having operative personnel so very forward has proved an undoubted success in this instance, and although for tactical reasons instances may arise in which their presence would be definitely contra-indicated, it seems that in selected theatres of war they undoubtedly fulfil an extremely useful function.'

NOTES ON CERTAIN MEDICAL UNITS AND SERVICES

Ambulance Trains. At the beginning of the campaign the rolling stock available for conversion was extremely limited. This difficulty was enhanced by the fact that sleeping accommodation had to be provided for all patients in view of the great distances between the forward areas and base hospitals.

Eventually four ambulance trains were designed to take 76 stretcher cases each and, by the addition of extra coaching, as many sitting or lying cases as the situation demanded. The maximum capacity for any one train was reached on one occasion by the addition of fourteen extra coaches, bringing the actual train capacity to over 350 patients.

Before the re-occupation of Kassala two ambulance trains were based on Khartoum and a third at Gebeit.

1 and 2 Amb. Trains were used to evacuate patients from Gedaref and, later, Kassala to Khartoum. After the completion of repairs to the

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Kassala section of the line and the opening of the Tessenei Road, all trains normally used Tessenei as the railhead. By this time 4 Amb. Train was in operation, making it possible to base two trains on Gebeit.

In the period September 1940 to August 1941 a total of 22,155 patients were moved by ambulance train. The total mileage has been calculated at about 70,428 miles.

In addition to the ambulance trains, two ambulance carriers, composed of converted railway sleeping cars, were used to evacuate patients during the early months of the campaign either from Butana Bridge to Gedaref or from Aroma to Derudeb. Their function was not unlike that of a motor ambulance convoy, inasmuch as they evacuated patients in relatively small numbers from field ambulances and staging sections to 'collecting' medical units, such as a C.C.S., before evacuation by ambulance trains to base hospitals. The procedure was to run these carriers forward at night and evacuate the cases to the C.C.S. at Gedaref or the field ambulances at Haiya Junction or Derudeb respectively.

At a later date, when it was possible for ambulance trains to proceed as far as Kassala or Tessenei, the carriers were withdrawn from this area and combined to form, with the addition of some rolling stock, a fifth ambulance train. This train was of great assistance in clearing the Khartoum hospitals to Gebeit, especially during the battle of Keren when the other four trains were fully occupied in clearing forward areas.

When no longer required for this purpose the carriers reverted to their original function as smaller units. One was used to transfer patients from Gebeit to hospital ships at Port Sudan and to clear casualties from the Port Sudan area to Gebeit for treatment. The other was used for a considerable period in the evacuation of sick P.o.W. from the camp at Wad Medani to hospitals in Khartoum.

In addition to an adequate medical equipment, a good supply of rations and medical comforts was carried on each ambulance train.

Fresh meat, vegetables, fruit and bread were always available.

The water tank capacity of each train was sufficient for 100 patients for all purposes for about 36 hours.

Mobile Field Hospitals. From information obtained in peace-time of the rôle which the Sudan Defence Force would be called upon to play in war and of strength and dispositions of units, an organisation was worked out designed to meet all possible eventualities, with particular reference to conditions in the Sudan.

The scheme adopted was to form a medical corps recruited entirely from Sudan Medical Services personnel and composed of units designated mobile field hospitals, six of which were constituted and mobilised. Each mobile field hospital was commanded by a British medical officer with a Sudanese medical officer as second-in-command, and the remaining personnel was composed as follows:

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1 Head Attendant . .	Sergeant-major	All Sudanese of considerable practical experience in civil hospitals.
1 Head Operating Theatre Attendant . . .	Sergeant-major	
1 Laboratory Attendant .	Sergeant-major	
1 Head Attendant, Hygiene .	Sergeant-major	
12 Medical Orderlies . .	Other Ranks	
1 Hygiene Orderly . .	Other Ranks	

Conditions made it necessary that each unit should be instantly and at all times mobile and able to operate over long distances, and an establishment of vehicles was therefore worked out which was composed of:

1 van for officer commanding;
3 load-carrying trucks, in one of which the Sudanese medical officer travelled;
4 ambulance cars.

Drivers were recruited from the Sudan Medical Service establishment of drivers and from ex-drivers of the S.D.F. Mechanical Transport Section.

Scales of equipment, instruments and drugs were laid down. Units were capable of carrying out major operative work when necessary and in this respect were self-contained in all essentials.

Holding capacity was governed by the availability of tentage and stretchers, and up to eighty cases could be held and adequately dealt with at any one time. When sufficient tentage was not available this difficulty was circumvented, if the hospital happened to be temporarily static, by the local construction of grass or palm-leaf huts camouflaged against air observation.

In the month preceding the declaration of war by Italy these mobile field hospitals were embodied, one for each S.D.F. Group, usually about a battalion strong:

1 M.F.H. was stationed with the S.D.F. in the area between Atbara and Kassala;
2 M.F.H. was stationed at Khashm el Girba on the river at Atbara;
3 M.F.H. was stationed with S.D.F. in the Gallabat area;
4 M.F.H. was stationed at Sennar for operations in the Fung and Blue Nile area;
5 M.F.H. was posted to the Equatorial Corps on the Boma Plateau;
6 M.F.H. was embodied in Khartoum and held in reserve.

In addition to the M.F.H. organisation a company medical unit was appointed to each company of the S.D.F. This unit was composed of a senior Sudanese medical assistant in the rank of sergeant or sergeant-major, who had at his disposal an ambulance car, and two O.Rs. who had undergone a previous course of training in first aid of three months' duration in a hospital. Arrangements had been made in January 1939 for all ranks of the S.D.F. to be given a short course in the principles of first aid.

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These company medical units came under control of the parent M.F.H. and replenished their supplies from it. They proved invaluable in the field. They formed an integral part of the company organisation; they went everywhere the companies were called upon to go, supervised their field hygiene requirements, rendered first aid to casualties, treated all current diseases such as dysentery and malaria and kept men in the field who otherwise would have had to be evacuated to base hospital with the consequent loss of man-power.

Army Transfusion Service. In October 1940, it was decided that all blood transfusion apparatus would be despatched to the reception station and ambulance train depot, Khartoum, in the first instance for distribution. It was also agreed that the Stack Memorial Laboratories, Khartoum, should be asked to manufacture such quantities of glucose-saline and distilled water as were required.

As an electric stove did not become available until a very late date, twelve primus stoves were obtained from the Sudan Medical Service and proved most satisfactory. The sterilisation recommended was thirty minutes at a pressure of twenty pounds. In practice sterilisation was carried out on two successive occasions at twenty-four hour intervals. By this method no moulds were ever grown, and all bottles were kept for fourteen days before issue.

The capping of bottles presented no difficulties. The ordinary beer bottle was used for both glucose-saline and distilled water. The usual 'crown' with a rubber washer instead of a cork washer was used. The whole was covered with a piece of cotton wool and some lint.

Dried plasma was used throughout in preference to whole blood transfusions. Because of climatic and other conditions a blood bank was not regarded as feasible, though whole blood, when available, was used.

Generally supplies were fully adequate and the scale of equipment met all demands.

Army Dental Service. A well equipped dental centre already existed in Khartoum. The three British battalions already sited in the Sudan were made dentally fit before the campaign opened, and by February a fair number of dental officers had arrived and been attached to various medical units. In November 1940, a dental officer was sent specially to Gedaref to treat troops of Indian 5th Division as the I.M.S. did not at that time include a dental officer on the establishments of its medical units. No information is available as to the extent of invalidism caused by dental disease or deficiency in the force.

NOTES ON PRISONERS-OF-WAR

The influx into the Sudan of some 45,000 P.o.W., about 20,000 of these being Italians, created many difficult problems for the medical services. The only part of the country that was suitable for P.o.W.

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camps for the Italians was the north, and even there the riverain area was intensely malarious at certain times of the year. Away from the river, with the exception of the Gebeit region, water was scarce. It was finally decided to site a few camps in a carefully selected area near the river and the rest in or near the Red Sea hills.

The camps for the native troops were sited near the river to the north of Khartoum. The one exception was a camp at Wad Medani where the prisoners were working in an irrigated area of the Gezira.

Beds were provided at the rate of 4 per cent. of the strength. A camp hospital of 200 beds and staffed by Italian medical officers and Italian or Eritrean medical orderlies was established in each camp.

Acute and serious cases were evacuated to the base hospitals in certain of which special sections were set aside for such.

In Kenya the problems were even greater for some 80,000 P.o.W., including 63,000 Italians, had to be accommodated. To begin with they had to be congregated in areas which were entirely devoid of sanitary facilities.

Disinfestation had to be carried out in improvised apparatus of the Serbian barrel type. It says much for the efficiency of the grossly overworked hygiene personnel that no case of typhus and no serious outbreak of dysentery occurred.

Scurvy was not uncommon among the native troops and pellagra was encountered among the Abyssinians. It was found that ground nuts were an excellent preventive of pellagra, especially when combined with the local bean, rich in live yeast.

B. EAST AFRICA FORCE

STATISTICS

TABLE 58

Admission Rates (all causes) per 1,000 Troops per Annum

	European	Non-European
U.D.F. troops 1941	952	804
S.A. 1st Div. U.D.F. Tps. January–March 1941	844	733
S.A. 1st Div. attached E.A. Tps. January–March 1941	940	2,155
12th A. Div. including S.A. 1st Bde. December 1940–February 1941	859	731

The admission rate for sickness alone among U.D.F. Troops in East Africa in 1916–18 was 2,243/1,000/annum, so that the above rates show a considerable improvement except in the case of the E.A. Bde. attached to S.A. 1st Division which suffered a serious outbreak of dysentery.

These admission rates, also per 1,000 troops per annum, when broken down show the more frequent causes of admission.

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TABLE 59

	All U.D.F. Tps. 1941		S.A. 1st Div. January–March 1941		S.A. 1st Div. E.A. Tps. January–March 1941		12th A. Div. December 1940–February 1941	
	European	Non-European	European	Non-European	European	African	European	African
Battle casualties	11	1	14	1	80	91	62	93
Accidental injuries .	78	59	104	80	—	47	92	50
Malaria .	215	292	59	120	187	119	130	63
Dysentery and enteritis .	53	26	167	136	407	1,026	69	231
Venereal diseases .	25	82	8	128	5	45	6	50
Influenza .	47	40	33	24	20	58	21	6
Other sickness .	523	306	459	284	241	769	449	183
	952	806	844	773	940	2,155	829	676

Ratio of battle casualties to sick approximately 1: 40.

Deaths	European	Non-European	Rate per 100 per annum	
			European	Non-European
All diseases	43	295	1·7	4·4
Malaria .	10	29	0·4	0·4

Accidental injuries, infections of various kinds, tropical diseases of surgical import and battle casualties, in that order, accounted for the majority of the admissions to the surgical wards of the hospitals in the East Africa Command. The relative incidence of these conditions naturally varied in Europeans and Africans. In the fighting units the Europeans suffered more heavily *pro rata* from battle casualties, less from accidental injuries, tropical diseases and the effects of sepsis. The African, excellent as a fighting man, has twin passions for wine and women and a carefree enthusiasm in the handling of motor vehicles that accounts for a high proportion of his invalidism. Accidents include not only those caused by the crashing and overturning of motor lorries but cut heads and fractured skulls and limbs resulting from brawls.

Venereal disease caused a high proportion of invaliding, and among hospital admissions appeared to be a frequent cause of bone and joint lesion and of delay in recovery after operation or accident.

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TABLE 60

(*a*) ***Average strength of Command, June*** **1, 1940–*May* 31, 1941, 92,033**

Total Casualties, June 1, 1940–*May* 31, 1941

	Number of Cases	Rate per 1,000	Number of Deaths	Rate per 1,000
Battle casualties (wounded)	854	9·28	65	0·71
Killed in action	—	—	300	3.26
Accidents	5,607	60·92	249	2·71
Diseases:				
Malaria	10,784	117·17	57	0·62
Dysentery	10,574	114·89	30	0·33
Venereal diseases	5,461	59·34	2	0·02
Pneumonia	2,995	32·54	119	1·29
Enteritis and diarrhoea	2,995	32·54	—	—
Other infectious diseases	1,437	15·61	—	—
Other helminthic diseases	791	8·59	—	—
Schistosomiasis	530	5·76	—	—
Cerebro-spinal meningitis	147	1·60	53	0·58
Effects of heat	134	1·46	5	0·05
Relapsing fever	78	0·85	—	—
Typhoid	72	0·78	13	0·14
Other deficiency diseases	40	0·43	—	—
Scurvy	17	0·19	—	—
Typhus	13	0·14	—	—
Undulant fever	3	0·03	—	—
Tetanus	3	0·03	—	—
Total preventable diseases	36,074	391·95	279	3·03
Total other diseases	32,869	353·88	216	2·34
Total diseases	68,943	745·85	495	5·37
Total casualties	75,404	816·05	1,109	12·05

Average Daily Admission rate per 1,000, 2·23.

(*b*) ***Average strength of Command, June*** **1, 1941–*May* 31, 1942, 121,641**

Total Casualties, June 1, 1941–*May* 31, 1942 (*D.D.M.S.*)

	Number of Cases	Rate per 1,000	Deaths	Rate per 1,000	Case mortality per cent.
Battle casualties (wounded) (Gondar)	703	5·78	41	0·34	5·83
Killed in action	—	—	105	0·86	
Accidents*	6,292	51·73	347	2·85	5·83
Total preventable diseases	45,820	376·66	681	5·61	
Total other diseases	25,473	20·943	324	2·65	
Total diseases	71,293	586·09	1,005	8·26	
Total casualties	78,288	643·60	1,498	12·31	

Average Daily Admission rate per 1,000, 1·76.

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(*c*) ***Distribution of casualties by Ethnic Group*, 1941 (*A.D.H.*)**

	Total	European	Non-European
Diseases	84,648	24,856	59,792
Accidents	7,406	2,213	5,193
Battle casualties	1,232	349	883
Other war conditions	84	83	1
	93,370	27,501	65,869

* Accidents were a major cause of gross wastage of trained personnel and precious equipment and transport in every campaign and at home. Strict control and strict discipline of all transportation by 'A' and the C.M.P. were demanded.

The conditions were such that at no time was it possible to establish a well-equipped and well-staffed operating unit within six hours of the fighting line. In most actions the Italians were holding a strong point on a mountain top and its outlying ridges, and the attacking troops had to approach in sweeps through roadless and often precipitous country. The Consulting Surgeon to the Force writes:

'At the advanced and main dressing stations of field ambulances the main surgery of wounds, the work of C.C.Ss. in the last war, was done by officers whose experience was for the most part small and whose equipment was, on paper, inadequate. But the conditions produced, as they usually do in our Army, a type of surgeon suited to them, young men who made up for their lack of experience by common sense and knowledge of basic principles, who developed a fine sense of proportion and who turned out results that are at least as good as those of the last war.'

PRINCIPAL DISEASES

Malaria. The high rate was due to the incidence of infection among L. of C. troops.

Dysentery and Enteritis. Acute bowel infections provided the most frequent cause of incapacity among both European and non-European troops in the forward areas. Most were of a mild Flexner type of bacillary dysentery.

Desert Sore (Veld Sore). These became more frequent in the dry sandy areas where water for washing purposes was scarce and where dust and dirt irritated the slightest scratch. No evidence that suggested that these sores were related in any way to avitaminosis was encountered.

Venereal Diseases. Of 1,073 cases among U.D.F. troops in 1941, 170 were instances of syphilis, 376 of gonorrhoea and 527 of soft chancre or other forms of venereal disease.

Other Diseases. No case of undulant fever, tetanus, trypanosomiasis or smallpox among U.D.F. troops was admitted to a medical unit during 1941–2. During the same period among the 28,000 Europeans and

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non-Europeans of U.D.F. troops there were admitted 13 cases of relapsing fever, 1 of yaws, 16 of cerebro-spinal meningitis, 2 of acute poliomyelitis, 8 of infective encephalitis, 8 of typhoid fever, 17 of typhus infection, 47 of bilharzia, 130 of pulmonary tuberculosis (43 Europeans, 87 non-Europeans) and 16 of other forms of tuberculosis.

Minor Local Conditions. 'Wajir Clap', a non-specific urethritis, followed upon the drinking of the highly saline water from the Wells of Wajir. 'Habaswein Itch', erythema and vesiculation of the skin, was caused by a caterpillar.

HYGIENE AND SANITATION

For nearly a year a large force of Europeans and Africans lived in a tropical area, much of which is malarial and most of which is climatically inhospitable because of the shortage or total lack of water and because of the shortage of locally obtainable foodstuffs. Yet the sickness rate of less than 850 admissions annually per 1,000 U.D.F. troops was not only lower than was expected but was indeed remarkably low in comparison with the 2,243/1,000 U.D.F. troops per annum in the East African campaign of 1916–18.

Among U.D.F. troops the S.A.M.C. hygiene personnel attached to each unit gradually managed to inculcate among the fighting troops an appreciation of the importance of strict sanitary control. But it became apparent that few officers, from commanding officers downwards, had learnt that the efficiency of their units in such a country was in exact proportion to the hygiene standards that obtained within the unit and that the responsibility for the maintenance of a high standard lay upon their shoulders.

2 and 3 (E.A.) Fd. Hyg. Secs. were attached to 12th and 11th A. Divisions respectively, but owing to the rapidity of the advance through Italian Somaliland and Southern Abyssinia a large area was left in the rear of the Army with no hygiene supervision. To meet this need 1 (E.A.) Fd. Hyg. Sec. was moved to Nanyuki and operated as far north as Neghelli and Yavello, while a fourth field hygiene section was formed in April 1941, and stationed in the Nairobi area. At the same time a separate unit was formed, known as the hygiene training centre, for the purpose of:

(*a*) providing refresher courses for hygiene personnel;
(*b*) training African O.Rs. as reinforcements for field hygiene sections;
(*c*) providing instruction for officers and British N.C.Os. from non-medical units.

As in the Sudan Force, the problem of conservancy in the field presented difficulties. Shallow trench latrines were permitted only for forty-eight hours while pit latrines were being constructed. Since breeding

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of *Calliphora* and allied species almost always occurs in deep pit latrines the following measures were adopted, each of which in itself was insufficient to prevent breeding but which, in conjunction, were usually effective:

1. Latrines were covered with stances, cased in concrete in base areas and improvised in forward areas.
2. Stances were fitted with removable tops, it being a matter of unit discipline to replace them.
3. Unnecessary light was excluded from the building covering the latrine.
4. Pits were provided with shaft fly-traps opening to the outside of the building.
5. Smoke boxes were provided in order to smoke the pits continually during the day.
6. Any fly breeding that occurred was controlled by pyrethrum powder placed in the latrine as a larvicide.

When tactical considerations in the field permitted, and elsewhere at all times, refuse was incinerated. Various types of field incinerators were used, one of the best being made of two oil drums on an inclined plane.

Early in the campaign it became evident that field hygiene sections were inadequate to supervise both malaria control and camp sanitation. Accordingly, two mobile malaria sections were formed, one being posted to the forward area and one based on Nairobi for duty in that area and the L. of C. generally. A consultant malariologist was also appointed.

After the occupation a severe additional burden was thrown on the Army hygiene organisation. Inevitably there was a breakdown in the Italian hygiene arrangements in towns, and, as the occupied enemy territory administration had no medical service of its own, the reconstitution of health services devolved on the Army Medical Services. The sanitary conditions of most of the towns, many of which are larger than any town in British East Africa, can only be described as appalling. The Italians had in any event demanded what by British criteria was a very low standard of hygiene; and to this was now added the dislocation due to war and havoc caused by looting by the native population. On the occupation of a town, therefore, there was always a grave danger of epidemic disease, and the first duty of hygiene personnel was to organise the cleaning up of the town to render it fit for occupation by troops.

The policy subsequently adopted was to restore the previously existing Italian health services. Although this policy was carried out as far as possible, it was always necessary, in order to achieve a standard approaching British standards of hygiene, for supervision to be exercised by British hygiene officers and N.C.Os.

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Camp Sites. General cleanliness of camp sites was reasonably good, except for the quantities of tins, boxes and other litter left about the area. With moves frequently taking place at first light, units found difficulty in cleaning up their camp sites before departure, but on too many occasions units which had had plenty of warning of their impending departure failed to ensure that a fatigue party under a hygiene officer or N.C.O. was left at the rear of the column finally to clear the site. Moreover, advantage was seldom taken of the presence of attached hygiene personnel to ensure that the advanced party choosing a new camp site had the advice of a trained hygiene worker on the suitability of the site from the hygiene point of view.

Water Supplies. There was no lack of water in camps in the Kenya Highlands, and when the Abyssinian Highlands were reached adequate water supplies were again encountered. The intervening deserts are, however, very sparsely watered and forward of the Uaso Nyiro and Juba Rivers water was to be found only in shallow wells and water holes, often badly fouled by natives and stock. During the early stage of the advance into enemy territory drinking water had as a rule to be carried. Some South African units had water trailers which all too often broke down and had to be abandoned, but the bulk of the water, previously chlorinated, had to be carried in 40-gallon drums. Two gallons per man per day was the usual allowance, but on several occasions this had to be reduced to one gallon for short periods. Semi-permanent camps were generally provided with surface installations pumped from the adjacent river. Borehole supplies were later installed where service supplies were non-existent or unsatisfactory.

As only a few units were provided with water trailers, canvas tanks were extensively used both for sedimentation and chlorination. These proved fairly satisfactory although the canvas was liable to rot in the tanks used for chlorination. Forty-gallon oil drums were also used for this purpose. When there was a shortage of alum, cement was found to be a satisfactory substitute where only small quantities of water had to be clarified.

Ration Scales. The composite army which was formed in East Africa was derived from divers parts of the continent and each new arrival had its own ration scale. There were at one time five or six different African scales, three Indian and two European. This naturally caused supply difficulties, and after some delay three consolidated ration scales, one for each ethnic group, were adopted. Later a diet scale for Somalis was added. The energy value of the European scale was 4,403 Calories, a high figure for the Tropics, which is accounted for by the relatively large ration of meat and bread required by the South Africans. The combined Indian scale had a calorie value of 4,248 and the African 3,634.

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The European and Asian scales caused little anxiety as regards possible deficiencies. It was otherwise, however, with the African scale. It may be stated, so far as such generalisation can be applied to a multitude of African tribes, that the African in his own environment does not commonly suffer from dietetic deficiencies, with the exception that vitamin A deficiency and pellagrous symptoms are not uncommon in certain areas. Symptoms due to lack of mineral salts and of vitamins B1, C and D are uncommon.

Fruit rations obtained were insufficient to provide enough vitamin C and the following substitutes were from time to time adopted:

1. *Ascorbic Acid Tablets.* These were for a long time unobtainable and never in sufficient quantities to be available as a routine issue. They were kept in reserve in supply depots and issued only on the authority of the S.M.O.
2. *Sprouted Pulses.* Dried peas and choroko were sprouted by soaking in water for 24 hours and then keeping moist between wet sacking for 48 hours. This method had only a limited application before, and was impossible during, the advance but was later recommended for troops in stationary camps.
3. *Concentrated Orange Juice.* A specially prepared antiscorbutic product was supplied by a South African firm. This unfortunately had to be discontinued owing to fermentation.
4. *Dried Vegetables.* Research was undertaken by the senior agricultural chemist in South Africa with a view to turning out a palatable product which would contain as much vitamin C as possible. After preliminary experiments large scale production was decided upon. Unforeseen circumstances delayed production until August 1941. The whole output was then shipped to the Middle East and was not available in East Africa.
5. *Paprika.* A large range of chillies was assayed; eventually two varieties of red sweet pepper were found to contain very large quantities of vitamin C. Local production was encouraged and the dried product was ready for issue in September 1941. One-eighth ounce per man per day was the ration recommended.

After the issue of dates was discontinued and before the addition of vegetables to the native diet, the ration was seriously deficient in vitamin A. Fortunately red palm oil, obtainable from Tanganyika and the Belgian Congo, is very rich in carotene, the precursor of vitamin A. It was therefore arranged to manufacture in Tanganyika, under the supervision of the government chemist, a synthetic mixture of vegetable oils containing a sufficiency of deodorised red palm oil, and this was issued as an alternative for ghee.

Vitamins B_1, B_2 and D were considered to be adequate in the ration scales. A deficiency of calcium in the native scale was rectified by the addition to the maize meal of a finely ground bone meal in the proportion of ½ per cent.

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European hospital diets were based on the regulations for the allowances of the Army. Indian and African diets were designed to meet local conditions and were based on the ration scales for each ethnic group. During active operations, owing to the lack of fresh supplies, the demand for hospital extras and medical comforts was greater than the supply, the shortages especially affecting medical units in forward areas. The number of hospital extras was later considerably curtailed owing to the reduction in imports. These restrictions encouraged the development of local substitutes such as arrowroot, meat extracts, fruit juices and a number of canned articles.

Kitchens. Shortage of water in the forward areas created difficulty in keeping food utensils and food satisfactorily clean. In 25th E.A. Bde. inadequate control over kitchens and food-handlers led to a disturbing and continuing epidemic of bacillary dysentery. It became necessary to require that small platoon and section kitchens should be abolished and central kitchens in company areas provided in their place wherever tactical considerations would allow.

Clothing. The clothing issued to Europeans calls for no particular comment.

At the outset of the campaign it was decided that all African troops should wear boots. This decision, which was made for tactical reasons, resulted in the virtual abolition of a condition of 'cracked feet' which had previously been causing much trouble, particularly among recruits. The universal adoption of footwear to which the men were unaccustomed led at first to other troubles caused by badly fitting boots, shortage of socks (foot bandages had to be used instead) and lack of attention to foot hygiene. All these difficulties were soon solved. Army boots were found to be unsuitable for Africans and a special wide last boot was developed which gave complete satisfaction throughout the period of active operations.

NOTES ON FIELD MEDICAL UNITS

The many difficulties likely to be experienced in the adequate treatment and evacuation of casualties in this terrain, and in rapidly moving warfare, were appreciated from the start. D.M.S. records that:

'Foreseeing the difficulties likely to be encountered in the evacuation of casualties, South African field ambulances were organised to meet these, so far as could be foreseen prior to actual field operations. Reorganisation of these field ambulances was based on the views of a conference held in Pretoria in November 1939, in which medical officers who served in the East African campaign of 1916–18 and in Mesopotamia took part. Arising out of this conference it was accepted that the guiding principles in designing the equipment of field ambulances were (*a*) that each company might have to operate independently, (*b*) that

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patients might have to be treated and nursed by the field ambulance for a considerable time, (*c*) that the M.D.S. should be equipped to perform most types of major surgery, and (*d*) that the field ambulances should have sufficient motor vehicles to move independently of extraneous help. In summary, the South African field ambulance could act as a C.C.S. if necessary, and yet could move as rapidly as any motorised formation which it served. In practice the field ambulances both South African and East African (after reorganisation) did quite frequently act as C.C.Ss. and did so quite successfully.'

With this organisation both South African C.C.Ss. were retained in base areas—as 200 bed general hospitals—to look after local sick, and did not function along classical lines, i.e., as an intermediate medical unit between field ambulance and general hospital. The one South African general hospital functioned at Nyeri in much the same way. The whole brunt of the treatment of divisional sick and battle casualties fell, therefore, upon the heavily equipped field ambulances. In the absence of air evacuation, for which only one old Fokker (provided by the Belgian Congo) was available, apart from Dragons, Rapides and J.U.52s which were used on odd occasions for this purpose but which were rarely available when most wanted, D.M.S. found it necessary to instruct divisions that sick and wounded would be treated at field ambulance level whenever possible. This had one immediate operational advantage—sick and minor wounded were not lost to the division for long periods as the result of rearward evacuation for 700 miles or more. To achieve this organisation within S.A. 1st Division it was necessary to equip 4 (S.A.) Fd. Amb. still more heavily, so that it could function as a C.C.S. within the divisional area.

The working of this plan was not altogether satisfactory. Each field ambulance company was equipped to carry out surgery, but each field ambulance company did not have an accredited surgeon. In actual fact, most of the specialist surgeons in the command were at general hospitals and C.C.Ss. in base areas where battle casualties rarely arrived until long after wounding. Field ambulances used, for the most part, general practitioners practising surgery who did some excellent work under difficult conditions. At this stage in the war U.D.F. had not undertaken the establishment of mobile field surgical units (each with a specialist surgeon) which were to prove of such value in the Italian campaign, because they could keep up with a rapidly moving division and could provide expert surgical attention at divisional H.Q. level.

It was a disadvantage that no U.D.F. consulting surgeon was with the command, with the result that no clear directive was given to surgeons in the field on the broad principles of surgical action to be taken. As the result of this lack of formulation of surgical policy, to take one example, abdominal operations were undertaken at field ambulance

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company level at a time when the unit was engaged in moving warfare and had, indeed, to move forward with such patients.

A greater disadvantage arose from the absence of adequate transfusion facilities in the forward areas. At this stage of the war U.D.F. had not come to appreciate, in official practice, that the most important feature of the treatment of battle casualties is the pre-operative requirement of putting the patient into a state fit for operative intervention—in short, resuscitation. Some A.C.F. personnel had been trained in resuscitation procedures, but the field ambulance equipment included only one Baxter vacolitre. No blood bank was available, and with rare exceptions no grouping of donors had been carried out. It was fortunate that ampoules of saline and some plasma were captured from the Italians in the field and used to good effect.

With rapid movement and the need to split up the heavy companies of field ambulances, light sections had to be developed within the field ambulance establishment in order that essential first aid and evacuation services could be provided immediately behind the R.A.Ps. In actual experience it was found that the South African field ambulances were unnecessarily heavy and too inflexible, both in equipment, and in personnel, unless an independent brigade action had to be served many miles from medical support. Against a virile enemy very much larger casualties must have been expected, and it is difficult to know how these heavy field ambulance companies could have coped adequately with, say, 500 casualties in each major action, while still moving forward. The emergency light sections formed did well, but had many casualties occurred, it would have been very difficult to have had to leave parties of wounded and sick lying unprotected in the bush behind them, with an improvised detachment of the field ambulance to look after them, the nearest C.C.S. 200 miles or more away over an execrable road and the nearest general hospital at least 700 miles away.

Evacuation of patients under desert and hot, dusty conditions, and over tracks in sand and mud, soon disclosed that the panel type of ambulance car was most unsuitable. Some relief to patients was achieved on hot, dusty tracks by the use of ambulance cars with canvas sides in which the sides were rolled up to allow the maximum admission of air, but the absence of dust-proof cars with a ventilating cowl, with a four-wheel drive and with heavy treaded desert type tyres was keenly felt. In forward areas the 3-ton troop carrier, with stretchers slung across the box body, was the vehicle of choice for the evacuation of patients.

It is to be understood that the unorthodox use of the field ambulance was made possible only by the extraordinary nature of the campaign and that such a use may not be found to be suitable in other and widely differing circumstances. A field ambulance can act as a C.C.S. at one time and as a field ambulance at another, only when the force is rapidly

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pursuing a defeated enemy, and when it can confidently be expected that during the advance enemy medical institutions will become regularly available for the admission of cases needing hospitalisation. Then the field ambulance can function as a C.C.S. while static, and when it must resume its proper function it can unload its cases into a hospital and leave a detachment of itself to look after them. But to do this on several occasions in rapid succession would mean that the unit would soon be inadequate to serve the formation to which it was attached.

In this campaign the formations pressed forward with such rapidity that there was always a danger lest the field ambulance H.Q. company would be left behind. It quickly became clear that a much more mobile unit than a C.C.S. was required to follow up the column and take over casualties from the field ambulances and hold them until the C.C.S. itself could be moved forward. So it was that 5 (K.) Fd. Amb. followed closely behind 11th Division and took over the hospitals at Kismayu, Mogadishu and Jijiga in succession. These arrangements worked well, but only for the reason that casualties were remarkably few and that at every stage of the advance an enemy hospital was available for their reception.

NOTE ON THE ITALIAN MEDICAL SERVICE

This organisation was the source of continual amazement to all R.A.M.C. and S.A.M.C. personnel who came into contact with it. Its hospitals, its laboratories, its stores and equipment were truly magnificent. The number of instances, however, in which its members seemed to display indifference to their professional obligations and the general disregard for what the British and South African Medical Services believed to be the normal rules of hygiene and sanitation, were utterly astonishing and incomprehensible to the R.A.M.C. and S.A.M.C.

D.M.S. found reason to record at the time:

'In the matter of medical stores the equipment of the Italian Army was surprisingly complete and of excellent quality. Before the main advance, at the capture of El Wak, it was found that even a relatively small post was abundantly equipped, far more so than a corresponding establishment in the British Army. . . . The dressings were of excellent quality, and the Italian first field dressing can certainly give points to our own.

'Sanitation was practically non-existent, flies swarmed in every part of the hospital and dysenteric patients eased themselves promiscuously in the paths between the wards. . . . Speaking generally, hospital facilities for Europeans in Italian territories were adequate, but the enemy appears to have had but little idea of his responsibilities towards the native troops. Men were found lying around whose wounds had not been examined for days. Cases were discovered in which men with abdominal wounds had been merely given a dose of morphia, as they

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had arrived out of hours and the surgeon did not feel disposed to put himself to the inconvenience of operating after dinner.

'In both categories knowledge of hygiene is so lamentably absent as to make it appear that instruction in this very important branch of Military Medicine must take up only an infinitesimal part of the syllabus of training.

'An interesting point is an apparent aversion from oral medication. Nearly all drugs were made up in ampoule form, and ordinary mixtures, tinctures, liquid extracts, etc., were almost completely absent. An officer who had been under treatment in an Italian hospital described his life as one constant succession of needle pricks.'

APPENDIX XX

SUDAN FORCE. ORDER OF BATTLE. JANUARY 1941.

(abbreviated)

H.Q. Sudan Force

- Indian 4th Division
- Indian 5th Division
- 'Gazelle' Force
- Sudan Defence Force
- Force Troops.

Force Troops

- 'B' Squadron 4th Royal Tank Regiment
- A Squadron of French Spahis
- Artillery, Engineer, Signals, Ordnance, S. and T., Pioneer Units etc.
- 2/5th Mahratta Light Infantry
- 2/6th K.A.R.

Medical

- 21 (Ind.) Fd. Amb.
- 16, 32 and 53 B.G.Hs.
- 10 I.G.H., less three sections
- 11 and 30 I.G.Hs.
- 14 and 16 C.G.Hs.
- 11 M.A.S. less one section
- 1, 2 and 3 (Sudan) Ambulance Trains
- 2 (Egypt) Ambulance Train
- 11 British Staging Section
- 11, 12 and 19 I.S.Ss.
- 4 and 7 Ind. Depots of Medical Stores
- 8 Ind. Adv. Dep. Med. Stores
- 1 and 2 Anti-malaria Units
- 1 and 4 Ind. Mob. X-ray Units
- 2 and 6 Ind. Fd. Labs
- 10 Ind. Convalescent Depot

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Indian 4th Division

Indian 5th Infantry Brigade
1st Royal Fusiliers
3/1st Punjab Regiment
4/6th Rajputana Rifles

Indian 7th Infantry Brigade
1st Royal Sussex Regiment
4/11th Sikh Regiment
4/16th Punjab Regiment

Indian 11th Infantry Brigade
2nd Cameron Highlanders
1/6th Rajputana Rifles
3/14th Punjab Regiment

Divisional Troops and Services including
Medical
14, 17 and 19 (Ind.) Fd. Ambs.
15 (Ind.) Fd. Hyg. Sec.
2 (Ind.) C.C.S.

Indian 5th Division

Indian 9th Infantry Brigade
2nd West Yorkshire Regiment
3/5th Mahratta Light Infantry
3/12th Frontier Force Regiment

Indian 10th Infantry Brigade
1st Essex Regiment, replaced by 2nd Highland Light Infantry
4/10th Baluch Regiment
3/18th Garhwal Rifles

Indian 29th Infantry Brigade (previously numbered 21st)
1st Worcestershire Regiment
3/2nd Punjab Regiment
6/13th Frontier Force Rifles

Divisional Troops and Services including
Medical
10 and 20 (Ind.) Fd. Ambs.
7 and 12 (Ind.) Fd. Hyg. Secs.
3 (Ind.) C.C.S.

'Gazelle' Force

Formed around Skinner's Horse and 1st Motor M.G. Group of the S.D.F.
Medical
170 Lt. Fd. Amb.
11 M.A.S. one sec.

The Sudan Defence Force

Medical
1–6 Mobile Field Hospitals

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APPENDIX XXI

EAST AFRICA FORCE. ORDER OF BATTLE. JANUARY 1, 1941.

(abbreviated)

Force Troops

South African 1st Division

S.A. 2nd Inf. Bde.

1st Natal Mounted Rifles

1st Field Force Bn.

2nd Field Force Bn.

S.A. 2nd Armd. Car Coy.

and signals, engineer and other units including

12 (S.A.) Fd. Amb.

S.A. 5th Inf. Bde.

S.A. 1st Irish

2nd Regiment Botha

3rd Transvaal Scottish

S.A. 1st Armd. Car Coy.

and signals, engineer and other units including

11 (S.A.) Fd. Amb.

25th East African Inf. Bde.

2/3rd King's African Rifles

2/4th K.A.R.

Detach. Somaliland Camel Corps Armoured Cars

and signals, artillery, engineer and other units including

6 (Uganda) Fd. Amb.

and divisional troops.

11th African Division

21st E.A. Inf. Bde.

1/2nd K.A.R.

1/4th K.A.R.

1st Northern Rhodesia Regiment

and signals, engineer and other units including

2 (Zanzibar) Fd. Amb.

23rd (Nigeria) Inf. Bde.

1st Nigeria Regiment

2nd Nigeria Regiment

3rd Nigeria Regiment

and signals, artillery, engineer and other units including

3 (Nigeria) Fd. Amb.

and divisional troops including 3 (E.A.) Fd. Hyg. Sec.

12th African Division

S.A. 1st Inf. Bde.

1st Royal Natal Carbineers

1st Transvaal Scottish

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1st Duke of Edinburgh's Own Rifles
3rd S.A. Armd. Car Coy.
and signals artillery, engineer and other units including
10 (S.A.) Fd. Amb.

22nd E.A. Inf. Bde.
1/1st K.A.R.
5th K.A.R.
1/6th K.A.R.
and signals, artillery, engineer and other units including
1 (Tanganyika) Fd. Amb.

24th (Gold Coast) Inf. Bde.
1st Gold Coast Regiment
2nd Gold Coast Regiment
3rd Gold Coast Regiment
and signals, artillery, engineer and other units including
4 (Gold Coast) Fd. Amb.

and divisional troops including 2 (E.A.) Fd. Hyg. Sec.

On February 10, 1941, 11th (African) Division consisted of 21st and 23rd Bdes. and 12th (African) Division of S.A. 1st, 22nd E.A. and 24th G.C. Bdes.

On February 23, 11th (African) Division consisted of 22nd E.A. and 23rd Nigeria Bdes. and 12th (African) Division of 21st E.A. and 24th G.C. Bdes. S.A. 1st Bde. was now included in Force Troops.

On March 11, 11th (African) Division consisted of S.A. 1st, 22nd E.A. and 23rd Nigeria Bdes.

On April 5, 12th (African) Division consisted of 21st E.A. and 25th E.A. Bdes.

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CHAPTER 7

THE CAMPAIGN IN GREECE

April 6 – 28, 1941

Précis

WHEN, toward the end of 1940, Italy attacked Greece, Britain, at the request of the Greek Government, sent to Greece a small R.A.F. contingent with Army ancillaries. When, in the early spring of 1941, the threat of a German attack upon Greece became imminent, the British Government decided to supplement this exiguous aid by the despatch of a small expeditionary force from Middle East Command. In March and early April this British Commonwealth Force (Australian, New Zealand and U.K.) landed without loss at Piraeus and by the end of the month was in its assigned positions in the Aliakmon Line.

On April 6, the Germans struck simultaneously at Yugoslavia and Greece. Their columns poured down the Vardar valley to seize Salonika and through the Monastir Gap to threaten both the Greek forces in Albania and the left flank and rear of the Aliakmon Line. The British Commonwealth force was compelled to withdraw, first to the Mount Olympus–River Aliakmon Line and then to the Thermopylae Line. But the deterioration of the general military situation rendered this untenable and nothing remained for the Commonwealth force but to get out of Greece with as little loss as possible.

The Germans had complete control of the air. German airborne troops seized the bridge over the Corinth Canal. Nevertheless the great majority of the fighting troops was taken off by the Royal Navy, either from the ports on the mainland around Athens or else from those in the south of the Peloponnesus, during the nights of April 26/27 and 27/28. But large numbers of L. of C. and base troops were taken prisoner and all heavy equipment was lost.

STRATEGIC AND OTHER CONSIDERATIONS

When, in April 1939, Italy overran Albania, she advanced her border to the frontier of Greece. On October 28, 1940, the Italians invaded Greece from Albania. This invasion, successful at first, was checked after a fortnight's fierce fighting and the initiative passed to the Greeks.

The Greek Government appealed to Britain for military aid, this to take the form of air crews, aircraft, transport and a limited number of technical specialists. This appeal was at once heeded. But at this time

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Britain's resources were exceedingly meagre. If military aid were to be provided by far the greater part of it would have to come from M.E.C., already deeply involved. Nothing could be done that would endanger the British position in the Western Desert.

'BARBARITY' FORCE

A military mission was sent to Athens and it was decided in early November to send from the Middle East a small advanced air striking force together with Army ancillaries ('Barbarity' Force). This force landed at Piraeus during November 16/19. The Army component consisted of 130 officers, 50 Q.A.I.M.N.S. and 1,850 O.Rs., drawn from A.A., R.E., R.A.S.C., R.A.O.C. and R.A.M.C. personnel.

Medical Units of 'Barbarity' Force

189 Fd. Amb. ('B' Coy.) in Amolyan Orphanage, Athens.
(H.Q. and 'A' Coy. were in Crete.)
48 Fd. Hyg. Sec. in Amolyan Orphanage, Athens.
26 B.G.H. (600 beds) in the Cecil, Apergis and Olympus Hotels, Kephissia, a suburb of Athens.
4 A.A.C., R.A.S.C. (two sub-sections) in Amolyan Orphanage, Athens.

The Greeks desired far more substantial military aid than this, yet hesitated to accept it. However, on the 18th of January, General Metaxas, reluctantly reaching the conclusion that the Germans meant to invade Greece no matter what the Greeks might do, asked that, should the Germans enter Bulgaria, the disembarkation of a British expeditionary force on the Greek mainland should begin immediately.

When, on February 7, the Italians had been driven beyond Benghazi, General Wavell was instructed to be prepared to send to Greece 'Lustre' Force, consisting of an armoured brigade, three infantry divisions, a Polish brigade, some British corps artillery together with the necessary ancillary troops, services and transport. The infantry divisions selected were New Zealand 2nd Division and Australian 6th and 7th Divisions. The New Zealand and Australian Governments agreed that their troops should be used in this enterprise.

On March 1 Bulgaria joined the Axis and on March 7 'Lustre' Force began to disembark at Piraeus.

'W' FORCE—'BARBARITY' PLUS 'LUSTRE'

General Papagos, on the death of General Metaxas, became C.-in-C. Allied Forces in Greece and General Maitland Wilson assumed command of 'W' Force. Australian 7th Division and the Polish brigade were not sent to Greece; they had to be retained in the Western Desert to help check General Rommel's counter-offensive which, starting on

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April 3, quickly swept W.D.F. back to the Egyptian border. The total number of troops sent to Greece was 58,000, of whom 35,000 were fighting personnel.

'W' Force. Order of Battle.

Headquarters 'W' Force*
H.Q. Australian Corps
Australian 6th Division
Aust. 16th Inf. Bde.
Aust. 19th Inf. Bde.
New Zealand 2nd Division
N.Z. 4th Inf. Bde.
N.Z. 5th Inf. Bde.
N.Z. 6th Inf. Bde.
1st Armoured Brigade
with attached troops including British artillery, A.A., R.E., R.C.S., R.A.S.C., R.A.O.C., R.A.M.C., A.M.P., units and details, etc.
Base
L. of C.
and the Greek Central Macedonian Army.

Disposition of 'W' Force. On April 6 the New Zealand Division was occupying the right sector of the Aliakmon Line, from the coast to a point north-east of Servia. On its left was a regiment of Greek 12th Division, holding the Pieria mountains. Aust. 16th Bde. went into the line at the Veria Gap. On the left of the Australians were the remainder of Greek 12th Division and Greek 20th Division, holding the line between Veria and Edessa. It was intended that Aust. 17th and 19th Inf. Bdes. should, when they arrived, be held in reserve, the former at Kozani and the latter at Servia.

1st Armd. Bde., the first unit to reach the line, was patrolling the Axios (Vardar) valley in front of the Aliakmon Line.

The right sector of the line to Veria, inclusive, was placed u/c Australian Corps; the left sector came u/c of the Central Macedonian Greek Army.

THE DISTRIBUTION OF MEDICAL UNITS OF 'W' FORCE ON APRIL 6

Forward Areas.

New Zealand 2nd Division

4 (N.Z.) Fd. Amb.	Kalokouri, near Katerine.
(serving N.Z. 4th Bde.)	A.D.S. at Paleonellene.
5 (N.Z.) Fd. Amb.	Dolikhe (in reserve).
(serving N.Z. 5th Bde.)	A.D.S. at Ag Demetrios.

* If greater detail concerning the affairs of the Australian or New Zealand formations is sought, the Official Australian or New Zealand Medical Histories should be consulted.

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FIG. 71. Northern Greece.

6 (N.Z.) Fd. Amb. (serving N.Z. 6th Bde.)	Katomelion, 10 miles west of Katerine. A.D.Ss. at Koukas and Sphendami.
4 (N.Z.) Fd. Hyg. Sec.	with 4 Fd. Amb. at Kalokouri.
1 (N.Z.) Mob. Dental Unit	moving to Katerine but recalled to 1 N.Z.G.H. at Farsala.
Australian 6th Division	
2/1 (Aust.) Fd. Amb. . .	South of Servia.
2/3 (Aust.) Fd. Hyg. Sec. .	Gerania.
24 C.C.S., Lt. Sec. . .	Servia.
Armd. Bde. Gp.	
168 Lt. Fd. Amb. with surgical team from 2/6 A.G.H.	Mavrodendri, north of Kozani.
4 Lt. Fd. Amb. . .	Edessa with detachments at Yannitsa and Nea Khalkedon.
Armd. Bde. Lt. Fd. Hyg. Sec.	Katerine.
Adv. H.Q., B.T.G. . .	Elasson. (A.D.M.S.)
Corps Troops	
2/3 (Aust.) C.C.S. . .	Elasson.
H.Q. 2/1 (Aust.) M.A.C. and 'C' Sec. + a workshop sub-sec. (44 cars) . . .	Gerania.
81 B.S.A. (Larissa) . . .	(A.D.M.S.)
1 N.Z.G.H. (600–1,000) .	Farsala
2/6 A.G.H., less detach. .	Moving on Volos, due to arrive on April 10.
2/6 A.G.H. detach. (200) .	Volos.

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24 C.C.S., less Lt. Sec. .	Larissa.
189 Fd. Amb., 'B' Coy. with surgical team . .	Larissa.
5 Mob. Bact. Lab. . .	Larissa.
1 Amb. Train . . .	Lamia.
Railhead . . .	Larissa.
80 B.A. (Athens) (A.D.M.S.)	
26 B.G.H. (600–1,000) with 1 F.T.U. attached .	Kephissia.
7 Adv. Depot Med. Stores	Kephissia.
1 Mob. Malaria Fd. Lab. .	Kephissia.
4 A.C.C., two subsecs. .	Kephissia.
2 Amb. Train (under preparation) . . .	Athens.

H.Q., B.T.G. Athens (D.D.M.S., Australian Medical Liaison Officer).

At the base, awaiting onward move:

2/1 (Aust). Fd. Hyg. Sec. for corps area, awaiting personnel due 9th.
2/7 (Aust.) Fd. Amb. for corps area, awaiting personnel due 9th.
2/2 (Aust.) Fd. Amb. Sec. for corps area, awaiting personnel due shortly.

In the Delta awaiting embarkation there were:

2/5 A.G.H. (1,200) . .	8th Flight
6 B.G.H. (1,200) . .	8th Flight.
2/1 (Aust.) C.C.S. . .	8th Flight.
4 A.C.C., 'B' Sec. . .	9th Flight.
2/9 A.G.H. . . .	10th Flight.
9 (Aust) Dental Clinic .	10th Flight.
13 (Aust.) Dental Clinic .	10th Flight.
1 (Aust.) Mob. Bact. Lab.	10th Flight.
1 (Aust.) Adv. Depot Med. Stores, a Con. Depot .	10th Flight.

Note: Many places in Greece have their names spelt in two or even three ways: Turkish, Modern Greek, Slav. Thus there may be great variety in books and maps.

Other British medical units selected to go to Greece were 7 and 16 B.G.Hs., 2/7 A.G.H., 17 C.C.S., 13 and 15 Lt. Fd. Ambs., 7 Lt. Fd. Hyg. Sec., 17 and 36 Fd. Hyg. Secs., 16 M.A.C., 6 Mob. Bact. Lab., and 3 Mob. Hyg. Lab.

But these plans were disrupted. The order of despatch was changed and not all of these units left Egypt, for the reason that the campaign was of such brief duration.

MEDICAL TACTICAL PLAN

(a) From M.D.S. to C.C.S. by M.A.C.

The dressing stations of the field ambulances had to be sited on or near the main road, Veria–Servia or Katerine–Elasson, but advantage

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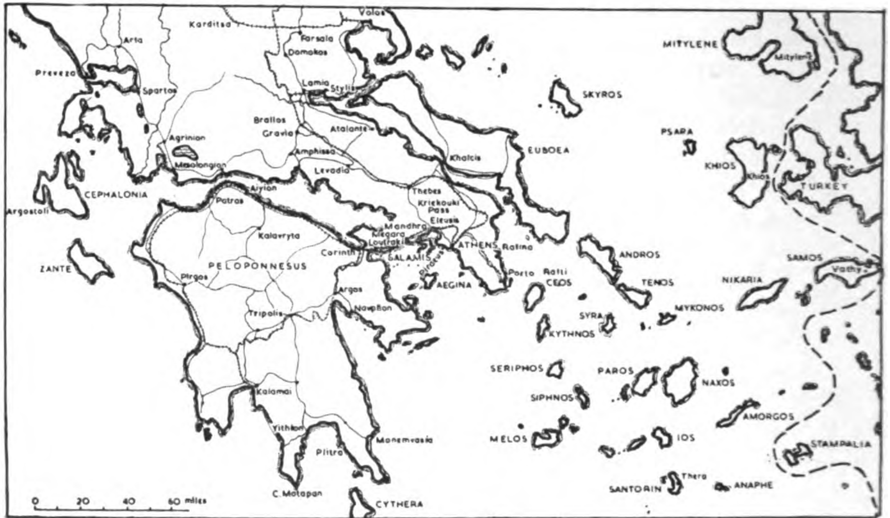

FIG. 72. Southern Greece.

was taken of side-tracks to get them out of the direct line of traffic. Since a journey by ambulance car across the mountain range from Edessa to Elasson might easily have taken 24 hours, the field ambulances were so disposed as to serve as staging sections* where seriously ill or wounded men could be given rest and treatment on their way down to the first 'retaining unit', 2/3 (Aust.) C.C.S. at Elasson.

2/3 (Aust.) C.C.S. was sited at Elasson, where the branch road from Katerine joined the main road from Edessa to the south. It was thus able to deal with casualties from both right and left sectors of the front.

24 C.C.S. was placed at Larissa to deal with any overflow from 2/3 (Aust.) C.C.S. and to retain casualties pending further evacuation by ambulance train to the base. Attached to 24 C.C.S. was 'B' Coy. 189 Fd. Amb. which had been immobilised there with tentage and palm beds for 200 so that it could function as a C.C.S. prior to the opening of 24 and 2/3 (Aust.) C.C.Ss.

(b) From C.C.S. to general hospital by ambulance train.

1 N.Z.G.H. (600) at Farsala and 2/6 A.G.H. (600) at Volos were sited so far forward for two reasons. Firstly, the vulnerability of the railway line at Brallos was such that it was thought desirable to have a considerable number of hospitals beds north of this point. It was intended that these hospitals should be cleared by sea from Volos to

* It is of interest to note that the medical organisation of the Indian Army had a most useful medical unit designed for this very purpose—'the staging section'—which discharged this particular function and so released field ambulances for other purposes.

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the base, but in the event this evacuation by sea did not take place. Secondly, the journey by ambulance train from Larissa to Athens took anything from 15–24 hours and the ambulance trains themselves were of poor quality, consisting of refrigerator vans fitted with slung stretchers.

Staff and equipment for two ambulance trains were supplied from Egypt. For some time after the 'British' component of 'W' Force had reached Greece it remained impossible to obtain suitable rolling stock for conversion into ambulance trains. Ultimately, however, one suitable train (2 Ambulance Train) was improvised. A Greek ambulance train was obtained on loan. This could take 250 lying cases on stretchers. This train was halved and to each half accommodation for 100 sitting cases was added. Thus in the end there were three ambulance trains, 1A and 1B (both staffed by 1 Ambulance Train assisted by Greek personnel) and 2 Ambulance Train (staffed entirely by British personnel). These ambulance trains were stabled at Athens

In retrospect it is clear that the time allowed for the concentration and deployment of 'W' Force was insufficient, as was also that for the selection of sites for the medical units and for the development of an integrated medical organisation. There were many deficiencies and not a little confusion. 7 Adv. Depot Med. Stores remained the only source of supply until the arrival, on April 19, of 1 (Aust.) Adv. Depot. According to the original plans it was intended that this unit should open at Volos. For the supply of forward medical units two tons of medical stores, comprising 22 boxes of drugs, 13 bales of dressings, 3 bundles of splints and an operating table, were sent up to 24 C.C.S. at Larissa on April 8. All medical units were instructed to exercise the most rigid economy in the use of medical stores.

In the 'British' component of 'W' Force there were Australian, British and New Zealand combatant and medical units. In so far as this was possible, it was to be the policy to admit casualties of each of these groups into medical units of their own Service. But the combatant units did not remain segregated into their national groups and the medical units of one were commonly in the area of another. Thus the two British light field ambulances and the light section of 24 C.C.S. were in the area of the Australian Corps while 2/3 (Aust.) C.C.S. was not in the corps area. In order to avoid confusion it became necessary to place all these units u/c Australian Corps.

At the beginning of the campaign many of the medical units were not in possession of their complete equipment, and so 26 B.G.H. in Athens and 'B' Coy. 189 Fd. Amb. in Larissa were called upon to act as 'mother units' to the rest.

British, Australian and New Zealand medical headquarters all issued instructions concerning precautions to be observed against

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malaria, and unit malaria squads of one N.C.O. and three O.Rs. were formed. At the same time forty Greeks were undergoing training in Athens. The course was to end on April 24, after which these men were to be distributed as and where required, each with anti-malarial equipment and a gang of 23 labourers. Stocks of anti-malarial stores were deficient at this time but further supplies were expected to arrive in the immediate future.

THE TERRAIN—COMMUNICATIONS

The Aliakmon Line, running from the mouth of the R. Aliakmon through Veria, Edessa, Florina and thence in a north-westerly direction to the Greco-Yugoslav frontier, was 150 miles in length and 300 miles north of Athens. It was a mountain barrier with three passes—Olympus Pass at Katerine, Veria Pass and Edessa Pass. Behind it was a shorter natural defensive line—the Mount Olympus–River Aliakmon Line. In front of it stretched the malarious plains of Macedonia.

To the south of this line was a transverse stretch of very mountainous country traversed by a single narrow and hilly main road from Edessa in the north through Veria and Servia to Elasson, on the southern edge of the range 150 miles away. At Elasson it was joined by a branch road from Katerine over the shoulder of Mount Olympus.

There was a single continental gauge railway running from Athens through Larissa and Katerine to Salonika. Near Dhomerli, south of Larissa, a narrow-gauge line running from Volos to Kalabaka crossed this main line. Further south of Larissa, near Lamia, the main line passed over the Brallos Bridges to constitute a most vulnerable point in the L. of C.

Piraeus was the only good port, with Volos as a secondary port. Athens was the only possible centre with reasonable communications with all parts of the country.

MEDICAL INTELLIGENCE

While the plans for sending an expeditionary force to Greece were being considered, the Consulting Physician and D.D.P., Middle East, drew up a memorandum for presentation to General Wavell. In this it was pointed out that malaria was endemic throughout S.E. Europe and Asia Minor and hyper-endemic in the plains of Macedonia and in the basins of the Vardar and Struma rivers. It was stated that while military operations in Greece could safely be undertaken during the period October–May, during the rest of the year malaria could be expected to exact a crippling toll.

THE GERMAN INVASION OF GREECE

On April 6, Germany declared war on Yugoslavia and Greece. The impending German onslaught was heralded by intense and sustained

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aerial bombardment aimed particularly at Yugoslavian troops taking up their positions in southern Yugoslavia and in Greece, at Larissa with its airfields and at Piraeus with its shipping. During the raid upon Athens on the 6th/7th by mine-laying aircraft, the S.S. *Clan Fraser*, carrying ammunition, was hit.

The ammunition exploded, as did also that in an ammunition train ashore, and the port was put out of action, being completely closed for two days. Communications were seriously disrupted and D.D.M.S., B.T.G., found it increasingly difficult to maintain contact with his A.D.M.S. at Adv. H.Q. and A.D.M.S., 81 B.S.A. It was fortunate that the Australians had a medical liaison officer with D.D.M.S., and he, with other liaison officers, travelled frequently between base and the forward zone. D.D.M.S., B.T.G., gave authority to D.D.M.S. Corps, A.Ds.M.S. divisions, Adv. H.Q. and 81 B.S.A., to act on their own initiative whenever necessary.

The German tactical plan, as it unfolded, took the form of: (*a*) a penetration of the Metaxas Line in the Eastern Rhodope Mountains along the Greco-Bulgarian frontier at the Rupel Pass in the Struma valley to cut off the Greek forces in Eastern Macedonia; (*b*) a thrust along the Struma, Strumitza and Vardar valleys to isolate Salonika; and (*c*) an advance through the Monastir Gap to turn the Aliakmon Line.

Yugoslavian resistance collapsed, the Metaxas Line, manned by Greek divisions, was broken, Salonika was occupied, and on the 10th the Germans were in Monastir and entered Greece north of Florina.

THE WITHDRAWAL TO THE MOUNT OLYMPUS–RIVER ALIAKMON LINE

The fall of Monastir meant that the Aliakmon Line could be taken in reverse. To guard against this 'Mackay' Force, built around elements of the armoured brigade and two battalions of Aust. 19th Inf. Bde., newly arrived, was formed and took up positions on April 9 at Amyntaion, near Florina, facing the Monastir Gap. At the same time N.Z. 4th Bde. moved from the right of the line to the Servia Pass.

But as the pressure upon the Greek Army in Albania increased it became evident that the Aliakmon Line must soon become untenable. General Wilson decided to withdraw to the Mount Olympus–River Aliakmon Line which ran from Mount Olympus on the right to the bridge at Servia and the line of mountains west of the Kozani–Amyntaion valley.

On April 11, 'Mackay' Force was heavily attacked at Veve and on April 12/13, 'W' Force began to move back. As the outcome of the integration of Australian and New Zealand units, the name Anzac Corps was revived.

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Aust. 16th Inf. Bde. pulled back from Veria to a position on the right of N.Z. 4th Bde. at Servia, while Aust. 19th Inf. Bde. moved west into the mountains to a position on the left of this N.Z. brigade but separated from it by the swift-flowing Aliakmon River. To the right of these formations and guarding the Olympus Pass and the Platamon Tunnel were the other two N.Z. brigades, while on their left were the Greek 12th and 20th Divisions. Aust. 17th Inf. Bde. had disembarked at Piraeus and was moving towards the front, there to block the roads from the north at Kalabaka.

No sooner had the Mount Olympus–R. Aliakmon Line been partly occupied than the Germans (on April 13) attacked on the left of the Anzac Corps front and also on the right where the New Zealanders, holding the pass between Mount Olympus and the sea, had blown the bridge across the Aliakmon.

MEDICAL COVER FOR THIS WITHDRAWAL

The disposal of the sick and wounded from the forward areas was already causing much concern. The M.A.C. was working under great strain. Some of its cars were being used in the Larissa and Farsala areas, in the latter to connect the hospital with R.H. which had been moved back to Dhomerli. Others were needed by 189 Fd. Amb. at Larissa. Further forward the field ambulance cars were encountering terrible conditions. The roads were mere tracks and were choked with Greek and Yugoslav refugees and their livestock. Snow and mud multiplied the difficulties a hundredfold. Stretcher-bearers were carrying for as much as 1½–3 miles in these conditions and to aid them the help of donkeys had been enlisted.

Medical arrangements in the forward zone were made exceedingly difficult by the fact that 2/2 and 2/7 (Aust.) Fd. Ambs. were still awaiting the bulk of their personnel and stores. Part of 2/7 was in Piraeus on April 6/7 when the port was so badly damaged. It set up a dressing station in the docks and assisted in the treatment and evacuation of the many casualties. In this catastrophe the equipment of 2/6 A.G.H., awaiting shipment to Volos, was damaged. The balance of the stores and the personnel of these two ambulances did not reach Piraeus until the 12th, together with 2/5 A.G.H. which opened shortly afterwards in Ekali, near Athens.

On April 9, the nurses of 2/3 (Aust.) C.C.S. were sent back to 1 N.Z.G.H. at Farsala. Much extra work was therefore thrown upon the male staff, already labouring under the severe handicap of extreme dispersal. Instructions had been issued to the effect that no more than three E.P.I.P. tents were to be clumped together and that each set of tents must be 100 yards away from any of its neighbours. The difficulties created by such dispersal can well be imagined. This dispersal indicated

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the prevailing view that the Germans would pay but little heed to the Geneva Cross. In fact there was much discussion as to whether or not the Red Cross flag should be flown over medical units; some advocated that camouflage would provide greater protection. In the end the Red Cross was displayed and was not disregarded by the enemy.

On April 10, 2/6 A.G.H. with its equipment reached Volos by train.

In connexion with the withdrawal to the Mount Olympus–R. Aliakmon Line the following general instructions were issued by D.D.M.S., B.T.G.:

(1) Medical cases were to be evacuated by the first suitable means to medical units south of the Servia defile.

(2) Divisional medical units of Anzac Corps were to accompany the formations to which they were attached.

(3) 4 and 168 Lt. Fd. Ambs. were to move from Edessa and Perdika to Grevena.

On the way back 4 Lt. Fd. Amb. joined up with 'A' Coy. 2/1 (Aust.) Fd. Amb. to form dressing stations along the route, the latter unit establishing a staging post in Petrana to serve Aust. 16th and 19th Inf. Bdes. The position of Aust. 19th Inf. Bde., still to the north of the Aliakmon River, created a difficult problem for 'A' Coy. 2/1 (Aust.) Fd. Amb. The bridge had been blown, as has been related, and the field ambulance therefore either had to hold its patients, bringing them back as it withdrew in conformity with the movements of 19th Bde., or else send them down to Larissa *via* Kalabaka, a detour of some 80 miles, and thus throw an even greater strain upon the M.A.C. But 19th Bde. got safely back over the river on the 15th. Aust. 16th Inf. Bde. was being cleared by H.Q. 2/1 (Aust.) Fd. Amb. at Gerania to 5 (N.Z.) Fd. Amb.

H.Q. and 'B' Coy. of 4 (N.Z.) Fd. Amb. moved back to the site of the M.D.S. of 5 (N.Z.) Fd. Amb. near Dolikhe and 'A' Coy. took over the site of the A.D.S. of 5 (N.Z.) Fd. Amb. at Ag Demetrios, there to serve N.Z. 5th Bde. fighting at Olympus. 5 (N.Z.) Fd. Amb. moved back to a site 7½ miles north of Elevtherokhorion at the entrance to the Servia Pass and there established a M.D.S. to serve N.Z. 4th Bde. Its 'A' Coy. opened an A.D.S. three miles in front of the M.D.S. in the winding road through the Servia Pass. Assistance to the M.D.S. was given by 2/1 (Aust.) Fd. Amb. Evacuation was to 2/3 (Aust.) C.C.S. at Elasson. By April 14 some 150 casualties had passed through the M.D.S. of 5 (N.Z.) Fd. Amb. On the 14th and again on the 15th the A.D.S. in the Servia Pass was heavily dive-bombed and machine-gunned.

2/5 A.G.H. opened in Ekali on the outskirts of Athens on April 14 and admitted 50 patients.

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THE WITHDRAWAL TO THE THERMOPYLAE LINE

The Mount Olympus–R. Aliakmon Line was no sooner occupied than it became untenable.

On April 14, 'Savige' Force, built around Aust. 17th Inf. Bde., newly arrived in the forward zone, was created to guard the flank about Kalabaka. 2/2 (Aust.) Fd. Amb. was sent forward from Athens by D.D.M.S., G.H.Q., to provide medical cover for this force. 4 Lt. Fd. Amb., serving with 'Mackay' Force which was withdrawing through Grevena, was open in Kalabaka. On this date 'Mackay' Force was heavily attacked from the air at Grevena and its armour became further depleted.

On April 15, orders were issued by G.H.Q. for a further withdrawal to the Thermopylae Line, covering Athens. On the night of 15th/16th, N.Z. 6th Bde. was to move back to a position covering the roads leading from Elasson and Tyrnavos, Aust. 16th Inf. Bde. to a position astride the Trikkala road at Zarkos, and Aust. 19th Inf. Bde. to Domokos, there to join detachments of Aust. 17th Inf. Bde. Then N.Z. 4th and 5th Bdes. would withdraw through their 6th Bde., while the Domokos force would withdraw to Thermopylae. Finally the rearguards would follow.

No general instructions of this kind were issued in so far as the medical services were concerned. The movements of the forward medical units were being controlled at this time by Corps and 81 B.S.A.

These plans were disrupted somewhat, for the Germans, instead of attacking on the open left flank as was expected, struck against the N.Z. 21st Bn. at Platamon, on the extreme right, as well as at the N.Z. brigade at the Servia Pass. This thrust brought with it the threat of grave danger, for if successful the enemy could reach Larissa through the Pinios Gorge and so cut off the main body of the Anzac Corps. 'Allen' Force was hurriedly formed around two battalions of Aust. 16th Inf. Bde. and sent to the Pinios area, there to reinforce the New Zealanders who had been forced back. The Germans were held until the 18th. 'Allen' Force at Pinios and the Australians at Domokos checked all attempts on the part of the Germans to interfere with the withdrawal to the Thermopylae Line. By April 18 all formed bodies of the Anzac Corps had passed through this covering force, which then disengaged and withdrew on the night of the 18th/19th.

MEDICAL COVER FOR THIS WITHDRAWAL

2/3 (Aust.) C.C.S. at Elasson received orders from the Anzac Corps commander to close, move to the south and re-open at Levadia. As this unit was moving back it was joined at Farsala by 4 and 168 Lt. Fd. Ambs. On April 15 it had reached a point thirty miles beyond Lamia. 24 C.C.S. and 189 Fd. Amb. were instructed to remain at Larissa as

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long as there were casualties requiring attention. If overrun by the enemy they were to take advantage of the Geneva Convention. In the event, these units evacuated all their casualties and were then instructed to join 2/3 (Aust.) C.C.S. at Levadia.

1 N.Z.G.H. at Farsala was instructed by A.D.M.S., 81 B.S.A., to evacuate all patients, leave everything behind just as it stood, save portable valuable medical equipment, and move to the south. Some 400 patients and all personnel with such equipment as could be carried were, with very great difficulty, loaded on to a train and headed for Athens. A good deal of the remaining equipment was salvaged and utilised by field ambulances as they staged at Farsala. 2/6 A.G.H. at Volos received similar urgent orders. Its nurses had been retained in Athens and at this time it was not fully opened. Its 56 patients were immediately sent off to Athens by ship and its equipment was loaded and taken to the quay. There was much difficulty, however, in obtaining small craft to get it to the ship and so it had to be left behind. The staff set out for Athens by road.

To provide medical cover for N.Z. 21st Bn. in the Pinios Gorge a detachment of 'B' Coy. 6 (N.Z.) Fd. Amb. was sent to Rapsane where it remained on wheels and treated casualties in its two ambulance cars. This detachment was required to endure much bombing and shelling.

4 (N.Z.) Fd. Amb. moved back through Farsala to Lamia, there to establish an A.D.S. 5 (N.Z.) Fd. Amb. moved back to Molos, south-west of Lamia, provided an A.D.S. for N.Z. 4th Bde. and attached an ambulance car to each of the R.A.Ps. 6 (N.Z.) Fd. Amb. moved on April 15 from Elevtherokhorion to Tyrnavos and opened A.D.Ss. in the valleys between this place and Elasson to serve N.Z. 6th Bde. which was covering Larissa. Later its H.Q. and 'B' Coys., less the detachment at Rapsane, withdrew through Larissa to Molos, there to be joined on the 19th by its 'A' Coy. from Tyrnavos.

2/1 (Aust.) Fd. Amb. moved to Domokos to provide medical cover for the rearguard, and 2/2 with 'Savige' Force opened a M.D.S. near Trikkala, the only time this unit was ever unpacked while in Greece.

This abrupt withdrawal of the C.C.Ss. and general hospitals from Larissa, Elasson and Volos meant that for the next few days, until the forward troops had reached the Thermopylae Line, there would be a huge gap to begin with between M.D.Ss. and C.C.Ss. Fortunately the withdrawal was attended by only slight military activity and there were relatively few casualties, so that the need for extensive surgical facilities in the forward zone was not felt. As the withdrawal proceeded the columns were everywhere subjected to intense aerial bombardment and great damage was done to the roads and to transport. Enemy guns and mortars searched the blocked roads and the crowded villages and townships. Following closely upon the heels of the retiring columns

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came seemingly endless streams of German armour and lorried infantry.

Moving with Aust. 17th Inf. Bde., 2/2 (Aust.) Fd. Amb. reached Larissa on the 17th. They found 24 C.C.S. empty and deserted. This unit, together with 189 Fd. Amb., had loaded all their cases, 66 lying and 106 sitting, on to an ambulance train and had then departed at mid-day, leaving their camp standing. A.D.M.S., 81 B.S.A., was not to be discovered (he had left with B.S.A. for Thebes on the 16th) and no information could be obtained from anyone as to where casualties should be sent. Five R.A.S.C. lorries appeared seeking the C.C.S. These joined the field ambulance and, having been loaded with blankets and the like salvaged from the C.C.S., were sent northwards to join units in the retiring columns which lacked ambulance cars. The personnel of 24 C.C.S. were later encountered at Farsala on the site of 1 N.Z.G.H. 24 C.C.S. and 189 Fd. Amb. then moved into camp five miles south of Amfiklia.

A party from 2/6 A.G.H. went back by road to Volos to salvage equipment. There they found that the Greeks, fearing German retaliation should they be caught with any part of this equipment in their possession, had thrown much of it into the harbour. There had been a great deal of pillaging, however, and the party was able to recover tents, tables and X-ray equipment.

Evacuation by ambulance train had by this time become greatly disrupted, for the Greek railway personnel had left their posts. Such trains as were running, and they did run on the 19th, 20th, 22nd and 23rd, were manned by anyone who could drive the engine. On one occasion a medical officer on the staff of A.D.M.S., 81 B.S.A., was called upon to be the engine-driver. The railway line was being continually cut. In this way 2 Amb. Train was isolated for several days and its 300 patients had to be transferred to ambulance cars and lorries. These ambulance trains were plying whenever possible between Athens and the most recent break in the line, and in this way did much to aid evacuation. 150 patients collected at Dhomerli were loaded on to such a train.

On the 17th also, D.D.M.S., B.T.G., sent 2/7 (Aust.) Fd. Amb. up to Gravia, there to deal with any casualties sustained at the Brallos Pass and so to act as a retaining unit for casualties awaiting the ambulance train, which moved up on the 19th. It was given a large supply of medical stores for distribution to divisional field ambulances. The unit opened a M.D.S. at Gravia, to which was attached the personnel of the Friends' Ambulance Unit with ten ambulance cars. 2/3 (Aust.) C.C.S. re-opened at Levadia and was soon joined by the personnel of 24 C.C.S. and 189 Fd. Amb. on the 19th.

The 18th was the critical day of the campaign. N.Z. 4th Bde., the rearguard of the New Zealand Division, was pulling out of the position

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in the Servia Pass. N.Z. 6th Bde. was at Elasson and Aust. 17th Inf. Bde. was on the Trikkala road, out on the left. The remains of 1st Armd. Bde. were making their hazardous way down through Kalabaka and Dhomerli to Lamia and the Brallos Pass. Much now depended on 'Allen' Force at Pinios. Under heavy pressure this force held the Pass until late afternoon when the Germans shifted their attack to the right flank held by N.Z. 21st and Aust. 2/2nd Inf. Bns. This was also held and the danger passed. 'Savige' Force and the New Zealand brigades passed safely through Larissa and turned south. 1st Armd. Bde. moved through Domokos to reach Atalante, having shed the last of its armour but still possessing guns. The most northerly force was now that at Domokos which was covering the rest as they settled into the Thermopylae Line, the New Zealanders on the right between the Pass of Thermopylae and the sea, the main body of the Australians at the Brallos Pass and Aust. 2/5th Bn. out on the left at Delphi.

2/7 (Aust.) Fd. Amb. had its M.D.S. at the junction of the Brallos and the main west roads and its A.D.S. at Lamia. 2/1 Fd. Amb. had opened a M.D.S. just south of Domokos and 2/3 (Aust.) C.C.S. at Levadia, reinforced by members of the staff of 24 C.C.S., was working at high pressure, having dealt with 299 admissions within the previous twenty-four hours.

To provide medical cover for the New Zealand Division in the Thermopylae Line 4 (N.Z.) Fd. Amb., serving N.Z. 5th Bde., was sited about 18 miles south of Molos. The A.D.S. of 'B' Coy. was subjected to repeated attacks from the air. 5 (N.Z.) Fd. Amb. established its M.D.S. in a wing of a Greek hospital two miles west of Kamena Voula and its A.D.S. three miles in front of this. 6 (N.Z.) Fd. Amb. moved from Molos to Lavanates and opened a mobile M.D.S. In Athens 26 B.G.H. was quickly filling. It had extended from 600 to 1,000 beds, but within the next few days was to be called upon to accommodate as many as 1,250. 2/5 A.G.H. was also exceedingly busy, but an inadequacy in respect of water supply limited its intake to 500.

On April 18, General Wavell arrived in Greece. The decision was reached that there was nothing left to do but bring the campaign to an end and evacuation plans in accordance with this decision were prepared.

On April 19, the withdrawal to the Thermopylae Line continued. The nurses of 2/6 A.G.H. received instructions to be ready to leave on two hours' notice. 1 N.Z.G.H., less nurses, 3 Mob. Hyg. Lab., 5 Mob. Bact. Lab., 2/1 (Aust.) Fd. Hyg. Sec., the representative of the Australian Red Cross Society and the light field hygiene section of the Armoured Division embarked at Piraeus on *S.S. Rawnsley*.

On April 20 'W' Force was in the Thermopylae Line. The H.S. *Aba* arrived at Piraeus and took aboard 387 wounded together with the

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matron and 24 nurses of 2/6 A.G.H. An air raid prevented the rest of the nurses from getting away and they returned to Athens and proceeded to Rafina. A.D.M.S., Australian 6th Division, now had all his three field ambulances under his control for the first time during the campaign.

The railway station at Levadia was heavily bombed and set ablaze. At Thebes an ambulance train had been loaded, but repeated attacks from the air had smashed several of the coaches and had demolished a number of engines. The line itself was cut. However, by the 22nd the line had been repaired and another engine found and so 200 casualties and the personnel of 24 C.C.S. and 189 Fd. Amb. got away.

On the 21st the Greek Army in the Epirus had no alternative but to capitulate. 'W' Force was no longer strong enough to hold the whole length of the Thermopylae Line; its left flank was open and, moreover, the enemy could easily move round the right flank by an amphibious operation from Euboea Island.

THE EVACUATION, OPERATION 'DEMON'

On April 22, instructions were issued concerning the withdrawal of 'W' Force from Greece. The night of 24th/25th was announced as D.1 for embarkation and beach groups for the following beaches were organised:

	Collection Areas	Beach	Kms. from Athens
On the mainland, in the vicinity of Athens	Rafina	C	27
	Porto Rafti	D	35
	Megara	P	42
	Theodhor	J	—
In the Peloponnesus	Navplion	S and T	148
	Yithion	Y	306
	Plitra	N	—
	Monemvasia	X	—
	Kalamai	Y	289

Troops were to remain under cover by day in the assembly areas and were to be collected in darkness on the beaches. The rearguard for the whole force would be N.Z. 4th Bde., which would occupy a position near Thebes in the Kriekouki Pass on the night of 22nd/23rd.

D.D.M.S., Anzac Corps, received the following message from D.D.M.S., B.T.G.:

(1) 4 and 168 Lt. Fd. Ambs. are setting up posts on the beaches west and south of Athens and by April 24/25 will, if necessary, establish M.D.Ss. there.

(2) There will be two collecting posts, one on each main beach.

(3) It is unlikely that after 24th/25th the conducting parties bringing casualties to Athens will be able to return to their units. As few as possible will be sent through therefore.

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(4) Subsequently, every effort will be made to embark all possible casualties on to transports.
(5) The possibility that medical details from these units may have to be left behind, if circumstances so demand, is being considered.

The evacuation policy of Anzac Corps was as under:

(1) 2/3 (Aust.) C.C.S. to evacuate as many as possible on the night of April 22/23; to cease receiving on the 23rd; and to withdraw on the night of 23rd/24th.
(2) 24 C.C.S. to accompany the patients so evacuated.
(3) 2/1 (Aust.) M.A.C. to clear all M.D.Ss., to distribute cars to 2/7 (Aust.) Fd. Amb. and to the N.Z. Fd. Ambs. and thereafter accompany 2/3 (Aust.) C.C.S. with the remaining cars.
(4) In so far as is possible, evacuation to be by train. 30 lorries to be provided for evacuation by road.
(5) Further details to be left to A.Ds.M.S. divisions.
(6) After the movement of the C.C.Ss. all casualties to be sent back to Athens direct. Two ambulance trains to be available.

A.D.M.S., Australian 6th Division, issued the following detailed orders:

(1) 2/1 (Aust.) Fd. Amb. to move that night with a composite Australian and New Zealand covering force.
(2) 2/2 (Aust.) Fd. Amb. with 16th and 17th Inf. Bdes. to move back on the 23rd.
(3) 2/7 (Aust.) Fd. Amb. with 19th Inf. Bde. to move back on the 24th.
(4) Ambulance cars to be distributed through the convoys.

A detachment of 1 N.Z.G.H. had been staffing a convalescent hospital at Voulas camp. By April 19 it had some 450 patients in its care. Of these about 250 were evacuated to Athens on the 20th. On the following day orders were received for total evacuation and abandonment of all equipment and personal gear. The detachment, its patients and the N.Z. Mob. Dental Unit moved out in trucks, heading for Eleusis. The convoy was halted outside Megara by Movement Control. All those who because of illness or injury were unfit to endure the anxieties of waiting or the stresses of embarkation from the beaches were sent to 26 B.G.H. It was not until the 24th that the party moved to the beach at Megara there to be joined by walking cases from 26 B.G.H. and other medical units. All vehicles were destroyed. Embarkation began on the night of April 25/26. But at 0400 hours on the 26th there were still some 400 men on the beach when it was announced that there was to be no further evacuation from Megara and that they were to move on towards Corinth, 20 miles away. Trucks were found to transport about 200 of the less fit and the rest set out on foot. With the coming of the day they were persistently attacked from the air. About 80 of them decided to return to Megara. Another 40 made for Athens. The rest continued to move southwards. But only a few escaped capture.

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On April 23, 80 B.A. left Athens for Navplion with its small harbour dominated by an old Venetian fort high upon a hill, handing over to the Greeks and to representatives of the American Red Cross Society. The nurses of 2/5 A.G.H. and of 1 N.Z.G.H., together with 400 lightly wounded, moved from Athens to Argos in the Peloponnesus. 2/3 (Aust.) C.C.S. closed at Levadia, its 348 patients having been sent back to Athens. The unit left all tents standing and all its equipment behind and proceeded to Megara.

About this time a discussion of some importance was proceeding. The nurses wished to stay with their patients who were bed-bound. D.D.M.S., B.T.G., was of the opinion that of those who now remained in the hospitals at Athens, 42 British and 40 Australian nurses should stay and, if necessary, be left behind. D.D.M.S., Anzac Corps, thought otherwise. G.O.C., Anzac Corps, gave orders that the Australian and New Zealand nurses should be evacuated without delay; this being so, it was decided that the British nurses should also depart. (Plate XXXIII shows a party of Australian nurses after disembarkation at Alexandria.)

The Anzac Corps order included instructions that all equipment that could not be carried away was to be destroyed. In this order no special reference was made to the equipment of medical units which, according to the Geneva Convention, must be left intact. The more experienced medical officers assumed that the order did not apply to medical units and did not destroy equipment, but in several instances senior combatant officers, unaware of the correct procedure, insisted that the medical units associated with them should destroy everything that could not be carried away.

According to the evacuation plan much use was to be made of the small ports of Peloponnesus. Running across the narrow neck of land at the level of Corinth is the Corinth Canal, which for the greater part of its length lies deep down in a cutting through the hills. The road from Athens into Peloponnesus crosses this canal near the western Corinth end. On April 24, 'Isthmus' Force, built around N.Z. 19th Bn. and 4th Hussars, was formed and sent to Corinth, there to safeguard this passage. The Greek ship *Hellas*, with 79 walking wounded, many civilians, R.A., and A.M.P.C. personnel aboard, was sunk in the harbour at Piraeus and such as survived were sent to hospital. The air attack upon this port was now so continuous that all attempts to evacuate by hospital ship were abandoned. Furthermore, the main point of embarkation was switched from the mainland to the beaches on the south coast of the Peloponnesus. Part of the staffs of 2/5 and 2/6 A.G.Hs. left Athens on this day for Navplion, getting across the Corinth Canal by punt. At Navplion this party joined all the nurses who now remained in Greece and the personnel of the Friends' Ambulance Unit. On the night of the 24th/25th, N.Z. 5th Bde. with 5

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and 6 (N.Z.) Fd. Ambs., 4 (N.Z.) Fd. Hyg. Sec. and A.D.M.S., N.Z. 2nd Division, assembled at Porto Rafti and were taken off by R.N. units (5,700* altogether).

From Navplion a further 6,685* including the party from 2/5 and 2/6 A.G.Hs., 150 nurses and the personnel of the Friends' Ambulance Unit, were embarked on naval vessels. S.S. *Ulster Prince*, while engaged on this work, ran aground. Later this ship was bombed, hit and set on fire. On the same night 51 New Zealand nurses were embarked at Rafina.

To 26 B.G.H. 30 orderlies from 1 N.Z.G.H. had been attached. They received orders to join a convoy leaving Athens for Corinth. On the way they came across N.Z. 21st Bn. and attached themselves thereto. They reached Navplion and were evacuated to Crete there to be attached to 7 B.G.H.

On April 25, N.Z. 4th Bde., with a section of 4 (N.Z.) Fd. Amb. and 2/1 (Aust.) Fd. Amb. attached, was in position in the Kriekouki Pass. Aust. 16th and 17th Bdes., with 2/2 (Aust.) Fd. Amb., were at Mandhra, on the mainland north-west of Athens. G.H.Q., B.T.G., moved from Athens to Tripolis *en route* for Monemvasia, there to embark, and 80 B.A. reached Corinth *en route* for the south. On the night of the 25th/26th, Aust. 19th Bde. moved to Megara and was taken off, together with 80 nurses and many sick and wounded (some 5,900* altogether). Aust. 16th and 17th Bdes. moved towards Kalamai along with 6th Divisional troops. A skeleton 'W' Force H.Q. was set up in Crete. At Navplion dressing stations were established by 2/3 (Aust.) and 24 C.C.Ss. and by 'B' Coy. 189 Fd. Amb.

On April 26, German dive-bombers attacked Corinth and some 800 paratroops were dropped from troop-carrying planes. They were too late, however, to prevent the passage of the bulk of 'W' Force into the Peloponnesus. N.Z. 6th Bde. was in position at Tripolis covering Navplion. H.Q. and 'B' Coys. of 4 (N.Z.) Fd. Amb. established a M.D.S. to serve this brigade three miles south-east of Tripolis and 'A' Coy. opened a dressing station at the foot of the pass leading over the ranges to this key town. When units of this brigade joined 'Isthmus' Force an ambulance car of this field ambulance went with them. This was attacked from the air, the driver killed and the orderly mortally wounded.

On the night of April 26/27, N.Z. 4th Bde., now cut off from the Peloponnesus by the loss of the Corinth bridge, began to move back towards Megara where 2/1 (Aust.) Fd. Amb., to which a detachment of 'A' Coy. 4 (N.Z.) Fd. Amb. was attached, set up a dressing station. At Kalamai Aust. 16th and 17th Bdes. with 2/2 (Aust.) Fd. Amb. embarked (8,650* altogether). 2/7 (Aust.) Fd. Amb. was at Megara

* From the Appendix to the Despatch by Admiral Sir Andrew Cunningham. *The London Gazette*, May 18, 1948.

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where it had established a dressing station from which some 20 serious casualties were sent into 26 B.G.H. in Athens. At Porto Rafti and Rafina 8,223* were embarked. From Yithion 80 B.A. got away in caiques—the two-masted schooners of the Eastern Mediterranean. The Dutch ship S.S. *Slamat*, filled with troops from Navplion, was bombed and sunk early in the morning of the 27th. The survivors were picked up by the destroyers *Wryneck* and *Diamond*, but both of these were attacked from the air and sunk. There were very few survivors, at least 500 being drowned. The N.Z.M.C. provided 12 medical officers and 24 orderlies for duty aboard the transports. It was a New Zealand medical party that was aboard S.S. *Slamat*, and of this only one man was saved. 1st Armd. Bde. reached the coast at Rafina and, together with N.Z. 4th Bde., a section of 4 (N.Z.) Fd. Amb. and 4 Lt. Fd. Amb., it embarked at Porto Rafti. 2/1 (Aust.) Fd. Amb., together with the casualties it was holding, embarked the following night.

N.Z. 6th Bde., with 4 (N.Z.) Fd. Amb., withdrew from Tripolis to Monemvasia, there to embark.

In connexion with the evacuation of 'W' Force from Greece the following arrangements were made by D.D.M.S., B.T.E.:

8 B.G.H. expanded by	100 beds to	700
9 B.G.H. expanded by	200 beds to	800
15 B.G.H. expanded by	200 beds to	800
27 B.G.H. expanded by	300 beds to	1500,
63 B.G.H. expanded by	200 beds to	1,400
64 B.G.H. expanded by	100 beds to	1,300
	1,100	6,500

On April 28 the Germans entered Athens and had reached Navplion and Tolos, where they captured some 1,700 men. Later in the day they entered Kalamai and actually reached the quay. They were attacked and driven back while some 332* Anzac troops embarked. Some 7,000 others, however, had to be left behind. Some 250 wounded had been admitted to the local Greek civil hospital which had been given medical supplies and comforts by A.D.M.S., 80 B.S.A. At Yithion about 1,000 failed to get away. The last to be evacuated by the Navy during this period were embarked by destroyers on the night of April 30th/May 1. But during the following months many other parties, some quite large, got away in all kinds of boats to reach Crete and elsewhere. During the course of Operation 'Demon' the Royal Navy embarked a total of 50,672. Of these 500 were lost in S.S. *Slamat*.

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* *See* footnote on previous page.

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PLATE XXXIII. The Evacuation from Greece. Australian Nurses reach Alexandria.

[*Imperial War Museum*

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Sufficient A.A.M.C. and R.A.M.C. personnel were left behind in 2/5 A.G.H. and 26 B.G.H. in Athens to deal with 1,000 patients. It is known that at least 353 gravely wounded men were in their care when H.Q. 'W' Force left the capital.

It is of interest to note that the members of the staffs of 26 B.G.H. and 2/5 A.G.H. left behind in Greece to take care of the patients too ill to be evacuated did far more than this: they also cared for casualties evacuated from Crete by the Germans. In 2/5 A.G.H. at Ekali were left 112 patients, 7 medical officers, 2 W.Os. and 148 O.Rs. Six Greek nurses voluntarily joined the hospital. On the morning of April 27 the Germans placed a guard over it but permitted its work to continue without hindrance. Later a German mobile equivalent of a C.C.S. took the building over and the hospital moved to Kokkinia, west of Piraeus, to open in a new large building. 26 B.G.H. at Kephissia was closed, its patients being transferred to 2/5 A.G.H. and its staff distributed among this hospital and the P.o.W. camps in the Peloponnesus. As they were gathered in by the Germans, many Australian, British and New Zealand medical personnel became added to the staff of 2/5 A.G.H. which by May 20 numbered no less than 28 officers and 188 O.Rs. Its patients now totalled 621.

On May 23 the first casualties from Crete arrived by air. By the end of the month the hospital (1,200 beds) was full and an annexe was opened in a nearby Greek barracks. The staff was now 39 officers and 256 O.Rs., the patients 1,590. The protected personnel were in receipt of pay from the Germans and money for the purchase of amenities was received from the International Red Cross.

In July it was necessary to open another annexe staffed by members of 26 B.G.H. and 1 N.Z.G.H. The calorie value of the ration had by this time dropped to about 1,350, but in September food parcels began to arrive.

As the patients became fit again they were taken by sea to Salonika and thence distributed among P.o.W. camps. The annexes were closed and by December 4 the hospital itself was empty. On December 14 the last party of 120 members of the staff left for Salonika, after having handed over to the Germans the hospital equipment intact.

LOSSES

Something of the order of 80 per cent. of the troops sent to Greece came back. The great majority of those taken prisoner were base and L. of C. troops and infantry reinforcements but newly arrived. The shipping losses during the evacuation, and exclusive of R.N. units, were very heavy and included no less than five hospital ships.

Owing to the conditions in which the campaign was fought, few if any reliable statistics of medical interest are available, but the losses among the U.K. medical units given in Table 61 are of interest.

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TABLE 61

Losses—United Kingdom Medical Unit Personnel

R.A.M.C. Units	War Establish-ment		Numbers reaching Crete		Numbers reaching Mobilisation Centre		Total accounted for		Deficient	
	Offr.	O.Rs.	Offr.	O.Rs.	Offr.	O.Rs.	Offr.	O.Rs.	Offr.	O.Rs.
4 Lt. Fd. Amb.	11	180	7	96	—	10	7	106	4	74
168 Lt. Fd. Amb.	11	180	4	105	6	61	10	166	1	14
189 Lt. Fd. Amb.	3	54	1	15			1	15	2	39
48 Fd. Hyg. Sec.	1	28	1	26			1	26	—	2
Armd. Div. Lt. Fd. Hyg. Sec.	1	28	1	30			1	30	—	—
24 C.C.S.	13	93	4	13	4	74	8	87	5	6
26 B.G.H.	23	145	11	60			11	60	12	85
7 Adv. Depot Med. Stores	1	13	1	13			1	13		
1 Mob. Mal. Lab.	4	8	3	9			3	9		
3 Mob. Hyg. Lab.	1	5	1	4			1	4	—	1
3 Mob. Bact. Lab.	1	5			1	5	1	5		
5 Mob. Bact. Lab.	1	5	1	4			1	4	—	1
1 F.T.U.	1	4	1	4			1	4		
1 Amb. Train	1	13	1	12			1	12	—	1
2 Amb. Train	1	13	—	11			—	11	1	2
	74	774	37	402	11	150	48	552	25	225

It is not known whether the strength of every one of these units on reaching Greece was equal to its W.E.

In the Official History of the Second World War, *The Mediterranean and Middle East*, Vol. 2 (Draft), the following figures are given:

Total transported to Greece.	Prior to 'Lustre' Convoys	4,200 approx.
	in 'Lustre' Convoys	58,364
		62,564

Embarked from the Beaches, April 24–May 1.

Date	Beach	Number	Troops
April 24–25	P. Rafti	5,700	N.Z. 5th Bde. Gp.
	Navplion	6,685	Corps H.Q. R.A.F., Base and Other Details
,, 25–26	Megara	5,900	Aust. 19th Bde. Gp.
,, 26–27	Rafina	3,503	1st Armd. Bde. (part) N.Z. Div. Tps.
	P. Rafti	4,720	Corps and N.Z. Div. Tps.
	Navplion, Tolos	4,527	Force H.Q., Base Details, 1st Armd. Bde. (part)
	Kalamata	8,650	Aust. 16/17th Bde. Gp.
,, 27–28	Rafina	800	1st Armd. Bde. (part)
	P. Rafti	3,840	N.Z. 4th Bde. Gp.
,, 28–29	Monemvasia	4,320	N.Z. 6th Bde. Gp.
	Kalamata	332	
	Kithera	820	
,, 29–30	Kalamata	33	
,, 30–May 1	Kalamata	202	
	Milos	700	
		50,732	(includes an uncertain number of Greeks and Yugoslavs)

Total casualties from all causes were about 12,000 of whom many returned to duty.

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A more recent estimate of the Australian losses is given in the Official Australian Medical History.

Disembarked in Greece	17,125
Killed	208
Presumed dead	38
Died of wounds	74
Wounded	494
P.o.W.	2,030
Total losses	2,844

OBSERVATIONS BY D.D.M.S., B.T.G.

(1) *The Red Cross Emblem**

Field medical unit commanders were unanimous in stating that the Germans respected the Red Cross whenever they could see it. They would fly over camps and roads machine-gunning troops and lorries whenever these could be seen, but on flying over a medical unit with the flag prominently displayed they ceased firing. German prisoners in medical units stated that they had been ordered to respect the Geneva Cross and that ambulance cars were not distinguishable from the air unless the whole of the top was occupied by this emblem. It is certainly the case that ambulance cars were subjected to frequent bombing and machine-gunning, so much so that after the withdrawal to the Thermopylae Line it was possible to evacuate casualties only by night. On account of this, advice was given to O.C. 7 B.G.H. in Crete to display several large Red Crosses over his scattered unit which lay in an isolated position in the direct path of bombers coming over from Greece.

(2) *Flint Stretcher Gear*

Very few sets of this were available. Large numbers of casualties, however, had to be removed by lorry owing to the fact that the number of ambulance cars available could not deal with the sixty or seventy miles of 'carry' necessary in the last few days of the withdrawal. Much more generous provision of this gear is necessary under such conditions as obtained in Greece.

(3) *Single Pole Hammock Stretchers*

R.M.Os. working in mountainous areas found that the ordinary stretcher was unsatisfactory on steep hill-sides and demanded the 'Thompson' hill-stretcher. Events, however, moved so rapidly that these could not be provided in time. A hammock stretcher slung on a single pole was designed locally, but it also could not be produced in quantity

* In every campaign it was re-learnt that the immunity of the medical unit from air attack was, in large measure, dependent upon the visibility of the Red Cross emblems that were displayed. The usual flag distinguishing marks proved to be useless. To be visible from 10,000 ft. the white background must be a circle 35 ft. in diameter and the arms of the cross must be 5 ft. broad and must extend to the edge of the circle.

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in time. It is recommended that in future operations in mountainous country a light hammock stretcher be provided to regimental units in the proportion of one per company. The 'Thompson' hill-stretcher itself is too heavy and cumbersome. A much lighter design should be adopted even though it may not stand up to hard service as well as the 'Thompson' hill-stretcher.*

(4) *Unauthorised Equipment*

Unauthorised medical equipment carried by medical units should be very strictly limited. Certain Australian medical units were presented with numerous gifts of equipment by well-wishers in Australia, with the result that the total weight to be carried by road far exceeded the standard. 2/3 (Aust.) C.C.S., for example, had over 100 tons of equipment instead of the normal 35 and much delay in its movement was caused by the fact that extra railway trucks had to be obtained at the last minute. When the C.C.S. was withdrawn by road the greater part of this unauthorised equipment had to be jettisoned.

(5) *Casualty Clearing Stations*

The C.C.S. in Greece was found to be too immobile. Once established it did most excellent work, but any mobile unit which requires 'Q' to provide twenty-two 3-ton lorries to move it is out of place in a campaign of this kind. It is considered that a field ambulance provided with a surgical team and one or two lorries for tentage and stretchers would have been more satisfactory for a short-time retaining unit. As a matter of fact, 168 Lt. Fd. Amb. and 6 (N.Z.) Fd. Amb. were so provided under local arrangements and so employed prior to the arrival of the C.C.Ss. By making use of beds in billets they were able to perform C.C.S. work very satisfactorily. Had the warfare been static, as was expected, then of course there would have been no cause for criticism.

(6) *General Hospitals*

The apparent unpopularity of the 200-bed general hospital is to be regretted. It may be said that its place is taken by the C.C.S., but there is a great deal of difference as far as comfort to patients is concerned between a C.C.S. and a general hospital. The 200-bed hospital is so very much more mobile than the 600 or 1,200 that it can be sited more easily so as to avoid long road and rail journeys.† In addition it can be hidden under trees from the air much more easily. It would have been

* These remarks refer to the Ordnance pattern of the Thompson hill-stretcher which weighs from 18 to 24 lb. The original model, designed for use on the North West Frontier of India, weighed only 9 lb.

† The 200-bedded general hospital can, in actual practice, be rapidly expanded in an emergency to accommodate 400 or 600 cases in far better conditions than can a similarly expanded C.C.S. Experience throughout the war showed clearly that the provision of the 200-bedded hospital and of 200-sections of such hospitals was more than justified.

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far more useful in Greece than the 600-bed hospital such as that at Farsala or Volos.

(7) *Salvage of Medical Equipment*

Nothing was saved and brought back to Egypt owing to the rapidity of the withdrawal and to the bombing of shipping. Considerable quantities of the more valuable equipment had, in fact, been taken to the seaport at Athens by train or even carried by the men themselves, but shipping was not available nor were the men allowed to carry anything other than a haversack on board. This was due to shortage of space. The Greek D.M.S. was informed that this equipment was being left and it is understood that a considerable quantity was collected by him for his own hospitals before the Germans came in.

(8) *Rations*

The Emergency Ration was commonly stated to be thirst-producing. The Ration Sub-committee of G.H.Q., M.E., investigated the complaint and found it to be justified and War Office was requested to produce a more suitable form.

It is difficult for the medical services to plan for, or to make an adequate contribution to a campaign which takes the form of a series of rearguard actions and ends in a withdrawal by sea. It was fortunate that these actions, being skilfully fought, yielded relatively few casualties. and that at no time did the situation become really critical.

In Greece the source of the difficulties that beset the medical services was to be found in the utter inadequacy of the means of inter-communication between D.D.M.S. at the base and A.Ds.M.S. in the forward area. When the battle became one of movement D.D.M.S. found it necessary to delegate authority. Under the circumstances this arrangement could not be satisfactory; it led to considerable misunderstanding and confusion.

At one point the evacuation system became disrupted, 24 C.C.S., 2/6 A.G.H. and 1 N.Z.G.H. abruptly became non-functional when they hurried south and this at a time when 2/3 (Aust.) C.C.S. was on the move. This elimination of the mid-part of the evacuation system threw a very heavy burden upon the field ambulances and the M.A.C.

Inevitably when a C.C.S. or a general hospital hastily leaves a site it must leave much of its equipment and stores behind unless it can obtain transport. This is not forthcoming when a whole army is withdrawing. In Greece medical equipment and stores were doubly precious

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owing to the low place that 5 Adv. Depot Med. Stores occupied in the embarkation list. This experience revealed the need for new methods of packing equipment and stores, methods that later became elaborated in connexion with the campaign in North Africa.

The field ambulances, the M.A.C. and the ambulance trains were less affected by the peculiar circumstances that attended the campaign and were able to perform their tasks of evacuation efficiently and well.

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CHAPTER 8

THE CAMPAIGN IN CRETE*

May 20–31, 1941

Précis

In October 1940, Italy invaded Greece. Thereupon, in accordance with an agreement previously made with Greece, Britain sent a small force to Crete. Conditions were such that this force was divided into a number of small garrisons, widely separated and largely self-contained. As a consequence of the evacuation from Greece in April 1941, large numbers of Australian, New Zealand and United Kingdom troops reached and remained in Crete. But their heavy equipment, arms, transport and stores had been left behind.

On May 20 the Germans invaded Crete. The form which this invasion took was novel. An army was transported by air. After much fierce fighting the Retimo garrison was forced to surrender, the Heraklion garrison was rescued by the Royal Navy and that of Maleme, Canea and Suda was forced back to the south coast whence it was taken off by the Navy during the nights of May 29/30–May 31/June 1. Losses of men, ships and material were heavy.

STRATEGIC AND OTHER CONSIDERATIONS

The possibility that Italy might enter the war as an ally of Germany made it imperative for Britain to forestall the seizure of Crete by the Axis powers. From the point of view of the Admiralty it was highly desirable that a fuelling base on this island should be made available. These matters were under consideration as early as April 1940, and tentative plans were prepared in the following month. It was then decided that no steps should be taken unless and until Greece had become involved in the war, but as a precautionary measure the French in Syria earmarked a small expeditionary force and in M.E.C. a battalion was warned to be prepared for shipment to Crete.

FORCE 'ACTION' AND FORCE 'ASSUMPTION'

On May 21, 1940, the Greek Government gave permission to the Allies to land troops at any Greek port in the event of hostilities breaking out

* Since Australian and New Zealand formations played such prominent rôles in this campaign and since both the Commander and the A.D.M.S. 'Creforce' were New Zealanders, it would be well to consult the Official Australian and New Zealand Medical Histories.

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between Greece and Italy. On October 28, 1940, Greece rejected the Italian ultimatum and M.E.C. reviewed its plans for sending aid. On October 31, 2nd York and Lancaster Regt. (Force 'Action') sailed from Egypt to land at Suda and Canea, on the north shore of Crete, on November 1. On November 5, Force 'Assumption' followed.

FORCE 'ASSUMPTION' ORDER OF BATTLE

H.Q. 14th Inf. Bde. (6th Division)
2nd Black Watch (to follow on November 18)
2nd Y. and L. (already in Crete)
1st Welch
R.E. and A.A. units

Medical: A.D.M.S. and staff
7 B.G.H. (600 beds).
H.Q. and 'A' Coy. 189 Fd. Amb. ('B' Coy. went on from Crete to Greece).

The instructions given to Force 'Assumption' were to protect the naval fuelling base which the Navy was about to establish at Suda Bay, to maintain close contact with the Greek forces on the island and to prevent or to defeat any attempt by hostile forces to obtain a footing on the island. It was understood that Force 'Assumption' would gradually be increased and that preparations were to be made for the accommodation of a complete division. The Australian and New Zealand Governments (with contingents in the M.E.) were asked for permission to use their troops in this enterprise and Aust. 17th Bde. was ordered to stand by.

On November 8, Force 'Assumption' became 'Creforce'. On November 19, 2nd Black Watch reached Crete, as did M.E. Commando (18 officers, 367 O.Rs.) on the 24th and 51 M.E. Commando on December 12.

The majority of regular Greek troops were withdrawn for service on the mainland and by December 1940, their numbers in Crete had become reduced to 746. Following a raid in May 1941, on the Dodecanese by 50 M.E. Commando, this unit returned to Egypt, but to Crete had come 1st Welch Regt. Between January and May 1941, there arrived further reinforcements, mainly R.A., A.A. and S/L units and the Mobile Naval Base Defence Organisation (M.N.B.D.O.)* consisting in the main of coastal defence and A.A. units but with a tented hospital of 60 beds.

With M.N.B.D.O.(1) in 1941 to Egypt went two tented hospitals, one well trained and equipped, the other not so. The staff of a tented hospital consisted of 10 medical officers and 26 sick berth personnel. The first tented hospital, leaving three medical officers behind and

* For more comprehensive information concerning the medical organisation of M.N.B.D.O. the Royal Naval Medical Services, Volume II, Chapter 2, in this Series should be consulted.

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adding to itself two sick berth attendants and a wardroom attendant, sailed from Port Said to reach Suda on May 9. Its staff consisted of:

1 surgeon lieut. commander	. S.M.O.
6 surgeon lieutenants	
2 sick berth chief petty officers	. (C.P.O.)
5 sick berth petty officers .	. (P.O.)
5 leading sick berth attendants	. (L.S.B.A.)
10 sick berth attendants .	. (S.B.A.)
3 cooks	
5 wardroom attendants	

From these the following could be provided:

Two surgical teams, each of 1 medical officer and 3 attendants.
One anæsthetist.
One medical officer i/c casualty reception and resuscitation.
One medical officer as physician.
One C.P.O. for general administration.
One C.P.O. i/c stores
One P.O. for reception duties.
One P.O. and one S.B.A. for dispensary duties.
One P.O. for baggage and patients' effects.
One L.S.B.A. for laboratory and mortuary
and
Two surgical and one medical wards and a small venereal disease section.

On arrival the unit was placed under the senior medical officer (Army Medical Services) for operational and administrative purposes. Not all the unit's stores reached Crete. In place of the many and serious deficiencies there came portions of the stores of the second tented hospital in Egypt and these were duplicates of those already in the possession of the first hospital. On May 12 the unit moved to Mournies. The hospital opened on the 15th.

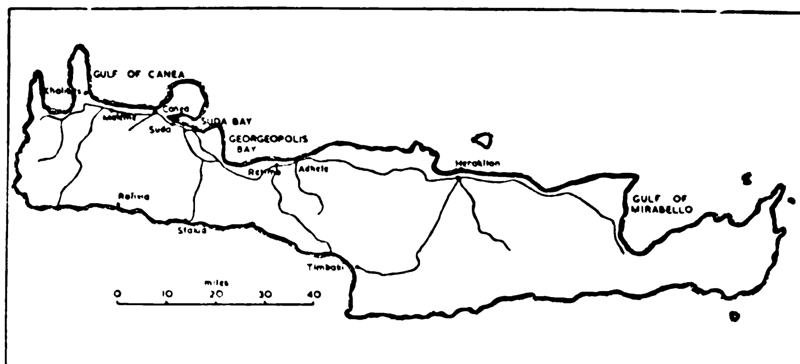

FIG. 73. Crete.

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THE TERRAIN AND COMMUNICATIONS

The island of Crete is some 160 miles long from east to west and at its broadest part is 35 miles wide from north to south. It is divided by the Gulf of Mirabello and Georgioupolis Bay into three sectors. Running east to west along the length of the island is a mountainous range rising to 7–8,000 feet. The south coast of the island, rocky and precipitous, has no natural harbour, but on the north there is an excellent one at Suda Bay and artificial ones at Canea, Retimo and Heraklion. From the shore of the north coast the foothills grade gently into mountains which are broken here and there by river valleys all running north and south. There was only one main road. This ran the whole length of the island along the north coast. It was narrow, ill kept, with weak bridges, and was everywhere vulnerable from the sea. Into this road ran several tributaries from the south, the main ones being those from Timbaki to Heraklion and to Retimo and from Sfakia to Suda Bay through the mountain passes. Near the south coast these roads deteriorated into mountain paths and goat tracks. There were no railways on the island but there were airfields at Maleme, Retimo and Heraklion, all in the north of the island.

MEDICAL INTELLIGENCE

The diseases of military importance were malaria, the enteric group, venereal disease, dengue and sandfly fever. Cutaneous leishmaniasis and kala azar were endemic.

Water supplies in the rural areas were from stream, spring and well and were commonly polluted. In the rural areas sewage was much used for agricultural purposes.

THE TACTICAL PLAN

The geographical features of the island, the distribution of the places of military importance and the paucity of communications imposed upon 'Creforce' the necessity of creating a number of garrisons, largely self-contained, at Maleme and Canea and at Suda, Retimo and Heraklion. It was recognised that, should the island be invaded by enemy forces at several points synchronously, there would be great difficulty in giving support to all of these garrisons if they became seriously threatened.

THE EVACUATION FROM GREECE

In association with Operation 'Demon', camps for the reception of the troops from Greece were prepared, tentage, blankets, etc. being sent from M.E.

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Camp A .	Galatas .	New Zealand troops	
Camp B .	Ay Marina	Walking wounded .	168 Lt. Fd. Amb.
Camp C .	Kalives .	Australian troops .	
Camps D & E	Perivolia .	U.K. troops . .	4 Lt. Fd. Amb. in medical charge of Camp D.

With the abrupt advent of troops evacuated from Greece between April 25–29, the garrison of Crete became greatly swollen:*

'Creforce' .	5,300	
ex 'W' Force .	8,800	Australians
	8,300	New Zealanders
	8,200	U.K. troops (including some 4,000 Cypriots and Palestinians)
	30,600	
M.N.B.D.O. .	1,200	
R.A.F. . .	800	
Greek troops .	15,000	(mainly ex Greece)
P.o.W. . .	15,000	(Italians from the Albanian front)

Evacuated from Greece to Crete were personnel from the following medical units:

2/5 A.G.H. . .	4 Lt. Fd. Amb.
2/6 A.G.H. . .	168 Lt. Fd. Amb.
2/3 (Aust.) C.C.S. .	2/1 (Aust.) Fd. Hyg. Sec.
2/1 (Aust.) Fd. Amb. .	4 (N.Z.) Fd. Hyg. Sec.
2/2 (Aust.) Fd. Amb. .	48 Fd. Hyg. Sec.
2/7 (Aust.) Fd. Amb. .	2nd Armd. Bde. Fd. Hyg. Sec.
5 (N.Z.) Fd. Amb. .	2/1 (Aust.) M.A.C.
6 (N.Z.) Fd. Amb. .	

180 nurses from the Australian, New Zealand and United Kingdom hospitals and 18 orderlies from 1 N.Z.G.H.

The Cretan civil population at this time numbered more than 400,000.

The only Army medical units in Crete which were fully staffed and equipped were those that had not been in Greece—7 B.G.H. and 189 Fd. Amb. (H.Q. and 'A' Coy.). At this time the Q.A.I.M.N.S. personnel had not joined their hospital. Thus, though many medical units were represented and medical personnel were relatively plentiful, an adequate medical service could not be provided for the swollen garrison because equipment, stores and transport were lacking. All that the men from Greece had brought with them was what they wore and what they could carry in their haversacks.

The arrival of so many sick and wounded among the survivors of 'W' Force completely overwhelmed the hospital accommodation in Crete. The excess had to be kept in transit camps and tended by field ambulance

*See footnote, p. 531.

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personnel. 4 Lt. Fd. Amb. was called upon to attend some 450 wounded, while 6 (N.Z.) Fd. Amb. cared for about a thousand. The dressings of many of these had not been changed for a week or more. Some 1,000 Australian casualties brought back from Greece needed urgent attention. Since the Australian medical units lacked equipment, their staffs were attached to 7 B.G.H. and to 189 Fd. Amb. and, with borrowed stores, tended these casualties. The more serious cases were admitted to 7 B.G.H. 6 (N.Z.) Fd. Amb., likewise borrowing tents, stretchers and blankets from 7 B.G.H. and dressings from 189 Fd. Amb., established an A.D.S. adjoining the hospital. In it about a thousand casualties were given essential treatment. The more serious cases were evacuated to 7 B.G.H., others requiring care beyond the means of the New Zealand unit to 189 Fd. Amb., and the rest were retained. The preparation of food for these patients presented great difficulty, for only the most primitive means were available. For shelter all that could be offered was a blanket. 5 (N.Z.) Fd. Amb. and 4 (N.Z.) Fd. Hyg. Sec. accompanied N.Z. 5th Bde. to the west of Canea on April 27 and established a M.D.S. in Ay Marina. The eighteen medical orderlies from 1 N.Z.G.H. were attached to 7 B.G.H. The New Zealand nurses of 1 N.Z.G.H. also joined 7 B.G.H., but on the 28th were moved into billets in Galatas.

The nurses, along with some 500 walking wounded, left Crete in the Greek ship *Ionia* for Egypt in convoy on April 29. In the same convoy there sailed large numbers of women and children and of battle casualties from Greece, D.D.M.S. British troops in Greece and A.D.M.S. Australian 6th Division.

On April 30 General Freyberg was appointed commander of all the Allied forces in Crete and A.D.M.S., N.Z. Division, became A.D.M.S. 'Creforce'.

It was, of course, intended that very many more of the useless mouths should be sent to Egypt, but for this there proved to be little time. On May 5, H.M.H.S. *Aba* arrived off Canea and relieved the hospital of 602 casualties. On May 14, the personnel of 2/5 A.G.H., 2/6 A.G.H., 2/3 (Aust.) C.C.S., 2/1 (Aust.) Fd. Hyg. Sec. and 2/1 (Aust.) M.A.C. left in convoy for Egypt. By May 17 the numbers had become reduced to 9,513 British, 4,900 Australians, 7,300 New Zealanders and 10,800 Greeks, a total of 32,513, including some 4,000 unarmed Cypriots and Palestinians. It had not been possible to ship the P.o.W. to Egypt.

On May 16, H.S. *Aba* arrived off Canea again and in the space of eight hours, by means of two caiques and a launch towing two ship's lifeboats, took off 561 patients. While embarkation was proceeding there was an air raid over Canea at 1745 hours, but although planes dived over the ship she was not attacked and sailed at 1840 hours. At noon the following day, however, *en route* for Egypt, she was attacked and damaged by enemy aircraft.

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On May 17, (N.Z.) Fd. Amb. moved from Ay Marina to Modhion, there to establish its M.D.S. in a building. Its equipment was indeed meagre. All that it had managed to bring away from Greece were 15 surgical haversacks and 3 medical companions. It had accumulated 20 stretchers. 6 (N.Z.) Fd. Amb. opened a convalescent depot adjoining the A.D.S. alongside 7 B.G.H.

Several hundred more wounded were evacuated to Egypt by H.M.A.S. *Perth*.

DISPOSITION OF 'CREFORCE'

H.Q. 'Creforce' in dugouts a mile out of Canea
- Force Reserve
  - 1st Welch in the Suda area
  - N.Z. 4th Inf. Bde., less one battalion, at Canea
- Medical
  - 7 B.G.H., tented, on a promontory about 2½ miles west of Canea

Maleme Sector
- H.Q. N.Z. 2nd Division at Galatas
  - N.Z. 5th Inf. Bde. at Platania
  - 10th (improvised) Inf. Bde., built around N.Z. 20th Bn., at Galatas, and
  - one Greek battalion
- Medical
  - 5 (N.Z.) Fd. Amb. at Modhion
  - 6 (N.Z.) Fd. Amb., functioning as a con. depot in connexion with 7 B.G.H.

Canea and Suda Sector
- H.Q. M.N.B.D.O. at Canea
  - 1st Rangers
  - Australian 16th (composite) battalion
  - Australian 17th (composite) battalion and
  - one Greek battalion
- Medical
  - 189 Fd. Amb., less detachment, at Khaleppa in a church, convent and house
  - The tented hospital of M.N.B.D.O. at Mournies
  - 2/1 (Aust.) Fd. Amb. at Kalives

Retimo Sector
- H.Q. Aust. 19th Inf. Bde. at Georgioupolis
  - Aust. 2/1 Inf. Bn.
  - Aust. 2/7 Inf. Bn.
  - Aust. 2/8 Inf. Bn.
  - Aust. 2/11 Inf. Bn. and
  - three Greek battalions

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Medical

2/7 (Aust.) Fd. Amb. at Neon Khorion, Georgioupolis and Adhele

2/2 (Aust.) Fd. Amb. at Neon Khorion and, later, near Bde. H.Q. at Georgioupolis

Heraklion Sector

H.Q. 14th Inf. Bde. at Wadi

2nd Black Watch at Posn

2nd Y. & L. at West Wadi

2nd Leicesters, of 16th Inf. Bde., at Contops Hill

Aust. 2/4th Inf. Bn., part of, and

three Greek battalions

Medical

189 Fd. Amb., detachment, at Knossos, 3 miles south-east of Heraklion.

It will be noted that N.Z. 4th and 5th Bdes. and Aust. 19th Bde. from Greece had reached Crete more or less intact. Their battalions consisted of about 575 men apiece. They suffered from a shortage in respect of certain infantry weapons, a serious shortage of artillery equipment and a very great insufficiency of transport. N.Z. 10th Bde. was an improvised formation consisting of N.Z. 10th Inf. Bn., gunners and drivers, and two Greek battalions. About one-third of the troops at Maleme, Retimo and Heraklion were disposed on and immediately around the airfields, while the remaining two-thirds occupied positions nearby.

In the last few days before the invasion further reinforcements arrived from Egypt. These included two squadrons of 3rd Hussars with 22 tanks (sent to Heraklion and Maleme sectors), 2nd Leicesters on May 16 (sent to Heraklion sector) and 1st Argyll & Sutherland Highlanders who disembarked at Timbaki on the south coast on May 19 (reached Heraklion in time for the evacuation). The third battalion (The Queen's) of 16th Inf. Bde., together with Bde. H.Q., was obliged to return to Egypt when the ship carrying them was bombed and hit. During these days Crete was continually being bombed from the air.

On May 18, 7 B.G.H. was bombed at 1605 hours. Twelve bombs were dropped. 3 medical officers and 2 O.Rs. were killed and one officer and 3 O.Rs. wounded. This attack appeared to be deliberate for the aircraft were flying at a low altitude and must have seen the Geneva Cross. The British air station at Maleme had previously reported that this emblem could be seen at a height of from 10,000 to 15,000 feet according to visibility. The R.A.F. was unable to provide any real protection and on the 19th it was withdrawn from the island airfields, as it could not continue to maintain its own machines under the constant

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bombing and machine-gunning of the Luftwaffe. Since the Egyptian airfields were 400 miles away, the R.A.F. could not hope to intervene in the battle about to begin.

THE INVASION

On May 20 the second phase of the assault upon Crete opened. The island was invaded. The method adopted was a revolutionary innovation in tactics—an Army was transported by air. The attack was successful and its success was assured by the complete control of the air which the enemy enjoyed. First came fighters to roar up and down the main street of Galatas and these were followed by waves of bombers to pockmark the airfields. At Maleme, Galatas, and Canea this bombardment opened at 0630 hours, progressively increased in volume and then suddenly ceased at 0800 hours when, in the haze of dust and smoke, the gliders, in a silence that was most menacing, came in, to be followed at 0830 hours by parachutists dropped into the Aghya Prison Valley from no higher than 300 feet. Firing as they descended they made at once for the craters that the bombers had caused. At Maleme no less than 3,500 men had landed in an area 10 miles by 3 before late afternoon that day, and by nightfall N.Z. 22nd Bn. had been forced out of its position around the airfield, although, of nearly four parachute battalions which landed, scarcely the strength of one remained at the end of the day. In the Retimo and Heraklion sectors these attacks, delivered later in the day, were not nearly so successful and a large proportion of the enemy was destroyed as the parachutists floated down. H.Q. Aust. 19th Bde. moved out of Retimo to Suda Bay. During the whole of this time dive-bombing was intense and continuous, causing great confusion and dislocation and cutting the field cables. Retimo was isolated from Suda and Maleme. 7 B.G.H. seemed to be a primary objective of the bombers. It was subjected to a most severe attack lasting about two hours during which time the wounded were machine-gunned in their tents by low-flying aircraft. Some of the tented wards, the medical store and the dispensary were set on fire. At 1130 hours the hospital and 6 (N.Z.) Fd. Amb. were overrun by German troops, who marched off most of the staffs and those of the wounded and sick capable of walking, several hundreds in all, towards Galatas prison. They were released later in the day, however, by a patrol of N.Z. 19th Bn. and the medical personnel rejoined their units. At 1300 hours a counter-attack by N.Z. 18th Bn. had retaken the hospital site. That evening the patients were removed to large caves situated on the foreshore close to the hospital and capable of accommodating about 300 cases. In these 7 B.G.H. and 6 (N.Z.) Fd. Amb. established themselves.

1 Marine Tented Hospital at Mournies was surrounded by parachutists early on the 20th, but although completely isolated continued

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to function. Later in the day the enemy was driven back but it continued to be exposed to much enemy sniping from the nearby foothills.

To deal with the overflow from 7 B.G.H., 189 Fd. Amb. was called upon to transform itself into a temporary hospital at Khaleppa. At one time it was accommodating as many as 464 cases. A New Zealand surgical team was attached to it and improvised a satisfactory operating theatre. 5 (N.Z.) Fd. Amb., its M.D.S. at Modhion, and 6 (N.Z.) Fd. Amb., close by 7 B.G.H., were both acting as improvised C.C.Ss., 5 (N.Z.) Fd. Amb. at one time holding as many as 130 patients. As has been related, 6 (N.Z.) Fd. Amb. was overrun by the enemy at the same time as 7 B.G.H. Its commanding officer was deliberately shot by a German parachutist although he had surrendered. During the counter-attack which released both 6 (N.Z.) Fd. Amb. and 7 B.G.H., some of the medical personnel of both these units became battle casualties. Nevertheless, the same evening a section of 6 (N.Z.) Fd. Amb. established an A.D.S. on the roadside under olive trees and continued to function.

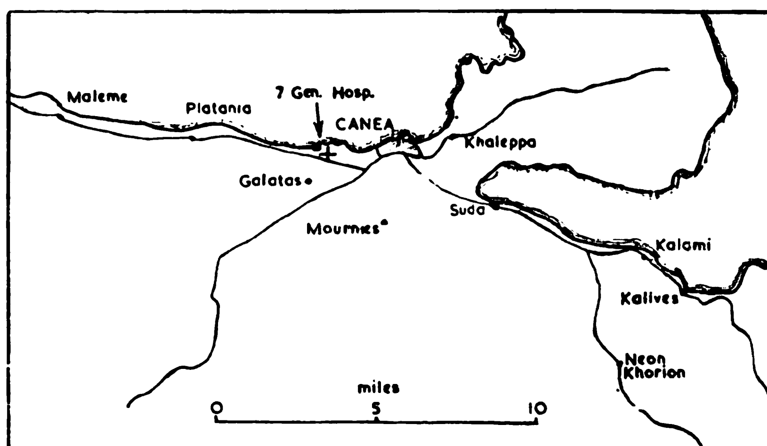

FIG. 74. The Maleme—Suda Area.

At the end of the first day the Germans had had partial success at Maleme and none elsewhere, but communications had been broken and bands of determined and well-armed men were at large. Moreover, a shortage of ammunition had begun to develop and naval losses were mounting.

On the 21st and the days immediately following, the Germans continued to pour in airborne troops at Maleme and Heraklion, while the Luftwaffe made all attempts at reinforcement of the hard-pressed garrisons most hazardous. The sky seemed to be full of menacing planes, diving, zooming and criss-crossing as they bombed and machine-gunned

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PLATE XXXIV. A Cretan Cave. Air-raid Shelter or Hospital.

[*Imperial War Museum*

PLATE XXXV. A Maori Battle Casualty from Crete reaches Egypt.

[*Imperial War Museum*

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the garrison. The problem of getting the wounded away to a medical unit quickly became insoluble. By May 23, the New Zealand troops at Maleme were becoming exhausted and it became necessary for them to withdraw from this area to a line Pergos–Galatas. 5 (N.Z.) Fd. Amb. withdrew to the site vacated by the A.D.S. of 6 (N.Z.) Fd. Amb. at the junction of the Canea–Galatas roads. Stretcher cases were evacuated to 189 Fd. Amb. at Khaleppa, walking wounded to the cave hospital of 7 B.G.H. To this M.D.S. of 5 (N.Z.) Fd. Amb. a surgical team was attached. The enemy now had uninterrupted use of Maleme aerodrome and the Germans there had effected a junction with those at Galatas.

On the 21st the Marine Tented Hospital was frequently machine-gunned and bombed from the air, for the road near which it was sited was much used by troops. On May 22 large numbers of casualties were received and the operating theatre was in continuous use. Rations were in short supply. During the next two days the aerial attack became intensified and it became evident that the units in the Maleme–Canea area were withdrawing.

On the night of May 21/22 an attempted strong seaborne reinforcement of the Germans in Crete was caught and dispersed with heavy losses twenty miles north of Suda Bay.

At Retimo the conflict had been fierce but undecided. 'B' Coy. 2/7 (Aust.) Fd. Amb. was quickly isolated from the rest of the unit. On May 21 the A.D.S. was overrun but its work continued. On the 23rd Australian and German medical officers and orderlies worked together to deal with some 147 Australian, 252 German and 51 Greek battle casualties. Medical supplies for the A.D.S. were dropped from the air by the Germans, as also by the R.A.F. M.E.C. was requested by the commander of the Retimo garrison direct to arrange with the Germans for the evacuation of these casualties, but nothing could be done.

On May 23 also 'Layforce'*, one ton of medical supplies and fifty tons of rations sailed from Egypt. On the 24th still more German troops and supplies were poured into Maleme and also at Heraklion, by air. The 25th was filled with continuous dive-bombing while the German ground troops swarmed everywhere. This was the critical day. Galatas was lost and then regained in the evening. During the night of May 25/26 the right flank of the New Zealanders fell back to a line

* 'Layforce', 7th, 8th and 11th Commandos with General Laycock in command, sailed from the United Kingdom for the Middle East in February 1941. There they were joined by 50th and 52nd M.E. Commandos, these being merged to form one unit. The force thus composed came to be known as 'Layforce' and served as a brigade of 6th Division, 7th Cdo. becoming 'A' Battalion, 8th, 'B', 11th, 'C' and the M.E. Cdo. 'D'. 'C' Bn. was sent to Cyprus as a reinforcement for the garrison, the rest formed the only reserve at the disposal of General Wavell at this time. They—'Layforce'—were sent to Crete. Failing to land at Sfakia on the 25th owing to bad weather, they tried again and went ashore at Suda on the night of May 26/27. The losses of 'Layforce' in Crete amounted to some 600, three-quarters of the total strength.

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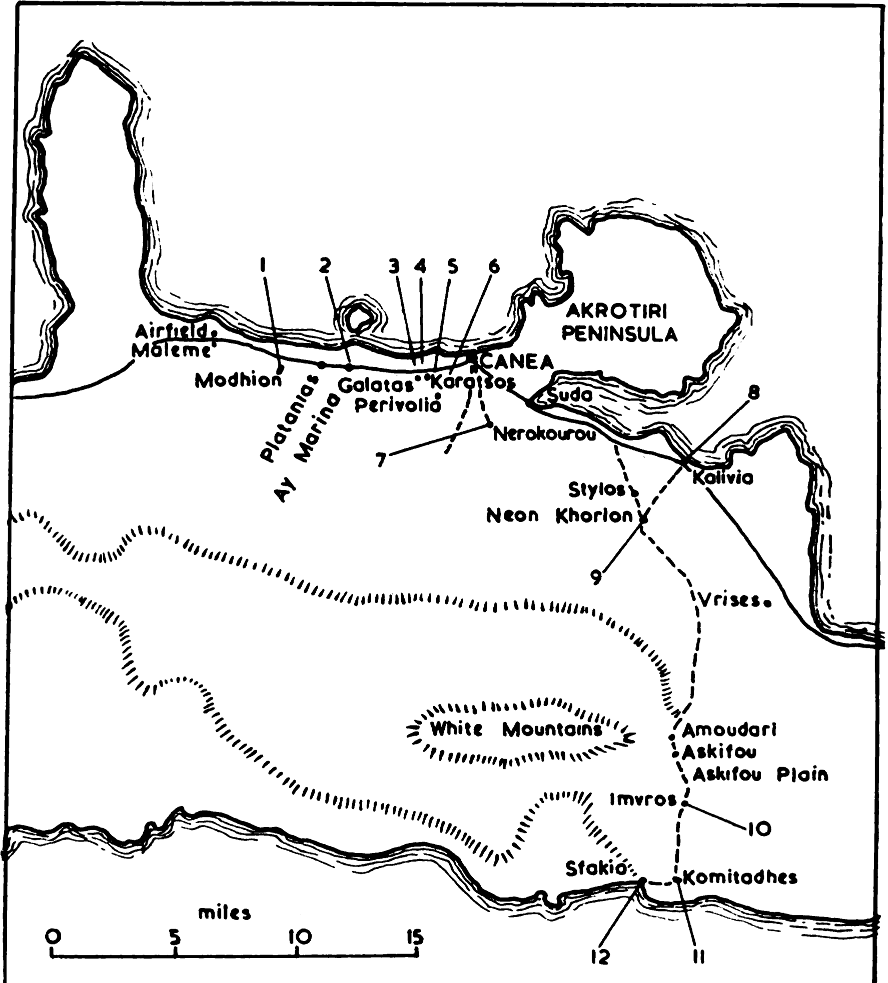

FIG. 75. The Distribution of the New Zealand Medical Units.
April 27–May 29.

1.	5 (N.Z.) Fd. Amb. . .	May 17–23
2.	5 (N.Z.) Fd. Amb. . .	April 27–May 17
3.	5 (N.Z.) Fd. Amb. . .	May 23–25
4.	7 B.G.H.	
5.	6 (N.Z.) Fd. Amb. . .	April 27–May 20
6.	6 (N.Z.) Fd. Amb. . .	May 21–25
7.	5 and 6 (N.Z.) Fd. Amb.	May 26
8.	5 and 6 (N.Z.) Fd. Amb.	May 26–27
9.	W.W.C.P.	May 27
10.	5 and 6 (N.Z.) Fd. Amb.	May 28–29
11.	W.W.C.P.	May 28–31
12.	Embarkation Point . .	May 28–31

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running southwards from the site of 7 B.G.H. This line was held by N.Z. 5th Bde. and Australian 19th Bde. throughout the 26th. During the night of May 25/26 'Creforce' reserve (1st Welch and 3rd Hussars) was sent forward to relieve N.Z. 5th Bde. On the 26th it was heavily attacked and out of its 1,400 men only about 300 managed to get away. On the night of the 26th/27th the whole force moved east of Canea. On the 27th the Australians and New Zealanders counter-attacked and thrust the Germans back for a mile and more, but by this time other German troops in the hills were threatening their flank.

On May 25 the medical situation was likewise becoming critical. All the field ambulances were gravely overcrowded and stores were rapidly running short. 7 B.G.H. and the field ambulances in the Maleme, Canea and Suda sectors withdrew to Neon Khorion. 5 (N.Z.) Fd. Amb. was obliged to leave some 20–30 serious cases behind with three medical officers and fourteen orderlies. 6 (N.Z.) Fd. Amb. had to leave about 150 serious cases with one medical officer and twenty orderlies. Many of the patients of 7 B.G.H. and of 189 Fd. Amb. at Khaleppa were transferred to 2/1 (Aust.) Fd. Amb. at Kalives on the night of May 25/26. Some 300 stretcher cases had to be left in the caves by 7 B.G.H., for all attempts to move them failed. With them stayed two medical officers and twenty orderlies.

On May 25, 37 casualties arrived at 1 Marine Tented Hospital. Two barns near the hospital were taken over and fitted to accommodate 60 patients. German parachutists landed immediately to the south of the hospital. On the 26th more than 200 casualties (mainly medical cases) were brought to the hospital by twelve orderlies of the Australian Army Medical Corps. The machine-gunning and the bombing in the area of the hospital were now so heavy and so continuous that it was impossible to use the operating theatre. Such of the patients as were able to do so spent the day-time in slit trenches. Since the hospital could not feed all those in its charge, about 400 altogether, efforts were made to return as many as possible of the light cases to their units. A D.R. was sent to Suda to contact Naval H.Q. He brought back instructions to 'move what you can eastwards immediately'. All walking cases were told to make their way to a point a mile beyond Suda and there take cover and await further instructions. With them went the sick berth staff, less one C.P.O., two P.Os. and seven others. The few ambulance cars that were available were loaded with lying cases, two to each stretcher head to heel and as many as ten to an ambulance, and despatched to Suda. But both they and the walking cases were advised by units they met on the road to make for Kalives.

On the 26th, at Retimo, a truce was arranged between 1000 and 1300 hours in order that the dead might be buried and the wounded gathered in.

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On the 27th orders for the withdrawal of the Maleme and Canea garrisons to Sfakia, some 34 miles away, were issued. 'Layforce' formed the nucleus of a rearguard. Units were instructed to make for the south coast independently. No walking wounded were to be permitted to set out on this journey unless they had a fair chance of finishing it. Troops were warned that to disregard this instruction would almost certainly mean death from starvation. Medical units were instructed to leave minimum medical staffs behind to attend to the wounded who could not be moved.

On the 27th, 7 B.G.H., 5 and 6 (N.Z.) Fd. Ambs. and 4 (N.Z.) Fd. Hyg. Sec., with such patients as could be moved, withdrew from Neon Khorion to Kalives where 2/1 (Aust.) Fd. Amb. had established an improvised hospital in the local school. In this there were quickly congregated 230 walking wounded and 375 lying. Leaving two Australian medical officers and a number of orderlies behind to tend the lying cases, the medical units continued on their way towards Sfakia.

On the early morning of May 27 only 11 lying cases and a small medical party remained in 1 Marine Tented Hospital. Five of the patients were loaded into a farm cart and, accompanied by four of the staff, set out for Kalives. The remaining six patients were hand carried until a returning ambulance car took four aboard. The other two, seriously wounded Maoris, were carried by the S.M.O., a medical officer and two S.B.As. until they in their turn were picked up by a returning ambulance car. Remaining in the hospital were two wounded German parachutists who were given water and food sufficient to last them until their own countrymen appeared. On reaching Kalives the unit was ordered to move during the night *via* Neon Khorion, Vrises, Askifou, Imvros, Komitadhes, to Sfakia. By dawn the following day the main body of the unit had covered only eighteen miles. During the day staff and patients hid where best they could and when darkness fell moved on again. After a journey that had all the qualities of a nightmare the unit ultimately reached the vicinity of Sfakia where the convoy was bombed. Incendiaries destroyed all the ambulance cars, but from them the patients had been removed and so no casualties were incurred. When night came the staff and over a hundred wounded made their hazardous way down the precipitous cliff face and proceeded to the beach whence boats transported them to waiting destroyers, to reach Alexandria on May 29. The tented hospital, in spite of all it had endured, lost none of its staff in Crete but all stores, equipment and records had to be left behind.

'Layforce' fought a delaying action in the town and docks of Suda while the main body of the garrison moved back to Stylos. Further delaying actions were fought by N.Z. 28th Bn. and N.Z. 4th and 5th Bdes. H.Q. 'Creforce' moved to Imvros, some five miles north of Sfakia, being covered by Aust. 19th Bde. and part of 'Layforce'. The

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road to the south became clotted by day with stragglers, masterless non-combatants, Greeks and Cretans in the main. The ditches became the beds of men deep in the sleep of utter exhaustion. But along this road moved also, by night at first and later by day as well, columns of disciplined troops, unbeaten and unafraid, to impregnate with new confidence the air that was filled with noise and dust and despair. Successive waves of planes swept down this single road each day from dawn to dusk to destroy an army that could not defend itself against them; and yet it was not destroyed.

Plans were being hurriedly made for embarkation by the Navy. On the 28th, communication between Force H.Q. at Sfakia and M.E. was re-opened by means of an R.A.F. wireless set. At Retimo news of what was happening elsewhere in the island, together with £1,000 in Greek money to aid such as managed to escape, was dropped from the air. In the Heraklion sector 189 Fd. Amb. hospital in the Villa Ariadne at Knossos (four miles south of Heraklion) was mortared and machine-gunned for the first time. Prior to this it had been used impartially by both sides. Naval cruisers and destroyers reached Heraklion on the 28th/29th and took off the garrison, some 4,000 altogether.

On the return voyage to Egypt the convoy was heavily attacked. The cruisers *Orion* and *Dido* were hit. Of the 1,000 and more troops aboard *Orion* about 80–100 men were killed and 250–300 wounded. Of the 240 men of the Black Watch who embarked on *Dido* only 130 survived. The destroyer *Hereward* was sunk and the survivors taken prisoner.

As the garrisons of Maleme and Suda approached Sfakia they were covered on the 29th by N.Z. 23rd Bn. and Aust. 2/8th Bn. at Amigdalokorfi. N.Z. 18th Bn., N.Z. 5th Bde. and Aust. 19th Bde. were at Sin Kares. During these days the troops lay concealed in scrub and cave by day and at night were marshalled on the beaches whence destroyers took them off in their boats.

A mile or so south of Imvros a dressing station had been opened in a gully by the personnel of 2/2 (Aust.) and 5 & 6 N.Z. Fd. Ambs. u/c O.C. 5 (N.Z.) Fd. Amb. They had but two surgical haversacks, an assortment of mixed dressings and a German medical kit, but by the exercise of much and ingenious improvisation they tended the wounded and the exhausted and gave emergency treatment. By day these sheltered in the gully and by night were sent on towards Sfakia by lorry—any lorry. They were instructed to cast away their arms and their steel helmets. The lorries in which they travelled were marked with improvised Red Cross emblems and the orderly in charge of the party, when air attack seemed imminent, waved a Red Cross flag while the lorry halted. It is recorded that on several occasions such parties, so behaving, were inspected from low flying aircraft and thereafter not molested. The planes even dipped their wings in salute. It would appear that

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P.o.W. had stated that the Red Cross would be respected whenever it was recognised.

The road to Sfakia ended at Komitadhes, some two miles inland. It continued into a number of goat tracks which wound their crazy way through defile and gorge to the small fishing village of Sfakia and its beach, 150 yards long and 20 yards wide, 500 feet down. For the wounded and the exhausted this would have been the most arduous stage of the journey, had not their eyes been held by the shimmer of the sea on which the rescuing ships rode gently. Awaiting them were the massive invasion barges on to which they moved with order and decorum, and by them they were transported to the cruisers, destroyers and transports whose protection was not more comforting than was the gentle care showered upon them by the men of the Navy. 2/2 (Aust.) Fd. Amb. opened a dressing station in a church and at Nebros a hospital was improvised. In it 50 seriously ill patients were left, together with a medical officer and two orderlies to look after them.

During the embarkation one medical officer and five medical orderlies were in charge of each batch of 50 casualties. On the first night of evacuation, May 28/29, 1,000 men, including 200 wounded, were taken off. 4 Lt. Fd. Amb. also embarked. On the second night 6,000 were taken off; 1,500 left on the 30/31st, and 4,000 on the night of May 31/June 1. There then remained some 6,500, including 1,250 Australians.

At Retimo, on May 30, the garrison was completely surrounded and the Germans were using A.F.Vs. The commander of the garrison decided that it was necessary to surrender, but many men of Aust. 2/11th Bn. got away to Ay Galen, on the south coast, where they joined the A. & S.H. and a party of Black Watch from Knossos. Of the Retimo garrison, as it was in the last days, 700 were taken prisoner, 160 were killed and 140 escaped. The Germans took over the A.D.Ss. of 2/7 (Aust.) Fd. Amb. and began to evacuate the patients by air to Greece. By June 1 all the Australian casualties had been so evacuated and on the 7th the personnel of 'B' Coy. followed as prisoners-of-war.

On May 31 there were still some 6,550 awaiting evacuation at Sfakia and rations were now in exceedingly short supply. The naval losses had been such as to make it necessary to warn the troops that the night of May 31/June 1 would be the last for evacuation. That night naval units took off 4,050 and the rest took to the hills. After the surrender the severely wounded—about 60 altogether—were carried by the medical personnel left with them up the precipitous cliff to the road end *en route* to hospital. Donkeys were used for their transportation but the track was too steep for the animals so loaded.

The table below records the numbers of U.K., New Zealand and Australian casualties during the campaign ; no reliable medical statistics are available.

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TABLE 62

Losses, United Kingdom, Australia and New Zealand

In the Official History of the Second World War, *The Mediterranean and the Middle East*, Vol. 2 (Draft), the following figures are given:

The total number of all contingents and all services in Crete was just over 32,000. Of these 21,000 came from Greece. There were, in addition, over 10,000 Greek troops. Roughly 18,000, including 1,500 wounded, reached Egypt.

	Killed	*Wounded*	*P.o.W.*
British Army	612	224	5,315
Royal Navy	114	30	1,035
R.A.F.	71	9	226
Australians	274	507	3,079
New Zealanders	671	967	2,180
	1,742	1,737	11,835

The 'British Army' killed includes 92 missing.

New Zealand casualties. (Revised figures, 1951)

	Officers	O.Rs.
Killed (including died of wounds)	36	607
Wounded	61	978
Missing	—	1
Died on active service	1	9
Prisoners-of-war	72	2,213
	170	3,808
Of the prisoners-of-war:		
Died of wounds	1	30
Wounded	14	482
Total killed	37	637
Total wounded	75	1,460

N.Z.M.C. losses

	Killed	Missing
5 (N.Z.) Fd. Amb.	1	65
6 (N.Z.) Fd. Amb.	7	85
4 (N.Z.) Fd. Hyg. Sec.	—	17
1 N.Z.G.H.	—	17

Australian casualties

Estimated total of A.I.F. in Crete prior to the attack	6,486
Total number evacuated (including 526 wounded)	2,887
Unaccounted for	3,599

Another estimate:

Taken prisoner in Crete	3,068
Killed in Crete and during evacuation	250
Died of wounds in Crete	24
Died of other causes	7
Rejoined the A.I.F. in the M.E. after the fall of Crete	155
	3,504

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OBSERVATIONS BY A.D.M.S. CRETE

MEDICAL SUPPLIES

Steps were taken to make good the acute shortage of medical supplies which was apparent soon after the arrival of additional troops in Crete. In this connexion two major setbacks occurred:

1. The sinking on May 5 of the S.S. *Rawnsley* by enemy action with 25 tons of medical supplies aboard.
2. The loss of the entire reserve of medical stores at 7 B.G.H. by bombing. The store tent received a direct hit and took fire.

Local civilian supplies were commandeered and gauze and flannelette obtained from ordnance stores to supplement requirements. 7 B.G.H. even used sheets for bandages. However, many units were in possession of small reserves brought from Greece, and as far as it is known all wounded received at least initial dressing and treatment.

Later, medical stores were dropped by British aircraft in the Heraklion and Retimo sectors while destroyers brought small amounts of much needed supplies to Suda Bay for the Maleme–Suda sectors.

TRANSPORT

The complete lack of medical transport on the island caused difficulty for patients and staff alike. Originally the only ambulances were six motor ambulance cars possessed by 189 Fd. Amb. and two cars by the R.A.F. These were subsequently supplemented by five Naval ambulance cars on May 17, but the total was still quite inadequate to cope with the large number of wounded and the necessary transfers from one hospital to another and from hospitals to hospital ship.

Most evacuations had to be carried out at night. Wounded able to walk had necessarily to do so and severe cases were removed in trucks.

CASUALTIES

In Crete the fighting was very fierce and casualties on both sides heavy. When evacuation was ordered it became apparent to those concerned that the Navy would be unable to embark stretcher cases, even if these could have been transported forty miles to the south coast. It was agreed that these cases would have to be left, with a proper proportion of medical personnel to look after them, and that walking wounded only would be evacuated. These latter were to be given priority of embarkation. On the news of this difficult decision filtering down to all ranks, many severely wounded made efforts to be classified as walking wounded, in order that they might avoid becoming prisoners-of-war. Men with severe injuries displayed almost unbelievable fortitude in marching a distance of thirty-five to forty miles over rough stony roads at night in order to reach the south coast. Men with foot wounds covered

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long distances on crutches; some shot in the chest chose to proceed as 'walking wounded' rather than be left. A man whose arm had been amputated only a few days before got up and walked over stony goat tracks, at times falling in the dark on his injured stump.

On the first night of embarkation at Sfakia the Navy could not take all the walking wounded. Those left were therefore dispersed in the village near the beach. Next evening the Germans heavily bombed this village, killing some and re-wounding others of those awaiting embarkation.

It can truly be said that the wounded at Gallipoli and in the mud of Passchendaele suffered no greater horrors than did these of the Commonwealth Forces in Crete. And, just as a donkey was used at Gallipoli for carrying wounded, so a donkey was used in Crete to convey wounded down the final, stony, precipitous slope of the beach.

With regard to the stretcher cases left in the caves of 7 B.G.H. and in the wards of other temporary hospitals, more than the requisite medical personnel volunteered to remain and become prisoners-of-war with them. So much was this so that A.D.M.S. had to issue an instruction that additional medical officers and nursing orderlies would not remain unless given a direct order by superior authority to do so.*

RATIONS

Difficulty of supply from ships at Suda Bay made it necessary for the rations to be reduced to four-fifths of the normal scale in the early stages of the occupation of Crete. Later, heavy bombing of the port made a further reduction to two-thirds of the normal scale necessary.

In the last few days, owing to difficulty of distribution, some troops went without rations altogether. At first oranges, eggs and bread were available locally, but the supply of these soon became exhausted. When the flour mills were destroyed by bombing and a ship containing flour was sunk the bread supply was cut off altogether.

WATER

Adequate water supply was available in most areas from wells, but some of these became fouled owing to poor water discipline. Water sterilising powder was available at D.I.Ds. but a large supply of individual water sterilising tablets for use in water bottles would have been advantageous.

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* This was by no means the only occasion on which a decision of this kind was demanded. It would assist those who are called upon to make such decisions, if future training manuals laid down the ratio of medical personnel to casualties to be left behind in various circumstances.

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THE HEALTH OF THE TROOPS

The general health of the troops was remarkably good considering:

1. the small ration scale;
2. most troops were without change of clothing;
3. hygiene and sanitation were not up to standard on account of:
   (*a*) lack of shovels for digging latrines and refuse pits in the early stage of the occupation;
   (*b*) lack of facilities for water testing, chlorination and cartage.

In the latter stages many of the dead remained unburied owing to the stony nature of the ground and at the time of the evacuation cases of dysentery occurred.

On the other hand, there were remarkably few cases of malaria. This was partly attributable to the fact that a malaria officer had been doing malaria control work in Crete since February 1 and, by employing seven foremen and approximately a hundred men working by squads in areas, had rendered the island reasonably safe. As the troops arrived without any individual protection against malaria (i.e. nets, cream, sprays, etc.), the value of this work cannot be overestimated.

A CAVE HOSPITAL

It has been related that for a period of about a week 7 B.G.H. was obliged to function in caves, having been driven by heavy bombing from its original site. The following extract from an account of the work performed under these unusual conditions by a member of the staff of this hospital is of considerable interest:

'Fortunately there were several good caves along the rocky coast. Our faith in the protection afforded by the Red Cross had temporarily disappeared and it was decided to give the enemy no clue to the whereabouts of the new hospital. This made proper work very difficult; movement by day was hampered by the sudden and frequent appearance of aircraft and all major activities such as removing necessary equipment, collecting rations and so on, had to be carried on under cover of darkness. The blackout also had to be considered.

'The cave hospital presented new problems all of a sudden; the state of the floor needed attention as it had been frequented by goats and other animals. The irregular surface and strange slopes did not help the arrangement of patients, though the slopes were useful when Fowler's position was indicated. No beds were available but patients can be made surprisingly comfortable on stretchers or mattresses. Such cooking as was necessary was done on primus stoves in a corner of the cave. Each cave was responsible for its own cooking. Rations were distributed

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beforehand and a central dump or quartermaster's store was established in a convenient spot under an overhanging ledge of rock.

'The severely wounded patients and the new cases requiring operations were collected into the largest and best cave and here an operating table was set up and the necessary surgery carried out, both for our own people and for wounded German prisoners. The patients were magnificent; they never grumbled though it was difficult to give them a fair deal. Cramped space, poor light, awkward slopes and lack of proper hygienic arrangements made work more difficult. Water was carried from a well some distance away and had to be carefully conserved. There was fortunately plenty of sea water a few yards away and the sea was useful for the disposal of excreta. Incidentally, a corpse, which had been laid outside the cave till burial could be effected at night, was fired on by machine-gunning from the air.

'On May 23, 5 (N.Z.) Fd. Amb., falling back with the Division, formed a M.D.S. in a building nearby which had previously been used as the officers' mess. They reported that their Red Cross flag had been completely respected, and from that time onwards a large Red Cross was displayed over the caves, most of which were conveniently near together, and all the work was carried on in an ordinary way, quite openly and irrespective of the presence of enemy aircraft. The Red Cross was absolutely respected, save when one of the trucks belonging to the field ambulance and bearing the Red Cross was deliberately attacked by cannon from the air and destroyed.

'The field ambulance M.D.S. and the cave hospital thereafter worked in complete co-operation; wounded were evacuated and new cases admitted; at least 500 patients were housed in the caves. It was most unfortunate that during the first hour of the attack both the hospital medical store and the dispensary were completely destroyed by fire, so that equipment was short and many important drugs were unobtainable. It is interesting to note that, in spite of the impossibility of giving A.T.S. (it had been destroyed) the subsequent incidence of tetanus was negligible, no doubt due to the previous administration of toxoid. The lesson to be learned is that two medical stores are safer than one.

'The cave hospital was improving day by day as it became more organised and as more equipment was brought in under cover of darkness; but the enemy was advancing and was not far away when orders came to move on May 25. In the subsequent trek across the island, during which time a surgical team worked with the field ambulance, the need for improvising became even more insistent. Army tin hats are excellent as drinking cups, as wash-hand basins or as bed pans; if all strapping has been expended a 6-inch nail removed from a wall will make a good improvised extension for a fractured femur if driven through the sole of the boot. When elaborate treatment is impossible

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it is surprising how well patients get on if they have rest, food, drink and some simple wound treatment.' (Plate XXXIV shows the entrance to a cave used as an Air-Raid Shelter or a Hospital.)

AN EXTEMPORISED HOSPITAL

The following excerpts from the diary of a New Zealand surgical team provide another example of the conditions under which the medical services worked.

'During the height of the struggle an A.D.S. from 189 Fd. Amb. established an improvised hospital in Canea. Here a very large number of wounded had to be dealt with by a limited medical staff. Patients were accommodated in an evacuated Greek hospital (with only a few beds available), a large church and a convent some 400 yards away, as well as in a vacant house nearby. These last were removed when the house next door was demolished by a bomb. With the use of surgical instruments brought out of Greece, and later of some others salvaged from various places or taken from captured German parachute troops, operations were carried out night and day in these places for the next four days, three teams being organised, one to take the heaviest cases while the others put through numbers of lighter cases and wound dressings.

'Most of the operating was done during the day, as the hurricane lamp which was the only artificial light available rendered operating slow. The outstanding difficulty was to catch up with the accumulated cases while at the same time doing those urgent operations where the time factor was of vital importance. Another difficulty was the classification of cases requiring operation which could only be done correctly by the medical officer, whose time was also most important for actual operating. Otherwise the less vital cases often arrived in the operating theatre while the urgent one might be deferred.

'Movement by day from one place to another was hampered by enemy air action of ever increasing intensity. None of the hospitals was actually hit, although part of the surrounding fence was demolished, the cookhouse slightly damaged and the theatre corporal struck by a bomb fragment which came through the window during an operation. One unexploded bomb falling at the entrance to the hospital provided a problem until removed later in the day by the R.E.

'This daily bombardment, which included the peppering of the whole area with M.G. fire, was most demoralising to patients, and the wounded Germans in particular showed great apprehension. Personnel had to be kept inside and risk was run even in going to the well for water. Mention should be made of the fine conduct of a Greek nurse, the only one available, who remained on duty in the wards at the convent during the heaviest attacks when the building appeared at times as if it would come down. The nurse was subsequently evacuated to Cairo.

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'Eventually the German advance passed Canea, which was surrounded and occupied, the personnel of the field ambulance making their escape individually, almost all wounded having first been evacuated towards Suda.' (Plate XXXV shows a Maori battle casualty from Crete arriving in Alexandria.)

* (*See* p. 513.) Buckley in *Greece and Crete* gives the following figures :

May 20	'Creforce'	from Greece	Reinforcements from Egypt	Totals
Br. . . .	5,200	6,339	3,464	15,063
Aust. . . .	—	6,451	—	6,451
N.Z. . . .	—	7,100	—	7,100
Totals	5,200	19,950	3,464	28,614

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CHAPTER 9

THE CAMPAIGN IN IRAQ

May 2 – 30, 1941

Précis

By agreement with the Iraqi Government, Britain was permitted to maintain air bases near Basra and Baghdad. In April 1941 the Iraqi Government, friendly towards Great Britain, was overthrown by a *coup d'état*. The new régime displayed a hostile attitude towards Great Britain and appealed to Germany for military aid. Iraqi troops occupied the oilfields, cut off the flow to Haifa and threatened the Habbaniya air base near Baghdad.

Reinforcements for the Habbaniya garrison were flown in from India, Indian 10th Division was ordered to Basra and 'Habforce' was organised in Palestine to move to Habbaniya and Baghdad.

On May 2–5, the Habbaniya garrison attacked the Iraqi positions on the plateau overlooking the air base. On the 6th, the Iraqi force withdrew towards Baghdad. On the 18th, 'Habforce' reached Habbaniya and together with the garrison moved on Falluja and Baghdad. Hostilities ceased on May 30 and 'Habforce' entered Baghdad. A new Iraqi Government was formed on June 3.

Meanwhile Indian 10th Division had occupied Basra and Shuaiba. Later this division moved up to Baghdad and was replaced in the Basra area by Indian 8th Division.*

STRATEGIC AND OTHER CONSIDERATIONS

Following the War of 1914–18, Iraq was detached from Turkey and placed under a British mandate. Later she was given her independence. Between Iraq and Britain there came to exist a diplomatic and defensive alliance, according to the terms of which Britain was permitted to maintain air bases near Basra and Baghdad, to enlist levies for their protection and to move troops and supplies through the country. In the event of war Britain had the right to make use of Iraqi railways, rivers, ports and airfields. The Iraqis maintained a well equipped regular army of four infantry divisions and one mechanised brigade and an air force which possessed some sixty first line aircraft, including fast Italian fighters and American bombers.

On the outbreak of war in September 1939, Iraq broke off diplomatic relations with Germany, but later, when Italy entered the war, there

* For fuller information concerning the affairs of the Indian Army, The Indian Medical History should be consulted.

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was no similar reaction and the Italian embassy in Baghdad remained open, to become a hotbed of intrigue and a source of much anti-British propaganda.

Iraq forms part of the land bridge between the Mediterranean and the Persian Gulf and occupies a strategic position of great importance on the lines of communication between the West and the East. The path to India and Australia from Britain by air ran through Iraq. It was imperative that this should be kept open. British naval security in the Indian Ocean depended upon the control of the head of the Persian Gulf. Britain had large financial interests in the oil companies of Iraq and Persia. The security of the oil wells in Iraq and in the south-west of Persia and of the oil pipe-lines was dependent upon the friendliness of the Iraqi Government. At this time the oil of Iraq and Persia had become a primary necessity to Great Britain and any threat to the tranquillity of these countries would endanger its supply, interrupt its flow along the pipe-lines and immobilise the machines in the Western Desert. With Greece and Crete in German hands it was always possible that the Axis powers might decide to thrust through Syria and Iraq and thus threaten the British position in Egypt from the north-east. India was equally interested in the affairs of the region of the Persian Gulf and for similar reasons, for Axis possession of Iraq could open the way to Afghanistan. Iraq, Persia and Aden were included in India's plans for her own defence.

Early in the war the Government of India considered taking advantage of the existing treaty rights to open up lines of communication through Iraq to the Middle East and thus indirectly to secure Allied interests in Iraq. A brigade group was earmarked for this purpose. But the entry of Italy into the war greatly increased the strategic importance of this country, especially for the reason that the attitude of Russia remained unpredictable, and it came to be recognised that a far stronger force would be required.

Plans were formulated early in 1941 for the assembly of 'Sabine' Force, composed of Indian 10th, 8th and 6th Divisions, which would secure the Basra area, establish a base there, be prepared to advance to Baghdad and beyond, if necessary, and establish a friendly administration in Iraq. There were many difficulties to be overcome, however; the provision of shipping, of equipment and of those ancillary services beyond the power of India to supply.

On March 31, 1941, Middle East and India Commands conferred in Cairo to formulate joint plans for counteracting any move in Iraq on the part of the Axis powers. But these conversations were brought to an end by the imperative need for immediate action. In Iraq in the first week of April there was a *coup d'état*. Rashid el Gailani, with the help of four senior army officers known to be sympathetic towards the

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Axis cause, seized power. He announced that his government would fulfil all its international obligations and made special reference to the Anglo-Iraq treaty. The British Government did not attach any importance to this pronouncement. On March 31, the Regent found it desirable to seek refuge in the British air base at Habbaniya, whence he was flown to Basra. The new régime began to display a distinctly unfriendly attitude towards Britain and made it clear that this attitude might, sooner or later, become transformed into hostile action. Later, on May 2, the new government appealed to Germany for military support.

Iraq was within the sphere of Middle East Command. At this time, however, M.E.C. was hard pressed, and so the Government of India was requested to despatch a force to occupy Basra.

THE DEFENCE OF HABBANIYA

In Iraq at this time there were No. 244 Bomber Squadron, R.A.F., and two companies of levies at Shuaiba, sixteen miles south-west of Basra, and No. 4 Service Flying Training School, R.A.F., some 1,200 levies (mainly Assyrians and Kurds), and No. 1 Armoured Car Company R.A.F. (18 cars) at Habbaniya, about fifty miles west of Baghdad. At both of these air bases there were many British families and civilian employees.

Habbaniya was an outstanding example of man's conquest over physical nature. It was an isolated community, dependent entirely upon its own resources for the provision of those amenities that make social life possible in a strange and harsh environment. In the midst of desolation it was a garden filled with the greenery of leaves and the kaleidoscopic hues of flowers. It had become a sanctuary for birds. It had furnished itself with a wide variety of facilities for happily spent leisure—sailing on the lake, a pack of foxhounds, swimming baths, tennis courts and all the rest. Down its glades the high-pitched merry laughter of lustily growing children echoed.

The air base nestled between the Euphrates and Lake Habbaniya, used by the flying-boats on their way to and from Karachi. It was overlooked by a sandy plateau with its foothills which linked the river and the lake. The perimeter of the airfield was some seven miles in extent with blockhouses guarding the gates in the high steel wire fence. Among the 1,000 or so R.A.F. personnel stationed there, there were about 35 qualified pilots. For training purposes the school had some 80 assorted aircraft. Two howitzers, relics of the War of 1914–18, decorated the lawn in front of Air Headquarters. There were no anti-aircraft guns. There was a large and well equipped R.A.F. hospital that served the region.

On April 27, G.S.O.I. of Indian 10th Division was flown to Habbaniya, there to take command over all ground troops. On the 30th, 400 officers

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PLATE XXXVI. Iraq. A Surgical Ward of 61 British General Hospital, Shuiaba, under construction. Built of crude bricks, the arches have no keystone. They are covered with straw and lined with plaster.

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and men of 1st King's Own Royal Regt. (Lancaster) were flown from Shuaiba to Habbaniya.

Many of the women and children who had been congregated at the British embassy in Baghdad were brought to Habbaniya for evacuation by air to Basra. Iraqi troops to the number of eleven battalions, with a liberal supply of artillery, machine-guns, armoured cars and light tanks, occupied the plateau above and completely dominated the airfield on April 30, for training purposes it was stated. Within the perimeter all aircraft were at once fitted with bomb-racks, obsolescent machines were hastily rejuvenated and the pupils given intensive courses in gunnery and bomb-aiming. In these ways sixty-four aircraft were made ready for action and the trained pilots were reinforced by eager novitiates.

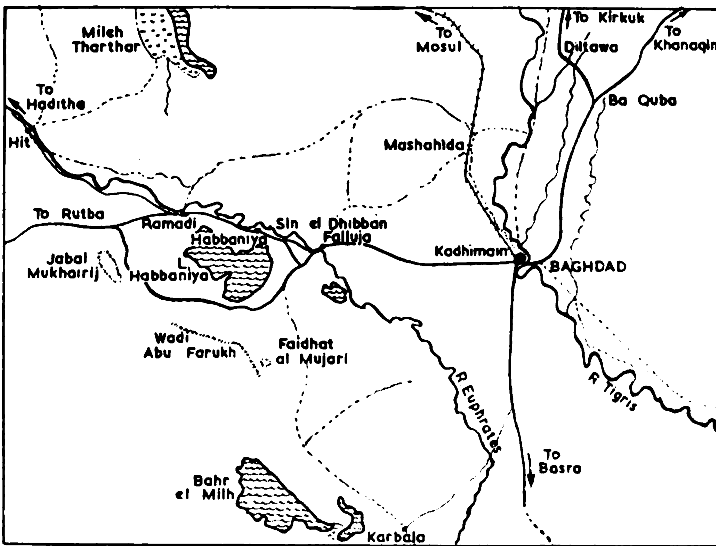

FIG. 76. The Baghdad–Habbaniya Area.

On May 1, the Iraqi commander intimated that as the airfield had been surrounded, all flying must cease. He was informed that training would continue and that should a British aircraft be fired upon, immediate reprisals would follow. Later the Iraqi commander was requested to move his troops off the plateau away from the air base and was told that failure to do so would be regarded as an act of war. It was decided that, if the Iraqi forces were still on the plateau next morning, they should be attacked by every aircraft that could get off the ground.

At dawn on May 2, the greying sky above the air base was filled with a strange miscellany of aircraft flying at different levels and in different directions, waiting to strike at 0500 hours. All through the day they continued to bomb the Iraqi positions on the plateau. The Iraqis

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retaliated with aerial bombardment and artillery fire. At the end of the day thirteen of the garrison had been killed and twenty-nine wounded and only forty-two of its machines remained serviceable. Bombers from Shuaiba attacked the airport in Baghdad.

On this day Iraq passed back from G.H.Q. India to M.E.C. General Wavell ordered Palestine and Transjordan Command to form and despatch a mobile column to Iraq to relieve Habbaniya, five hundred miles away, to secure H.4, a pumping station on the Haifa pipe-line where an advanced dump was to be established, and to clear the Iraqis out of the old fort and police-post at Rutba. The pumping stations on the Kirkuk, Haditha, Haifa and Tripoli pipe-lines are numbered consecutively, starting in Iraq, those on the Kirkuk–Haditha section being given the prefix K, those on the Haditha–Haifa line being given the prefix H and those on the Haditha–Tripoli line the prefix T. Each of these stations had a water supply and an air strip.

During May 3, 4 and 5, the R.A.F. in Habbaniya continued to attack the Iraqi positions. The women and children were evacuated by air to Basra. The wastage of aircraft was formidable. A few reinforcements were flown in. The Iraqis on the plateau were holding their positions with difficulty for their supply line was dominated by Habbaniya aircraft. The ground forces, the King's Own and levies, engaged in much active patrolling.

On May 6, it was found that the Iraqis had withdrawn from the plateau and were occupying a strong position near the village of Sin el Dhibban on the Habbaniya–Falluja–Baghdad road. The garrison moved out to attack with infantry, armoured cars, aircraft and the two 4·5 howitzers. Iraqi reinforcements from Baghdad were heavily bombed and suffered severe losses. The Iraqi positions were taken. The garrison's casualties were less than 40 killed and wounded.

'HABFORCE'

In Palestine, at Nathanya 35 miles south of Haifa, Habbaniya Force —'Habforce'—was forming. It was being built out of units then in Palestine and Transjordan, mainly out of 1st Cavalry Division, the Arab Legion and the Transjordan Frontier Force. 1st Cavalry Division was being transformed into 10th Armoured Division and at this time all that it could provide was 4th Cavalry Bde. to be used as lorried infantry.

'Habforce'—Order of Battle:

H.Q. 4th Cavalry Brigade
The Household Cavalry
The Royal Wiltshire Yeomanry (less one squadron)
The Warwickshire Yeomanry
1st Essex Regt. (two coys.)
No. 2 Armd. Car Company R.A.F.

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The Arab Legion (placed at the disposal of the British Government by the Amir of Transjordan)
A mechanised regiment of the Transjordan Frontier Force
R.A., R.E., R.C.S. R.A.S.C. units and
medical—166 Lt. Fd. Amb. of 1st Cavalry Division
8 Fd. Hyg. Sec.

'Habforce' was instructed to send in advance of itself a flying column, 'Kingcol', to reach H.4 in time to cross the frontier into Iraq on May 12.

'Kingcol'—Order of Battle:

Headquarters and Signals 4th Cavalry Bde.
The Household Cavalry
1st Essex Regt. (two coys.)
No. 2 Armd. Car Coy. R.A.F.
L.A.D., R.A., R.E. elements and
medical—'A' Section 166 Lt. Fd. Amb.
In all about 2,000 strong with 500 vehicles.

On May 2 the Iraqis had occupied Rutba, about 180 miles to the west of Habbaniya, and the pumping stations K.1, K.2, and H.3 further to the west. On May 3, a company of 1st Essex was flown from Lydda in Palestine to H.4 and a squadron of the T.J.F.F. was ordered to move thereto. This force occupied H.4 and expelled the Iraqis from H.3. On May 9, the R.A.F. bombed the massive stone fort at Rutba and a detachment of armoured cars and the Arab Legion surrounded the place. On the night of May 10/11, the Iraqis withdrew from Rutba and the Arab Legion occupied it. On May 13, 'Kingcol' reached H.3 and moved on at once to Rutba.

The Iraqis now resorted to inundating large areas in attempts to slow down the advance of 'Habforce'. The Euphrates was in flood at this time and it was a simple matter to cause inundation by cutting the river bund at suitable places. By these means Ramadi, about eighteen miles to the northwest of Habbaniya, was completely isolated and the Rutba–Ramadi–Habbaniya road rendered unusable. The only other route of advance to Habbaniya was by the road through Mujara, on the south shore of Lake Habbaniya. This road was likewise involved in the inundations but Indian sappers and miners of Indian 10th Division were flown in from Basra on May 10 and these quickly repaired the road and constructed a bridge.

The advance of 'Kingcol' from Rutba was resumed on May 15. German aircraft attacked the column as it moved forward and caused a number of casualties. The Haifa–Baghdad road was left at Km. 25, 15 miles from Ramadi and the column headed south-east to cross the Mujara bridge and to reach Habbaniya on May 8.

It was decided that 'Habforce' should proceed beyond Habbaniya on to Baghdad itself, the aim now being the establishment of a friendly

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government in Iraq. Detachments of 2/4th Gurkha Rifles were flown from Basra and 1st Essex, less the two companies with 'Kingcol', from H.4 to Habbaniya.

Preparations were made for the advance to Baghdad. It was essential that the five-spanned bridge over the Euphrates at Falluja should be secured. The approaches to the bridge had been inundated. On May 18 the R.A.F. bombed the Iraqi positions guarding the bridge and a company of the King's Own was flown to a position to the flank of the Iraqi defensive line. Then the levies attacked and flung the Iraqis back. The village of Falluja, beyond the bridge, was occupied. On May 22 the Iraqis, using a fresh brigade, counter-attacked but were repulsed with heavy casualties. The levies had 12 casualties and the King's Own about 40. The Iraqis still held Ramadi and, in spite of determined efforts to bomb them out, were not to be dispossessed. It was decided, however, that the advance on Baghdad should be continued, 'Kingcol' moving along the Falluja–Baghdad road while the Arab Legion and a detachment of the Household Cavalry moved to Mashahida, twenty-five miles north of Baghdad, and thence along the Mosul–Baghdad road on to the capital. 'Habforce' joined 'Kingcol' in Habbaniya.

'Kingcol' commenced its advance on Baghdad on May 28 and by the evening of this day had reached the line of a canal some twelve miles to the west of the city, which was held in strength by the Iraqis. On the following morning a bridgehead was established and a bridge over the canal constructed. The advance was resumed on the morning of the 30th and by the afternoon the leading troops were within five miles of the bridge across the Washash canal, a mile or so from the outskirts of the city.

Meanwhile the column advancing from the north had been making steady progress. It crossed the Euphrates near Habbaniya on the evening of the 27th and reached Mashahida on the Mosul–Baghdad railway on the following day. Crossing the railway line it turned south along the Mosul–Baghdad road, brushed aside Iraqi detachments at Taiji and reached a point some eight miles from Baghdad. On May 29 the column continued its advance until it was checked at Al Kadhimain.

Rashid el Gailani and his associates fled to Persia. The mayor of Baghdad assumed command of the Iraqi Army, called on the British Embassy in Baghdad and asked for an immediate armistice. This was granted. Its main provisions were:

1. All British P.o.W. were to be released.
2. The Iraqi Army was to be allowed to retain its arms but was to proceed to its peace-time stations.
3. All Axis personnel were to be interned.
4. All Iraqi P.o.W. were to be handed over to the Regent.

'Kingcol' remained on the western side of the Washash canal and the northern column returned to Habbaniya. A new government was formed

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on June 2 and on the 3rd 'Habforce' entered Baghdad. The howitzers resumed their decorative function on the lawn at Habbaniya.

'HABFORCE', MEDICAL COVER

On May 2, D.D.M.S. British Troops in Palestine instructed A.D.M.S. 1st Cavalry Division to be prepared to send a section of a light field ambulance to H.4, there to open a C.R.S. of 20 beds. He further arranged that a surgical team from 61 B.G.H. at Nazareth should join this section at H.4. Seven ambulance cars of 7 M.A.C. were also sent there. To H.4 A.D.M.S. 1st Cavalry Division sent a section of 9 Lt. Fd. Amb. (1st Cavalry Division).

With 'Habforce' A.D.M.S. 1st Cavalry Division sent 166 Lt. Fd. Amb., less 'A' Section, and 8 Fd. Hyg. Sec. With 'Kingcol' he sent 'A' Section of 166 Lt. Fd. Amb.

Heatstroke centres were established at Mafraq and at H.4.

When 'Habforce' had moved beyond H.4 the balance of 9 Lt. Fd. Amb., less one section, moved up to H.4 there to join its section at the C.R.S.

Casualties were few. Those among the Habbaniya garrison were admitted to the R.A.F. hospital at the Habbaniya air base. Those among 'Habforce' were evacuated by ambulance car of 166 Lt. Fd. Amb. to the C.R.S. at H.4 and thence by M.A.C. to 61 B.G.H. at Nazareth. Then, as 'Habforce' approached Habbaniya, casualties were carried forward with the column to be admitted to the R.A.F. hospital at Habbaniya. Casualties incurred during the actions at Falluja and before Baghdad were evacuated to the R.A.F. hospital at Habbaniya.

INDIAN 10TH DIVISION

On April 12, Indian 20th Infantry Brigade of Indian 10th Division* with 26 (Ind.) Fd. Amb. and 1 (Ind.) Fd. Hyg. Sec. attached, sailing from Karachi to Malaya, was diverted to Basra with instructions to occupy the Basra–Shuaiba area and so enable a base to be established there. On April 17 400 officers and men of 1st King's Own Royal Regt. (Lancaster) were flown from Karachi to Shuaiba.

Plans for the landing of Ind. 20th Bde. matured during the voyage. It was decided that the troops would land at Maqil Docks, Basra, and gain control of the area enclosed by the R.A.F. cantonment. Two companies of 2/8th Gurkha Rifles landed unopposed on April 18, and by the 20th, H.Q. Ind. 20th Inf. Bde. was established in Makina.

Raschid el Gailani promptly demanded that no further troops should be landed and concluded a treaty with the Axis powers by which the latter promised all help to Iraq. The Allies insisted that they must have

* Ind. 20th Inf. Bde. 2/11th Sikhs, 2/7th and 2/8th Gurkha Rifles.
Ind. 21st Inf. Bde. 4/13th Frontier Force Rifles, 2/4th and 2/10th Gurkha Rifles.

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a powerful garrison in Iraq. On April 28 further troops were arriving and Raschid el Gailani began to reinforce the Iraqi forces in the Basra area.

Ind. 20th Inf. Bde. was deployed for the defence of the perimeter of the area held, the docks and the aerodrome.

On April 30, as the situation worsened, plans were made to take over certain key points in the Basra area—the Zubeila barracks, all government offices, the power station and the banks in Ashar, the docks area, the wireless station, the Maqil aerodrome, the railway station and the post office. 2/8th Gurkhas were held in reserve to be deployed if necessary for the capture of Az Zubair or to move on Shuaiba to assist the garrison of the aerodrome there. The guns were concentrated so as to cover Basra and the Makina barracks.

On May 1, 2/8th Gurkhas moved to Shuaiba and took over the defence of the aerodrome. On the outbreak of hostilities on May 2, all these plans were put into effect with the exception of the occupation of Ashar. This was postponed until additional troops had become available. Any opposition that was encountered was quickly subdued. The Iraqi barracks at Zubeila, being vacated, were occupied.

On May 6, Ind. 21st Inf. Bde. reached Maqil and H.Q. Indian 10th Division arrived in Basra. General Quinan, G.O.C. designate of Iraq Force, arrived next day.

Ashar was then occupied by 2/7th Gurkhas moving in two columns, one by river and the other by road.

On May 9, Ind. 21st Inf. Bde. assumed responsibility for the defence of the Ashar–Zubeila–Makina–Maqil area and Ind. 20th Inf. Bde. took over the defence of the Shuaiba area.

On May 12, Ind. 20th Inf. Bde. sent out strong patrols towards Jebel Sanam, Safwan, Chinwaibda, Ar Rafuja and Ar Ramaila, while 21st Bde. carried out similar patrolling in its area. A strong detachment of Iraqi troops was discovered in the Habibshawi area. On May 24, 2/4th Gurkhas were despatched to disperse it. One column ('Landforce') moved by road and a second ('Shattforce') by river. The Iraqis quickly withdrew to the north. Indian 10th Division casualties totalled 1 V.C.O. and 3 O.Rs. killed; 4 O.Rs. wounded (of these 2 died).

On May 27, Ind. 20th Inf. Bde., less one battalion and with supporting troops, moved to Ur. After a brief encounter the Iraqi garrison withdrew and Ur was occupied on the 28th. The column carried ten days' rations and 14,500 gallons of water in improvised water lorries, water pakhals and containers. Water was available at Liqait, 59 miles from Shuaiba, and Ur itself.

On May 31 information was received that the Iraqis had asked for an armistice and so no further offensive action was taken.

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INDIAN 10TH DIVISION, MEDICAL COVER

When Ind. 20th Inf. Bde. was deployed for the defence of the docks and aerodrome in the Basra–Shuaiba area, 26 (Ind.) Fd. Amb. took over the R.A.F. hospital at Makina on April 20. On April 29, 29 C.G.H. arriving with the second convoy, took over this hospital. 6 (Ind.) Depot of Medical Stores also arrived.

On May 2, 26 (Ind.) Fd. Amb. opened a M.D.S. in Maqil camp for the reception of all casualties. From this M.D.S. the few casualties that occurred were evacuated to 29 C.G.H.

A company of 26 (Ind.) Fd. Amb. accompanied the column that moved to Shuaiba on May 5. It opened an A.D.S. in Shuaiba camp, evacuating casualties to the M.D.S. at Makina.

In the operation that had for its object the occupation of Ashar, casualties were evacuated from the R.A.P. by motor boat to a car post established by 26 (Ind.) Fd. Amb. at the R.A.F. jetty, Maqil, on May 7. Casualties were evacuated from the C.P. direct to 29 C.G.H. at Makina. Two ambulance cars accompanied the road column and casualties were sent back in them to the M.D.S. at Maqil and thence evacuated to 29 C.G.H.

No field ambulance came to Basra with Ind. 21st Inf. Bde. One company of 26 (Ind.) Fd. Amb., therefore, served this brigade for the time being, providing an A.D.S. in Shuaiba and a detachment with two ambulance cars which accompanied the patrols. Evacuation was to this A.D.S. by ambulance car escorted by armoured car.

29 (Ind.) Fd. Amb. arrived on May 16 and on the 18th relieved 26 (Ind.) Fd. Amb., opening a M.D.S. to serve the troops in the Maqil–Makina area. 26 (Ind.) Fd. Amb. thereupon moved to Shuaiba to join its own brigade. The A.D.S. at Shuaiba was replaced by a M.D.S. and a 50-bedded hospital was opened in the R.A.F. hospital for the B.O.Rs. of Ind. 21st Bde.

During the advance on Habibshawi, a detachment of 29 (Ind.) Fd. Amb. established a car post at the airport jetty at Maqil. Thence casualties of 'Shattforce' were evacuated by river launch to the car post of 26 (Ind.) Fd. Amb. at the R.A.F. jetty and thence to 29 C.G.H. A detachment of 29 (Ind.) Fd. Amb. accompanied 'Landforce' and casualties were sent back to the M.D.S. of 29 (Ind.) Fd. Amb. in Maqil and thence to 29 C.G.H.

With Ind. 20th Inf. Bde. to Ur went 26 (Ind.) Fd. Amb. less one company which remained in Shuaiba to run a M.I. Room. During the first day's march casualties were sent back in ambulance cars to Shuaiba. Thereafter they were evacuated by air from the L.G. at Ur. After June 2, evacuation was by train to Basra.

During May the hospital cover in Basra was considerably expanded. 23 C.G.H. and 26 I.G.H. arrived in the third week of May and opened in Shuaiba.

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THE HEALTH OF THE TROOPS

INDIAN 10TH DIVISION

Malaria. In spite of all that was known of the medical hazards that were to be encountered, malaria was the cause of much wastage. 2/7th and 2/10th Gurkhas were badly hit, the former losing 160 out of its effective strength of 800 and the latter 250 out of 900. Both these battalions, on arrival in Iraq, were obliged by operational considerations to bivouac in areas known to be highly malarious. Personal protective measures were not fully used. Then these battalions were employed in and around Ashar, a notoriously malarious area, and during these operations personal protection had to be restricted to the use of repellent cream. Since the incidence of the disease in these units reached its peak on May 23/24, it can be assumed that infection occurred during the Ashar operation.

A directive was issued on May 24 for the administration of suppressive quinine. Quinine tablets were not available at this time and it was suggested that quinine gr. 5 in mixture should be given twice a week. Later in the month quinine tablets were forthcoming and an order was issued prescribing the administration of quinine grs. 5 thrice weekly. After this date the incidence of malaria became greatly reduced. Malaria remained troublesome in and around the dock area at Basra, however, and, as usual, affected the many small units and detachments that lacked adequate supervision.

The base hospital, not yet functioning fully, was strained by the influx of malaria cases. D.D.M.S. was obliged to direct that units with medical officers on their establishments should retain and treat cases of clinical malaria in unit lines. Since it became at once obvious that to do this was quite impracticable, the directive was modified to give medical officers a wide discretion in the selection of cases to be retained or to be sent into hospital. It was stipulated that all cases with high fever should be sent to hospital without delay.

Dysentery. Only a few cases were reported. Vigorous anti-fly measures were employed. Mechanisation undoubtedly contributed to the abatement of the fly nuisance.

Effects of Heat. Only a few cases were reported. Clothing, water and salt supplies were all harnessed to the task of preventing heat effects, and most successfully, for during the whole of the summer there were only sixty cases of heat exhaustion and ten of heatstroke. Nine of these heatstroke cases occurred in one Gurkha battalion during and immediately following disembarkation and were plainly due to ignorance or disregard of the necessary and simple precautions.

Water. In the area occupied by the troops during this campaign a piped water supply was usually available. An additional pipe-line was laid to Shuaiba later.

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Conservancy. Owing to the high level of subsoil water in the port area it was not possible to use deep trench latrines. The only alternative was the pan system, and since pans had not been brought from India the field hygiene section had to make them out of kerosene tins.

Combustible materials were not available in sufficient amounts, and so incineration was made difficult. However, the port authorities permitted the use of their incinerators and so the situation was eased.

In the Shuaiba area the level of the subsoil water was lower, and here it was possible to use deep trench latrines in addition to the pan system and Otway pits for temporary use.

EVENTS FOLLOWING THE ARMISTICE

Following the armistice, places of strategic importance were occupied. A mobile column from 'Habforce' left Baghdad for Mosul on June 2, to be followed on the 3rd by 2/4th Gurkhas who were flown from Basra to Habbaniya and thence to Mosul. On the 7th a column of the Mosul garrison was despatched to Tel Kotchek. It met with no opposition and was withdrawn on the following day. A detachment of 'Habforce' occupied Kirkuk on the 8th, on which day an Iraq garrison at Haditha, which offered resistance, was eliminated. On June 2 a detachment of Ind. 20th Inf. Bde. at Ur advanced to Al Khidr, thirty-five miles to the north-west. On June 5 the new Iraqi government agreed to the advance of Indian 10th Division on Baghdad. On June 10, Ind. 20th Inf. Bde. left Ur for Baghdad by road and rail. On the 12th, Ind. 21st Inf. Bde., less two battalions, left Basra by river for Kut. From Kut it was to move to Baghdad by road. Ind. 25th Inf. Bde., the third brigade of Indian 10th Division, had arrived in Basra on May 30 and Ind. 17th Inf. Bde. of Indian 8th Division on June 9. H.Q. Indian 10th Division reached Baghdad on June 12 and proceeded to take over Mosul, Kirkuk and Rutba from 'Habforce'. By June 17 'Habforce' had left for Syria.

Meanwhile Ind. 20th Inf. Bde. moved to Mosul on June 9. It was relieved by Ind. 17th Inf. Bde. of Indian 8th Division on July 6. Ind. 17th Inf. Bde. had been involved in the Syrian campaign and had returned to Iraq. Ind. 20th Inf. Bde. then left Mosul for Baghdad.

Ind. 24th Inf. Bde. of Indian 8th Division arrived in Iraq on June 16. By the end of June the distribution of Indian troops in Iraq was as follows:

H.Q. Indian 10th Division . . .	Baghdad
Ind. 20th Inf. Bde.	to the north of Baghdad
Ind. 21st Inf. Bde.	to the north of Baghdad
Ind. 25th Inf. Bde.	moving to Baghdad
Ind. 17th Inf. Bde. (Indian 8th Div.) .	in the Basra–Shuaiba area
Ind. 24th Inf. Bde. (Indian 8th Div.) .	in the Basra–Shuaiba area

The main task of the force was to defend the Mosul and Basra–Shuaiba areas against any Axis attack.

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By mid-July the force in Iraq consisted of Indian 8th Division (with 17th Bde. in Mosul and 24th Bde. in Basra) and Ind. 20th Inf. Bde. of Indian 10th Division in Baghdad and with detachments guarding the Kirkuk oilfields and the Kirkuk–Haifa pipe-line.

MEDICAL COVER

1. The move of Ind. 21st Inf. Bde. Gp. by river and road to Baghdad.

   For the journey by river from Basra to Kut-el-Amara iron barges were to be used, and so it was expected that many cases of heat exhaustion would require attention. Moreover, it would not be feasible to carry forward such casualties.

   Two detachments from 29 (Ind.) Fd. Amb. accompanied the brigade group. Precautions against heat exhaustion were observed and the troops stood the journey well. No evacuation to the base was necessary. On reaching Kut on June 17 an A.D.S. was established and this remained behind when the column left for Baghdad by road.

2. The move of Ind. 20th Inf. Bde.

   A detachment of 26 (Ind.) Fd. Amb. accompanied the rail party. The rest of the field ambulance moved with the road party. No casualties occurred.

3. The move of H.Q. Indian 10th Division.

   The M.D.S. of 29 (Ind.) Fd. Amb. at Makina closed on June 12 and moved to Shuaiba. A detachment proceeded to Baghdad with the rail party, the rest moved with the road party. On June 19 the reassembled unit opened a M.D.S. in Taiji camp north of Baghdad.

   Twenty-eight beds in the railway hospital in Baghdad were placed at the disposal of the division and a detachment of 26 (Ind.) Fd. Amb. took them over.

A section of 25 C.G.H. reached Baghdad on June 20 and opened on the 24th. The advanced depot of medical stores followed on the 22nd.

When Ind. 20th Inf. Bde. left Baghdad for Mosul on June 9, 26 (Ind.) Fd. Amb. accompanied it. In Mosul already was a detachment of 26 I.G.H., consisting of two medical officers and some fourteen O.Rs., which had been flown in along with a detachment of Indian troops. This detachment had opened a small hospital of fifty beds in the local rest-house. British personnel were admitted to the R.A.F. hospital in Mosul. 26 (Ind.) Fd. Amb., on arrival on June 17, took over all medical arrangements in the Mosul area. It was called upon to deal with many malaria and sandfly fever cases and with a mild outbreak of diphtheria in 1st King's Own Royal Regt. which had come to Mosul from Habbaniya.

In the middle of July Ind. 20th Inf. Bde. was relieved by Ind. 17th

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Inf. Bde. of Indian 8th Division and 31 (Ind.) Fd. Amb. then took over from 26 (Ind.) Fd. Amb.

Early in July 25 C.G.H. was established in the King Feisal College in Baghdad and to it casualties from the Mosul area were evacuated.

By the beginning of August there were functioning in Iraq:

25 C.G.H.	Baghdad
26 I.G.H.	Shuaiba
23 C.G.H.	Shuaiba
29 C.G.H.	Makina

On August 10 a directive was issued to the effect that all casualties unlikely to recover within a month should be evacuated to India. This policy touched upon the problem of the provision in India of hospital beds for overseas casualties. Planning had been based on the provision of a 10 per cent. hospital bed cover for forces despatched overseas. The strength of the force in Iraq was 7,184 British and 59,107 Indian troops. The hospital cover provided and expected was 2,100 British and 4,200 Indian beds, distributed between one I.G.H., seven C.G.Hs., two B.G.Hs., and one British and two Indian convalescent depots. This gave a surplus of 1,432 British beds and a deficiency of 710 Indian beds. But the ultimate strength of the force was to be 38,663 British and 104,054 Indian troops.

The hospital build-up was planned as follows:

	Br.	Ind.	Date
28 C.G.H.	100	500	Sept. 1941
31 C.G.H.	100	500	Sept. 1941
33 C.G.H.	100	500	Sept. 1941
34 C.G.H.	100	500	Oct. 1941
35 C.G.H.	100	500	Oct. 1941
36 C.G.H.	100	500	Oct. 1941
37 C.G.H.	200	500	Oct. 1941
18 I.G.H.	—	1,000	Oct. 1941

	Br.	Ind.	Date
Total	800	4,500	
	2,100	4,200	already in existence
	2,900	8,700	

So that at the end of October the expected deficiencies would be:

3,866—2,900 = 966
10,405—8,700 = 1,705

Three more hospitals, four Indian and two British convalescent depots were therefore added so as to bring the totals to 3,950 British and 11,200 Indian beds. In the event the cover provided, 10 per cent. of the strength, proved to be more than adequate.

(Plate XXXVI shows the method of construction employed for the wards of a general hospital at Shuaiba.)

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CHAPTER 10

THE CAMPAIGN IN SYRIA

Précis

WHEN in June 1940 France capitulated, the French political and military authorities in Syria sided with the Vichy Government. During the course of the brief campaign in Iraq the Germans were permitted to make use of the Syrian airfields. It seemed as if Syria was about to pass under the domination of the Axis powers. It was decided to send an expeditionary force into Syria from Palestine and Transjordania. Its objectives would be Damascus, Rayak and Beirut, preliminary to the occupation of the whole country.

On June 8, 1941 this force, composed of Free French, Australian, Indian and United Kingdom contingents, crossed the border into Syria, soon to meet very stubborn resistance.* At the end of a week's bitter fighting it became clear that reinforcements were necessary. 6th Division was sent to Palestine from the Middle East and thence moved into Syria. 'Habforce' in Iraq was instructed to advance on Palmyra from the east and Indian 10th Division in Iraq to move up the Euphrates on Aleppo.

Damascus was captured on June 22 and the Australians, moving up along the coast, broke through the Litani defensive line and advanced on Damour. On July 12, the Vichy French agreed to a conference without conditions and on the 14th an armistice was signed at Acre.

(i)

The Invasion—June 8–July 14, 1941

STRATEGIC AND OTHER CONSIDERATIONS

As an outcome of the War of 1914–18 Syria was held under mandate by France. In 1936 this mandate gave place to Syrian autonomy but France retained the right to maintain two airfields in the country and armed forces at Jebel ed Druz and at Latakia. After the fall of France, in 1940, the chief political and military personalities in Syria gave their allegiance to the Vichy Government. There was much disaffection, however, in the Army of the Levant, and a considerable number of

* For fuller information concerning the affairs of the Australian and Indian Army Medical Services the Official Australian and Indian Medical Histories should be consulted.

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troops, siding with General de Gaulle and his Free French, crossed the border into Palestine. A whole Polish brigade did so.

When Rumania, in October 1940, joined the Axis powers, Germans in various guises and in increasing numbers made their appearance in Syria, where there was an Italian Armistice Commission. Britain found it necessary to let it be known that the occupation of Syria by a hostile power could not be permitted. When, in March 1941, Bulgaria joined the Three Power Pact and the Germans were in Bulgaria in force, it became an imminent possibility that they would move into Syria, since by doing so they would drive a wedge from the Levant to the Tigris, greatly to the disadvantage of British interests, and would also encircle Turkey.

During the course of the military operation in Iraq a R.A.F. pilot on reconnaissance reported that German transport planes were landing on Syrian airfields. Confirmation that the Vichy Government had conceded the use of these airfields to the Germans *en route* for Iraq was soon forthcoming and offensive action against the Luftwaffe in Syria by the R.A.F. was unleashed on May 14.

On May 18, General Catroux, Free French Commissioner in the Middle East, informed General Wavell that he had reason to think that the French were about to hand over Syria to the Germans and withdraw into the Lebanon. Though this information turned out to be incorrect it acted as a further stimulus to action.

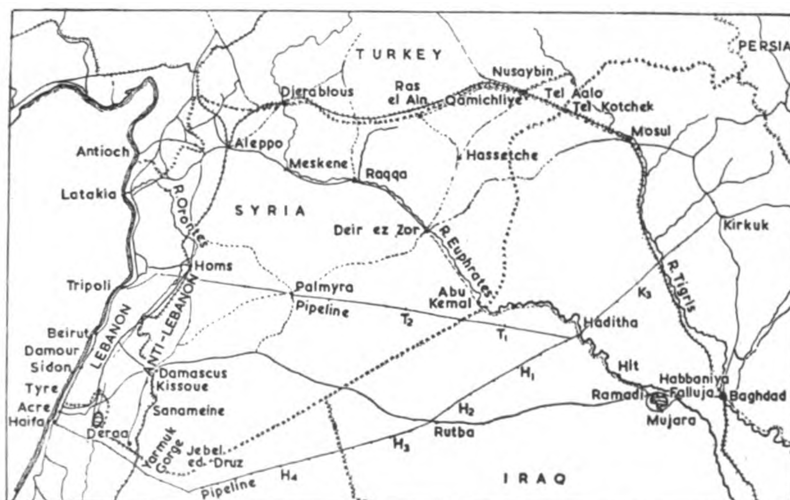

FIG. 77. Syria.

OPERATION 'EXPORTER'

It was decided to send an expeditionary force into Syria, this force to be found by Middle East Command. General Maitland Wilson,

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Commander in Palestine and Transjordan, was placed in charge. The units and formations to be made available for this operation were:

Two brigades of Free French (including metropolitan and colonial troops) then at Qastina in Southern Palestine.

Australian 7th Division, in Palestine, less its 18th Bde. in Tobruk with Australian 9th Division.

Indian 5th Bde. of Indian 4th Division, then returning to the Western Desert from East Africa. It moved from the Western Desert to Gadera in Palestine on May 19; with it were 14 (Ind.) Fd. Amb. and 12 I.S.S. By May 25 the brigade was concentrated in the Irbid–Samak area near the Syrian border.

Elements of 1st Cavalry Division (The Scots Greys and the Cheshire Yeomanry).

A Commando from Cyprus.

Units of the Transjordan Frontier Force.

(Br. 6th Division, only partially equipped, was not ready for incorporation in the force.)

Australian 7th Division was not yet tempered by battle experience. 'Habforce' in Iraq had depleted Palestine of its mobile force and most of its transport. A motorised cavalry regiment was formed around H.Q. and two squadrons of The Scots Greys.

General Maitland Wilson was informed that a British cruiser squadron would be available for the support of the force.

THE TERRAIN, CLIMATE AND COMMUNICATIONS

The Lebanon and Syria lie between the irregular border with Palestine in the south and the Turkish border in the north, with the Mediterranean Sea on the west and Iraq on the east. The main features of the landscape are two parallel mountain ranges, the Lebanons along the coast and the Anti-Lebanons some forty miles inland. Between them is the Great Rift Valley. Between the Lebanons and the sea the coastal plain, fertile in parts and with several important towns—Sidon, Beirut, Tripoli, Latakia—is nowhere extensive, rarely exceeding half a mile in width. About Tripoli the peaks and foothills flatten into valleys and plains that stretch northwards towards Aleppo. In the Great Rift Valley the River Orontes courses through a series of swamps to Antioch. In the south stands the Baal of Baka, the lord of the plain. To the east of the Anti-Lebanons is the desert, dominated in the south by the lava masses of the Jebel ed Druz. Here the Barada river fertilises the region around Damascus.

For nine months of the year no rain falls. Towards December the wet season breaks with its bitter cold and its snow upon the mountain tops.

From Palestine there were three routes into Syria. In the coastal belt was the good main road from Acre to Beirut and beyond. This crossed

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the border at Enn Naqoura. It passed over a number of rivers near their mouths, all of these forming strong defensive positions. In the centre there was a good road that entered the valley of the Litani between the Lebanons and Anti-Lebanons and ran from Jericho to Metulla on the Palestine–Syrian border and on to Rayak where it cut the road from Damascus to Beirut. It coursed through a highly malarious zone in the Hula marshes and through deep gorges dominated by the garrison towns of Marjayoun and El Khiam, to join the Beirut–Damascus road. On the right there was a way into Syria in the plain between the Anti-Lebanons and the Jebel ed Druz. It was crossed by two roads leading to Damascus. One of these passed through the village of Qnaitra and thence followed the eastern slopes of Mount Hermon. The other, starting in Transjordan, crossed the Yarmuk Gorge and passed Deraa junction on the Hejaz railway. The only lateral road south of the Beirut–Damascus highway ran from fifteen miles north of Deraa through Qnaitra and Marjayoun to Sidon.

A railway line entered Syria from Palestine to run through Deraa, Damascus, Rayak, Homs, Aleppo, and along the Turkish border to cross into Iraq and so reach Mosul. Branches of this line ran from Rayak to Beirut, from Homs to Tripoli and from Aleppo northwards across the Turkish border.

MEDICAL INTELLIGENCE

Little was known of the prevalent diseases in Syria. The strict secrecy which attended the preparations for this campaign interfered considerably with medical planning. It was assumed that malaria was rampant and would cause much loss. It was assumed also that dysentery, relapsing fever, amoebiasis and sandfly fever would be encountered.

TACTICAL PLAN

Damascus, Rayak and Beirut would be captured by a three-pronged attack as a preliminary to the occupation of the whole country. D-day would be June 8.

(1) On the right, Ind. 5th Inf. Bde.,* the Free French formations and the Transjordan Frontier Force would seize the bridge over the Yarmuk Gorge, take Deraa and move on Damascus, sending a detachment to hold Qnaitra.

(2) In the centre, Aust. 25th Inf. Bde. and the mechanised cavalry unit would take Marjayoun, advance up the Litani valley and also assist, if necessary, the column moving up the coastal road on the left.

(3) On the left, Aust. 21st Inf. Bde., together with the Cheshire Yeomanry, would move along the coast road on Beirut.

* Ind. 5th Inf. Bde. 3/1st Punjab Regt., 4/6th Rajputana Rifles, 1st Royal Fusiliers.

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(4) 'C' Battalion S.S. Bde. (11th Cdo.), from Cyprus, would land north of the mouth of the Litani on the night of D-day–1 and secure the road bridge at Kafr Bada.

(5) A patrol of Aust. 2/14th Inf. Bn. would move in advance of Aust. 21st Inf. Bde. to prevent demolition of the bridge at Ickandaroun south of Tyre.

(6) 5th Cruiser Squadron and the R.A.F. component in Palestine would stand by to provide bombardment of the French positions when called upon.

In attempts to confuse and mislead the enemy in orders and signals, Australian 7th Division was known as Australian Division 'Exporter'.

MEDICAL TACTICAL PLAN

In the last week of May 1941 the medical units of the force were concentrated in Northern Palestine:

2/6 (Aust.) Fd. Amb. 14 Lt. Fd. Amb., one section	u/c Aust. 21st Inf. Bde.
2/4 (Aust.) Fd. Amb.	u/c Aust. 25th Inf. Bde.
14 (Ind.) Fd. Amb.	u/c Ind. 5th Inf. Bde.
Groupe Sanitaire The Hadfield Spears Unit	with Free French at El Tabigha
2/2 (Aust.) Fd. Hyg. Sec.	with H.Q. Aust. 7th Div.
2/2 (Aust.) M.A.C.	Sections at Rosh Pinna, Haifa and Nazareth.

In the rear areas were:

12 I.S.S.	at Jasr el Majami
168 Fd. Amb.	Haifa
2/1 (Aust.) C.C.S.	Nazareth
22 I.G.H.	Kafr Balu, near Rehovot
12 B.G.H.	Sarafand, near Jaffa
2/7 A.G.H.	Rehovot
2/1 A.G.H.	Gaza
2 Maxillo-facial Unit	Jerusalem.

Evacuation from the forward medical units would be from A.D.Ss. through 2/1 (Aust.) C.C.S. at Nazareth and 168 Fd. Amb. at Haifa to 12 B.G.H. at Sarafand, to 2/7 A.G.H. at Kafr Balu near Rehovot and to 2/1 A.G.H. at Gaza. An Australian surgical team would be attached to 168 Fd. Amb. 2/2 (Aust.) Fd. Hyg. Sec. would be responsible for the anti-malarial work in the forward areas.

Much anxiety concerning malaria arose. The Australian division was very deficient in respect of protective clothing and as yet had not encountered the hazards of fighting in a highly malarious region.

THE INVASION

During the night of June 7/8 the columns crossed the frontier. On the right Ind. 5th Inf. Bde., moving in four columns and starting from

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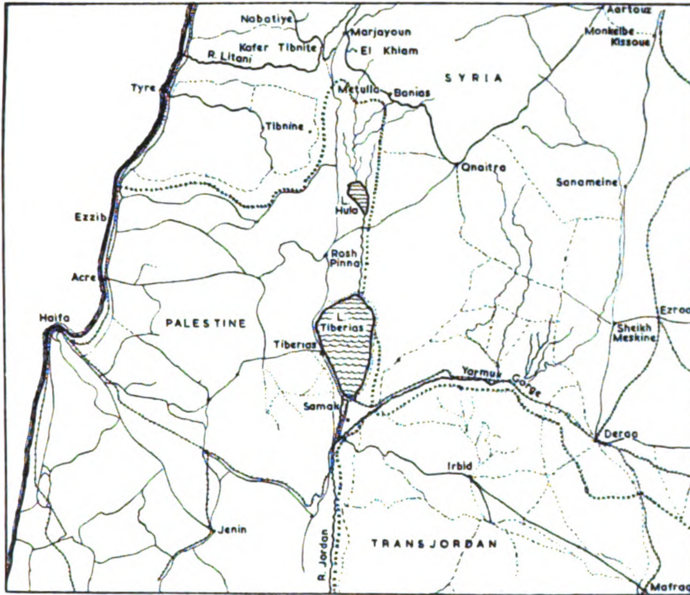

FIG. 78. Southern Syria.

Irbid, captured the Yarmuk Gorge bridge and occupied Deraa, Ezraa and Sheikh Meskine. The Free French then passed through to seize Sanameine. French casualties were dealt with by the Groupe Sanitaire and the Hadfield Spears Unit.

14 (Ind.) Fd. Amb. established a M.D.S. at Irbid and an A.D.S. at Samak. 12 I.S.S. was at Jasr el Majami. Immediately prior to the advance the A.D.S. closed and medical detachments were allotted to each of the four columns, while 12 I.S.S. moved to Kinneret, south of Samak. Ten ambulance cars from the M.A.C. were attached to the M.D.S.

When Deraa was occupied an A.D.S. was opened therein and evacuation therefrom was to the M.D.S. at Irbid. Then the M.D.S. moved up to Deraa and the A.D.S. to the vicinity of Sheikh Meskine.

In the centre Aust. 25th Inf. Bde. crossed the frontier at Metulla and advanced on Marjayoun, in front of which it was attacked. Casualties were evacuated from the A.D.Ss. of 'A' and 'B' Coys. of 2/4 (Aust.) Fd. Amb. to a relay post at Rosh Pinna, whence cars of 2/2 (Aust.) M.A.C. transported them to the rear. H.Q. 2/4 (Aust.) Fd. Amb. established a M.D.S. at Tabigha on Lake Tiberias, but this did not function.

On the left the patrol of 2/14 Aust. Inf. Bn. failed to prevent the destruction of the bridge at Ickandaroun, but a detour was made by Aust. 21st Inf. Bde. to occupy Tyre and to find the line of the Litani River strongly held. The commando, delayed by rough seas, landed on

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the evening of June 9 and after very severe fighting during which the unit lost 123 officers and men, a quarter of its strength, secured, with Australian help, a small bridgehead north of the Litani.

On June 9 and 10 the advance into Syria was continued, but stiffening resistance was everywhere encountered.

On the right the Free French were checked in the range of hills about Kissoue, south of Damascus, while 1st Royal Fusiliers of Ind. 5th Bde. entered Qnaitra. In the centre, Aust. 25th Bde. captured Khiam and entered Marjayoun; but Aust. 21st Bde. on the coast road made but little progress. In the coastal sector a company of 2/6 (Aust.) Fd. Amb. was attached to each of the two battalions in the line. The ambulances' vehicles were at Tyre and moved forward under fire to collect casualties. 2/2 (Aust.) M.A.C. moved up to Tyre and evacuated casualties back to Haifa to 168 Fd. Amb.

On the 11th bitter fighting took place at the mouth of the Litani. 'A' Company of 2/6 (Aust.) Fd. Amb. established its A.D.S. to the south of the river on the right of the line, with an A.D.S. of a section of 14 Lt. Fd. Amb. some little distance to the rear. On the left 'B' Company opened its A.D.S. just north of the river. In the centre Aust. 25th Bde. was in Marjayoun being served by a section of 14 Lt. Fd. Amb. 2/4 (Aust.) Fd. Amb. was at Metulla waiting to move forward with Aust. 25th Bde. when the opposition about Marjayoun had been overcome.

On this day suppressive quinine administration was started (5 grs. daily) and the North of Palestine, excluding the Haifa–Nazareth–Tiberias road, all parts of the Jordan valley, all parts of Syria, including the Lebanon, were declared to be highly malarious areas. Instructions were issued to the effect that nets were to be used by all ranks, that long trousers should be worn, that repellent cream should be used and that veils should be worn by all sentries and guards.

On the 12th both banks of the Litani were secured by 21st Aust. Bde. Ambulance cars could now reach both of the dressing stations of 2/6 (Aust.) Fd. Amb. In the centre Aust. 25th Bde. moved forward from Marjayoun and the Cheshire Yeomanry occupied Nabatiye. Marjayoun itself was heavily attacked by the French from the air. 'A' Company of 2/4 (Aust.) Fd. Amb. moved up from Metulla and opened an A.D.S. in a school in Marjayoun and 'B' Company established an A.D.S. in a valley a little to the east of the town. Evacuation was to 1 (Aust.) C.C.S. at Nazareth direct. The collection of casualties was a most difficult task owing to the nature of the country and to the intensity of the fighting. It was noted that instances of gas gangrene were being admitted to the medical units and that Thomas' splints were not always being applied in the forward units.

On June 13 the situation on the left was stabilising. Part of Aust. 25th Bde. moved by way of Nabatiye to Kafer Houne and Jezzine, overlooking

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Sidon, to aid Aust. 21st Bde. This move was by night over exceedingly difficult country along an unreconnoitred mountain track. The defenders of Jezzine were surprised and the town occupied on the 14th. 'A' Company 2/4 (Aust.) Fd. Amb. accompanied Aust. 25th Bde. and established its A.D.S. in Kafer Tibnite, evacuating its cases to 2/6 (Aust.) Fd. Amb. in front of Sidon by ambulance car from 14 Lt. Fd. Amb. On the right there was no change.

On June 15, Aust. 21st Bde. advanced to enter Sidon. 'A' Coy. 2/6 (Aust.) Fd. Amb. moved in and 'B' Coy. prepared to open in a hospital in the town.

In the centre at Marjayoun, while the Australians were deploying prior to clearing the road to the north, the town was temporarily uncovered and Vichy French elements re-occupied it and also Khiam.

'B' Coy. 2/4 (Aust.) Fd. Amb. and the section of 14 Lt. Fd. Amb. withdrew from Marjayoun to Metulla and thence to El Khalissa, while H.Q. 2/4 (Aust.) Fd. Amb. with its M.D.S. pulled back from Metulla to Tabigha. These moves did not materially disturb the system of evacuation.

On the right Ind. 5th Bde. moved up through the Free French and captured Kissoue. But at Qnaitra 1st Royal Fusiliers of Ind. 5th Bde., together with a troop of 1st Royals, were attacked by Vichy French medium tanks and forced to surrender on the 16th.

For this advance on Kissoue 14 (Ind.) Fd. Amb. was deployed as follows:

With Ind. 5th Inf. Bde.	an A.D.S.
At Sanameine	a staging A.D.S.
At Sheikh Meskine	a car post
At Deraa	a M.D.S., 12 I.S.S.
At Irbid	The Hadfield Spears Unit.

Further east the Vichy French attacked Ezraa from the east and pushed the Transjordan Frontier Force back to Sheikh Meskine. As a result, this evacuation chain was broken for a time. The M.D.S. at Deraa was closed and withdrawn to Irbid. However, Ezraa was recaptured on the 16th and evacuation continued as before.

On the 17th Qnaitra was retaken by 2nd Queen's (of 16th Inf. Bde. of 6th Division) which had been brought up from Palestine. Ezraa was also retaken by a small mixed force.

By this time considerable numbers of malaria cases were being admitted to the Australian C.C.S. at Nazareth and the general hospitals at Gaza and Kafr Belu. 2/1 A.G.H. at Gaza was obliged to expand from 600 beds to 1,800 and, finally, to 2,000.

On June 18 General Laverack, commanding Australian 7th Division, assumed command of Australian I Corps (ultimately to consist of Australian 6th, 7th and 9th Divisions) and was placed in control of the whole operation.

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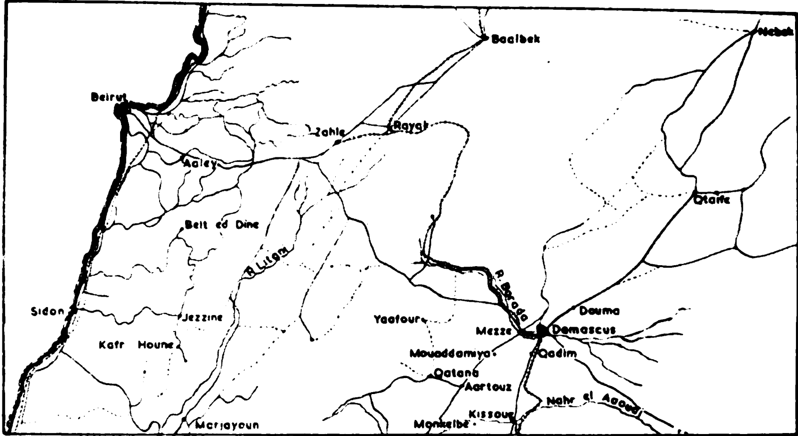

FIG. 79. Central Syria.

A certain reorganisation of the forward medical services took place:

(*a*) 2/13 (Aust.) Fd. Amb. newly arrived, became the corps field ambulance.

(*b*) 2/6 (Aust). Fd. Amb. with its H.Q. at Kasmiye, 'A' Coy. nearby and 'B' Coy. at Sidon, was allotted to the coastal sector.

(*c*) 14 Lt. Fd. Amb. H.Q. and two sections was allotted to the Jezzine–Beit ed Dine sector, together with 'A' Coy. 2/4 (Aust.) Fd. Amb.

(*d*) 2/4 (Aust.) Fd. Amb., less 'A' Coy. and with its H.Q. at Tabigha, was allotted to the Marjayoun–Qnaitra sector.

(*e*) 14 (Ind.) Fd. Amb., 12 (Ind.) Staging Section and The Hadfield Spears Unit were allotted to the Deraa sector.

(*f*) The Groupe Sanitaire was allotted to the Free French on the right.

Evacuation: from the left to Haifa; from the right to Nazareth.

On June 19 the fighting around Jezzine and Marjayoun flared up and the numerous Australian casualties were dealt with by the A.D.S. of 2/4 (Aust.) Fd. Amb. at Kafr Tibnite and by 14 Lt. Fd. Amb. which had its sections on the Qnaitra road and at El Khalissa, a small village near Marjayoun.

General Maitland Wilson was now informed that Br. 6th Division was being placed at his disposal. Two battalions of 16th Inf. Bde. of this division fought in Crete. The third battalion and brigade H.Q. did not land there. Following the withdrawal from Crete 16th Inf. Bde. was hastily refitted and despatched to Syria. On June 13, H.Q. 6th Division with 33 Fd. Hyg. Sec. and 7 M.A.C. also moved to Syria. 215 Fd. Amb. remained with W.D.F. On June 21, 6th Division, with its H.Q. at Rosh Pinna, came under command Australian I Corps.

The division had under command:

(1) Ind. 5th Inf. Bde. Gp., with 14 (Ind.) Fd. Amb., in action on the outskirts of Mezze and Damascus.

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(2) 16th Inf. Bde., less one battalion. Bde. H.Q. and one battalion were at Kissoue, the other battalion in Qnaitra. With this battalion was a section of 14 Lt. Fd. Amb.

(3) A variety of Australian infantry, artillery and M/G units and parts of units which joined or left 6th Division at short notice.

23rd Inf. Bde., which included one Czech battalion, with 189 Fd. Amb. attached, was *en route* from the M.E. to Syria.

A fresh tactical plan was now devised:

(*a*) While the weight of the attack of Australian 7th Division was directed against Beirut;

(*b*) H.Q. 6th Division would assume operational control of Ind. 5th Inf. Bde. Gp. and of the Free French Force;

(*c*) 16th Inf. Bde. of 6th Division would attack westwards.

(*d*) 23rd Inf. Bde. of 6th Division would take over the Marjayoun sector;

(*e*) 'Habforce' in Iraq would move to Rutba and against Palmyra, 130 miles north-east of Damascus. When Palmyra had been reduced 'Habforce' would move on Homs and Tripoli;

(*f*) Indian 10th Division in Iraq would move up the Euphrates on Deir ez Zor and thence on Aleppo.

The line of evacuation during the forthcoming action was to be:

(*a*) by ambulance car from the A.D.Ss. along the Damascus–Deraa road to the Railhead at Deraa. At Deraa were H.Q. 14 (Ind.) Fd. Amb., 12 I.S.S. and a section of 7 M.A.C;

(*b*) by ambulance coach to Afula;

(*c*) by M.A.C. (7 M.A.C.) to 2/1 (Aust.) C.C.S. at Nazareth.

The Order of Battle of the 6th Division and the Indian 5th Infantry Brigade is shown in Appendix XXII.

The Free French units were operating against Damascus on the right of Ind. 5th Inf. Bde. The enemy held Qatana and also the road between Qnaitra and Mezze. The Deraa–Damascus road therefore had to be used both for supply and evacuation. 16th Inf. Bde. was concentrated in the Qatana area. One of its battalions, 2nd Queen's, was in Qnaitra.

The road to Damascus was barred by the Vichy French positions around Mouaddamiya, Qadim and Mezze. In order to facilitate the advance on Qadim and Damascus by the Free French, Ind. 5th Inf. Bde. moved on Mouaddamiya and Mezze. After overcoming severe resistance Mouaddamiya was occupied during the early hours of June 18 and Mezze early on the 19th. But the attack on Qadim by the Free French was unsuccessful and so Ind. 5th Bde. in Mezze had now to face the full strength of the Vichy French forces in this area. Two companies of 3/1st Punjabis had not yet reached Mezze from Mouaddamiya. For them the road was blocked and they were isolated in the woods south-east of Mezze. Mezze itself was completely invested and every attempt

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to get reinforcements into the place was foiled. The garrison did everything possible to put the village into a state of defence. Mezze House, a two-storied square villa on the northern outskirts of the village, was taken over by brigade headquarters.

Attacks by heavy tanks quickly broke through the road blocks and the village was continuously shelled by guns in the hills nearby. By the afternoon of the 19th the garrison had been obliged to withdraw to Mezze House. At nightfall the attacks ceased but the situation remained desperate. Early on the morning of the 20th a battery of 1st Field Regt. and the French Marines set out on an attempt to relieve the garrison, but before they could arrive the Vichy French began to shell Mezze House at point blank range. The garrison had been without food for more than fifty hours and its ammunition was exhausted. A white flag was flown in order that a request that permission to evacuate the wounded might be made. This was misunderstood and taken to be the symbol of surrender. The Vichy French troops rushed into the house and the remnants of the garrison were overpowered. When the relieving column, reinforced by an Australian battalion, reached Mezze at 1900 hours that day Mezze House held none but the dead.

On the morning of June 21, the Free French captured Qadim and by noon were in Damascus and the Vichy French were retreating along the Beirut road.

Ind. 5th Inf. Bde. lost 11 officers and 51 O.Rs. killed, 15 officers and 197 O.Rs. wounded and 43 officers and 1,201 O.Rs. missing in this action. Of the last, 881 were later recovered at the time of the armistice. This unforeseen disaster disrupted the plan of evacuation. It was intended that casualties should pass through the forward A.D.S. at Monkelbe to the staging A.D.S. at Sanameine and thence *via* the C.P. at Sheikh Meskine to the M.D.S. at Deraa. But on June 19 the forward A.D.S. had been captured, and although another detachment was sent forward it became clear that evacuation must remain impossible for the time being.

With the troops in Mezze there was but one medical officer and by the afternoon of the 19th he was out of touch with the rest of the brigade and his medical supplies soon became exhausted. When the surrender occurred he was not permitted to stay with his wounded. These were removed to a Vichy French hospital.

When on the 21st, Mezze had been recaptured and communications re-established, a forward A.D.S. was opened just south of Mezze on the Qnaitra–Damascus road. Then on June 22 the M.D.S., being relieved by 2/13 (Aust.) Fd. Amb., moved forward to Sheikh Meskine, while 12 I.S.S. remained in Deraa. The absence of a surgical team in the forward area was keenly felt at this time. One such team was sent forward but it arrived without any equipment. 14 Lt. Fd. Amb. established

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a staging post at Sanameine and the surgical component of the Groupe Sanitaire was in Khane Denoun. When 9 Lt. Fd. Amb. went with 'Habforce' to Iraq it left a section behind. This section moved up from Palestine into Syria and now established a staging post in Qnaitra.

Dysentery, P.U.O. and exhaustion were now taking heavy toll of the Australians, who were operating in very difficult country. 168 Fd. Amb. in Haifa was full and 2/1 (Aust.) C.C.S. at Nazareth was rapidly filling. Up to midnight on June 21 there had been admitted to hospital from the Australian sector:

TABLE 63

	Battle casualties	Sick
Australian	542	520
United Kingdom	70	100
P.o.W.	122	11
Civilian	9	0
Royal Navy	24	24
Others	4	8
	771	663

During these events 16th Inf. Bde. maintained contact with the enemy on the Qatana front and astride the Damascus–Beirut road until the Vichy French in this sector withdrew to positions on the Jebel Mazar.

H.Q. and another section of 14 Lt. Fd. Amb. was allotted by D.D.M.S Australian corps to 6th Division and moved to Qnaitra. 14 (Ind.) Fd. Amb. moved into Damascus to open in the British Mission Hospital. Into Damascus too moved the Hadfield Spears Unit with a sub-section of 7 M.A.C. attached. 12 I.S.S. and a section of 7 M.A.C. remained at Deraa.

Ind. 5th Inf. Bde. was now withdrawn to rest at Mezze. On June 23 the Australians re-occupied El Khiam and on the following day recaptured Marjayoun, the key to the central sector. On the coast they entered Kassouba, south of Damour.

2/6th (Aust.) Fd. Amb. established an A.D.S. near Jezzine whence casualties were evacuated to the M.D.S. of the same unit in Ford House, Sidon. To this M.D.S. an Australian surgical team from 1 (Aust.) C.C.S. at Nazareth was attached. Another Australian surgical team was attached to 168 Fd. Amb. at Haifa.

On June 26 the Australian field ambulances reverted from brigade to divisional control. 'A' Coy. 2/4 (Aust.) Fd. Amb. moved from Jezzine to Kasmiye to come under command of 2/6 (Aust.) Fd. Amb. at Sidon, for the reason that owing to the nature of the terrain it was out of touch with its own headquarters. 'B' Coy. 2/4 (Aust.) Fd. Amb. moved back to

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El Khalissa, this being the most convenient non-malarial site. 2/13 (Aust.) Fd. Amb. opened a rest station at Az Zib on the coast and a section of this unit was posted to Deraa. 215 Fd. Amb. now reached Syria from the Middle East.

The distribution of the medical units of 6th Division at this time was as follows:

14 (Ind.) Fd. Amb. .	H.Q. moving from Sheikh Meskine to Damascus. S.P. at Sanameine. M.D.S. in the British Mission Hospital, Damascus. A.D.S. at Mezze with Ind. 5th Inf. Bde. A.D.S. at Monkelbe moving to Aartouz.
14 Lt. Fd. Amb., less two sections	in the Qatana–Yaafour area with 16th Inf. Bde. Section at Qnaitra.
7 M.A.C. section .	moving from Sheikh Meskine to Damascus.
33 Fd. Hyg. Sec. .	moving from Rosh Pinna to Damascus.
215 Fd. Amb. . .	moving from Benat Yacoob to Damascus to relieve 14 (Ind.) Fd. Amb. which was to go into reserve.

In 6th Division sector 16th Inf. Bde. made an unsuccessful attack on Jebel Mazar. On July 1 and 2, 23rd Inf. Bde. reached the forward area and took over the Marjayoun sector from a brigade of Australian 7th Division. With 23rd Bde. came 189 Fd. Amb., less one company. As part of the preparation for another attack on the Jebel Mazar position, 23rd Inf. Bde. passed under the direct command of Australian I Corps while he North Somerset Yeomanry and Australian 9th Divisional Cavalry came under command 6th Division. The Yeomanry were allotted an offensive rôle on the high ground south of Jebel Mazar. Ind. 5th Inf. Bde., now greatly depleted by losses, was to give support around Qatana, while 16th Inf. Bde., reinforced with Free French units, was to make the main assault astride the Beirut road. A pursuit force was compounded out of mechanised and armoured units. To this 'D' section of 14 Lt. Fd. Amb. was attached.

Plans for the attack on the Damour position in front of Beirut, now occupied in strength by the Vichy French, were now maturing. Because of the difficult nature of the terrain a request was made by the Australians for donkeys to help in the collection of casualties from the R.A.Ps. Twenty mules with Cypriot muleteers were sent up.

2 C.C.S. had now arrived at Haifa. It remained closed, awaiting orders for forward movement, while 2/3 (Aust.) C.C.S. at Gaza prepared to move forward, possibly to Acre, if required.

In the east, 'Habforce' with 9 and 166 Lt. Fd. Ambs. and 8 Fd. Hyg. Sec. attached, moving on Palmyra, found the place strongly defended. While investing Palmyra, 'Habforce' was heavily attacked from the air and it began to look as if the task of reducing the place was beyond the

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slender powers of this force. However, a company of 1st Essex managed to capture the mediaeval fort which dominated the town and on July 3 the garrison capitulated. Arrangements were now made for evacuation from 'Habforce' into Damascus.

Meanwhile the Arab Legion had routed and chased units of the French Camel Corps, and Ind. 21st and 25th Inf. Bdes. of Indian 10th Division were nearing the Syrian border. So also was Ind. 17th Inf. Bde. of Indian 8th Division which had moved up from Basra.

On July 5 the attack on the strong Damour position opened. The cruiser squadron bombarded the French line and the Australians by an outflanking movement over very rough ground and after four days of very bitter fighting, forced the Vichy French to withdraw. Damour was taken on the 9th and Abey on the 10th.

On July 6, Ind. 17th Bde. of Indian 8th Division, under command of G.O.C. in C. British Troops in Iraq, moving from Mosul along the line of the railway in the north, occupied Qamichliye and Hassetche while Ind. 21st Inf. Bde. of Indian 10th Division, following the line of the Euphrates, captured Deir ez Zor and moved on Raqqa. Ind. 25th Inf. Bde. of Indian 10th Division was employed on L. of C. duties and later relieved Ind. 17th Inf. Bde. in the Hassetche–Ras el Ain area. Ind. 17th Inf. Bde. thereupon returned to Mosul.

On July 10, 6th Division's second attack on Jebel Mazar was launched and the crest was taken. On July 11, 14th Inf. Bde. of 6th Division, with 173 Fd. Amb. attached, reached the forward area.

On this date the Vichy French Command asked for a conference at which the terms of an armistice could be discussed, but they demanded that from this conference the Free French should be excluded. They were informed that this condition was unacceptable and that if resistance was continued Beirut would be shelled. On July 12 the Vichy French agreed to a conference without conditions and on the 14th an armistice was signed at Acre and Syria passed under the political control of the Free French.

It was estimated that the Vichy French casualties amounted to some 6,000. Australian losses were 327 killed, 89 died of wounds, 1,136 wounded, a total of 1,552, which exceeded that of the Australian losses, excluding P.o.W., in Greece and Crete. Indian and United Kingdom casualties totalled 1,800 plus 25 killed, 50 wounded and 10 missing of Indian 10th Division. Those of the Free French were 1,300.

This brief campaign was most distasteful for the reason that Frenchmen were fighting, and with bitterness, against their own countrymen, and even after it had ended much occurred that gave cause for regret. Of the 37,736 Vichy French troops that had been involved only 5,668 elected to throw in their lot with General de Gaulle. The return of prisoners-of-war taken by the Vichy French was associated with much

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unpleasantness. Indeed it became necessary to arrest General Dentz, the French Commander-in-Chief, himself before the Vichy French were persuaded to return such prisoners quickly and in accordance with the terms of the armistice.

MEDICAL COVER FOR THE FINAL BATTLE

Australian 7th Division. Medical cover was provided by 2/6 (Aust.) Fd. Amb. operating north of Sidon, 2/4 (Aust.) Fd. Amb. in the vicinity of Kasmiye and 2/13 (Aust.) Fd. Amb. at Ez Zib. A light section of 'A' Coy. of 2/6 was near Kassouba, 'A' Coy. itself at El Remeili, halfway between Kassouba and Sidon where H.Q. 2/6 (Aust.) Fd. Amb. had its M.D.S. with 'B' Coy. nearby. A light section of 'B' Coy. was at Aanout, inland from El Remeili. At Kasmiye H.Q. 2/4 (Aust.) Fd. Amb. had its M.D.S. with 'B' Coy. nearby. At Ez Zib 2/13 (Aust.) Fd. Amb. was running a rest station to which exhaustion cases were sent.

The medical cover for the Australian attack on Damour functioned smoothly, though the use of mules proved to be unsatisfactory. Between July 5–10, 145 battle casualties and 255 sick passed though the Australian forward medical units. Cases of gas gangrene were encountered. Of 115 cases of P.U.O. investigated by the Australian mobile laboratory, 2 were shown to be due to relapsing fever, 51 to benign tertian and 7 to malignant tertian malaria. There was trouble with the stored blood received from 60 B.G.H. at Jerusalem. There were several instances of severe reaction and two deaths attributable to its use. It was decided that henceforth only fresh blood should be used and this was obtained from the rest camp at Ez Zib and from the Australian convalescent depot in Palestine.

The surgical teams rendered good service. The A.A.M.C. reached the conclusion that such a team should be reorganised as an independent unit and provided with its own transport.

The Australian system of assigning a different rôle to each of the two Australian field ambulances, one handling those cases requiring immediate surgical treatment of a major kind and the other dealing with the less seriously wounded, worked well. During action both of these field ambulances formed mobile dressing stations and these proved to be most satisfactory under the conditions that existed. The ambulance train system was satisfactory after a special medical staff of one officer and six O.Rs. had been provided for each train. The system whereby patients were taken to Amman by train and thence by M.A.C. to the B.G.H. in Jerusalem had to be dropped for the reason that Arabs sniped at the traffic on the Amman–Jerusalem road. Afula was found to be a better terminus than Amman. The rest station, run by a field ambulance, did much to prevent wastage. It could hold up to 650 men when fully developed. The lack of an advanced depot of medical stores nearer than

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central Palestine was felt, but the greatest anxiety was attached to the paucity of anti-malarial stores.

2/1 and 2/7 A.G.Hs. were hard pressed. The former was obliged to expand from 600 to 1,500, to 1,800 and finally to 2,000 beds. The latter was not completely established when the campaign began and so worked under considerable difficulty.

6th Division. Up to the time of the capture of Damascus all medical arrangements were made by the officer commanding 14 (Ind.) Fd. Amb. There was an A.D.S. at Monkelbe, a staging post at Sheikh Meskine and a M.D.S. at Deraa. Evacuation from the M.D.S. was by train to 2/1 (Aust.) C.C.S. at Nazareth. Twelve cars of 7 M.A.C. were assisting 14 (Ind.) Fd. Amb. in the collection of casualties from the R.A.Ps. and in their further evacuation through the A.D.S. to the M.D.S.

When Damascus fell medical arrangements were taken over by H.Q. 6th Division. 14 (Ind.) Fd. Amb. opened a M.D.S. in the British Mission Hospital in Damascus, using one company until the H.Q. could arrive from Deraa. The other company moved to Mezze to join Ind. 5th Inf. Bde.

The cars of 7 M.A.C. were employed in evacuation between the M.D.S. in Damascus and 12 I.S.S. at railhead in Deraa. A certain proportion of the casualties were sent by road to 2/4 (Aust.) Fd. Amb. at the Beatitude Hostel, El Tabigha. Thence they were evacuated by 2 M.A.C. to 2/1 (Aust.) C.C.S. at Nazareth.

To serve 16th Inf. Bde. one section of 14 Lt. Fd. Amb. opened an A.D.S. at Qatana; the other section opened an A.D.S. at El Hame on the Damascus–Beirut road. From these A.D.Ss. evacuation was to the M.D.S. in Damascus. H.Q. 14 Lt. Fd. Amb. opened in Mouaddamiya.

H.Q. 215 Fd. Amb. took over the M.D.S. in Damascus and 14 (Ind.) Fd. Amb. joined its section in Mezze to deal with the minor sick of Ind. 5th Inf. Bde. 'B' Coy. 215 Fd. Amb. relieved H.Q. 14 Lt. Fd. Amb. at the A.D.S. at Aartouz which then went into reserve at Mouaddamiya. 'A' Coy. 215 Fd. Amb. was also kept closed and in reserve in the vicinity of Mouaddamiya.

From June 26, ambulance coaches ran daily from Damascus to Amman, whence the patients were carried by road to the general hospitals in Jerusalem. The most seriously wounded were still sent by road to El Tabigha and thence to Nazareth. The section of 9 Lt. Fd. Amb. at Qnaitra provided a staging post.

In the first and unsuccessful attack on Jebel Mazar a detachment of 14 (Ind.) Fd. Amb. relieved the section of 14 Lt. Fd. Amb. at Qatana and this then rejoined its H.Q. at Mouaddamiya.

On the 28th, 23rd Inf. Bde. with 189 Fd. Amb. (less one company) took over the Marjayoun sector and Ind. 5th Bde. the Qatana area in

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relief of Aust. 2/3rd Inf. Bn. 14 (Ind.) Fd. Amb. established a forward collecting post in the Qatana area and sent a detachment to open an Indian wing at the A.D.S. of 215 Fd. Amb. at Aartouz. H.Q. 14 (Ind.) Fd. Amb. remained at Mezze to form a reception station for Indian sick.

189 Fd. Amb. took over the M.D.S. at El Tabigha and the A.D.Ss. at El Khalissa from 2/4 (Aust.) Fd. Amb. on July 2/3. The Australian medical unit thereupon proceeded to the coastal sector north of the Litani. Evacuation from the M.D.S. was by a section of 2 M.A.C. to 2/1 (Aust.) C.C.S. at Nazareth.

By July 3 the section of 9 Lt. Fd. Amb. had left Qnaitra and was relieved by that section of 14 Lt. Fd. Amb. that had been withdrawn from Qatana. Then came orders for 14 Lt. Fd. Amb. to move to Australian 7th Divisional area and this unit, less the section at Qnaitra, was withdrawn. The A.D.S. at El Hame was taken over by 'A' Coy. 215 Fd. Amb. 'B' Coy. 215 Fd. Amb. handed over the A.D.S. at Aartouz to a company of 14 (Ind.) Fd. Amb. and went into reserve. H.Q. 14 (Ind.) Fd. Amb. at Mezze continued to deal with the minor sick of Ind. 5th Inf. Bde. but all other casualties were taken to the M.D.S. of 215 Fd. Amb. in the Mission Hospital, Damascus, to which a surgical team from 14 C.C.S. (moving to Syria from Palestine) was now attached.

For the second and successful attack on Jebel Mazar the M.D.S. of 189 Fd. Amb. was moved from El Tabigha to El Khalissa and an A.D.S. was opened at Metulla.

On July 9, 14 C.C.S. from Palestine was open in Damascus. It was joined by 12 I.S.S. which opened an Indian wing. Between July 9–14 this C.C.S. dealt with 426 casualties. Evacuation was through the A.D.Ss. at Aartouz and El Hame direct to 14 C.C.S. by 7 M.A.C. Sick were sent to the M.D.Ss. of 14 (Ind.) and 215 Fd. Ambs. The number of wounded evacuated during this operation was 128.

On the cessation of hostilities Ind. 5th Inf. Bde. with 14 (Ind.) Fd. Amb. reverted to corps control and 6th Division prepared to move to new areas in the Lebanon and Syria in accordance with the armistice terms.

The medical services, greatly relieved by the ending of the campaign before sick-wastage due to malaria had begun to embarrass tactical plans, began to prepare for the dispersal of the force throughout the country, now known from experience to be highly malarious in many parts. The consulting malariologist urged that the dose of suppressive quinine should be increased to five grains twice a day. Ten thousand nets of the sandfly bivouac type had gone astray and for them a widespread search was now made.

This campaign was notable for its swift changes of fortune and of plans. The force was minimal in its numbers and the firmness of the French resistance precluded any possibility of holding any portion of it in reserve. There was much and constant switching of units from one

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sector to another and several changes in command. It was not until Damascus had fallen and 6th Division had arrived in the forward area that any unified control of the medical services could be exercised.

THE ADVANCE OF INDIAN 10TH DIVISION FROM IRAQ INTO SYRIA

On June 17, G.O.C. in C. in Iraq was informed by M.E.C. that he would be required in the near future to provide a force of approximately two brigades to assist in the operations in Syria. H.Q. Indian 10th Division in Baghdad was thereupon instructed to prepare to undertake this assignment. The forward base for this force was to be at Haditha, 145 miles north-west of Baghdad. The force would be supplied by Iraq Command but would pass under the operational control of Palestine and Transjordan Command. It was decided that one of the selected brigades should move on Deir ez Zor and that the second would follow up and take over the L. of C. between Haditha and Deir ez Zor in the first stage of the operation.

On June 22 information was received from G.H.Q. M.E. that it was imperative that Deir ez Zor should be occupied at the earliest possible moment. So, although Ind. 21st Inf. Bde. was by no means ready and although transport was exceedingly deficient, its advance elements set out from Baghdad for the Syrian border with instructions to capture Abu Kemal. On June 24, Ind. 21st Inf. Bde. moved from Baghdad *via* Habbaniya to reach Abu Kemal on June 29. By July 1, Ind. 25th Inf. Bde., having arrived in Baghdad from Basra on June 24, was concentrated in Habbaniya.

Ind. 21st Inf. Bde. occupied Abu Kemal in the face of negligible opposition and at once commenced vigorous patrolling toward Deir ez Zor. At the same time a small force derived from Ind. 20th Inf. Bde. in Mosul crossed the Syrian border west of Al Badi and advanced towards Fadrhami, which was reached on July 1. It made no contact with Vichy French forces and withdrew to Al Badi on the 2nd.

On July 1 the advance towards Deir ez Zor commenced, the main column following the line of the Euphrates while a small column proceeded to T.2 on the pipeline to Tripoli, about eighty miles south of Deir ez Zor. The main column was frequently attacked from the air but the advance continued and Deir ez Zor was occupied on July 4.

On July 5 a detachment moved on Raqqa, to the north-west of Deir ez Zor seventy-five miles up the Euphrates. Raqqa was occupied on the 6th and contact made with 'Habforce'.

On July 14, Ind. 21st Inf. Bde. was instructed to send a battalion group to Meskine. On the 15th, H.Q. Indian 10th Division opened in Deir ez Zor. Ind. 25th Inf. Bde. had remained in Habbaniya during these events but moved to K.3 on July 10 and to Deir ez Zor on the 18th.

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Indian 10th Division was now assigned the task of enforcing the terms of the armistice in its area, the north-east sector of Syria. Ind. 21st Inf. Bde. was to occupy the Raqqa–Meskine area; Ind. 25th Inf. Bde. the Hassetche–Deir ez Zor–Ain area and Ind. 20th Inf. Bde. the Desert L. of C.

The division was relieved by Ind. 5th Inf. Bde. in the early part of August and left Syria for north-west Persia.

Medical Cover. The distance between the Syrian border and Baghdad, the base, was some 215 miles. For the most part the road was nothing more than a desert track. The only hospitals available were in Habbaniya and Baghdad. No C.C.S. and no staging sections were to be supplied. It became necessary therefore to improvise a C.C.S. out of a detachment of 25 C.G.H. in Baghdad. This improvised C.C.S. was established at Haditha. Two staging posts were provided by 30 (Ind.) Fd. Amb., one at Hit, midway between Haditha and Habbaniya, the other at T.1, about seventy miles to the west of Haditha.

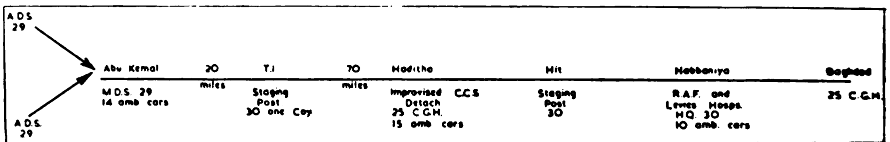

FIG. 80. Indian 10th Division. Evacuation Chain. June 29, 1941.

29 (Ind.) Fd. Amb. moved forward with Ind. 21st Inf. Bde. and reached Abu Kemal on June 29. Its H.Q. formed a M.D.S. there while its two companies moved on with the brigade to form A.D.Ss. as required. The distribution of these forward medical units as on June 29 is shown diagrammatically in Fig. 80.

When Ind. 21st Inf. Bde. moved forward towards Deir ez Zor, H.Q. 29 (Ind.) Fd. Amb. moved with it and opened a M.D.S. about 14 miles to the south-east of Deir ez Zor. A detachment of 30 (Ind.) Fd. Amb. was sent forward to Abu Kemal to stage casualties. On July 7, H.Q. 30 (Ind.) Fd. Amb. from Habbaniya, joined the S.P. at T.1 and began to function as the rear M.D.S. This M.D.S., like the improvised C.C.S. at Habbaniya, was accommodated in excellent and suitable buildings of the Iraq Petroleum Company. The water supply at T.1 came from the Euphrates, 25 miles away, being sedimented and chlorinated at the source. The pumping machinery had been damaged but though the water supply was limited water was not scarce.

When Deir ez Zor had been occupied 29 (Ind.) Fd. Amb. moved into the town, took over part of the French barracks and opened a M.D.S. One of its companies moved with the brigade. On July 15 H.Q. 30 (Ind.) Fd. Amb. moved to Deir ez Zor, leaving one company at T.1.

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It took over the M.D.S. and 29 (Ind.) Fd. Amb. moved on to Meskine on the road to Aleppo. In Meskene it opened a M.D.S. to serve Ind. 21st Inf. Bde. then in this area. One company of 30 (Ind.) Fd. Amb. moved to Hassetche to provide an A.D.S. to serve Ind. 25th Inf. Bde.

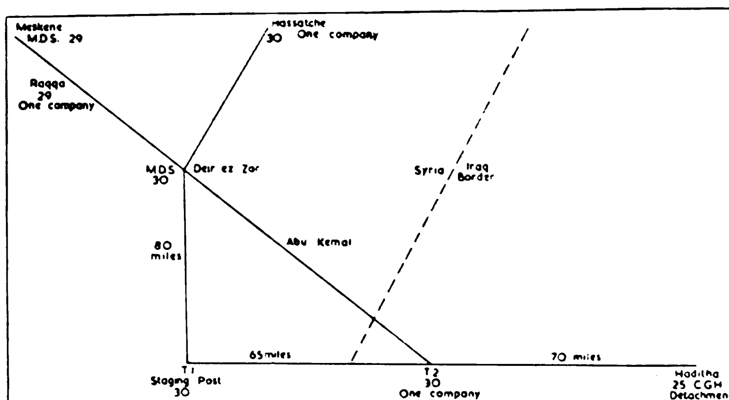

FIG. 81. Indian 10th Division. Evacuation Chain. July 15, 1941.

The evacuation scheme was as is depicted in Fig. 81. The M.D.S. of 30 (Ind.) Fd. Amb. at Deir ez Zor was functioning as a field hospital. X-ray facilities were available in the local American Missionary Hospital. Evacuation therefrom was by ambulance car to T.2. Though this journey was longer than that *via* Abu Kemal the tracks were far better. At T.2 the patients were transferred to the cars of another convoy and taken to T.1, and on to Haditha. At both T.1 and T.2 the patients were screened and those not fit for further travel held until fit.

When Ind. 21st Inf. Bde. left Syria for Persia 29 (Ind.) Fd. Amb. accompanied it. In August H.Q. 30 (Ind.) Fd. Amb. closed in Deir ez Zor and moved back to Mosul and Basra, there to join Ind. 25th Inf. Bde. from Syria which had been placed u/c Indian 8th Division. Two companies of this medical unit accompanied the brigade in its move.

THE ADVANCE OF INDIAN 17TH INFANTRY BRIGADE FROM IRAQ INTO SYRIA

G.O.C. in C. Iraq decided to assemble a small force in Mosul for use in the Bec du Canard area of Syria, having for its purpose the occupation of the Qamichliye–Hassetche area and the securing of the railway running along the Turkish border. The operation was primarily designed to attack the northern flank of the Vichy French and so threaten Aleppo. Ind. 17th Inf. Bde. of Indian 8th Division was brought to Mosul from Basra, having arrived from India on June 10.

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A column consisting of two companies of 1/12th Frontier Force Regt., with supporting troops, moved from Mosul on July 2/3 with orders to occupy Tel Kotchek. Complete surprise was achieved and Tel Kotchek was abandoned by the Vichy French troops. On July 4 the remainder of 1/12th F.F.R. reached Tel Kotchek and advanced to Tel Aalo which was captured on July 5. H.Q. Ind. 17th Inf. Bde. moved from Mosul to Tel Aalo on the 6th. On the 7th the brigade advanced to Qamichliye to meet only slight opposition and to occupy the town. The entire railway line from Mosul to the Turkish border was now secured.

On July 8 a small column occupied Hassetche which had been abandoned by the Vichy French, as had also Ras el Ain. Leaving a battalion in the occupied area the brigade moved back to Mosul on July 14.

Since this operation met with no opposition no medical problems arose. 31 (Ind.) Fd. Amb. accompanied the brigade, its H.Q. moving with brigade H.Q. and companies moving with the various columns. One company accompanied the column that went to Qamichliye and established an A.D.S. there, evacuating such casualties as occurred to the M.D.S. at Tel Aalo, 50 miles back. The same company went with the column that moved on Hassetche and remained there until the operation ended.

(ii)
The Occupation of Syria

On June 22 Germany struck against Russia. It became necessary to add to the strength of the Russian left flank by concentrating a force in Syria. In this way the threat to Turkey could be met and the Persian oilfields safeguarded. So, following the armistice, Australian 7th Division was distributed in the coastal plain and 6th Division in the inland areas, H.Q. Division in Baalbek, 23rd Bde. in the Aamiq–Kabbelias area, spreading later to Mreijatte, 14th Inf. Bde. in the Zahle, Rayak and Tagia area and 16th Inf. Bde. in the Homs–Hama area with one battalion at Palmyra.

The medical units participated in this distribution:

2/4 (Aust.) Fd. Amb.	took over an Italian hospital in Tripoli.
2/6 (Aust.) Fd. Amb.	opened in Ain Sofar, near Beirut.
2/3 (Aust.) C.C.S.	moved to Beirut from Haifa.
2/1 (Aust.) C.C.S.	moved to Asfurieh near Beirut from Nazareth.
215 Fd. Amb.	moved to Homs and a detachment to Palmyra.
173 Fd. Amb.	moved to Zahle.
189 Fd. Amb.	moved to Mreijatte.

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14 Lt. Fd. Amb.	(less one section moved to Nebek).
'C' Section 14 Lt. Fd. Amb.	moved to Baalbek.
'D' Section 14 Lt. Fd. Amb.	moved to Nebek and later to Palmyra.
7 M.A.C. sub-section	moved to Nebek.
33 Fd. Hyg. Sec.	moved to Baalbek.
3 Mob. Bact. Lab.	was attached to 173 Fd. Amb. at Zahle.

'D' Section 14 Lt. Fd. Amb. at Nebek established a staging post for patients being evacuated from Homs to Damascus and to serve a number of units guarding supply installations in the area. When base was moved to Homs 'D' Section 14 Lt. Fd. Amb. moved to Palmyra in relief of a detachment of 215 Fd. Amb. Patients evacuated from Homs were then staged through 'C' Section 14 Lt. Fd. Amb. at Baalbek.

To begin with, the field ambulances were cleared by 7 M.A.C., located at Damascus (85 L. of C. sub-area), but later, when it became evident that this M.A.C. could not cope with the demands made upon it, D.D.M.S. Australian I Corps arranged that 6th Divisional casualties should be cleared by 2/2 (Aust.) M.A.C.

3 Mob. Bact. Lab. became attached to 173 Fd. Amb. on July 26.

The general policy was that the field ambulances should hold and treat all minor sick and that malaria cases should be evacuated to 14 C.C.S. at Damascus.

On August 3, 23rd Inf. Bde. Gp. moved to Aleppo and 189 Fd. Amb. took over the French military hospital there from 166 Lt. Fd. Amb., which moved out with 4th Cavalry Bde. On September 7 this field ambulance moved into the Italian Mission Hospital.

On September 9, 189 Fd. Amb. became complete through the addition to it of 'B' Coy. 200 Fd. Amb.

33 Fd. Hyg. Sec. was installed at Baalbek and had detachments with each of the field ambulances. On July 31 it was joined by 11 M.C.U.

In August nurses joined the Australian C.C.Ss., some being posted to the field ambulances. 14 Lt. Fd. Amb., two Australian malaria control units and two Australian dental clinics were attached to 2/2 (Aust.) Fd. Hyg. Sec. in the Australian 7th divisional area. 2/9 A.G.H. opened in Nazareth. C.C.Ss. were required to function as general hospitals and field ambulances as C.C.Ss.

In September, Aust. 18th Inf. Bde., with 2/5 (Aust.) Fd. Amb., from Tobruk rejoined Australian 7th Division. 6th Division, renumbered 70th, left Syria to relieve Australian 9th Division in Tobruk, and by the end of October this interchange was completed and Australian 9th Division was concentrated in Palestine. In relief of 70th Division in Syria came Australian 6th Division (restored and re-equipped after its losses in Greece), with 2/1 and 2/2 (Aust.) Fd. Ambs. The latter relieved

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2/5 (Aust.) Fd. Amb. in Homs. 2/5 (Aust.) Fd. Amb. then moved to Aleppo to take over an Italian hospital from 189 Fd. Amb. and to serve Aust. 18th Inf. Bde. 2/1 (Aust.) Fd. Amb. took over from 173 Fd. Amb. at Zahle, Qatana and Zebdani.

There were thus two evacuation routes, the central route passing through Damascus and the coastal route from Beirut to Haifa. The most difficult part of the task of the medical services was that of serving the troops scattered along the northern frontier. Each post had a medical orderly and a medical officer visited them all at frequent intervals. During October the troops in the more mountainous areas were exposed to fierce cold and cases of frostbite were being admitted to the medical units.

On November 1, Palestine and Transjordan Command was dissolved and Ninth Army (Lebanon and Syria) was created in its place. Its headquarters was at Brumana, six miles out of Beirut. Ninth Army included X and Australian I Corps. To it came Indian 3rd Motor Brigade for employment in occupational duties in the Deir ez Zor area.

On December 7, 1941, Japan struck at Pearl Harbour and in so doing greatly extended the war. By agreement between the United Kingdom and Australian governments two of the Australian divisions were withdrawn from the Middle East. Australian 6th Division left for Australia and was quickly followed by Australian 7th Division. They were replaced in Ninth Army by New Zealand 2nd Division and Australian 9th Division (from Tobruk by way of Palestine) in January 1942.

With Australian 9th Division there came to Syria 2/3, 2/8 and 2/11 (Aust.) Fd. Ambs. 2/3 went to Tripoli and Aahache, 2/8 to Aleppo and Latakia and 2/11 to Tripoli. 2/4 Fd. Hyg. Sec. of Australian 9th Division relieved 2/2 Fd. Hyg. Sec. and was stationed at Chekka. With Australian 6th and 7th Divisions, when these went back to Palestine *en route* for Australia, there went 2/1 (Aust.) C.C.S. 2/3 (Aust.) C.C.S. remained in Beirut. 2/1, 2/2, 2/4, 2/5 and 2/9 A.G.Hs. sailed with Australian 6th and 7th Divisions from Palestine; 2/6 and 2/7 A.G.Hs. were left behind in Palestine. 14 Australian Special Hospital at Bhamdoun, which had been dealing with V.D., also left the M.E. in January and was not replaced in Syria by another separate special medical unit. Thereafter V.D. cases were sent from Syria to 8 (Aust.) Special Hospital in Palestine. 2/4 (Aust.) Convalescent Depot was established in Sidon. 2/13 (Aust.) Fd. Amb. (Corps) moved from Ez Zib to Dhour Chouer but left Syria in February. Active anti-malarial work was undertaken. There were now six Australian M.C.Us., each of these working under the regimental medical officer of some unit in each area.

The evacuation of Australian casualties was mainly by road by A.F.S. But at the end of August ambulance planes arrived from Australia.

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An ophthalmologist from 2/9 A.G.H. and a venereologist from 2/8 A.G.H. at Gaza moved up to 2/3 (Aust.) C.C.S. The corps rest station at Ez Zib was retained.

In June 1942, 2/3 (Aust.) C.C.S. moved to Tripoli to relieve 2/11 (Aust.) Fd. Amb. 3 N.Z.G.H. opened in Beirut to replace 2/3 (Aust.) C.C.S. 2/7 A.G.H. at Kafr Belu in Palestine, having moved to Sidon, was immediately sent to Buseili in the Nile Delta. 2/4 (Aust.) Con. Depot moved from Sidon to Tolumbat in Aboukir Bay in Egypt.

In the third week of June 1942 the New Zealand Division, followed by Australian 9th Division, left Syria for the Western Desert. Tobruk had fallen and Egypt itself was threatened by Marshal Rommel's advance. With them went 2/3 (Aust.) C.C.S. Indian 3rd Motor Brigade also left Syria for the Desert.

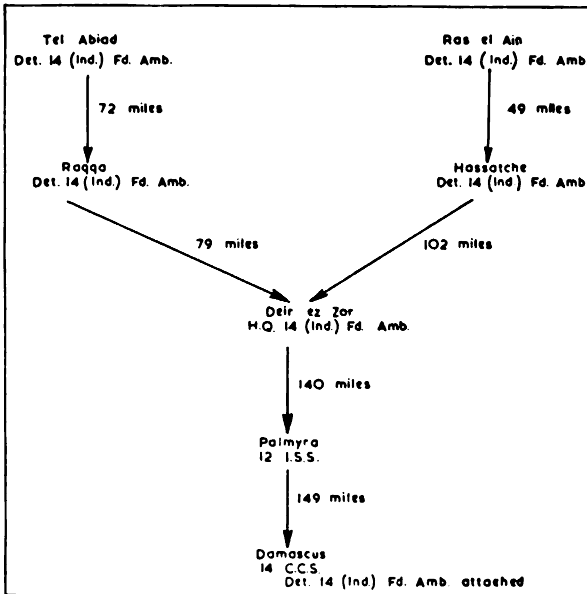

FIG. 82. Indian 5th Infantry Brigade. Evacuation Chain between Deir ez Zor and Damascus. August 1941.

Ind. 5th Inf. Bde. moved on August 5 to Deir ez Zor to replace Indian 10th Division on occupational duties. Its main detachments were distributed in Tel Abiad, Ras el Ain, Raqqa and Hassetche. With the brigade went 14 (Ind.) Fd. Amb. Evacuation arrangements were as shown in Fig. 82. Emergency cases could be sent from Deir ez Zor by air to Damascus. For the rest an ambulance convoy left Deir ez Zor once a week. During August the 'hospital' run by H.Q. 14 (Ind.) Fd. Amb. at Deir ez Zor admitted 399 patients of whom only 32 were evacuated.

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The brigade and the ambulance moved to Egypt in the middle of September 1941.

The successive movements of the Australian hospitals in the Middle East were as follows:

2/1 A.G.H. (1,200 beds) .	Gaza, Palestine 1940. 'Stepsister' Movement. (Return of Australian 6th and 7th Divisions to Australia) January 1942.
2/2 A.G.H. (1,200 beds) .	Kantara, Egypt 1940. 'Stepsister' Movement. formed in United Kingdom, 1940. Palestine May 1941, but never functioned.
2/4 A.G.H. (600 beds) .	Egypt, Tobruk March 1941, Barce, Tobruk. The siege till October 22. 'Stepsister' Movement.
2/5 A.G.H. (1,200 beds) .	Kafr Balu, Palestine 1940. Greece, Crete, Palestine. Gura near Asmara, Eritrea, September 1941. 'Stepsister' Movement.
2/6 A.G.H. (600 beds) .	Palestine 1940. Greece, Crete, Gaza, Palestine, taking over from 2/1.
2/7 A.G.H. (1,200 beds) .	Kafr Balu 1941. Sidon, July 1942.
2/9 A.G.H. (600 beds) .	Amiriya March 1941. Nazareth August 1941. 'Stepsister' Movement.
2/11 A.G.H. (200 beds) .	Alexandria 1941. 'Stepsister' Movement.
2/12 A.G.H. . .	Colombo, Ceylon. Mid 1941. Staging *en route* to Australia.

THE HEALTH OF THE TROOPS*

6TH DIVISION

The following sample tables containing the weekly medical situation reports from 6th Division give an indication regarding the health of the troops at the end of the campaign.

TABLE 64

Weekly Medical Situation Report, week ending June 29, 1941

	Admitted to Fd. Amb.		Returned to duty		Died		Evacuated	
	B.C.	Sick	B.C.	Sick	B.C.	Sick	B.C.	Sick
British .	59	223	1	17	2	0	40	126
Australian .	28	58	0	1	2	0	21	33
Indian .	16	42	1	3	0	0	12	23
	103	323	2	21	4	0	73	182

Total Admissions, 426. Total Evacuations, 255.

* For information concerning Australian troops the Official Australian Medical History should be consulted. It was in Syria that the Australians came to recognise malaria as the great enemy of military achievement.

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These figures include 2 cases of clinical malaria, 13 cases of clinical dysentery and 5 cases of P.U.O.

TABLE 65

Weekly Medical Situation Report, week ending July 6, 1941

	Admitted to Fd. Amb.		Returned to duty		Died		Evacuated	
	B.C.	Sick	B.C.	Sick	B.C.	Sick	B.C.	Sick
British	25	340	—	94	3	—	31	163
Australian	3	53	—	9	1	—	6	59
Indian	1	79	—	8	—	—	3	64
	29	472	—	111	4	—	40	286

Total Admissions, 501. Total Evacuated, 326.

These figures include 14 cases of clinical malaria, 30 cases of clinical dysentery and 66 cases of P.U.O.

TABLE 66

Weekly Medical Situation Report, week ending July 13, 1941

	Admitted to Fd. Amb.		Returned to duty		Died		Evacuated	
	B.C.	Sick	B.C.	Sick	B.C.	Sick	B.C.	Sick
British	122	437	—	77	3	1	109	421
Australian	19	101	—	22	—	—	18	98
Indian	11	62	2	38	1	—	5	40
Czech	—	16	—	—	—	—	—	11
	152	616	2	137	4	1	132	570

Total Admissions, 768. Total Evacuations, 702.

These figures include 28 cases of clinical malaria, 38 cases of clinical dysentery and 164 cases of P.U.O.

During the period following the armistice the chief medical problems were those associated with malaria, sandfly fever and venereal disease. During the occupation the main surgical work dealt with fractures due to accidents, burns and septic ulcers (Syrian sores).

Malaria. Cases of malaria occurring between July 1–28 were almost certainly infected prior to July 15 during the period of active operations in areas subsequently shown to be malarious. At that time the means of personal protection were very scanty for anti-malarial stores had not accompanied the troops. Suppressive quinine was being taken, however. Up to July 15 the diagnosis of malaria was purely clinical within 6th

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Division and all cases of fever were evacuated to the C.C.S. or to the base before they could be accurately diagnosed. After July 15 these cases were held in the field ambulances until it was clear that they were not instances of sandfly fever.

The total number of cases of malaria diagnosed between July 1–15 was:

	Clinical	*Reported from Base*	*Totals*
From the Damascus area .	44	2	46
From the Marjayoun area .	23	3	26
	67	5	72

Between July 1–28, 202 cases of P.U.O. were evacuated, 182 before it had become possible to hold and treat sandfly fever and only 20 after July 15. Though these may have included a number of malaria cases, the majority were certainly cases of sandfly fever. It is probable that before July 15 the total incidence of malaria in 6th Division was not much more than 100.

From July 28 the incidence of malaria in 6th Division was affected by the following events:

(*a*) The division moved into known malarious areas;
(*b*) Facilities for microscopic diagnosis were now available;
(*c*) Anti-larval control was instituted in Baalbek and Rayak and in all unit lines from July 28;
(*d*) Full anti-malarial equipment was available to all troops by July 28;
(*e*) From August 3 detailed returns of all cases of malaria were available;
(*f*) On August 3 all troops from the Aamiq–Kabbelias area moved to Aleppo, which was free from malaria;
(*g*) Suppressive quinine was continued through the period July 28–August 31.

The total number of cases of malaria between July 28–August 31 was:

	Diagnosed Locally	*Notified from Base*	*Totals*
Kabbelias area .	242	6	248
Rayak area .	37	—	37
Baalbek area .	1	—	1
Homs area .	54	—	54
			340

Of the 94 cases of P.U.O. evacuated to the C.C.S. during this period, 6 proved to be cases of malaria.

During the period September 1–October 4 the incidence of malaria in 6th Division was affected by the following events:

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(*a*) Suppressive quinine was discontinued as from September 13 in the case of troops in non-malarious areas and in the case of all the rest as from September 25;

(*b*) Units of 23rd Inf. Bde. were required to occupy frontier posts in highly malarious areas.

In Table 67 admissions for malaria during this period are given:

TABLE 67

Weekly Returns of Fresh Cases of Malaria

Week ending	Numbers
September 7	87
„ 13	44
„ 20	52
„ 27	43
October 4	21
	247

The discontinuance of suppressive quinine did not produce a rise in the incidence of malaria. In the Aleppo area such fresh cases of M.T. as did occur were among troops in the frontier posts. During the first two months stay of 6th Division in Tobruk, whence it went from Syria, on and after September 17, only 13 cases of malaria occurred.

The Tables below indicate the prevalence of sandfly fever and dysentery:

TABLE 68

Sandfly Fever

Week ending	Numbers of cases
August 3	186
„ 10	224
„ 17	297
„ 24	165
„ 31	136
September 7	157
„ 13	120
„ 20	106
„ 27	158
October 4	93
	1,642

Of these a few cases were subsequently diagnosed as malaria.

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TABLE 69

Dysentery

Week ending		Number of cases
August	3	11
,,	10	16
,,	17	12
,,	24	22
,,	31	7
September	7	13
,,	13	15
,,	20	2
,,	27	5
October	4	12
		115

Diphtheria. There were two small outbreaks at the end of August and at the beginning of September. The total number of cases was twelve.

Medical Supplies. Great difficulties were experienced in obtaining adequate stocks during the early part of this campaign. Prior to the armistice 6th Division obtained its replacements from 14 C.C.S. at Damascus. With the wide distribution of the field ambulances following the armistice, these units transformed themselves into small stationary hospitals and their increased demands upon 14 C.C.S. could not be met.

The nearest source of supply was 6 Base Depot of Medical Stores at Tel-Aviv. However, an advanced depot was established by Australian I Corps at Beyrouth on September 1 and thereafter all was well.

INDIAN 10TH DIVISION*

Sandfly Fever. This disease was very common and caused many casualties. The troops were usually accommodated in old-fashioned barracks and forts; they were not provided with sandfly nets and the provision of insecticides was much delayed. Sandfly fever cases were held in the M.D.S. at Deir ez Zor.

Sanitation. On the whole this was unsatisfactory, owing largely to the haste with which the L. of C. was opened.

Conservancy. There was considerable difficulty in securing a sufficient number of latrine covers. 1 (Ind.) Fd. Hyg. Sec. made large numbers of these and instructions were issued to the effect that they should be carried forward in every move. This was not done.

All too commonly the field hygiene section was required to undertake constructional work and this interfered greatly with its advisory and supervisory functions.

* For fuller information the Indian Official Medical History should be consulted.

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DISEASES PREVALENT AMONG THE CIVIL POPULATION

The incidence of malaria was low, smallpox was well under control. The most important disease seemed to be 'Bejel', regarded by the local authorities as an attenuated form of syphilis, contracted not during sexual intercourse but by way of drinking vessels. The disease responded completely to anti-syphilitic treatment.

APPENDIX XXII

6TH DIVISION AND INDIAN 5TH INFANTRY BRIGADE

Order of Battle. (Abbreviated)

6th Division
14th Infantry Brigade
1st Bedfordshire and Hertfordshire Regiment
2nd Black Watch
2nd York and Lancaster Regiment
16th Infantry Brigade
2nd Queen's Royal Regiment (West Surrey)
2nd Leicestershire Regiment
2nd King's Own Royal Regiment (Lancaster)
23rd Infantry Brigade
1st Durham Light Infantry
4th Border Regiment
Czechoslovak 11th Battalion
Divisional Troops and Services including
Medical
173, 189 and 215 Fd. Ambs.
14 Lt. Fd. Amb.
(a section of 9 Lt. Fd. Amb. also served with the Division)
33 Fd. Hyg. Sec.
Indian 5th Infantry Brigade
1st Royal Fusiliers
3/1st Punjab Regiment
4/6th Rajputana Rifles
Medical
14 (Ind.) Fd. Amb.
12 I.S.S.

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CHAPTER 11

THE CAMPAIGN IN PERSIA*

August 25–28, 1941

Précis

IN 1941 it was imperative, for a variety of reasons, that Persia should not pass under the control of Germany. It seemed likely that this would happen, for in Teheran there was a strong German mission which was exerting a considerable influence upon Persian affairs.

The British Government requested the Persian Government to expel or at least to reduce the size of this mission. This request being rejected, Britain and Russia conjointly decided to occupy Persia in order to safeguard their interests at this most critical stage of the war.

Indian 8th Division, based on Basra, was assigned the task of securing the oilfields in the Abadan–Ahwaz area in the south-west, while Indian 10th Division, based on Khanaqin, seized those in the Kermanshah area, 250 miles to the north.

These operations were skilfully and successfully undertaken. All resistance was overcome in four days at a cost of 22 killed and 42 wounded.

Meanwhile Russian columns were moving southwards.

The country was divided into Russian and British zones. A supply route was created from the Persian Gulf, through Persia, into Russia. Along it, during the rest of the war years passed millions of tons of material which undoubtedly contributed notably to the success of the Russian armies.

Preparations for the defence of Persia against possible German intrusion were made.

STRATEGIC AND OTHER CONSIDERATIONS

In 1941 it was imperative that Russia should receive all possible material help from her allies. The Arctic sea route to Archangel, difficult and hazardous, was not enough, and an alternative safer route had to be sought. It was to be found in the land route from the Persian Gulf through Persia to the Caspian.

It was always to be expected that the Germans would attempt to thrust round the Russian left flank through the Caucasus, or through Turkey, into Iraq and Persia. Should this happen the Allied position in the Middle East would indeed become perilous.

* A more comprehensive account of this campaign is given in the Official Indian Medical History.

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In Persia there was oil. It necessarily became the ardent interest of each of the antagonists to enjoy the use of this and to deny its use to the opponent.

In Teheran at this time there was a strong and active German mission which was exercising a powerful influence upon Persian affairs. It became necessary, therefore, for the British Government firmly to request the Persian Government to expel this mission or at least to reduce its size. This request was refused. It was then decided that Britain and Russia should together occupy Persia in order that their mutual interests should be safeguarded.

In so far as Britain was concerned it was decided that troops from Iraq should seize Abadan with its oilfields and refinery and the oilfields near Kermanshah, 250 miles to the north. Thereafter the force was to secure control, with Russian co-operation, of the country's communications so as to secure a through route to Russia from the Persian Gulf.

It was decided that the force operating in south-west Persia should be based on Basra and that in West Persia on Khanaqin (both in Iraq). The force to operate in the south-west would be Indian 8th Division, that in the west Indian 10th Division.

THE ORDER OF BATTLE

Indian 8th Division

Ind. 18th Inf. Bde.
Ind. 24th Inf. Bde. (of Indian 6th Division)
Ind. 25th Inf. Bde. (of Indian 10th Division)

At this time Ind. 24th Inf. Bde. was in the Basra area; Ind. 25th Inf. Bde. was due to arrive from Syria on August 10 and Ind. 18th Inf. Bde. from India on August 23.

Indian 10th Division ('Hazelforce')

Ind. 2nd Armd. Bde. (motorised, but with one British regiment of light tanks.)
9th Armd. Bde. (motorised) (reached Kirkuk from Palestine on August 10)
Ind. 21st Inf. Bde.

The medical units with Indian 8th Division were:

32 (Ind.) Fd. Amb. . with Ind. 18th Inf. Bde.
25 (Ind.) Fd. Amb. . with Ind. 24th Inf. Bde.
30 (Ind.) Fd. Amb. . with Ind. 25th Inf. Bde.

Those with Indian 10th Division were:

2 (Ind.) Lt. Fd. Amb. . with Ind. 2nd Armd. Bde.
166 Lt. Fd. Amb. . . with 9th Armd. Bde.
29 (Ind.) Fd. Amb. . with Ind. 21st Inf. Bde.

With Indian 8th Division was 11 M.A.S.
With Indian 10th Division was 10 M.A.S.

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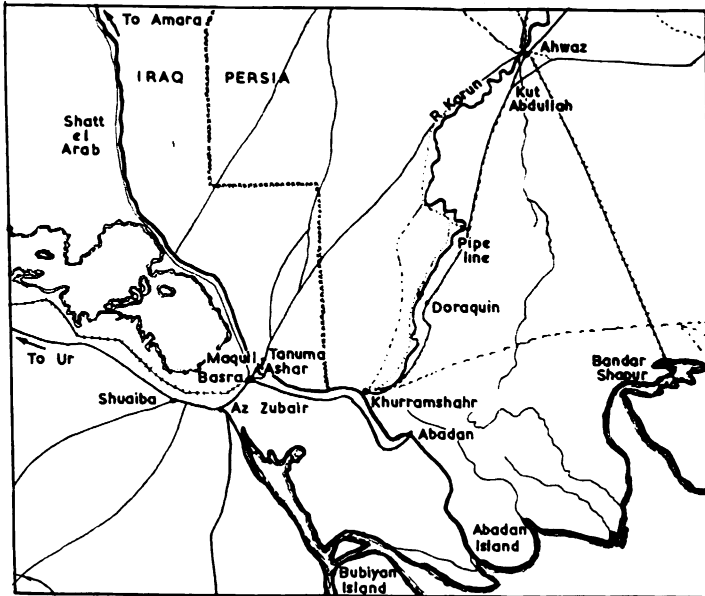

FIG. 83. South-west Persia.

THE TACTICAL PLAN

A. *South-West Persia.*

(1) Ind. 24th Inf. Bde., less one battalion, would occupy Abadan and its refinery at first light on D-day, moving down the Shatt-el-Arab, supported by the Royal Navy.

(2) Ind. 18th Inf. Bde., less one battalion and supported by one battalion of Ind. 24th Inf. Bde., would occupy Khurramshahr.

(3) Ind. 25th Inf. Bde. would advance from Tanuma to Ahwaz and thence to Haft-i-Khel, sending detachments to Kut Abdullah and Doraquin on the pipe line from Ahwaz.

(4) The Royal Air Force would provide cover for all these moves.

(5) A small composite force consisting of three or four naval units and two companies 2/10th Baluchs would occupy Bandar Shahpur and seize the shipping in the port.

B. *West Persia.*

(6) Ind. 2nd Armd. Bde. would occupy Naft-i-Shah and Qasr-i-Shirin and advance to the Gilan area, preparatory to a general advance to Kermanshah.

(7) If necessary 9th Armd. Bde. would be used to reinforce Ind. 2nd Armd. Bde.

D-day would be August 25.

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MEDICAL TACTICAL PLAN

In connexion with the campaigns in Iraq and Syria, Basra had grown into a base sub-area and into a H.Q. L. of C., the former with an A.D.M.S. and staff, the latter with a D.D.M.S. and staff. On July 7, H.Q. 2 L. of C. S.A., with an A.D.M.S. and staff, had opened in the Tanuma area opposite Ashar to form a base for the projected operations in south-west Persia. On August 7 a company of 25 (Ind.) Fd. Amb. (Indian 8th Division) had established an A.D.S. in Tanuma and by the 14th a boat bridge was constructed across the river. On the 19th a British and an Indian staging section joined this A.D.S.

29 C.G.H. was open in Makina
21 C.G.H. was open in Makina extension camp
61 C.G.H. was open in Makina extension camp
23 C.G.H. was open in Shuaiba
26 I.G.H. was open in Shuaiba

It was estimated that in the operations in south-west Persia there would be 560 casualties in Indian 8th Division.

	Lying	*Sitting*
Abadan . . .	35	65
Haft-i-Khel . .	50	110
The advance to Ahwaz	100	200
	185	375
	560	

Because it was expected that the operation would be brief, it was decided that the field ambulances should be brigaded, though this meant that there would be no reserve. Evacuation would be to the A.D.S. at Tanuma. 11 M.A.S. would be allotted to H.Q. 2 L. of C.

Evacuation from the Ahwaz area would have to be by road until Ahwaz was occupied. Then evacuation by air would become possible. The time taken for the journey between Ahwaz and Tanuma would be about 6–7 hours. Two lorries laden with medical comforts, ice, cold drinks and plentiful water would therefore accompany the brigade. The lorries would, if necessary, be used for the evacuation of sitting cases.

Evacuation from the A.D.S. at Tanuma would be across the boat bridge to 29 C.G.H. At either end of the bridge loading parties would be stationed.

Evacuation from the Abadan area would be by river by returning water transport. The Oil Company's hospitals at the refinery were known to be excellent and would be used.

Ambulance convoys would ply between Seeba, across the river from Abadan, and Makina.

Evacuation from the Bandar Shahpur area would be by river to Basra. With the composite force one medical officer and 4 N.Os. would go.

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Ind. 18th Inf. Bde.

32 (Ind.) Fd. Amb., moving with the brigade, would establish an A.D.S. with one company at Manduaan for the attack on Khurramshahr, H.Q. and one company remaining at Tanuma to open a M.D.S.

A company of 25 (Ind.) Fd. Amb., u/c 32 (Ind.) Fd. Amb., would accompany the column of Ind. 18th Inf. Bde. on its approach to Khurramshahr from the north.

Ind. 24th Inf. Bde.

25 (Ind.) Fd. Amb., less one company, would accompany Ind. 24th Inf. Bde. on its advance to Abadan by river.

Ind. 25th Inf. Bde.

30 (Ind.) Fd. Amb. would accompany Ind. 25th Inf. Bde. for the advance on Ahwaz.

These field ambulances would open M.D.Ss. as required and from them evacuation would be by 11 M.A.S. ambulance cars. Six cars were allotted to each of 30 and 32 (Ind.) Fd. Ambs.

SOUTH-WEST PERSIA

The landing of Ind. 24th Inf. Bde. was unopposed, but in Abadan itself some resistance was encountered. By the evening of August 26 the whole of the island had been cleared and on the following day the brigade, leaving a garrison in Abadan, moved to Khurramshahr.

A composite force, built around 5/5th Mahrattas of Ind. 18th Inf. Bde. and accompanied by a company of 25 (Ind.) Fd. Amb., embussed at Tanuma and made a night march of some thirty miles across the desert to a point about eight miles due north of Khurramshahr. Then it moved on the town, and after some desultory fighting Khurramshahr was captured. Other columns of the brigade captured Manduaan and Pul-i-Nao on August 25 and cleared the left bank of the Shatt-el-Arab. The Engineers then built a bridge over the Karun at Marid, ten miles above Khurramshahr. Across this Ind. 18th Bde. passed in its advance to the north.

Ind. 25th Inf. Bde. captured the fort at Qasr-i-Shaikh, 30 miles north of Khurramshahr, by noon on August 25 and, leaving one battalion behind, the brigade advanced to Rahmaniyeh and Sabeh.

Ind. 18th and 25th Inf. Bdes. then set out for Ahwaz on August 28, Ind. 24th Inf. Bde. following. But before the investment was completed news that the Persians had asked for an armistice was received.

A company of 3/10th Baluchs left for Haft-i-Khel in six aircraft from Shuaiba on August 25. The landing was unopposed and there were no casualties. The area was occupied and on the 29th the company was relieved by a company of Gurkhas.

Two companies of 3/10th Baluchs went aboard the armed merchant cruiser H.M.A.S. *Kanimbla* on August 11. For the next fortnight the

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ship cruised up and down the Persian Gulf while the troops were taught how to take control of a ship and how to prevent sabotage.

On the 25th the *Kanimbla* entered the port of Bandar Shahpur. All the ships save one, a German which was scuttled by its crew, were promptly captured. The troops landed and occupied the port and patrols were sent out along the railway line to Ahwaz and other ports in the neighbourhood.

MEDICAL COVER

The campaign was exceedingly brief. The route of evacuation was short and casualties were very few. There was no hostile air activity. For these reasons no stress was endured by the medical services. Although the field ambulances were brigaded, leaving no reserve whatsoever at the disposal of the A.D.M.S., and although no C.C.S. was available, no problem of any magnitude, administrative or tactical, arose.

Each landing party of Ind. 24th Inf. Bde. had its own medical detachment from 25 (Ind.) Fd. Amb. and casualties from the landing areas were evacuated to one of the vessels of the convoy standing off Abadan. The wardroom of this vessel served as the M.D.S. Later the main party of 25 (Ind.) Fd. Amb. landed and established a M.D.S. in the local camp hospital. Evacuation to the base hospitals from Seeba across the river was not possible for a time because of the prevalence of sniping along the river front. Later still a tug belonging to the Oil Company was used for the evacuation of casualties to Basra. Others were accommodated in the American Club and the Anglo-Iranian Oil Company Hospital in Abadan itself.

On August 27, 25 (Ind.) Fd. Amb. moved to Khurramshahr to join the reserve brigade (24th) which it accompanied to Ahwaz.

One company of 25 (Ind.) Fd. Amb., u/c 32 (Ind.) Fd. Amb., accompanied the column of Ind. 18th Inf. Bde. to Khurramshahr. A company of 32 (Ind.) Fd. Amb. accompanied the advanced troops of the main body of Ind. 18th Inf. Bde., while H.Q. 32 (Ind.) Fd. Amb. moved with brigade H.Q.

An A.D.S. was opened in Mundwan and evacuation therefrom was by road to Basra. On August 26, 32 (Ind.) Fd. Amb. set out with Ind. 18th Inf. Bde. from Khurramshahr to Ahwaz, the company of 25 (Ind.) Fd. Amb. remaining in Khurramshahr to look after the local sick and to stage casualties *en route* to the base.

Such few casualties (Offrs. Br. 7, Ind. 2; O.Rs. Br. 2, Ind. 50) as occurred during the advance to Ahwaz were carried forward and evacuated on the following day to 24 I.S.S. at Khurramshahr and thence to Basra.

30 (Ind.) Fd. Amb. with Ind. 25th Inf. Bde. moved in three groups; one to form a car post, one an A.D.S. and one with brigade H.Q.

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For the attack on the fort at Qasr-i-Shaik, an A.D.S. was established about two miles south-west of the fort and a M.D.S. three miles further back. Evacuation from the M.D.S. was by road to Basra. Leaving one company behind, the field ambulance then moved with the brigade to Rahmaniyeh, on the west bank of the Karun and about ten miles north-east of Qasr-i-Shaik, preparatory to the advance on Ahwaz.

On August 27 the advance was resumed. Such casualties as occurred were carried forward and later evacuated from Ahwaz by river to Khurramshahr and thence to Basra.

Medical Arrangements at the Base. 19 Br. and 24 (Ind.) Staging Sections were in the Tanuma area. Since casualties were few, however, and the evacuation route short there was no need for these units to function either in Tanuma or further forward. They were used to deal with wounded P.o.W.

All casualties were admitted to 29 C.G.H. save wounded P.o.W. who were sent to 61 C.G.H.

WEST PERSIA—THE TACTICAL PLAN

Khanaqin is some seven miles from the Persian border at Khusrovi, whence a good metalled road led to Qasr-i-Shirin, twelve miles away. Beyond this town the terrain is hilly and the road becomes narrow and

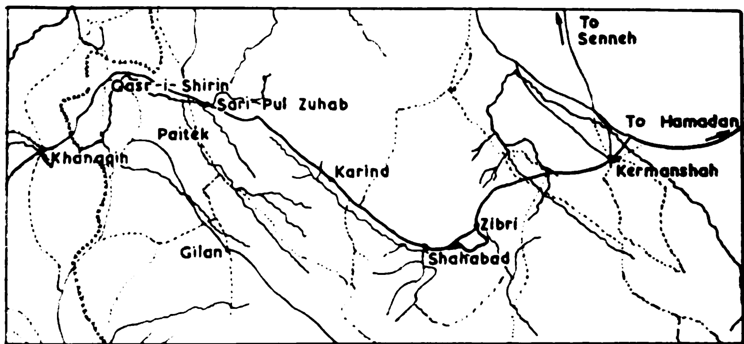

Fig. 84. West Persia.

tortuous. Twenty miles along it stands the village of Sari-Pul-Zuhab, fourteen miles from the formidable Paitak Pass. Sari-Pul-Zuhab and its vicinity were highly malarious. Sixty miles to the east of the pass is Kermanshah, the centre of the oil industry in this region. By-passing Paitak Pass a road ran from Khanaqin *via* Gilan to Shahabad.

The attacking force would consist of two columns ('A' and 'B') together with an independent battalion. 'A' column would advance from Khanaqin and capture Qasr-i-Shirin and Sari-Pul-Zuhab and reconnoitre towards the Paitak Pass. 'B' column would advance from Khanaqin to Gilan and Shahabad and so outflank the Paitak defences.

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The independent battalion would move to Naft-i-Shah, to the south-east of Khanaqin, and secure the oilfields in this area.

MEDICAL TACTICAL PLAN

Two sections of 2 (Ind.) Lt. Fd. Amb. would accompany 'A' and 'B' columns and would evacuate casualties direct to the advanced medical area at Khanaqin. Later, H.Q. 2 (Ind.) Lt. Fd. Amb. would move to Qasr-i-Shirin and open a M.D.S. there to receive casualties from the Sari-Pul-Zuhab–Paitak area. 'B' column casualties would be evacuated direct to the C.C.S. in Khanaqin until a M.D.S. was established in Sari-Pul-Zuhab. Evacuation from the M.D.S. to the C.C.S. would be by cars of 10 M.A.S.

At Khanaqin there would be:

12 Br.S.S.
26 I.S.S.
Lt. Sec. 7 (Ind.) C.C.S. } improvised C.C.S.
1 (Ind.) Fd. Hyg. Sec.
7 M.A.S.

From the improvised C.C.S. evacuation would be by ambulance coach to 25 C.G.H. at Baghdad.

THE ADVANCE

2/7th Gurkha Rifles was assigned the task of capturing and safeguarding the oilfield at Naft-i-Shah. This was done on August 25. Leaving a company to garrison the area, the rest of the battalion joined 'A' column at Sari-Pul-Zuhab.

'A' column moved out at 0400 hours on August 25, reached Qasr-i-Shirin by 0500 hours, captured Qasr-i-Shirin by 1000 hours and reached Sari-Pul-Zuhab during the evening. On the following day patrols probed the Paitak Pass position.

'B' column moved on the morning of August 25 and proceeded to Gilan, fifty-five miles away. Gilan was occupied without opposition by noon. The exits from Gilan were covered by Persian guns which were not silenced until nightfall when the Persians abandoned their positions.

On the 26th, 9th Armd. Bde. followed 'B' column and reached Gilan by 1000 hours.

The plan was now modified. Thus far the leading elements had been composed of armoured tracked vehicles and so the advance had been relatively slow. In order to speed it up and reach Shahabad in time to sever the connexion between the Persian troops in the Karind and Paitak area and Teheran through Kermanshah and Hamadan, it was now decided to put the unarmoured vehicles in the van. The advance was then continued, halted at times by road blocks, though these were undefended, and by dawn on the 27th the leading elements were in

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Shahabad. A detachment was then sent to Karind to link up with Ind. 21st Inf. Bde. that had advanced through the Paitak Pass.

Ind. 21st Inf. Bde., reaching Khanaqin on August 25, moved to Sari-Pul-Zuhab (Spz.) during the night of the 25th/26th. During the afternoon of the 26th the R.A.F. bombed the Persian positions in the Paitak Pass with the result that the Persians promptly withdrew. They were immediately followed by Ind. 21st Inf. Bde. which reached the summit by the afternoon of the 27th. The patrols of 'Hazelforce' (Ind. 2nd and Br. 9th Armd. Bdes.) were met and Karind occupied.

Reconnaissance from Shahabad on August 27 revealed that the high ground above the village of Zibri, twenty-five miles east of Shahabad, was strongly held. The guns were brought forward and the Persian positions shelled. The Persians withdrew and the high ground was occupied at 1800 hours. But the way through Zibri was blocked by the accurate fire of the Persian artillery and it became necessary to stage a set piece attack. However, before this was launched the Persians asked for a truce. They agreed to surrender Kermanshah. Indian 10th Division thereupon moved from Zibri on August 28 and reached Kermanshah on the 30th.

On August 30 it was learnt that a Russian column was advancing in the direction of Senneh–Kermanshah. A column of Indian 10th Division thereupon moved to Senneh, there to establish contact with the Russians on August 31. Another column of Indian 10th Division moved to Hamadan, 120 miles away, on the 30th and received the surrender of this town from the civil authorities. On the 31st the column moved on to Kazvin and there made contact with a Russian column.

MEDICAL COVER

No radical alteration of the plans was made save that H.Q. 29 (Ind.) Fd. Amb. took over the rôle assigned to H.Q. 2 (Ind.) Lt. Fd. Amb. and that 12 Br.S.S. did not arrive in Khanaqin until the campaign was over.

On August 29 the M.D.S. of H.Q. 29 (Ind.) Fd. Amb. moved forward from Qasr-i-Shirin to Sari-Pul-Zuhab, where it remained until the end of hostilities.

The C.C.S., though handicapped by the non-arrival of 12 Br.S.S. and by the scarcity of water, functioned satisfactorily, mainly because the Oil Company placed a most suitable building at its disposal. By the morning of the 26th it had admitted over 100 casualties, mainly minor sick and trivial injuries. On the following day considerable numbers of the same general types of mild sickness and slight injury were admitted and evacuated to Baghdad by ambulance coach. No attempt was made to make use of H.Q. 2 (Ind.) Lt. Fd. Amb., then in reserve, to hold these cases and so conserve man-power. 91 casualties were admitted to

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25 C.G.H. in Baghdad on August 27; 80 of these were at once discharged and sent to the rest camp.

TABLE 70

Battle Casualties in the Campaign in Persia

Total Indian and British killed . .	22
,, ,, ,, ,, wounded .	42

THE OCCUPATION

The conditions imposed upon the Persians were simple and minimal. They were the cessation of all resistance, the ejection of the German mission and the use by the Allies of Persian communications.

Teheran was jointly occupied on September 17. The Shah abdicated and was succeeded by his son.

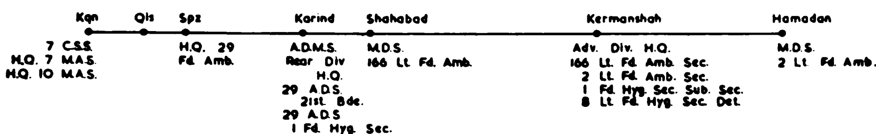

FIG. 85. The Distribution of the Medical Units of Indian 10th Division September 2, 1941.

Evacuation chain. From the M.D.S. at Hamadan to Kermanshah and Shahabad.
From the A.D.S. of 166 Lt. Fd. Amb. at Kermanshah to the M.D.S. of 166 Lt. Fd. Amb. at Shahabad and thence by M.A.S. to Kqn.
From the A.D.S. of 29 Fd. Amb. at Karind to the M.D.S. of 29 Fd. Amb. at Spz. and thence to 7 C.C.S. at Kqn.

Kqn. — Khanaqin; Qis. — Qasr-i-Shirin; Spz. — Sari-Pul-Zuhab.

The country was divided into a northern (Russian) zone and a southern (British) zone. Between them there was no free intercommunication. The occupying forces were concerned with two projects*; one was the creation of the supply line into Russia and in the southern zone this task, begun by the British, became in the end largely a United States responsibility. Along this line during the remaining war years passed no less than five million tons of supplies. The second project was the preparation of defensive schemes related to the possibility of a German incursion into this region by way of the Caucasus, and this became the responsibility of 'Paiforce'.

The distribution of the medical units of Indian 10th Division during the earlier phases of the occupation is shown in Figs. 85 and 86.

* These matters are considered at length in '*Paiforce*'; *The Official Story of the Persia and Iraq Command*, 1941–1946, and in Field Marshal Lord Wilson's *Eight Years Overseas*.

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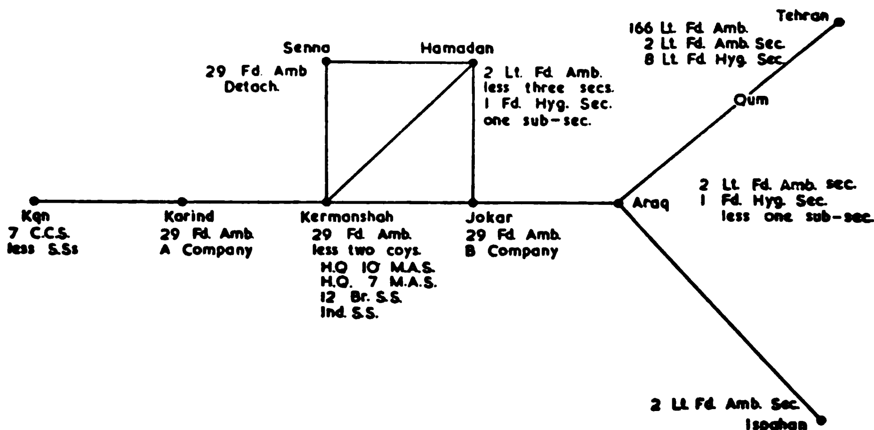

FIG. 86. The Distribution of the Medical Units of Indian 10th Division. September 21, 1941.

PRINCIPAL DISEASES AFFECTING THE TROOPS

Malaria. The malariologist, Force H.Q., arrived in Kermanshah on September 6, 1941, and conducted a survey of the area in which operations had been conducted. He found that malaria existed in a hyperendemic form.

	Spleen Rate
Villages near streams and rivers . .	95–100 per cent.
Villages near the origins of springs .	50–75 per cent.
Villages away from springs and rivers .	0–20 per cent.
Population in Shahabad and in the refinery area in Kermanshah	95–100 per cent.

Anopheles maculipennis and *superpictus* were common. It was assumed that much infection had occurred and that the danger of malaria was considerable. Anti-malarial measures were promptly put into effect.

The expected outbreak of malaria occurred on September 10, almost exactly fourteen days following the first passage of troops through Shahabad. In the following days the incidence of the disease assumed serious proportions. 2/10th Gurkhas and the Warwickshire Yeomanry were especially affected. Within the next ten days 568 cases of malaria occurred in the Kermanshah–Senna area, about 100 of them being British. There were 20 cases of the malignant type and 4 deaths. By the middle of October the worst was over. 2/10th Gurkhas had been depleted by 70 per cent. of its strength.

Two companies of a field ambulance were sent forward to Senna together with a M.A.S. Cases were evacuated to the emergency treatment centre established in Kermanshah, whence afebrile cases were sent to 7 (Ind.) C.C.S. at Khanaqin through a staging post at Karind.

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This staging post was provided first by 29 (Ind.) Fd. Amb. and subsequently by 26 (Ind.) Fd. Amb. From the C.C.S. evacuation was to the hospital in Baghdad.

Sandfly Fever. This was prevalent but its occurrence was spasmodic and at no time did it assume epidemic proportions.

HYGIENE

The need for secrecy was such that frequently, when units were moved, the medical branch was left uninformed. Thus it was that camp sites were commonly ill-chosen. There was a general shortage of sanitary stores and equipment and all too commonly unit responsibility for sanitation was off-loaded on to the field hygiene section. Insecticides and sprayers failed to appear at the same place at the same time. Units were often unwilling or unable to carry forward with them latrine equipment such as covers for deep latrine trenches and Otway pits.

Water Supplies. In west Persia the main source of water was the springs, of which there was an abundance. In the south-west there was a good and amply piped supply. The use of river water was prohibited because of the danger of bilharzia infection.

Clothing. K.D. was in use at the beginning of the campaign. When Hamadan and Kermanshah were occupied the troops suffered much distress, for the nights were bitterly cold. Winter clothing was hurriedly sent forward.

THE ARMY PATHOLOGY SERVICE. PERSIA AND IRAQ

ORGANISATION OF LABORATORIES

The force in Persia and Iraq was under the command of G.H.Q. India from its formation on April 10, 1941, and remained so until February 15, 1942, when it came under G.H.Q., M.E.F., until September 15, 1942. P.A.I. Force was then formed as a separate command directly under the War Office. The periods of active operations were:

Iraq	April 10, 1941, to May 30, 1941.
and Persia	August 25, 1941, to August 28, 1941.

In July 1941 there was only one laboratory actually functioning—5 Indian Field Laboratory attached to 29 C.G.H. at Makina. Between August, 1941, and the spring of 1942, there arrived in the country 4, 8, 10, 13, 14, 15, 16, 17, 18 and 19 Indian Field Laboratories and the pathology laboratory with 61 B.G.H.

The policy adopted at this stage for the distribution of laboratories was influenced by the following factors:

(*a*) Number of Indian field laboratories available.
(*b*) Wide dispersal of the force and great distance between places.
(*c*) Type of equipment available.

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In November 1941, 4 and 10 Indian Field Laboratories were combined in Baghdad to function as the central laboratory of the force. This was about a month after their arrival in the country. Extra equipment was obtained in the first instance by local purchase, on loan from the Royal Hospital, Baghdad, and from D.D.P., M.E.F. Guinea pigs and rabbits were first obtained locally pending the arrival of others from India. On April 1, 1942, the combined laboratory commenced carrying out Wassermann tests and special morbid histological and bacteriological examinations for the force. The remaining field laboratories were allotted to stations where at least 600 hospital beds were located, except in the case of Khanaqin, where 19 Field Laboratory was attached to 17 (Ind.) C.C.S.

The period from April 1942, until the middle of September 1942, was utilised in siting static medical units in permanent or semi-permanent locations. The laboratories were distributed as follows:

8 Ind. Fd. Lab. was attached to 32 C.G.H. in Shuaiba and in addition carried out the work for 23 and 37 C.G.Hs.

16 Ind. Fd. Lab. was attached to 31 C.G.H. at Ahwaz and in addition carried out examinations for 21 C.G.H.

18 Ind. Fd. Amb. was attached to 36 C.G.H. at Andiminsk.

17 Ind. Fd. Amb. was located in the machine-gun factory at Teheran where it carried out work for 34 C.G.H. and 18 I.G.H.

13, 17 and 18 Fd. Labs. were the only Indian field laboratories located in Persia.

14 Ind. Fd. Amb. was attached to 33 C.G.H. at Kirkuk.

15 Ind. Fd. Lab. to 28 C.G.H. at Mosul and 19 Ind. Fd. Lab. at first to 7 C.C.S. and later, in September 1942, to 117 C.G.H., both units being located at Khanaqin. The only other laboratory which arrived in the force during this period was the pathology laboratory with 28 B.G.H. which was located at Zubair, some fifteen miles from Shuaiba. This laboratory did not function fully until late August 1942.

During this period medical units were constantly on the move owing to operations and changes in disposition of the troops necessitated by the course of the war in Egypt after the fall of Tobruk.

With the apparent danger of a German break-through in the Caucasus in August 1942, a considerable influx of troops into Persia and Iraq took place. No further Indian field laboratories arrived from India, but 29, 33, 65 and 93 B.G.Hs. with their pathology laboratories came into the country. 29 B.G.H. was located in Teheran, 33 B.G.H. in Mussayib, 65 B.G.H. in Khanaqin and 93 B.G.H. at Shuaiba. In addition the pathology laboratories belonging to 1, 2 and 4 (Polish) G.Hs. were located at Khanaqin, Quisil Robat and Mosul and commenced functioning. 93 B.G.H. never opened and was kept in reserve.

By the middle of March 1943, it was evident that the danger of the

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threat to the Caucasus had been removed and the number of troops and medical units in the force therefore was reduced. Between the middle of March and August 1943, 28, 29, 33, 65 and 93 B.G.Hs. and 15, 16 and 18 Ind. Fd. Labs. left the force. 23 and 33 C.G.Hs. and 18 I.G.H. also separated. No change of location was made in the distribution of the remaining laboratories as a result of this reduction, but the distribution of work was modified. The examinations for 36 C.G.H. at Andiminsk were carried out by 13 Ind. Fd. Lab. at Ahwaz, some eighty miles to the south. In Shuaiba 8 Ind. Fd. Lab. was made responsible for the examinations for 32 and 37 C.G.Hs. and 16 I.G.H. 15 Ind. Fd. Lab. was moved from Kirkuk to Mosul on the departure of 33 C.G.H. to Mussayib to replace 33 B.G.H.

In mid-July 1941 the post of A.D.P. to the force was established. On September 15, 1942, consequent upon the formation of G.H.Q., P.A.I. Force, the appointments of D.D.P., A.D.P. and D.A.D.P. were created. In May 1943, as a result of the reduction of the size of the force, several appointments at G.H.Q. were down-graded, including those of D.D.P. and D.D.H. On February 15, 1945 P.A.I. Force ceased to be a separate command and came again under the control of Middle East Command.

SPECIAL INVESTIGATIONS

Certain major problems occurred that required special attention. During the summer of 1942 some 2,000 cases of the effects of heat occurred. (The pathological findings of fatal cases were reported in the *Transactions of the Royal Society of Tropical Medicine and Hygiene, Volume XXXVII, No.* 6, *May* 1944, *pages* 362 *to* 365.)

Early in 1943 a Medical Research Council team arrived in P.A.I. Force to carry out investigations into the aetiology of the condition.*

An extensive outbreak of typhus fever commenced in December 1942 and continued until July 1943. The greater number of cases occurred in northern Iran and rapidly spread throughout the country and into Iraq. There were many points of similarity between this outbreak and the one which occurred in the First World War during 1916–19.

An outbreak of faucial and cutaneous diphtheria occurred among British troops stationed at Qum, eighteen miles south of Teheran, during January to March 1943. With one exception all strains isolated were found to be *C. diphtheriae mitis*.

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* For a detailed account of this work, the volume on Medical Research should be consulted.

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CHAPTER 12

THE CAMPAIGN IN MADAGASCAR

May 5 – November 6, 1942

Précis

In order to forestall a Japanese occupation of Madagascar, a French possession since 1896, and to ensure that its harbours should not be used by German surface raiders and submarines, the Allies agreed early in 1942 to send a force to occupy the island. It was hoped that the French political and military authorities there would find it possible to attach their loyalties to the Allied cause.

On May 5, a combined force made its sudden appearance in Courrier and Ambararata Bays. 29th Independent Brigade and 5th Commando landed and in the face of slight opposition occupied Diego Suarez and the adjoining territory in the far north of the island.

By September it had become clear that between the occupying force and the French authorities in the rest of the island there could be no reconciliation. It was decided that therefore the whole of the island must be occupied.

29th Independent Brigade, from Mombasa, landed at Majunga on September 10. Then 22nd East African Brigade Group, from Diego Suarez, followed and advanced on Tananarive, the capital. Meanwhile 29th Brigade re-embarked and sailed for Tamatave on the east coast Here it landed, occupied the port and moved on Tananarive from the east to meet elements of 22nd East African Brigade at Moramanga. At the same time diversionary landings were made by South African 7th Brigade and 5th Commando at various points on the west coast. Then 22nd East African Brigade moved out of Tananarive to the south, to Ambositra and Fianarantsoa, which was reached on September 29.

Hostilities ceased on November 5. Madagascar was saved for the Allies. But the bills of morbidity and mortality from disease, especially from malaria, remained to be presented.

STRATEGIC AND OTHER CONSIDERATIONS

In 1942 it became necessary for the Allies to make use of the island's facilities in the defence of the western Indian Ocean and to deny them to the Japanese. With Madagascar in their possession the Japanese could hope to cut the lines of communication between Great Britain and India and between New Zealand, Australia and India and the Middle East. Moreover, there was at this time a distinct possibility that the

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French authorities in Madagascar, supporting the Vichy Government, would offer the hospitality of their harbours to German surface raiders and submarines.

TERRAIN, CLIMATE AND COMMUNICATIONS

The island of Madagascar, 900 miles long and 360 miles broad, lies off the south-east coast of Africa between 12° and 26° latitude south and between 43° and 51° longitude east. A narrow coastal strip on the eastern seaboard rises fairly sharply to a central plateau 4,500–5,000 feet above sea level, which descends gradually to the western shore. The surface of the island is much broken by hill features and is seamed by a multitude of rivers and streams. Thus, for example, the 80 miles stretch that separates Antsirane and Ambilobe averages a bridge a mile. Between the hills there is much flat ground devoted to rice growing. The island displays a wide variety of tropical scenery, dry dusty desert, dank swamp and vast mahogany forest.

The Malgache, possibly of Malayan origin, live in a beautiful and fertile land. Besides rice much sugar, maize, sweet potatoes, manioc, cocoa and tropical fruits are grown. Beef cattle are to be numbered in their millions.

The climate varies. The south-west is fairly dry and moderately hot; the eastern seaboard is tropical; the north sub-tropical.

The Bay of Diego Suarez is a truly magnificent harbour, though set in a hot, desolate and fever-stricken region. The island's other harbours are Majunga and Tamatave.

There were three unmetalled but nevertheless good roads linking the capital, Tananarive, with Majunga, with Tamatave, and with Fianarantsoa respectively. A railway line ran from Tananarive to Tamatave and Antsirane; another linked Tamatave to the east coast.

MEDICAL INTELLIGENCE

Malaria was rife. Blackwater fever was by no means rare. Plague occurred on the central plateau. Bilharziasis was prevalent in the southern three-fifths of the island. Dengue and sandfly fever were widely distributed. Typhus was both epidemic and endemic although ticks were by no means common in the Diego Suarez Province. Amoebic and bacillary (Flexner) dysentery were fairly common and venereal disease was very prevalent, though not nearly to the extent encountered in Ethiopia. Yellow fever was unknown.

Excerpts from *The General Report upon the Work of the Sanitary and Medical Services*, 1940, give a fairly complete picture of the major diseases and their incidence in the island at that time. (*See* Tables 71 and 72.)

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TABLE 71

The Principal Diseases affecting the Population, 1940

1940	Malgache			European		
	Out-patients	Hospital-ised	Deaths in hospital	Out-patients	Hospital-ised	Deaths in hospital
Malaria	821,479	7,353	373	1,708	726	18
Amoebiasis	3,975	166	9	26	47	—
Bacillary dysentery	132	13	3	—	19	1
Relapsing fever	11	—	—	—	—	—
Intestinal parasites	53,568	384	13	123	21	—
Dengue	30	5	—	13	12	1
Vesical bilharziasis	514	49	—	—	2	—
Rectal bilharziasis	274	66	2	2	—	—
Filariasis bancrofti	183	—	—	—	—	—
Beriberi	503	109	13	1	9	1
Yaws	12,465	461	1	2	—	—
Phagadaena	20,303	791	6	99	13	—
C.S.F.	148	698	159	—	15	5
Typhoid	3	36	11	—	3	2

	High Plateau		East Coast		West Coast	
	Native	European	Native	European	Native	European
T.B. pulmonary	1,803	36	694	23	1,315	81
Syphilis	65,961	39	79,402	24	68,989	136
Gonorrhoea	19,280	42	20,299	26	20,946	140
Leprosy	722	2	869	1	543	—

Plague

	Cases		*Cases*
1932	3,656	1937	916
1933	3,881	1938	630
1934	3,584	1939	681
1935	3,493	1940	754
1936	2,006		

Mass compulsory inoculation annually was introduced in 1935–6.

In so far as malaria is concerned the 1941 figures depict the importance of this disease.

TABLE 72

The Incidence of Malaria, 1941

Population

Europeans	50,429
Non-Europeans	4,007,852
	4,058,281

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Non-Europeans

	Number of cases		Deaths in hospital	Total cases
	Out-patients	Hospital patients		
Malaria . .	950,807	9,180	504	959,987
All other diseases .	2,922,353	41,342		2,963,695

Europeans

	Number of cases		Deaths in hospital	Total cases
	Out-patients	Hospital patients		
Malaria . .	2,409	774	23	3,183
All other diseases .	11,324	4,183		15,507

	Grand Total
Malaria	963,170
All other diseases . .	2,979,202

THE OCCUPATION OF DIEGO SUAREZ—OPERATION 'IRONCLAD'

The assault on Diego Suarez was carried out by a combined operations group, '121' Force, built around 29th Independent Brigade in the United Kingdom, which reached Durban on April 22, 1942.

'121' FORCE. ORDER OF BATTLE

H.Q. '121' Force (late H.Q. Royal Marine Division)
5th Commando

29th Independent Bde.
1st R.S.F.
2nd R.W.F.
2nd E. Lancs. R.
2nd S. Lancs. R.
17th Inf. Bde. Gp. (5th Division)
2nd R.S.F.
6th Seaforth
2nd Northamptons
13th Inf. Bde. (5th Division) (added to Force '121' on April 26 on arrival at Durban. 5th Division less 13th and 17th Bdes. proceeded to Mombasa and thence to Bombay.)
2nd Cameronians
2nd Inniskillens
2nd Wilts.

with attached troops and services including medical.

Medical
A.D.M.S. and staff, '121' Force
154 Fd. Amb.

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16 Fd. Hyg. Sec.
5 Fd. Hosp. (50 beds)
141 Fd. Amb. with 17th Inf. Bde. Gp.
164 Fd. Amb. with 13th Inf. Bde.

ACTICAL PLAN

1. 29th Independent Bde. would land in Ambararata Bay and immediately advance and capture Antsirane, 21 miles to the east.
2. At the same time 5th Commando with one company 2nd E. Lancs. R. would land in Courrier Bay, silence the coastal batteries in this area and then move to the east to secure the Andrakaka peninsula.
3. As soon as the landing-craft used by the above-mentioned formations became available, 17th Inf. Bde. Gp. and, if necessary, 13th Inf. Bde. also would land in Ambararata Bay and go into action to complete the capture of Antsirane and the Orangea (Oronjia) peninsula.
4. D-day would be May 5 and zero hour 0430 hours.

THE ASSAULT

29th Independent Bde. landed according to plan and moved at once to the east. The advance was checked in front of the Fort Bellevue–Fort Caimans line, but 17th Inf. Bde. Gp., passing through 29th Independent Bde. and supported by a few tanks that had come ashore, beat down the opposition to occupy Antsirane on May 7, already captured by 50 Marines landing from the destroyer *Anthony*, and to seize the Orangea or Ankorika peninsula. The conditions were exceedingly trying, for the heat was tropical.

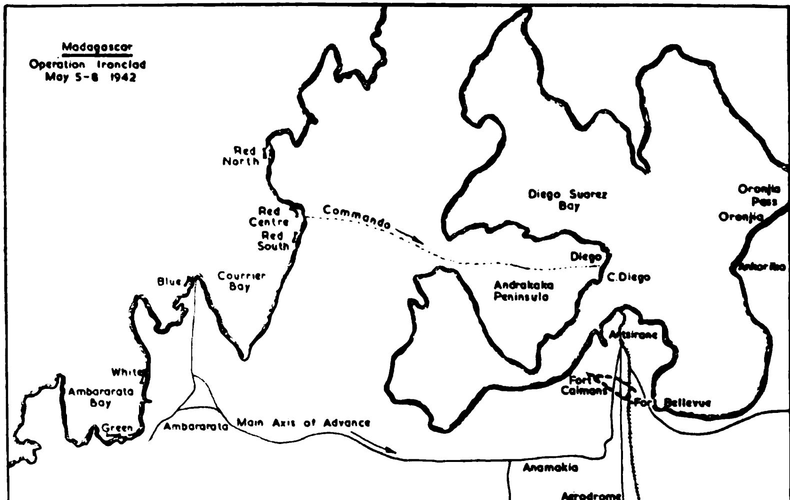

FIG. 87. Madagascar. Operation 'Ironclad'.

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Meanwhile the Commando had landed, and had surprised and captured the coastal defence battery. Then commando columns with 'B' Company 2nd E. Lancs. R. set out for Diego Suarez about 10 miles away. Brushing aside slight opposition, they entered this place at 1430 hours on the 5th. But they could not find any boats wherein to cross to Antsirane.

Early on May 7, however, the French forces formally surrendered. The operation was thus entirely successful. French resistance ceased as soon as it had become clear that to continue was not only hopeless but indeed senseless. They had no armour and their air power was weak. The line of approach of '121' Force was unexpected and enabled it to seize and hold the initiative. Moreover, the might of the Royal Navy was obvious to all.

MEDICAL COVER FOR OPERATION 'IRONCLAD'

154 Fd. Amb., landing, provided a beach section on Blue Beach. During the course of the operation this dealt with some 250 casualties who were evacuated to H.S. *Atlantis* lying offshore. On D-day+3 the beach section re-embarked. In addition, 154 Fd. Amb. provided:

(1) a M.D.S. which landed on Blue Beach on May 5, and moved behind 29th Independent Bde. to open in Anamakia on the 6th.

(2) 'B' Coy., which moved with 29th Independent Bde. along the main axis of advance.

(3) a light section attached to 2nd S. Lancs. R. which landed on White Beach at 1000 hours on May 5 and moved with this battalion to the east, a party of this section moving with each of the companies of the battalion.

(4) a light section attached to 2nd R.W.F. landed on White Beach at 0500 hours on May 5 and moved with this battalion. Beyond Anamakia 12 casualties were collected and left in charge of two O.Rs. R.A.M.C. On D-day+3 this light section moved on to Antsirane.

(5) a light section attached to 2nd E. Lancs. R. landed on Blue Beach at 0600 hours on the 5th and moved with the battalion. On D-day+3 this section moved to Antsirane.

(6) a light section attached to 1st R.S.F. landed on Green Beach at 0600 hours on the 5th and moved with the battalion to Anamakia and on D-day+3 to Antsirane.

The M.D.S. of 141 Fd. Amb. disembarked and moved forward to join that of 154 at Anamakia. Then on May 7 the M.D.S. of 154 moved on to Antsirane and opened in the French civil hospital there. It closed on the 9th.

When the fighting died down H.S. *Atlantis* sailed for South Africa and in her place came H.S. *Dorsetshire*.

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Battle Casualties (Ground Forces)

	Killed	Died of wounds	Wounded	Missing
Officers .	13	2	22	—
O.Rs. .	64	26	261	4
	77	28	283	4

Casualties embarked on H.S. *Atlantis*:

From 154 Fd. Amb. M.D.S. .	121
From 141 Fd. Amb. M.D.S. .	130
Direct admission . . .	73
From French military hospital .	20
P.o.W.	190
	534

Totals evacuated from Beaches:

	Beach Section	*Direct*
On D-day+1 .	1	40
D-day+2 .	83	15
D-day+3 .	185	—

THE OCCUPATION OF THE AREA

13th Inf. Bde., with 164 Fd. Amb., left for India shortly after the armistice. Then 17th Inf. Bde. Gp., with 141 Fd. Amb., departed. The remaining units of '121' Force were distributed as follows:

2nd R.W.F. . .	at Anamakia
1st R.S.F. . .	at Concession Grignon
2nd S. Lancs. R. .	at Fort Caimans
5th Commando .	in the Malgache Barracks
29th Independent Bde. Rest Camp	at Joffreville, 20 miles south-east of Antsirane

On June 8, 22nd E.A. Bde. Gp. reached Diego from Mombasa and moved to Orangea.

22nd E.A. Bde. Gp.
1/1st K.A.R. (Nyasaland)
1/6th K.A.R. (Tanganyika)
5th K.A.R. (Kenya)
with attached troops and services including
5 (Kenya) Fd. Amb.

Then S.A. 7th Bde. (First City Regt., Pretoria Regt., Pretoria Highlanders, Transvaal Scottish) with 19 (S.A.) Fd. Amb. arrived and moved to the area of Concession Grignon to the south of Diego Suarez.

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On July 1 the troops in Madagascar were placed under East Africa Command. On September 1 an Islands Area, consisting of Mauritius, Rodriquez and Seychelles, transferred from G.H.Q. India, together with Madagascar, was created. On July 2 the island of Mayotte in the Comorro group was occupied in order to provide a seaplane base in the middle of the Mozambique Channel.

MEDICAL ARRANGEMENTS IN CONNEXION WITH THE OCCUPATION

Light sections of 154 Fd. Amb. were with 2nd R.W.F. at Anamakia and 1st R.S.F. at Concession Grignon. 5 Fd. Hosp., at the beginning of the occupation, was in the French civil hospital at Diego Suarez. This was a fairly good building of three stories with a capacity of 250 beds. When taken over it was holding French casualties. These were promptly transferred to H.S. *Atlantis*. The hospital at this time was indescribably filthy and contained very little equipment. 5 Fd. Hosp. with its limited equipment was severely tested in its attempts to cope with the sick.

11 B.G.H., less its establishment of fifty Q.A.I.M.N.S. personnel, arrived from the United Kingdom and took over part of the French hospital at Diego Suarez on May 31 from 5 Fd. Hosp. which had 50 beds of its own and 48 French bedsteads in use together with some 200 stretchers. The personnel of 5 Fd. Hosp. were then employed on hygiene and embarkation duties. 11 B.G.H. had lost its G.1098 and I.1248 at sea. It therefore took over those of 5 Fd. Hosp. Extra beds were obtained from the French barracks and ultimately it was able to accommodate 468 patients.

The French X-ray set broke down on August 5 and thereafter the hospital was dependent upon hospital ships for X-rays, cystoscopies and dark ground illumination. A small incubator was constructed but its size seriously limited culture work. A grave shortage of electric light bulbs created much inconvenience.

On August 21, 5 Fd. Hosp. embarked, taking with it its own G.1098 and I.1248, so that 11 B.G.H. was acutely short of equipment until August 30 when additional G.1098, sufficient for 200 beds, arrived from Mombasa.

Dieting was exceedingly difficult. There were 650 patients and staff to be fed and the French shared the fly-infested hospital kitchen. It was necessary to construct field kitchens, to provide a new water supply, to provide new drains and to fly-proof the premises. Hay boxes were constructed to keep the food warm and an icebox had to take the place of a refrigerator. The R.A.S.C. were unable to produce eggs, fish and cooking fat. The South Africans found the meat ration (13 ozs.) too meagre for their liking while East African breakfasts failed to satisfy the United Kingdom troops.

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During the first four months after opening the surgical division of this hospital dealt with 573 in-patients, including 153 E.N.T. and 42 eye cases. Of the general surgical cases 3 were battle casualties, 12 were accidental G.S.Ws., 21 were appendicectomies and 26 were fractures. The medical division was hard-pressed. Admissions on account of malaria, dengue and dysentery were:

June	660
July	239
August	384
September	228

The lack of a sigmoidoscope added to the difficulties of diagnosis in bacillary dysentery.

Scabies and impetigo were the most common skin diseases. *Tunga penetrans* (chigger: jigger) was very troublesome, demanding curettage.

When Madagascar passed to East Africa Command A.D.M.S. '121' Force gave place on August 1 to A.D.M.S., Islands Area (an officer of the S.A.M.C.). On June 14, D.D.M.S. East Africa Force visited Diego Suarez to inspect and report upon the medical arrangements. At this time there were some 400 sick in the hospital and of these about 75 per cent. were suffering from malaria. D.D.M.S. formed the opinion that these malaria cases were 'battle casualties', the cost that had to be paid for victory. He hazarded the view that had Operation 'Ironclad' lasted twelve days instead of three, '121' Force would surely have been decimated by this disease, for the country through which the troops had moved was highly malarious. He saw no reason for any anxiety now that conditions were stable. The danger was there, but unit discipline, properly exercised, should hold it in check.

MEDICAL UNITS IN MADAGASCAR AUGUST 1, 1942

11 B.G.H.
5 Fd. Hosp.
154 Fd. Amb.
5 (K.) Fd. Amb. brigaded with 22nd E.A. Bde.
19 (S.A.) Fd. Amb. brigaded with S.A. 7th Bde.
16 Fd. Hyg. Sec.
6 (E.A.) Fd. Hyg. Sec.
3 (E.A.) Mobile Malaria Section
a small E.A. medical stores staff attached to 11 B.G.H.

PRINCIPAL DISEASES AFFECTING THE TROOPS

Malaria was responsible for a considerable amount of hospitalisation. The initial high incidence associated with the seizure of Diego Suarez had fallen, but there was a steady stream of cases from the Anamakia, Concession Grignon and Ambilobe areas. The proportion of benign tertian to sub-tertian was 2 : 1.

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Diarrhoea and dysentery were common, but their incidence never became alarming. One death was attributed to typhus but the diagnosis remained doubtful. The French medical authorities denied that typhus existed in the island. Dengue and sandfly fever were frequently diagnosed. Venereal disease had an incidence far lower than was expected.

On September 2, 53 South Africans were evacuated by hospital ship to South Africa; on September 7, 54 East Africans were evacuated to Kenya; on September 23 a further 112 patients were evacuated to Kenya and a further 46 to South Africa.

THE OCCUPATION OF THE WHOLE ISLAND

OPERATION 'STREAM-LINE-JANE'

By August it had become quite certain that between the French authorities in Madagascar and the occupying force in the north there was no possibility of reconciliation. It was reluctantly decided therefore that further military operations must be undertaken.

29th Independent Bde., with 154 Fd. Amb. and 5 Fd. Hosp., left Madagascar on August 23 for Mombasa, and 27th E.A. Bde., with 7 (Northern Rhodesia) Fd. Amb., reaching Antsirane from Mombasa on August 8, relieved 22nd E.A. Bde. in Orangea; the latter brigade moved to a health resort near Diego Suarez to prepare for these operations.

TACTICAL PLAN

'Stream . . an amphibious attack on Majunga
Line . . an advance by road from Majunga to Tananarive and thence to Brickaville
Jane' . . an amphibious assault upon Tamatave

(1) 29th Independent Bde. Gp., sailing from Mombasa, would make a surprise landing under cover of darkness at Majunga and seize the town and harbour, supported if necessary by ships of the Royal Navy and aircraft of the Fleet Air Arm.

(2) A detachment of 22nd E.A. Bde. Gp. from Diego Suarez, supported by S.A. armoured cars, would accompany 29th Independent Bde. Gp. and move at once to capture the Kamoro and the Betsiboka bridges, 90 and 130 miles away on the road to Tananarive.

(3) When a bridgehead had been secured the main body of 22nd E.A. Bde. Gp. would land and move on Tananarive.

(4) The advance of the East African Brigade would be supported by an air component which would move on to the Majunga airfield as soon as this became available.

(5) At the same time diversionary landings by S.A. 7th Bde. and 5th Commando would be made at Nose Be and at Morondava on the west coast.

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(6) When 22nd E.A. Bde. Gp. was nearing Tananarive, 29th Independent Bde. Gp. would re-embark at Majunga and be transported to Tamatave on the east coast for an assault on this place. Tamatave having been occupied, 29th Independent Bde. would move on Tananarive *via* Brickaville.

(7) When 22nd E.A. Bde. Gp. had taken Tananarive it would advance on Brickaville to join up with 29th Independent Bde. Gp.

MEDICAL TACTICAL PLAN

10 (Belgian Congo) C.C.S. from Hargeisa and a section of 1 M.A.C. (23 ambulance cars) would be provided by East Africa Command and would accompany 29th Independent Bde. Gp. from Mombasa.

H.S. *Dorsetshire* and H.S. *Vasna* would be made available to act as general hospitals.

154 Fd. Amb. would conform to the movements of 29th Independent Bde. Gp. 5 (K.) Fd. Amb. would conform to the movements of 22nd E.A. Bde. Gp., leaving a detachment for beach duties at Majunga.

5 Fd. Hosp. would accompany 29th Inf. Bde. Gp. to Tamatave.

FIG. 88. Madagascar. Operation 'Stream–Line–Jane'.

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THE LANDINGS AT MAJUNGA, TAMATAVE AND ELSEWHERE AND THE ADVANCE ON TANANARIVE

On September 9 the convoys bringing 29th Independent Bde. Gp. from Mombasa and 22nd E.A. Bde. Gp. from Diego Suarez met at their rendezvous in the Mozambique Channel and by dusk were just out of sight of land, west of Majunga. Shortly after midnight the leading ship of the column of forty-nine dropped anchor.

Shortly after 0100 hours on the 10th, 2nd R.W.F. and 2nd E. Lancs. R. of 29th Independent Inf. Bde. landed on an open beach eight miles north of the town, followed by H.Q. 29th Independent Bde. Their task was to attack Majunga at dawn from the north and north-east. At first light 2nd S. Lancs. R. and 5th Commando landed on the sea-front of the town itself. Resistance was negligible, and by 0800 hours the town was occupied. Casualties numbered twenty. The reserve battalion, 1st R.S.F., and the transport of 29th Independent Bde. were retained on board the convoy.

S.A. armoured cars and a company of 1/1st K.A.R., landing on the heels of 2nd R.W.F., at once pushed on to the bridge over the River Kamoro, ninety miles away. It was secured intact by 1800 hours. But that over the Betsiboka, forty miles on and reached in the early hours of September 11, proved to have been wrecked, though most inefficiently. The cable had been cut and the roadway of this bridge had collapsed on to the river bed so that its central part was about three feet under water. Ramps were constructed at either end and soon the bridge was in use again, to remain so until the heavy rains of October made it impassable.

Simultaneously with the landing at Majunga a battalion group of the South African 1st City Regt. occupied the island of Nose Be on the north-west coast and advanced therefrom *via* Beramanja towards Majunga. A few days later a small column set out from Majunga to meet the South Africans. When junction was effected both columns returned to their bases. Other small columns of South Africans moved down the north-east coast and cleared the road to Vohemar. A party from 5th Commando was landed at Morondava on the west coast and advanced some forty miles on their bicycles to create misunderstanding and confusion. After forty-eight hours of this the party was re-embarked.

When Majunga was safely occupied, 29th Independent Bde. returned to the ships for transport to Tamatave and 22nd E.A. Bde. landed. This brigade was organised into three battalion groups in order to ensure speed in disembarkation and onward movement.

Fifty miles beyond Betsiboka the road wound 2,000 feet up to Andriba. Here the Senegalese offered stiff resistance, but the East Africans quickly overcame it. Thereafter their advance was greatly impeded by innumerable road blocks of felled trees and hastily built stone walls. But, since these were never defended, they merely consumed time and labour, a great deal of both. At Mahitsy, thirty miles away from

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Tananarive, the capital, there was a sharp engagement, as also at Ambadatrino, but under cover of the guns of the S.A. armoured cars, 1/1st K.A.R. overcame the resistance and pushed on, to enter Tananarive on September 23.

Reconnaissance and other intelligence revealed that the French were withdrawing southwards to Antsirabe, Ambositra and Fianarantsoa. Since to follow them directly must be a slow affair it was decided to push the landing at Tamatave forward to September 18. Troops were landed and the town occupied in the face of token opposition. 29th Independent Bde. then began to move on Brickaville and Tananarive. A goods train was captured and with 2nd S. Lancs. R. was despatched to Brickaville, whence with the Commando they moved on to Moramanga, there to meet the 1/1st K.A.R. from Tananarive.

MEDICAL COVER FOR OPERATION 'STREAM–LINE–JANE'

154 Fd. Amb., accompanying 29th Independent Bde., did not disembark at Majunga, but did so at Tamatave, where a beach section and a light M.D.S. landed. The M.D.S. took over the building of the Gendarmerie Nationale but did not open. A light section (one officer and 15 O.Rs. with equipment for 100 casualties) accompanied 2nd S. Lancs. R. to Moramanga and used the canal for evacuation to Brickaville. In Tananarive 154 Fd. Amb. opened a convalescent hospital in a school. On October 18 the unit embarked for Durban.

5 Fd. Hosp., accompanying 29th Independent Bde., disembarked at Tamatave on September 18 and took over a French hospital there. By November 26 it was holding some 200 sick, mostly suffering from malaria. Handing over to 5 (K.) Fd. Amb., the unit then moved by train to Tananarive, where on November 29 it took over the French hospital from 10 (B.C.) C.C.S. During December the unit was dealing with some 250 occupied beds, malaria being the major cause of admission.

5 (K.) Fd. Amb. conformed to the movements of 22nd E.A. Bde., leaving a detachment for beach duties at Majunga.

10 (B.C.) C.C.S. disembarked at Majunga and, following closely upon the heels of 22nd E.A. Bde., reached Tananarive, there to open in the French hospital.

The 23 ambulance cars of 1 M.A.C. were divided between 22nd E.A. Bde., moving on Tananarive from Majunga, and 29th Independent Bde., landing at Tamatave.

MEDICAL COVER FOR THE COLUMNS OF S.A. 7TH BRIGADE

From Ambilobe to Maromandia *via* Ambanja there went a detachment 1,400 strong accompanied by one company of 19 (S.A.) Fd. Amb. The ambulance company took with it thirty days' medical supplies and six additional motor ambulances to function as a M.A.C. from the point furthest forward in the advance of the column from which its

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rations could be assured. But on the second day these ambulance cars were held up by a river and thereafter the column had to hold its own casualties until it returned at the end of September. The column had 50 cases of malaria, with no deaths. It was on suppressive quinine throughout, in spite of instructions to the contrary.

A medical officer and 7 O.Rs. of 19 (S.A.) Fd. Amb. with thirty days' medical supplies accompanied the force that occupied Nose Be. The garrison portion of this was 132 strong. Three casualties were incurred among the Marines. These were held on H.M.S. *Manxman* until this ship returned to Diego Suarez. 27 cases of malaria occurred among the garrison. These were admitted to the small French civil hospital.

A medical officer accompanied the column that moved on Vohemar and Sahambava. Three cases of clinical malaria occurred.

The regimental medical officer of 1st Pretoria Regt. accompanied the companies of this battalion that went to Tulear. Three O.Rs. of 19 (S.A.) Fd. Amb. were attached to him for this operation. The staff of the small French hospital at Tulear consisted of two French medical officers with non-European orderlies. A company of 1st Pretoria Regt. remained behind in Tulear as a garrison until relieved by 19th K.A.R. from East Africa, when the columns returned to Diego Suarez about the middle of September.

THE ADVANCE SOUTHWARDS

At the end of September, 22nd E.A. Bde. moved out of Tananarive to occupy Antsirabe, 100 miles to the south, on October 2. During this advance its main occupation was again the removal of road blocks. On October 18 stiff resistance was encountered at Andriamanalina. 1/6th K.A.R. made a twenty-four hour march to the rear of the position and 5th K.A.R. a shorter march to one flank. Then at dawn on the 19th these two battalions attacked, supported by the guns of 20th Fd. Bty. R.A. and 56th Fd. Bty. E.A. Artillery; 800 prisoners-of-war were captured. There were no casualties among the attacking troops. Continuing, the brigade reached Ambositra on the 19th and Fianarantsoa on the 29th. 22nd E.A. Bde. had travelled 360 miles in fourteen days.

On November 5 hostilities ceased and at Ambalavao on the 6th an armistice was signed.

Casualties during the advance southwards:*

	Europeans	*Africans*	*Totals*
Killed in action .	4	25	29
Died of wounds .	1	6	7
Wounded . .	2	77	79

* In *Five Ventures* the following figures are given: E.A. Bde. Br. officers and N.C.Os. 5 killed and wounded, S.A. Armd. Car Sqn. 6 casualties, Africans, 20 killed, 76 wounded. In operations elsewhere during the eight weeks casualties totalled 35.

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MEDICAL COVER FOR THE ADVANCE SOUTHWARDS

The task of the medical services was straightforward; casualties had to be collected over a very narrow front but evacuated over an ever-lengthening L. of C. with a good road to Antsirabe and thence by rail to 16 (B.C.) C.C.S. at Tananarive.

5 (K.) Fd. Amb. at this time was too greatly subdivided and dispersed to be able to give a really effective service to the brigade to which it was attached:

At Majunga . .	two sections
Tananarive .	one section
Antsirabe . .	H.Q. officer commanding only, and one company commander acting as M.O. to the airfield and one M.O. looking after odds and ends in the area
With the brigade on its advance .	two sections

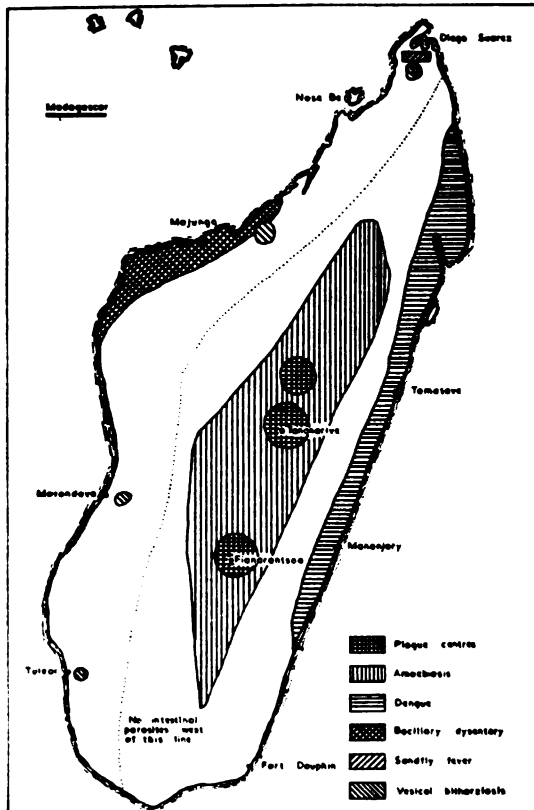

FIG. 89. Madagascar. The Distribution of Certain Diseases of Military Importance.

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Indeed had it not so happened that a R.M.O. was able to act as anaesthetist to a field ambulance section, the field ambulance might have failed in its duties towards battle casualties. A.D.M.S. therefore ordered a complete reorganisation of the field ambulance, to provide:

A section at Railhead, Antsirabe, to provide a staging post.
A M.D.S. to serve the brigade.
An A.D.S. in front of this.
A surgical team from 5 Fd. Hosp. (1 surgeon and 1 operating room asst.) for attachment to the M.D.S.

The distribution of the troops was such, when conditions became static, that the medical units were not sufficiently numerous to be able to provide an adequate service. A scheme was therefore developed whereby the French medical service could supplement the military medical services.

The distribution of diseases of military importance was now better known.

EVENTS SUBSEQUENT TO THE OCCUPATION OF MADAGASCAR

In October H.Q. Islands Area moved from Diego Suarez to Tananarive and a Sub-area, Diego Suarez Fortress, was formed. This was administered by H.Q. 27th N.R. Bde., the officer commanding 7 (N.R.) Fd. Amb. acting as S.M.O.

The distribution of troops in Madagascar at this time was as follows:

Troops	
H.Q. Islands Area	Tananarive
H.Q. Diego Suarez Fortress	Diego Suarez
27th N.R. Bde.	Diego Suarez
S.A. 7th Bde.	Diego Suarez
H.Q. '121' Force	at Tamatave (about to embark for Durban)
29th Independent Bde.	at Tamatave (about to embark for Durban)
22nd E.A. Bde. Gp.	Tananarive, Antsirabe and a point about 40 miles south of Antsirabe
19th K.A.R..	Majunga
Medical Units	
11 B.G.H.	Diego Suarez
19 (S.A.) Fd. Amb.	
7 (N.R.) Fd. Amb.	
16 Fd. Hyg. Sec.	
6 (E.A.) Fd. Hyg. Sec. detach.	
3 Mob. Mal. Sec. detach.	
31 (S.A.) Dental Unit	
7 (N.R.) Fd. Amb. detach	Mayotte
5 (K.) Fd. Amb., two secs.	Majunga

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5 Fd. Hosp.	Tamatave
154 Fd. Amb.	
1 M.A.C. detach.	Tamatave
10 (B.C.) C.C.S.	Tananarive
5 (K.) Fd. Amb. detach.	
1 M.A.C. detach.	
5 (K). Fd. Amb.	Antsirabe
H.Q. and two secs.	

H.Q. '121' Force and 29th Independent Bde. left Madagascar on October 18, to be followed by S.A. 7th Bde. on December 3. In their place came battalions of K.A.R., to constitute the island's garrison and to be stationed at Diego Suarez, Tamatave and Tulear.

The distribution of medical units as at December 31, 1942, was as follows:

11 B.G.H.	Diego Suarez
7 (N.R.) Fd. Amb.	
3 Mob. Mal. Sec. detach.	
6 (E.A.) Fd. Hyg. Sec. detach.	
10 (B.C.) C.C.S. (in transit)	Tamatave
5 (K.) Fd. Amb. ½ coy.	
3 Mob. Mal. Sec. detach.	
1 M.A.C. detach.	
5 Fd. Hosp.	Tananarive
5 (K.) Fd. Amb. ½ coy.	
6 (E.A.) Fd. Hyg. Sec. H.Q.	
3 Mob. Mal. Sec. detach.	
5 (K.) Fd. Amb. ½ coy.	Antsirabe
5 (K.) Fd. Amb. ½ coy.	south of Ambositra
5 (K.) Fd. Amb. H.Q.	Fianarantsoa
3 Mob. Mal. Sec. detach.	

In January 1943, 11 B.G.H. left Madagascar for the Middle East and was replaced in Fortress Diego Suarez by 10 (B.C.) C.C.S. 5 Fd. Hosp. gave place to 53 (E.A.) C.C.S. at Tananarive. At the end of the year 53 (E.A.) C.C.S., now in Antsirane, had 130 European and 220 African beds. 7 (N.R.) Fd. Amb. at Sakaramy was functioning as a field hospital with 50 European and 150 African beds, together with 50 European and 37 African beds at a convalescent camp. A detachment of this unit was running a camp hospital of 26 beds at Tulear. In Antsirane 109 (E.A.) C.R.S. was maintaining 182 African beds for V.D. cases. 75 (E.A.) Fd. Hyg. Sec., with its H.Q. in Antsirane, was operating throughout the Fortress Diego area. 23 (E.A.) Mob. Mal. Sec., with its H.Q. at Sakaramy, had a detachment in Antsirane and was active in mosquito control. At Tulear there was a camp hospital with 6 European and 22 African beds staffed by a medical officer from 109 (E.A.) C.R.S. and 17 O.Rs. from 7 (N.R.) Fd. Amb.

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In Mauritius there was a general hospital with 99 European and 201 non-European beds, 7 (Mauritius) Fd. Hyg. Sec. and 26 (E.A.) Mob. Mal. Sec. In Seychelles a station hospital with 50–75 beds was opened in 1944.

OBSERVATIONS OF A.D.M.S., ISLANDS AREA

A.D.M.S. found reason to comment upon the organisation and equipment of the field ambulances that had accompanied '121' Force. These medical units were fragmented into a number of light sections, none of which could function as a dressing station capable of holding almost any type of case if the need arose. He pointed out that the South and East African field ambulances, on the other hand, were organised and equipped to provide three companies, each with its own 500 gallon water tank, high pressure steriliser, microscope and staining box and tentage. The operation was one in which malaria was to be one of the major medical problems and in which detachments of a field ambulance were likely to be cut off from all hospital facilities by distance, bad roads and bad weather. Unless a field ambulance, or a portion thereof, operating in such a country had medical personnel trained in the diagnosis and treatment of malaria and could hold and treat such cases, a grave situation could arise. The field ambulances and the field hospital of '121' Force at one time were holding about 300 cases of malaria, yet there was not a microscope or staining box among them. In the S.A.M.C. and E.A.A.M.C. the early diagnosis of malaria was regarded as being of such primary importance that all the regimental medical officers were trained in such diagnosis and were equipped with microscopes and staining boxes.*

The hospital medical equipment in Diego Suarez was for long very inadequate, owing to the loss of the stores and equipment of 11 B.G.H. at sea. It was unfortunate that thermometers and syringes were omitted, through an oversight, from the earliest automatic replenishments of medical stores sent to '121' Force from the United Kingdom. The lack of X-ray dark ground illumination facilities was a serious handicap.

* The cost of this campaign in respect of continuing morbidity due to malaria was exceedingly high. It is significant that no specialist malariologist was associated with '121' Force. It has to be assumed that the cost was counted during the course of tactical planning and that strategical considerations overwhelmed any advice offered by the medical services. In 1942 the development of malaria control was at a stage when malaria cases were accepted as battle casualties by United Kingdom formations. Further time was required before a high incidence of malaria could come to be regarded not merely as unnecessary but, even in such conditions as those of Madagascar, as a true indication of the incompetence of commanding officers to manage their own affairs. The means of controlling the incidence of malaria were available in 1942, but at this time their value was not widely appreciated and, moreover, they were not in the possession of all those who needed them. Indeed it was not until the time of the campaigns in the Far East that it was finally accepted that malaria had lost its high place among the hazards of war, as typhoid and typhus had at the beginning of the century lost theirs.

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Rations. The Commander of 29th Independent Brigade found cause to be dissatisfied with the 48-hour ration pack supplied to his troops. 'This is too large and certainly, for hot climates, of an unsuitable type. Tins of bully beef and army biscuits are not encouraging during a long and thirsty march under a tropical sun, while the "Tommy" cooker does not last long enough to be used more than once. I understand that a really concentrated ration has existed for over a year. Could it not be made available for combined operations?'

A.D.M.S., Islands Area, recorded that in his opinion (though not in that of A.D.M.S. '121' Force), '121' Force was in danger of a seriously low bodily vitamin reserve level. His observations in the Abyssinian campaign were that after 4–5 months on inadequate fresh food or substitutes, health began to be affected. The rations that '121' Force received were adequate in quantity, but the proportion of fresh rations was, at the beginning of the operation and for some time afterwards, not adequate. After the occupation fresh meat became available. The native 'rum' was a most potent form of 'firewater'.

Medical Comforts. These were in short supply. Eggs and chickens were scarce, fish very scarce and fresh milk unobtainable.

Clothing. The drill in which all the troops were clothed was suitable, though shorts and short sleeves certainly made their contributions to the incidence of malaria. The mosquito net issued was not ideal for use outside of buildings.

Sanitation. During operations shallow trench latrines were used, but much fouling of the ground occurred, greatly to increase the fly menace. In Antsirane the troops were exposed to very poor standards of hygiene. Many of the billets were bug-infested and flies were everywhere. With the passing of time the standard of hygiene was raised to a satisfactory level.

Conservancy. In Antsirane the system was antiquated. Part of the town had a distinctly sketchy bucket system; part had a system of septic tanks with overflow to drains which also took waste and rainwater and discharged into the sea, though in certain instances they paused to irrigate market gardens on the way.

Refuse was dumped just beyond the native part of the town.

The conservancy system passed under the general supervision of the hygiene sections.

Water. The Orangea Peninsula, Sakaramy, Cap Diego and Red Beach had their own source of water—springs. Antsirane was supplied from the River Caiman and from small springs in the neighbourhood. The water was of fair quality, requiring 1 to 2 parts of chlorine per 1,000,000 in the dry season. The existing filtration plant could not deal with the very muddy water of the rainy season. The amounts available at the time of Operation 'Stream–Line–Jane' were: Antsirane 350,000

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gals., Cap Diego 5,700 gals., Orangea Peninsula 1,000 gals. In the remainder of the island water was plentiful. In most of the larger towns a purification system combining filtration and chlorination existed. Out of the towns military water supplies were chlorinated under unit arrangements.

SAMPLE STATISTICS

Tables 73 to 76 record the incidence of the prevalent causes of illness during this campaign and show the high incidence of malaria:

NOTE: *For Tables 73 and 74 see pages 610 and 611*

TABLE 75

Admissions to 11 B.G.H. June–July 1942

	Taken over from 5 Fd. Hosp.	June	July	Totals
Officers	25	72	41	138
O.Rs.	384	1,201	716	2,301
R.N.	—	18	43	61
R.A.F.	—	18	5	23
South Africans	—	5	15	20
S.A.A.F.	—	13	2	15
Totals	409	1,327	822	2,558

Cases diagnosed

	June	July	Totals
Malaria, M.T.	295	114	409
Malaria, B.T.	133	41	174
Malaria, clinical	67	18	85
Dengue	146	38	184
Dysentery, amoebic	5	6	11
Dysentery, bacillary	14	22	36
Died:			
Malaria, M.T.	3	1	4
Malaria, clinical	2	—	2
Injuries	1	—	1
Totals	6	1	7
Relapses:			
Malaria, M.T.	2	3	5
Malaria, clinical	2	3	5
Totals	4	6	10

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TABLE 73

*The Incidence of Malaria, V.D., Diarrhoea and Dysentery. August 1–September 26, 1942**

Week ending	Ethnic group	Ration strength	Malaria B.T.	Malaria M.T.	Malaria C.	Malaria P.	Totals	Average daily rate per 1,000 per week	Percentage proved micro-scopically	V.D.	Dysentery and diarrhoea	Total admissions to medical units
August 1, 1942	European	10,848	8	12	27	—	47	·46	34	19	11	267
	Non-European	7,556	—	—	11	—	11			10	17	108
	Totals	18,404	8	12	38	—	58			29	28	375
August 8, 1942	European	10,813	6	16	9	1	32	·28	72	15	13	221
	Non-European	7,617	—	3	1	—	4			9	19	99
	Totals	18,430	6	19	10	1	36			24	32	320
August 15, 1942	European	11,462	11	19	6	6	42	·32	83	14	19	250
	Non-European	10,385	—	2	3	1	6			13	19	127
	Totals	21,847	11	21	9	7	48			27	38	377
August 22, 1942	European	11,462	4	11	8	—	23	·23	61	9	16	155
	Non-European	10,385	—	3	5	2	10			9	25	142
	Totals	21,847	4	14	13	2	33			18	41	297
August 29, 1942	European	6,353	4	5	4	1	14	·18	66	6	16	108
	Non-European	9,991	—	3	3	1	7			6	16	110
	Totals	16,344	4	8	7	2	21			12	32	218
September 5, 1942	European	6,000	—	8	5	3	16	·43	69	11	10	107
	Non-European	5,800	—	13	6	1	20			4	31	139
	Totals	11,800	—	21	11	4	36			15	41	246
September 12, 1942	European	4,532	3	9	8	4	24	·59	69	6	14	110
	Non-European	5,994	1	13	11	—	25			7	24	108
	Totals	10,526	4	22	19	4	49			13	38	218
September 19, 1942	European	4,209	4	6	5	2	17	·48	70	10	5	105
	Non-European	4,754	1	6	3	—	10			4	14	64
	Totals	8,963	5	12	8	2	27			14	19	169
September 26, 1942	European	3,822	3	6	2	—	11	·21	85	6	12	94
	Non-European	5,101	1	1	—	—	2			4	5	41
	Totals	8,923	4	7	2	—	13			10	17	135

Non-Europeans include Africans, Asians, South African natives and Cape coloured.

* Excluding Mayotte.

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TABLE 74

The Incidence of Malaria, V.D., Diarrhoea and Dysentery. October–December, 1942

Week ending	Ethnic group	Ration strength	Malaria B.T.	Malaria M.T.	Malaria C.	Malaria P.	Totals	Average daily rate per 1,000 per week	Percentage proved micro-scopically	V.D.	Diarrhoea and dysentery	Total admissions to medical units	Percentage admissions against ration strength
October 3, 1942	European	14,500	3	7	12	—	22			3	10	122	·84
	Non-European	13,000	2	7	11	—	20			13	11	90	·69
	Totals	27,500	5	14	23	—	42	·22	45	16	21	212	·77
October 10, 1942	European	14,500	—	11	9	1	21			5	13	101	·69
	Non-European	13,000	1	15	10	—	26			15	21	123	·94
	Totals	27,500	1	26	19	1	47	·24	59	20	34	224	·81
October 17, 1942	European	7,803	43	131	88	—	262			39	19	514	6·57
	Non-European	12,777	1	37	20	—	58			23	39	281	2·21
	Totals	20,580	44	168	108	—	320	2·28	66	62	58	795	3·87
October 24, 1942	European	8,129	5	38	17	—	60			12	17	200	2·47
	Non-European	14,224	—	41	22	—	63			23	28	257	1·82
	Totals	22,353	5	79	39	—	123	·79	68	35	45	457	2·04
October 31, 1942	European	7,958	4	13	23	—	40			12	15	160	2·02
	Non-European	12,753	2	14	13	—	29			15	36	191	1·50
	Totals	20,711	6	27	36	—	69	·49	47	27	51	351	1·69
November 7, 1942	European	7,853	3	19	10	—	32			14	12	139	1·78
	Non-European	12,511	1	14	16	—	31			35	29	199	1·58
	Totals	20,364	4	33	26	—	63	·45	58	49	41	338	1·61
November 14, 1942	European	7,603	6	23	5	—	34			11	17	141	1·85
	Non-European	13,504	—	11	15	—	26			34	20	196	1·45
	Totals	21,107	6	34	20	—	60	·40	66	45	37	337	1·59
November 21, 1942	European	7,271	5	19	11	—	35			14	16	146	2·02
	Non-European	13,424	—	13	26	—	39			41	16	223	1·66
	Totals	20,695	5	32	37	—	74	·50	50	55	32	369	1·79
November 28, 1942	European	7,271	1	22	16	—	39			15	14	134	1·86
	Non-European	13,424	1	21	18	—	40			49	12	287	2·14
	Totals	20,695	2	43	34	—	79	·50	56	64	26	421	2·04
December 5, 1942	European	7,106	2	6	15	—	23			13	15	130	1·83
	Non-European	14,234	—	7	13	—	20			122	24	289	2·03
	Totals	21,340	2	13	28	—	43	·29	34	135	39	419	1·96
December 12, 1942	European	4,750	8	12	19	—	39			10	9	107	2·27
	Non-European	13,775	7	4	20	—	31			60	40	243	1·77
	Totals	18,525	15	16	39	—	70	·46	51	70	49	350	1·89
December 19, 1942	European	4,873	6	11	5	—	22			14	9	117	2·43
	Non-European	13,531	—	6	14	—	20			52	26	187	1·38
	Totals	18,404	6	17	19	—	42	·33	54	66	35	304	1·65
December 26, 1942	European	4,915	7	9	10	1	27			9	13	106	2·6
	Non-European	13,968	2	4	3	—	9			73	34	193	1·39
	Totals	18,883	9	13	13	1	36	·27	64	82	47	299	1·57

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TABLE 76

Direct Admissions 10 (*B.C.*) *C.C.S. Tananarive. August* 9–*November* 6, 1942

	Europeans	Non-Europeans
Average effective strength	1,200	4,600
Battle casualties:		
Killed . . .	5	20
Wounded . . .	6	78
Accidentally injured .	9	41
Total malaria . .	36	56
Total sick . . .	157	454

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CHAPTER 13

MALTA 1940–43*

MALTA is the largest of a group of five islands that lies halfway along the Mediterranean sea passage between Gibraltar and Port Said, being 58 miles from the nearest point on the coastline of Sicily and 180 miles from that on the coast of North Africa. Comino, Cominetto, and Filfla are small and uninhabited. Gozo, with an area of 24 square miles and, in 1940, a population of 29,295, lies to the north-west of Malta.

Malta has an area of 95 square miles, is 60 miles in circumference, 17 miles in its greatest length, 9 miles in its greatest breadth and, in 1940, had a population of 241,460 and a small British garrison. Like the rest of the group, it is composed of limestone. Its surface is irregular and rocky; indeed one-eighth of its surface is bare rock. Some 41,865 acres were under cultivation. Malta has no river, no lake. But there are plentiful springs on the higher ground and drinking water was carried therefrom by aqueducts to a number of reservoirs and thence pumped to the main centres of population.

STRATEGIC AND OTHER CONSIDERATIONS

Malta, with its fine harbour, its dockyard and its airfields, possessed in 1939 an exceptional strategical importance. The Great Power possessing it dominated the narrow sea corridor through the central Mediterranean, the sea route between Great Britain and the Middle and Far East. In 1940 this importance became magnified for the reason that the island stood athwart the path between Italy and her African colonies. Without Malta the very considerable contributions which the Royal Navy and the Royal Air Force could be expected to make to the campaigns in North Africa would inevitably be much diminished.

MEDICAL INTELLIGENCE

The Maltese Civil Medical Service in 1940 was well organised and efficient. There was a large and well equipped Government Hospital with a highly qualified staff which included men of international repute. In every village there was a public dispensary with its medical officer.

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* Since in Malta the affairs of the Civil and the Military Medical Services were so intertwined, the account of the Maltese Civilian Medical Services in the Civilian Health and Medical Services, Volume II, Part 1, Chapter 2 should be consulted. The account presented here should be regarded as being subsidiary to those that appear in the Royal Naval and Royal Air Force Medical Histories.

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Nursing was undertaken by nuns. There was a flourishing branch of the St. John Ambulance Association, but the great majority of the V.A.Ds. were immobile.

Sandfly fever, Malta fever, diphtheria, trachoma, jaundice, dysentery and diarrhoea were prevalent among the civilian population. There was a high incidence of tuberculosis. In 1938, in an attempt to curb Malta fever, pasteurisation of goat's milk was introduced; but since this procedure added considerably to the cost of the milk it never became universal.

THE GARRISON (ARMY)

At the outbreak of war in September 1939 there were on the island four battalions of infantry and a number of artillery units. These were gradually reinforced, until in 1942 there were eleven British and three Maltese infantry battalions, three regiments of artillery and a Home Guard 3,000 strong. Conscription of the Maltese had been introduced in 1941.

AVERAGE STRENGTH OF THE GARRISON

	1938	1939	1940	1942
British officers	154	216	350	1,077
Maltese officers	—	—	—	281
B.O.Rs.	2,605	3,985	6,157	16,995
M.O.Rs.	625	1,957	4,254	8,868
Maltese Auxiliary Corps	—	—	—	2,080
R.N.				1,623
R.A.F.				4,339
Civilian employees				20,055
Families				5,474

In June 1942 the garrison consisted of:

1st Malta Inf. Bde..	Fixed Defences. 5 Regts.
8th Manchesters	10th Hy. A.A. Bde.
2nd R.I.F.	7th Lt. A.A. Bde.
1st K.O.M.R.	
2nd K.O.M.R.	Ancillary Tps, and Services 10th K.O.M.R.
2nd Malta Inf. Bde.	R.E., R.C.S., etc., units
2nd Devon	
1st Hamps.	Malta Volunteer Defence Force 3,000
1st Dorset	
3rd K.O.M.R.	
3rd Malta Inf. Bde.	
11th L.F.	
1st Cheshire	
2nd R.W.K.	

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4th Malta Inf. Bde.
4th Buffs
8th King's Own
1st D.L.I.

BRITISH FAMILIES

There were 506 British wives and 688 children on Malta in June 1940. During the first week of June all those who wished to leave did so on the S.S. *Oronsay*. There was no compulsory evacuation of British families, for it was considered to be most undesirable to send these away and leave the Maltese women and children behind. The great majority chose to stay. These were congregated at St. George's barracks at the north-east corner of the island, but as time passed most of them trickled back to their homes.

THE MILITARY MEDICAL SERVICES

The peace-time establishment consisted of:

14 medical officers (including the D.D.M.S.)
11 Q.A.I.M.N.S.
75 other ranks, R.A.M.C.
a Station Hospital of 100 beds at Imtarfa
a Military Families Hospital of 24 beds at Imtarfa
a District Dispensary at Floriana

In August 1939, when the island was put on a war footing, there were added:

12 medical officers
7 Q.A.I.M.N.S.
75 other ranks, R.A.M.C.

The barracks adjacent to the Station Hospital at Imtarfa were taken over and the hospital enlarged to 800 beds with an isolation block of 20 beds. Maltese were enrolled as auxiliaries and were serving as G.D.Os., cooks, telephone operators and the like. The Royal Navy had a hospital at Bighi near the dockyard. In December this was closed and its staff and patients moved to Imtarfa. Later the Naval Hospital was reopened but only for out-patients of the Royal Navy.

By the time Italy entered the war on June 10, 1940, there were on the island:

30 medical officers
40 Q.A.I.M.N.S.
150 O.Rs. R.A.M.C.

THE BATTLE OF MALTA

When it became highly probable that Italy would enter the war on the side of Germany, the British Mediterranean fleet was withdrawn from Malta and distributed between Gibraltar and Alexandria, for Malta was

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but sixty miles away from the Sicilian airfields. The Aircraft Carrier *Glorious*, with her squadrons of fighters, left Malta for Norway. No squadrons could be spared from the United Kingdom for Malta at this most critical time. Lying as the island did in the shadow of the Italian airfields in Sicily and Southern Italy, it seemed in mid-1940 that Malta, the fortress, the naval base, the airfield, could not be used and could not be protected. In Malta there were three Gladiators and four Hurricanes. The Gladiators—Faith, Hope and Charity—had been left behind when the *Glorious* sailed. The Hurricanes, on their way from France to Egypt, had been retained in Malta.

It was fortunate that for the time being the Italians showed no sustained interest in Malta. The Regia Aeronautica made its first raid at 0649 hours on June 11, 1940 and during the rest of the day made seven more. There was an immediate exodus from Valletta, Vittoriosa Cospicua and Senglea. The result of this was a gross overcrowding locally with consequent insanitation and insufficiencies of water, food and fuel. The effects of this disruption were soon to be revealed. The death rate among the civilian population rose. In July 1940 it was 36 per 1,000 as compared with 25 per 1,000 in July 1939. In August 1940 it was 35 per 1,000 as compared with 21 per 1,000 in August 1939. But this initial panic quickly subsided and the Maltese and their civil medical and sanitary services were able to cope with the extraordinary circumstances and to adapt themselves to the stern tasks of individual and aggregate continuance. Wholesale T.A.B. and diphtheria toxoid inoculation was carried out and no epidemic occurred.

When France fell, Malta gained in importance, for the entire Mediterranean coast line, save Egypt, Palestine, Cyprus and Malta, was closed to the British fleet and if Malta were lost the Mediterranean sea route would be cut in two.

From the air Malta was an easy target and its main harbour and its airfields easily found. Hal Far airfield was but a narrow strip; Ta Kali airfield was encompassed with high hills on three sides; Luqa airfield was hemmed in by villages. Since every square yard of the island's poor soil was needed for food production it was not easy to find sufficient room for aircraft dispersal. The stone-walled road between Hal Far and Luqa was used for this purpose to form the Safi strip.

Fortunately the pale limestone of which the island is composed was easily worked, yet hardened quickly on exposure. There were many natural caves on the island and these together with the tunnel of a disused railway were enlarged by R.E. tunnellers to provide adequate air-raid shelters for the population and the garrison. The ancient underground granaries of the Knights of St. John made a safe store for the island's grain. But for most other things Malta was dependent upon that which could be brought by ship, submarine and aircraft.

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During the first seven months following Italy's entry into the war, Malta continued unexpectedly to survive. Her fighter strength was gradually increased and convoys in sufficient numbers came safely through. By August it had come to be accepted that not only could Malta be held, but it could be used to great advantage. By October 1940 the Germans found it necessary to intervene in the Western Desert and rightly decided that in their interests Malta must be neutralised in order that the supply line of the Afrika Korps should not be interrupted. To Sicily came Fliegerkorps X from Norway with 260 Stukas and Messerschmitt 109's.

On January 10, 1941 the Aircraft Carrier *Illustrious* was grievously hit and limped into the Grand Harbour. While there she was furiously attacked. The Mediterranean was closed to the convoys for the Middle East while Axis convoys crossed the sea freely.

By April however, the Luftwaffe was concentrated on the Russian front and so the attacks upon Malta slackened. Aircraft from Malta were able to give much needed help during the withdrawal from Greece, bringing away considerable numbers of troops.

By June 1941 the Afrika Korps had regained Cyrenaica. Greece and Crete had fallen. But Eighth Army was preparing for a counter-offensive and so it became imperative that the supply of the Axis forces in the Desert should be diminished.

Malta's aircraft ranged far and wide to locate Axis convoys and her aircraft, destroyers and submarines harried them as Eighth Army raced towards Benghazi. So effective was this intervention that Luftflotte II was despatched from the Russian front to Sicily with instructions finally to dispose of the nuisance, so that the advance of the German Italian Army in Africa towards the Egyptian border and beyond might proceed without interruption.

Malta was now about to face its most severe test. During January of 1942 bad weather saved the island and it was not until February 15 that the first heavy attack was made. The Luqa airfield suffered greatly but Army personnel, with the help of others, toiled without ceasing to repair the damage and managed to keep the airfield in a serviceable condition.

By March the situation was rapidly becoming critical. Spitfires were flown in only to be attacked immediately and for the most part destroyed. Convoys bound for Malta were ruthlessly attacked and endured crippling losses. In April the harbour was reduced to a shambles and the submarine flotilla was forced to leave. On the 20th the U.S. Carrier *Wasp* arrived off Malta and 47 Spitfires from her were flown to Ta Kali there to be attacked at once by 90 German planes. The runway was destroyed. Army units promptly repaired it in the light of burning aircraft.

The Germans succeeded in neutralising Malta much to the advantage of the Afrika Korps. Indeed the German High Command concluded

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that the island could henceforth be disregarded. Operation 'Hercules', an airborne invasion of Malta similar to that of Crete, was called off. The Luftwaffe's grip on the island loosened and its garrison enjoyed a brief respite. Strong Spitfire reinforcements were flown in and the R.A.F. found it possible for the first time to meet the Luftwaffe on more or less equal terms.

In July 1942 the Luftwaffe attack was stepped up again but it was clear that the danger was past and that Malta was safe. Its R.A.F. component passed to the attack to play a notable part in the victory of Alamein, for the Axis losses in respect of supplies for the Afrika Korps turned the scales in favour of Eighth Army.

The last heavy attack on Malta took place in October 1942. In November a convoy from Egypt made the passage safely and the siege was finally raised.

Thereafter its bombers attacked the Sardinia airfields at the time of the assault landing in North Africa (Operation 'Torch') and the airfields in Tunisia, Sicily and Italy in connexion with the advance of First Army into Tunisia. At the time of the invasion of Sicily, as many as 30 squadrons were based on Malta.

Between June 11, 1940 and February 1, 1943 there were no less than 3,243 alerts and 1,200 actual air raids. The greatest number of raids in one day was 17; the longest raid lasted 13½ hours without intermission; the greatest number of enemy aircraft over Malta at one and the same time was 300 fighters and 450 bombers. During a period of 18 days in April 1942 some 1,869 tons of bombs were dropped in the harbour area. Some 2,000 people were killed and some 3,000 wounded.

THE AFFAIRS OF THE ARMY MEDICAL SERVICES

In order to make the best possible use of the personnel and facilities available, the island was divided into Malta East and Malta West. Each of these had its S.M.O. The various medical units were required to function as A.D.S., M.D.S., C.C.S., or base hospital, some of them functioning as a combination of these. 90 B.G.H. at Imtarfa had Ta Kali airfield as a near neighbour and so received much that was addressed to the R.A.F.

Fig. 90 shows the distribution of the medical units as in June 1940.

The medical units were not unduly extended in their tasks of tending to the air-raid casualties among Service personnel and among the crews of the ships that defended or brought succour to the island. In March 1941 a small garrison of some 500 troops was placed on Gozo. With them went one medical officer, one sergeant and five privates, R.A.M.C., together with one W.D. ambulance and one van ambulance. It was intended to evacuate patients requiring hospitalisation to Malta by R.A.F. rescue launch. But this vessel was always attacked from the air and so evacuation had to be by air.

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In April 1941 conscription of Maltese for the R.A.M.C. Malta Section was instituted.

On April 13, 90 B.G.H. was deliberately attacked, 36 bombs being dropped causing serious damage. On the Italian wireless next day it was stated that the attack was a reprisal for the bombing of one of the Italian field hospitals in Libya.

In August 1941, 45 B.G.H. opened. Q.A.I.M.N.S. personnel were given the choice of staying in or of leaving Malta. In September 39 B.G.H. arrived, unfortunately without its equipment for this had been lost at sea.

In October 1941 the strength of the medical services had become 127 officers, 1,128 O.Rs. and 46 Q.A.I.M.N.S. and the site for a convalescent depot was prepared at Paceville.

The strength of the garrison was now:

Army . . .	25,500
Malta Auxiliary Corps	2,000
R.A.F. . . .	6,500
	34,000

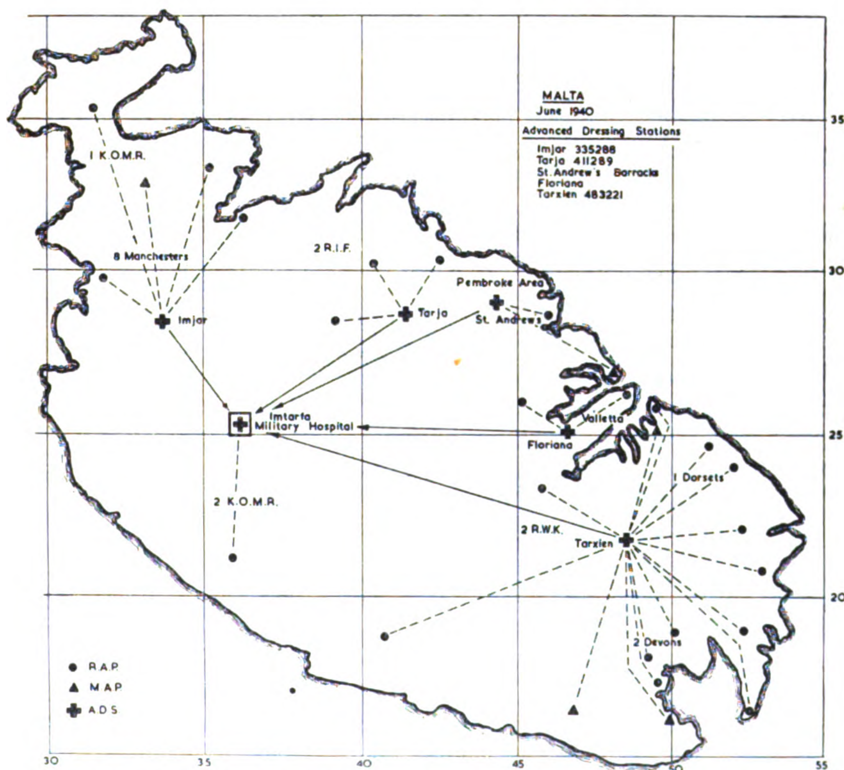

FIG. 90. Malta. Distribution of the Medical Units. June 1940.

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In December 1941 the frequency and intensity of the air raids markedly increased and the Luftwaffe was now taking the predominant part in them. Casualties due to enemy action were now mounting rapidly. They numbered:

January	1942 .	87
February	1942 .	201
March	1942 .	282
April	1942 .	486

It was in April that the first member of the R.A.M.C. was killed. On April 13, 1942, during an attack upon a large R.E.M.E. dump nearby, 39 B.G.H. at St. Georges, was hit, and much damage and many casualties among staff and patients resulted. As a general rule, however, the Red Cross was respected. About a hundred bombs fell into the hospital area during the siege and accommodation for 400 patients was destroyed.

The following local hospital instructions were issued:

(1) Staff will stay at their posts during air raids.
(2) All patients who cannot walk will be kept on the ground floor.
(3) At night, during air raids, all patients will be evacuated from the top floor.
(4) Patients who can walk but who cannot reach the shelters will get under their beds.
(5) Patients who cannot be moved will be covered with mattresses during air raids.
(6) Patients wishing to go to the prepared shelters during the daytime may do so.

Slit trenches, each holding 15 men standing, were dug and these were the only protection for staff and patients until late in 1941. Deep shelters were then provided for the female nursing staff. Three tunnels and deep shelters for patients were not completed by the time of the most concentrated bombing of May 1942. One reason why adequate shelters could not be provided was that such labour of the appropriate kind as was available had to be employed on other projects.

In March 1942, when 300–400 planes were over 90 B.G.H. every day, it was decided to evacuate the hospital and to accommodate the patients in these tunnels, even though they were unfinished. For forty-eight hours 300 patients and staff remained underground. The conditions were so unsatisfactory, however, that the plan was dropped. As elsewhere, it was found that it was the disruption of the routine of living and the lack of comfortable sleep that were the most serious effects of these air attacks. Night after night the sirens would scream at about 2100 hours and thereafter the night would be filled with commotion.

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STRENGTH OF MEDICAL UNITS. JUNE 1942

	British Officers	Maltese Officers	B.O.R.	M.O.R.	Q.A. I.M.N. S.	V.A.D.
D.D.M.S. and staff	3	—	15	—	—	—
39 B.G.H. (600) .	13	1	115	2	4	—
45 B.G.H. (600) .	17	1	101	44	18	—
90 B.G.H. (1,200)	24	3	181	25	35	35
*Mil. Fam. Hosp.	1	—	2	—	2	—
161 Fd. Amb. .	12	2	126	46	—	—
15 Fd. Amb. .	12	3	89	90	—	—
57 Fd. Hyg. Sec. .	1	—	14	10	—	—
*Command Lab. .	1	—	2	—	—	—
*Reception Block .	1	—	12	13	—	—
*Depot Med. Stores	1	—	9	4	—	—
Con. Depot (250) .	1 (R.A.M.C.)	—	5 (R.A.M.C.)	—	—	—
	87	10	671	234	59	35

* Staffed by personnel of 30 Coy. R.A.M.C.

Ambulances:	
W.D. . . .	41
Van ambulances . .	24
Buses	3
Bus ambulances . .	12
	80
Personnel—some . .	200

39 B.G.H. was not open. Its accommodation had been destroyed by enemy action on April 25, 1942. A new hutted site of 300 beds was being prepared at Mellieha.

The distribution of these medical units is shown in Fig. 91:

15 Fd. Amb. . .	M.D.S. .	Gargur
	A.D.Ss. .	Rabat
		Imjar
		Wardia
		Naxxar
		St. Andrews
161 Fd. Amb. . .	M.D.S. .	Hamrun
	A.D.Ss. .	Floriana
		Luqa
		Zabbar
		Zeitun
30 Coy. R.A.M.C. .		Families Hospital (60 beds)
		Command Med. Stores (Imtarfa)
		Command Lab. (90 B.G.H.)
		Reception Block (90 B.G.H.)

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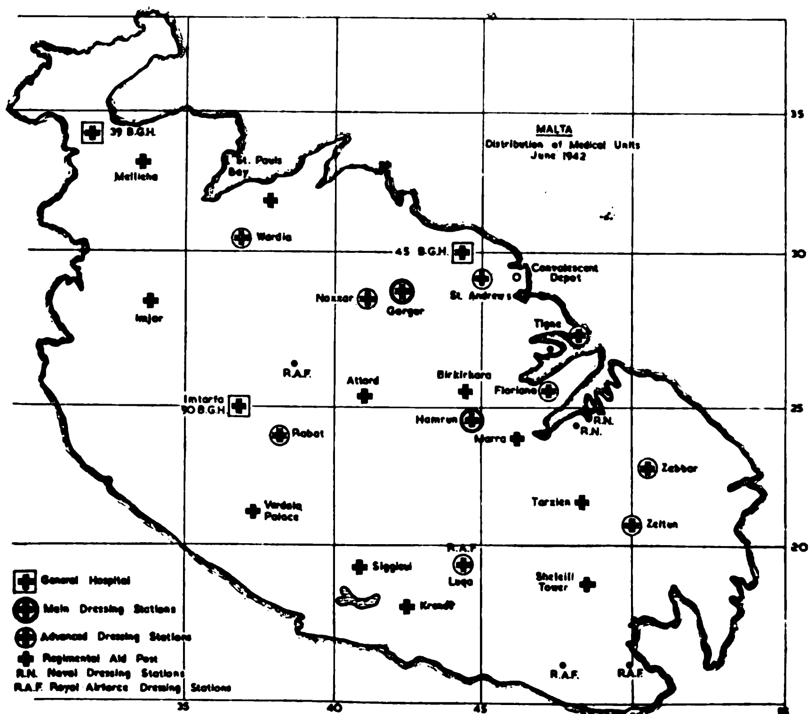

FIG. 91. Malta. The Distribution of the Medical Units. June 1942.

Up to this time there had been no medical officers serving as R.M.Os. It had been found to be more economical to provide a medical service based on A.D.Ss. serving zones. But now R.M.Os. were posted to the battalions.

Because of man-power shortages, 15 and 161 Fd. Ambs. had become much diluted with Maltese personnel. In November 1942, reinforcements becoming available and in order to prepare these medical units for service elsewhere, the Maltese were replaced by British personnel. In December official sanction was obtained for the establishment of 11 F.S.U., consisting of:

Officer Commanding (surgical specialist or graded surgeon)	1
Anæsthetist (major, captain or subaltern)	1
Clerk	1
Operating Room Assistant	1
Nursing Orderlies	2
Batman	1
R.A.S.C. Drivers attached	2
	9

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Cars, 4-seater	1
Lorry, 3-ton fitted with half penthouse	1

In December 1942 there was an alarming outbreak of anterior poliomyelitis among the civil population; 483 cases altogether were notified and of these 57 were Service personnel. Two excellent iron lungs were made by the R.E. and an urgent request for others was sent to Middle East Command.

EVACUATION OF CASUALTIES

In the early months of the siege naval, and a few army, casualties were evacuated by naval vessels to Alexandria. Others were taken off when the first convoy reached Malta three months after the siege had started. The first hospital ship arrived in early 1941 to take aboard the many casualties from the aircraft carrier *Illustrious*. After this evacuation was most irregular and was by bomber to Egypt or by flying-boat to the United Kingdom—one to four a week on the average—and by aircraft and submarine to Gibraltar. Psychiatric cases were not evacuated. Up to the end of 1942, 41 cases of tuberculosis had been evacuated. Submarines brought drugs, equipment and stores to the island.

RATIONS

Early in the siege food rationing for the civilian population was introduced and as the siege went on and the stores decreased, rationing became increasingly strict. It was not until the loss of a large convoy in March 1942 that strict rationing for the Army was instituted. After this it was no longer possible to buy any foodstuffs save in the black market, in which prices were prohibitive. The civilian ration fell dangerously low towards the end of October 1942.

Army Rations.

1942	*Calories*
April	2,366
June	2,800
July	2,600
August	2,860
September	2,720

	Oz. Daily		*Oz. Daily*
Bread	11	Sardines	—
Biscuits	1	Salmon	—
Flour	1	Herrings	—
Tinned meat	4	Pilchards	—
M. and V.	1	Potatoes (tinned)	1
Steak & Kidney (tinned)	1	Onions	—
Bacon (tinned)	—	Vegetables (tinned)	2
Cheese (tinned)	—	Vegetables (fresh)	2
Chocolate	—	Tomatoes	—

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	Oz. Daily		*Oz. Daily*
Milk (tinned)	1	Peas (processed)	1
Sugar	1⅓	Peas (dried)	—
Tea	⅓	Marmite	—
Salt	¼	Cooking fat	—
Jam	⅓	Meat and fish paste	—
Fruit (tinned)	—	Margarine	1
Fruit (fresh)	1		

2,722 Calories

Cigarettes	40 per week
Tobacco	2 oz. per week
Matches	1 box per week

Encouragement was given to units to grow food. Pigs, poultry and rabbits were bought by units; at Imtarfa there were 30 pigs, 50 rabbits and 100 poultry. But soon there developed a shortage of feeding stuffs and the animal population of the island, including the goats, had to be reduced.

Hospital diets, mainly tinned, were well maintained. There were no admissions to military hospitals on account of malnutrition and there was no evidence of vitamin deficiency among Army personnel.

WATER

Water rationing quickly became necessary—9 gallons/man/day; baths, shower only, once a week; water turned off between 1400 and 1700 hours daily; all taps save one removed from all ablution places; W.Cs. not used for urination.

FUEL

There quickly developed a fuel shortage. Coal was unprocurable and paraffin oil was in short supply. One day each week became a fuelless day. In the hospital all fires were banked down at midday. The electric power station was badly damaged by aerial bombardment. Electric power was cut throughout the summer months. Towards the end of the siege Diesel engines for 90 B.G.H. were made available so that it no longer depended on the main supply.

TRANSPORT

Horse transport replaced motor as far as possible. All high-powered cars were taken off the road. Buses ran only from 0630 to 0830 hours and from 1600 to 1800 hours daily on week-days.

THE HEALTH OF THE TROOPS

The sample statistics given in the tables below serve to illustrate the prevalence of disease and the casualties due to enemy action during the siege:

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TABLE 77

Prevailing Diseases necessitating Admission to Hospital, 1940

Disease	B.O.Rs.	Local Tps.	B.O.Rs. ratio per 1,000	Local Tps. O.Rs. ratio per 1,000
Local injuries	325	109	52·78	25·62
Skin	318	142	51·64	33·38
I.A.T.	316	119	51·32	27·97
Other diseases. Digestive system	305	299	49·53	70·29
Scabies	203	170	32·97	39·96
Inflammation of tonsils	163	98	26·47	23·37
Other diseases. Respiratory system	144	—	23·38	—
Bones, joints, etc.	125	83	20·30	19·51
Sandfly fever	104	60	16·89	14·10
Venereal diseases	95	—	15·43	—
Diseases of nervous system	95	56	15·43	13·16
Ear and nose	93	48	15·10	11·28
Inflammation of pharynx	84	83	13·64	19·51
Dysentery	83	—	13·48	—
Generative system	83	—	13·48	—
Other diseases due to infection	82	—	13·31	—
Teeth and gums	69	32	11·20	7·52
Diseases of liver	58	—	9·42	—
Mental diseases	52	—	8·44	—
Diseases of the eye	47	93	7·63	21·86
Urinary system	44	35	7·14	8·23

Average strength: . . B.O.Rs. . . 6,157
" " Local Tps. O.Rs. . . 4,254

TABLE 78

Admissions to Hospital and Average Constantly Sick in Hospital, 1940

	B.O.Rs.		Local Tps. O.Rs.	
	Number	Rate per 1,000	Number	Rate per 1,000
Admissions	3,064	497·64	1,857	436·53
Average constantly sick	234·44	38·35	118·66	28·40

Average strength: British O.Rs. 6,157.
" " Local Tps. O.Rs. 4,254.

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TABLE 79

Deaths, 1940

	B.O.Rs.		Local Tps. O.Rs.
Due to:			
Enemy action . .	3		6
Fracture of skull . .	3		1
Tuberculosis, generalised	1	Broncho-pneumonia	1
G.S.W. homicide . .	1	Heart failure .	1
,, suicide . .	1	Peritonitis . .	1
,, accident . .	1	Multiple injuries .	2
Heat, burns . . .	2		
Acute septicaemia . .	1		
	13		12

TABLE 80

Diseases leading to Invalidism, 1940

	B.O.Rs.	Local Tps. O.Rs.	B.O.Rs. ratio per 1,000
Mental	16	12	2·59
Bronchi, etc.	9	—	1·46
Ear and nose	7	10	1·13
Bones, etc.	7	8	1·13
Pulmonary tuberculosis . .	6	9	0·97
Other diseases. Digestive . .	6	4	0·97
Nervous system . . .	6	6	0·97
Other diseases. Respiratory .	4	1	0·65
V.D.H.	4	—	0·65
Local injuries	3	—	0·49
Other diseases. Circulatory .	3	8	0·49
Other diseases due to infection .	2	2	0·32
Diseases of eye	2	44	0·32
Rheumatic fever	1		0·16
Metabolism	1	3	0·16
General system		1	
Skin		3	
Tonsils		2	
Urinary system		2	
Tuberculosis, other forms . .		1	
Lung		1	
	77	117	

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TABLE 81

Women and Children. Admissions to Hospital and Average Constantly Sick in Hospital, 1940

	Number		Ratio per 1,000	
	Women	Children	Women	Children
Admissions . . .	246	181	487·13	268·95
Average constantly sick .	10·00	6·19	19·80	9·20

The admissions for women included 130 parturitions.
Average strength: Women 505; Children 673.

TABLE 82

Summary of Casualties (Army only) due to Enemy Action and treated in Medical Units. January–June 1942

	Wounds			Deaths		
	Fd. Amb.	Hospital	Totals	Killed	Died of wounds	Totals
January .	30	41	71	18	4	22
February .	37	84	121	20	8	28
March .	74	110	184	47	9	56
April .	164	344	508	137	50	187
May .	30	56	86	16	18	34
June .	6	23	29	15	5	20
	341	658	999	253	94	347

TABLE 83

Principal Diseases affecting the Troops. April–June 1942. *A.E.R./*1,000

	British	Maltese
Scabies . . .	102	339
Dysentery . .	34·6	5·4
Sandfly fever . .	38·4	7·7
Catarrhal jaundice .	2·4	0·5
V.D.	15·3	2·7
Diphtheria . .	2·6	—

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TABLE 84

Summary of Casualties due to Enemy Action treated in Medical Units. July–September 1942

	Hospital	Fd. Amb.
Army	45	27
R.A.F.	50	3
R.N. and M.N.	23	1
Others	6	—
Totals	124	31

TABLE 85

Summary of Casualties (Army only) due to Enemy Action and treated in Medical Units. July–September 1942

	Wounds			Deaths		
	Fd. Ambs.	Hospital	Total	Killed	Died of wounds	Totals
July	24	38	62	28	1	29
August	3	7	10	—	—	—
September	—	—	—	—	1	1
Totals	27	45	72	28	2	30

Wounded	45	Wounded since January, 1942	1,071
Died	2	Died since January, 1942	377
Total casualties	47	Total casualties	1,448

TABLE 86

Principal Diseases affecting the Troops. July–September 1942. *A.E.R./*1,000

	British	Maltese
Scabies	118·73	559·38
Sandfly fever	117·42	57·72
Dysentery	18·27	7·13
Infective jaundice	9·01	1·34
V.D.	13·52	2·28
Diphtheria	2·13	—
Enteric group	2·87	3·12

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TABLE 87

Principal Diseases. A.E.R./1,000. October–November 1942

	British	Maltese
Scabies . . .	50·64	395·20
Dysentery . .	22·72	5·29
Infective hepatitis .	27·74	2·85
Diphtheria . .	1·91	—
Enteric group .	0·48	2·03
V.D. . . .	11·71	2·03

TABLE 88

Anterior Poliomyelitis. January–March 1943

	Army	R.A.F.	R.N.	Families	Totals
January .	18	17	—	6	41
February .	—	2	—	—	2
March .	5	1	1	—	7

Deaths 9

TABLE 89

Principal Diseases. January–March 1943

	U.K.	Maltese	R.A.F.	R.N.	P.C.	Women	Families	Totals
Sandfly fever .	4	4	3	1	—	—	—	12
Amoebic dysentery .	102	16	33	6	1	2	—	160
Dysentery (other forms)*	6	3	3	4	—	—	—	16
Infective hepatitis .	45	4	54	17	2	—	4	126
Diphtheria .	8	2	5	6	—	—	—	21
Enteric group .	3	—	6	2	—	—	—	11

* The high figures for amoebic dysentery are misleading. Very many of the cases were indefinite gastro-intestinal upset.

TABLE 90

Scabies. A.E.R./1,000. January–March 1943

	U.K.	Maltese	Pioneer Corps	Totals
January .	171	889	—	437
February .	81	822	—	585
March .	82	601	36	273

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TABLE 91

Principal Diseases affecting the Troops. June 1943

	U.K.	Maltese	Mauritian	Basuto	Palestinian	Totals
Undulant fever	—	8	—	—	—	8
Anterior poliomyelitis	1	—	—	—	—	1
Amoebic dysentery	—	2	1	—	—	3
Dysentery (other forms)	32	6	1	—	—	39
Infective hepatitis	16	1	5	1	—	23
Malaria:						
Primary	1	—	—	—	1	2
Relapse	4	—	5	—	1	10
Scabies A.E.R./1,000	36	256	96	30	75	493
Sandfly fever A.E.R./1,000	61	20	30	42	56	209

Since all the battle casualties were the result of bombardment from the air the following figures may be of some interest:

TABLE 92

A. A series of 209 *Casualties* (124 *serious,* 25 *deaths,* 85 *slight*)

Head	26
Eyes	9
Chest	7
Abdomen	3
Bones and joints	34
Wounds of muscles, tendons; bruises and contusions	124
Burns	6

Agencies causing the injuries:	
Bomb splinters	45
Shell splinters	3
Falling masonry	127
Glass	21
Burns	6
Blast	7

B. A series of 69 *Persons Killed Outright*

Bomb splinters	12
Blast shock and/or asphyxia	26
Falling masonry	19
Burns	12

C. A series of 674 *Battle Casualties in Hospital over a Period of Six Months*

Died in hospital	9 per cent.
Invalided	7 ,, ,,
Returned to full duty	48 ,, ,,
Returned to light duty	21 ,, ,,
Remaining	15 ,, ,,

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D. A series of 826 Casualties

Head, slight	65
Head, serious	43
Neck, slight	5
Neck, serious	3
Spine, not involving C.N.S.	7
Spine, involving C.N.S.	8
Face and jaws, slight	30
Face and jaws, serious	12
Eyes	16
Chest, pleura involved	32
Abdomen, peritoneum or viscera	13
Trunk, not peritoneum or viscera	50
Limbs, not serious	153
Limbs, serious	35
External genitalia	1
Multiple flesh, not serious	70
Burns, slight	23
Burns, serious	10
Blast	42
Amputation before admission	19
Fractures:	
Humerus	12
Forearm	31
Femur	18
Tibia	22
Fibia	8
Carpus—hand	9
Os calcis	2
Foot	13
Others	15
Joints:	
Shoulder	6
Elbow	3
Hip	1
Knee	8
Ankle	9
Miscellaneous	32

PSYCHIATRIC CASUALTIES*

The conditions in Malta in 1941 and 1942 were such as to expose even the most stout-hearted among its garrison to the risk of breakdown. Violence continually descended from the skies and, save for the gunners and the fighter pilots, there was no means of retaliation. It had to be endured. To the endurance and to the resilience of everyone there is a limit; no wonder then that anxiety neurosis, though not labelled as such, came to figure largely among the causes of sickness.

In May 1942, at the request of Malta Command, the addition to the war establishment for Malta of a specialist psychiatrist was officially approved by War Office. One such was sent out in June from the United Kingdom, but having reached the Middle East, he stayed there, D.D.M.S. Malta stating that he was not wanted. In Malta an officer serving as a medical specialist was appointed acting command psychiatrist and two other medical specialists as area psychiatrists. Indeed it was not until May 1943 that a specialist psychiatrist joined Malta Command. The official attitude in Malta during the period of the siege seems to have been based on the view that, when there is no escape from danger, there are no psychiatric casualties, or at least very few.

It is of interest to note therefore that soon after the air raids began in 1941, the medical specialists found that some 60 per cent. of all the patients they were seeing were primarily psychiatric cases. The medical specialist who had been appointed to act as the command psychiatrist suggested that an adequate survey should be made in an attempt to assess the state of health of the troops and that a rest centre should be established where the over-strained might rest and recuperate. These suggestions were not accepted. Later he reported that as the strain of the siege increased, mental backwardness came to be more in evidence

* *See also* R.A.F. Medical Service, Vol. III, Chapter 6.

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among the out-patients who were seeking escape from the intolerable in sickness and in military crime. Indeed, he came to recognise that approximately 50 per cent. of all these out-patients showed evidence of some major psychiatric disorder. In his opinion at least 25 per cent. of the garrison displayed a response to aerial attack in March 1942 that bordered upon the pathological. By the end of April the proportion, in his considered opinion, had increased.

This state of affairs was known to others besides the members of the medical services. But there was in Malta at this time, as elsewhere, a difference of opinion concerning the best methods of dealing with the progressive demoralisation that comes to an individual taxed beyond his endurance. There were representatives of the 'tough' school which holds that the expression of fear in any form is a display of cowardice and should be treated as such. And there were representatives of the 'compassionate' school that holds that fear is a normal, healthy, and reasonable reaction to danger, that it should not be suppressed, that in the intelligent and educated individual it can be diminished and controlled through the proffering of sympathetic, understanding, prophylactic help of a skilled kind and that to regard anxiety as a form of cowardice and of military crime is not only useless but thoroughly mistaken.

In Malta at this time the first of these opinions prevailed as is revealed by a notice* that was posted in all gun sites in March 1942, when the bombing was at its peak. This indicates clearly that the seriousness of the situation was recognised and also that there was a profound misconception concerning the kind of contribution that the good psychiatrist can make to the maintenance of morale and to the conservation of man-power.

In June 1943 the Consulting Psychiatrist to the Army visited Malta and prepared the way for the Command Psychiatrist who reached Malta in July. The latter at once organised an efficient psychiatric centre of 60 beds to serve the Navy, the Army and the Air Force. During 1944 the amount of psychiatric work decreased considerably and at the beginning of 1945, in view of the shortage of Army psychiatrists in other theatres, the command psychiatrist was transferred to C.M.F. and was replaced by a Royal Navy psychiatrist.

* 'Fear is the weapon which the enemy employs to sabotage morale.

Anxiety neurosis is the term used by the medical profession to commercialise fear.

Anxiety neurosis is a misnomer which makes "cold feet" appear respectable.

To give way to fear is to surrender to the enemy attack on your morale.

To admit an anxiety neurosis is to admit a state of fear which is either unreasonable or has no origin in your conception of duty as a soldier.

If you are a man you will not permit your self-respect to admit an anxiety neurosis or to show fear.

Do not confuse fear with prudence or impulsive action with bravery.

Safety first is the worst of principles.

In civil life anxiety neurosis will put you "on the club". In battle it brings you a bayonet in the bottom and a billet in a prisoner-of-war camp.'

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