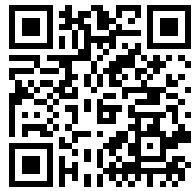

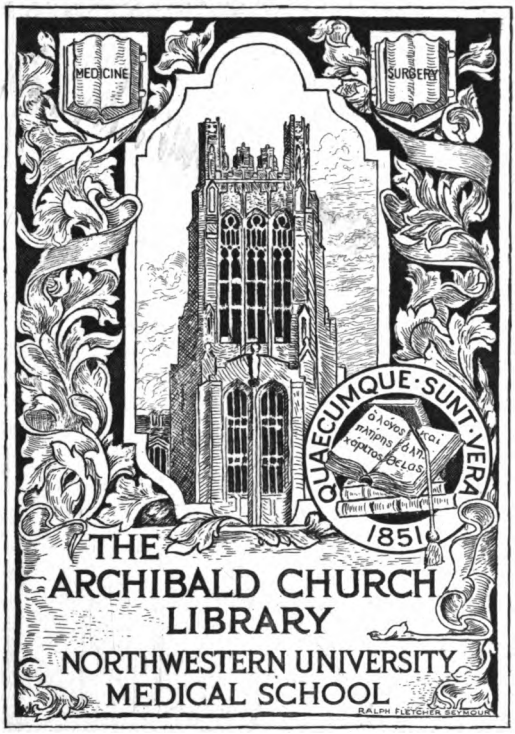

HISTORY OF THE SECOND WORLD WAR

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.

THE CIVILIAN HEALTH AND MEDICAL SERVICES

EDITED BY
SIR ARTHUR SALUSBURY MACNALTY
K.C.B., M.A., M.D., F.R.C.P., F.R.C.S.

VOLUME II

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Public Health in Northern Ireland

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PREFACE

THIS is Volume II of The Civilian Health and Medical Services in the Official Medical History of the War.

Its scope is world-wide, Part I being devoted to these Services in the Colonies; Part II deals with the Medical Services of the Ministry of Pensions; Part III gives an account of Public Health in Scotland; and Part IV is concerned with Public Health in Northern Ireland.

Chapter 1 of Part I treats of the general measures adopted by the Colonial Services during the war and is based on the medical chapters of a report by Sir John Shuckburgh to the Colonial Office.

There have been several epic sieges of Malta in History, but none surpasses that of the Second World War. Professor A. V. Bernard's admirable narrative in Chapter 2 describes how the medical services of the Island, though often assailed and faced with the perils and dangers of war, performed their duties nobly and efficiently—doctors, nurses and patients all played an heroic part—while to the casualties of war was added an epidemic of acute poliomyelitis. This chapter not only teaches many medical lessons gained in circumstances of unprecedented difficulty, but reveals how the spirit of man may overcome and assuage the horrors of totalitarian warfare. In Hong Kong and Malaya (Chapters 3 and 4), the outcome of the war was tragic and embittered by the rigours of enemy occupation. The narratives of Sir Selwyn Selwyn-Clarke and Dr. R. B. MacGregor show how the members of the medical services were animated by the fervour to prevent disease, to save human life and to treat patients in the irksome conditions of prison camps, although deprived of adequate nutrition and of necessary drugs and equipment. They were faced with deficiency diseases and with the perpetual shadow of torture and death overhanging them as 'suspects' concerned with the underground movement. After much tribulation, the ultimate victory of the Allies brought a happy ending for some of the leaders in the struggle, including the authors of these two important narratives.

Interesting and noteworthy accounts of public health administration under war conditions in North Borneo, British Somaliland, Palestine, Cyprus and Ceylon conclude Part I. Many problems of preventive medicine arose, in Palestine, for example, and Colonel Sir George Heron's account shows how they were met and overcome.

In Parts II, III and IV we return to the Civilian Health and Medical Services of the United Kingdom. In Part II, Dr. A. Sandison gives a valuable account of the Medical Services of the Ministry of Pensions. Dr. Sandison, who was concerned with the inception and organisation of these Services in the First World War, has seen them greatly extended and playing a most valuable part in the Second World War. That the countryside, as in past centuries, is no longer flooded with the distressing spectacle of crippled, blind and maimed persons, 'broken in the warres', is due to wise and farseeing legislation, guided by medical advice, which has enabled the Ministry of Pensions to perform its beneficent work.

Part III deals with Public Health in Scotland and shows that, while preserving certain independent features, the Department of Health for Scotland worked on similar lines to, and in close co-operation with, the Ministry of Health. The same happy co-operation is shown in Part IV, Public Health in Northern Ireland, although naturally here local conditions dictated more differences in planning and organisation than was the case in Scotland.

In both Scotland and Northern Ireland high standards of public health administration and work were maintained under war-time conditions and the health of the inhabitants not only remained satisfactory but improved. It was even found possible to make plans for post-war extensions and improvements in the contemplated National Health Services.

This volume has been prepared under the direction of an Editorial Board appointed by H.M. Government, but the Editor alone is responsible for the presentation of the facts and the opinions expressed.

ACKNOWLEDGEMENTS

In editing this work I have already expressed my indebtedness to the Colonial Office, Sir Andrew Davidson of the Department of Health for Scotland and Dr. J. Boyd of the Ministry of Health and Local Government in Northern Ireland, in the first volume.

In Part I, the Colonies, I am grateful to all the contributors of the different chapters, who after the strain and ordeal of nearly six years of war, nevertheless found time to write down the history of their own experiences when nearly all of them were already occupied with new work. Here I would again thank Sir John Shuckburgh for his kind co-operation.

In addition to writing the account of the Medical Services of the Ministry of Pensions in Part II, when engaged on other important duties, Dr. A. Sandison has kept in close touch with me and has closely co-operated in the work of the Medical History from its beginning. For this I express my thanks.

In Part III, Public Health in Scotland, in addition to Sir Andrew Davidson, much help has been received from Dr. Peters of the Department of Health for Scotland and Dr. A. K. Bowman, formerly of that Department. Dr. Bowman wrote the greater portion of Part III.

Sir John Parkinson, M.D., F.R.C.P., has kindly advised on certain questions relating to diseases of the heart in the Medical History. Finally, once more, I must express my thanks to Lt. Colonel C. L. Dunn for his help in the editing of this volume.

ARTHUR S. MACNALTY,
Editor-in-Chief.

PART I

The Colonies

INTRODUCTION

THIS section of the Medical History contains in Chapter I a short description of the pre-war organisation of the Medical Department of the Colonial Office, a summary of the general measures taken on the outbreak of war, and in the remaining chapters special accounts of the work of the medical departments of those Colonies which were attacked or invaded by the enemy or in which special action had to be taken in connexion with the war effort.

The principal territories directly affected by the war were Hong Kong, Malaya, Singapore and North Borneo, which were overrun by the Japanese, British Somaliland, which was occupied by the Italians, and Malta, which was subjected to heavy attacks by the enemy from the air. Palestine, Cyprus, Gibraltar and Ceylon also suffered from aerial attacks.

The accounts of the measures taken by the Civil Medical Authorities in these areas, and of the work done during attacks or occupation by the enemy, are of special interest.

CHAPTER 1
GENERAL MEASURES

Based on the medical chapters of a report to the Colonial Office by
SIR JOHN SHUCKBURGH
K.C.M.G., C.B.

PRE-WAR ORGANISATION

'UNTIL comparatively recent times', wrote Sir Charles Jeffries in 1938, 'the function of the medical services in the Colonies was primarily that of "garrison" services which existed mainly for the purpose of looking after the health of Government officials. But during the last thirty or forty years the Medical Departments have developed into highly organised State Public Health Services devoted to the prevention and cure of disease and the preservation of health amongst the general populations of the Colonies. It must be remembered that in these territories the Governments had, perforce, to undertake tasks which in this country were carried out by voluntary organisations, by private enterprise or by local and municipal authorities. In many areas of the Colonial Empire it was the Government alone which was in a position to erect and maintain hospitals and to organise public health activities. Not only this, but in all except a comparatively few centres, where there were sufficient inducements to private practitioners to establish themselves, there would be no medical attention available for the public were it not for the presence of the Government medical staff.'

When the war broke out every Colonial Government possessed a separate medical department, presided over by a senior medical officer who was known in most Colonies as the Director of Medical Services. The strength of the Department varied widely with the size and importance of the Colony concerned and in some cases, Nigeria for example, it reached considerable dimensions. Every Colonial Medical Department included an establishment of District Medical Officers who served the needs of the several administrative areas, and many of them employed a considerable staff of specialists at headquarters or elsewhere. The process of unifying the various medical services (previously separate services attached to separate territories) into a single Colonial Medical Service was carried out before the war (1934).

At the Colonial Office in London the Secretary of State was advised by a Chief Medical Adviser (with an Assistant) and by a standing committee, known as the Colonial Advisory Medical Committee, which was largely unofficial in composition and contained a number of members of high standing in the medical profession. Other official or semi-official bodies which interested themselves, in a greater or lesser degree, in Colonial medical problems, were the Medical Research Council;

the Tropical Research Committee (an advisory body including representatives of the Medical Research Council, the Colonial Office, and the Liverpool, Edinburgh and London Schools of Tropical Medicine); the Bureau of Hygiene and Tropical Diseases, whose main function was the collection and dissemination of reliable information; and the Imperial Institute of Entomology, whose business was to encourage and co-ordinate entomological work in relation both to human and animal diseases and to agriculture. There were also other important unofficial organisations working along similar lines. The London School of Hygiene and Tropical Medicine and the Liverpool and Edinburgh Schools of Tropical Medicine provided admirable training grounds for Colonial workers and centres of research into a number of tropical health problems. The Liverpool School of Tropical Medicine maintained a laboratory at Freetown, Sierra Leone, whose Director also acted as consulting pathologist to the Sierra Leone Government. The results of the research or inquiries undertaken by these various bodies were freely at the disposal of Colonial Governments and their medical departments.

THE IMPACT OF THE WAR

The advent of war, as was inevitable, brought a series of new problems in its train. The nature of these problems was succinctly stated in an address delivered by Dr. A. G. Smart (Medical Adviser to the Colonial Office) on February 24, 1943, to the Royal Society of Tropical Medicine and Hygiene:

> 'Broadly, how have our difficulties arisen and what is their nature? From the personnel standpoint they are associated mainly with the fact that in war-time troops and other people go to intrinsically unhealthy places and that they themselves have acquired no immunity to tropical diseases and usually no previous experience of a tropical climate. Thus they are not knowledgeable in this sense and are unable to look after themselves properly. This at once creates a situation which is potentially dangerous and it may be aggravated by the fact that sometimes it is impossible, for security or other reasons, to make adequate preparation from a health standpoint for such people before their arrival. In addition to troops, which constitute the main group in this category, there may be persons shipwrecked from enemy action. Furthermore, there are civilian personnel which the exigencies of war have created, who are additional to the ordinary peace-time establishments. A little consideration of the territories to which such people have gone at once suggests possibilities for the dissemination of disease.
>
> 'While under peace conditions most of these territories can be reasonably controlled from the disease standpoint, the situation becomes at once altered with the imposition on these territories of what may be termed emergency factors.
>
> 'Another important matter is the great increase in rapid transit that has arisen out of the war. Not only is transport rapid, but people are

being constantly moved from one area to another. There may be persons (or insects) that are in some respect infective and hence constitute sources of disease. Thus areas that formerly were isolated, or comparatively isolated, either because of limitations of transport or for other reasons, have during the war been thrown together in one tremendous huddle. This shrinking of space applies not only to territories within a regional group, but to continents. We know that now it is a mere step from Africa to the American continents and the Caribbean Islands. Formerly the South West Pacific territories were comparatively isolated. Many of them were free from malaria and to a very great extent from other epidemic diseases. They are now no longer isolated and are exposed to such risks, either through material or persons carrying infection by sea or by air.'

The war not only introduced new problems, but seriously restricted the means of dealing with them. The vital question of man-power necessarily arose, and was, in fact, the dominating factor in the whole situation. Month by month, as the war continued, it became increasingly difficult to find personnel with the knowledge and experience necessary for dealing with particular tasks. The question of nutrition affords a useful illustration of the handicaps imposed by dwindling resources in man-power. At the outbreak of war plans were well under way for a comprehensive survey of the nutritional requirements of the whole Colonial Empire. One such survey was already at work in Nyasaland; another was due to start operations in Tanganyika; and a programme had been laid down which not only covered the rest of the East African dependencies but was eventually to be extended to territories still farther afield. The war intervened. The necessary technical staff was diverted to other activities and only the Nyasaland survey was actually carried out, but not to the full extent originally contemplated. Another instance related to Medical Research. In 1938 the establishment of a standing Medical Research Committee in East Africa had been recommended and approved by the various governments concerned. This committee met on a number of occasions and an organisation, which included the appointment of a Director of Research for East Africa, was finally approved, and secured a free grant under the Colonial Development Act, 1929. Because of the war the scheme could not be proceeded with. Shortage of personnel made itself felt in almost every quarter. At the beginning of the war, or shortly afterwards, a large number of officers in the Colonial Medical Service were seconded or released for military duties. In Africa alone the total amounted to nearly a quarter of the total establishment. The loss of these officers, many of whom possessed special qualifications or experience, had an effect upon the more specialised activities of the Medical Departments which it is unnecessary to emphasise.

Broadly speaking, the depleted medical staff was restricted to routine measures of medical administration during the earlier years of the war.

But this general statement is subject to some qualification. It was found possible to proceed with certain schemes that had been taken in hand before the outbreak of war, and even to initiate others which were regarded as of special urgency; such as a scheme put forward late in 1939 to investigate and control the occurrence of sleeping sickness in Sierra Leone; an investigation into the incidence of tuberculosis in the gold mines of the Gold Coast Colony; and an investigation into the possible production of a protective vaccine against the disease known as tropical or scrub typhus conducted, in the first instance, at the Institute of Medical Research at Kuala Lumpur in the Federated Malay States until the Japanese invasion, and afterwards continued with the assistance of the Australian authorities at the Commonwealth Serum Laboratory in Melbourne. In the West Indies considerable progress was made in a number of directions, thanks to the presence of the special organisation, under the Comptroller for Development and Welfare, which was set up in 1940 on the recommendation of a Royal Commission. Sir Rupert Briercliffe, formerly Director of Medical Services in Nigeria, was attached to the organisation from the outset as Medical Adviser.

LATER WAR-TIME DEVELOPMENTS

The later stages of the war witnessed a considerable increase of activity. Medical and Health Services, like other branches of Colonial administration, derived great benefit from the provisions of the Colonial Development and Welfare Act, 1940 (Cmd. 6422, 6457, 6532 and Parliamentary Paper 106). Of 156 'development and welfare' schemes approved under the Act during the first two years of its operation (July 1940–October 1942), 33 were classified under the heading 'Medical, public health and sanitation'; of 11 'Research' schemes, two fell into the same category. By March 31, 1944, the number of approved medical schemes had risen to 57; a year later it stood at 100, with an aggregate expenditure of £3,072,744, of which £28,468 was in respect of research. During the first two years the medical schemes approved under the Act related almost exclusively to the West Indies. Later the benefits of the Act were more widely distributed, and there was a heavy all-round increase of expenditure under the Act, from which medical schemes received their full share of benefit, large grants being made to Colonies in East and West Africa and in the Pacific Ocean.

From the above general account of the work of the Medical Departments of the Colonies in areas only indirectly affected by the war, it will be seen that, in spite of the shortage of medical personnel and supplies, there was in certain important particulars an acceleration rather than a slackening of effort in the provision for continuous advances in the prevention and cure of disease.

The large grants made available were used for the control of malaria, yellow fever and leprosy, to establish health units and health centres,

to expand and improve hospital accommodation, to provide better facilities for medical training in local schools and colleges and many other activities.

PARTICULAR DISEASES

Apart from the general measures mentioned above, the Colonial Office, with the close collaboration of the military authorities, naturally devoted special attention to the control of diseases prevalent in the tropics, and of venereal diseases in areas in which military formations were concentrated, such as West Africa, East Africa, Palestine, Ceylon and Malaya.

MALARIA

West Africa. Of special interest were the steps taken to control the incidence of malaria in West African ports and in ships calling at these ports. Early in 1940 disquieting reports were received of the increasing occurrence of malaria among the crews of ships calling at Freetown and other ports. As examples of the number of cases of malaria in ships in this area, 223 cases were reported in ships from Freetown in July and 227 in August. The course the war was taking compelled special attention to be paid to the control of malaria in these ports; since the Mediterranean route to Egypt and the Far East for the supply of munitions and personnel to the Forces had become unsafe for convoys because of attacks by enemy submarines and from the air after the entry of Italy into the war, the Cape route had to be adopted for this purpose. As a result, Freetown harbour, which on any day in peace-time might contain a mail steamer, a couple of cargo steamers, a collier or a tanker and a few launches and lighters lying off the front, now presented a totally different picture. This huge harbour was full and there might be upwards of 200 large ships at anchor at any time. These were of all classes—battleships, cruisers, destroyers, aircraft carriers, transport of different sizes crowded with troops, cargo vessels of many nations, colliers, tankers and a host of other craft—an amazing spectacle.

It was a situation which demanded immediate and successful action on an unprecedented scale, not only to protect the personnel in the ships but, as far as possible, to eradicate the breeding grounds of the anopheline mosquitoes in and around the ports. Not only had the crews of the ships and the naval and military personnel in transit to be protected, but also shore establishment of all kinds, especially those engaged in constructing and afterwards operating the large Air Force base for the air route across Africa to Egypt and North Africa, brought into being for the air transport of personnel and supplies required at the earliest possible moment.

It was therefore decided to send a special mission to West Africa to go into the whole question. Professor D. B. Blacklock, C.M.G., M.D.,

of the Liverpool School of Tropical Medicine, was invited, at short notice, to go to West Africa, and Dr. Carmichael Wilson, M.B., B.Ch., of the Colonial Medical Service, was deputed to accompany him. They reached Sierra Leone in September 1940. Dr. Blacklock was given the temporary rank of Surgeon Captain, R.N.V.R., and Dr. Wilson that of Surgeon Commander to facilitate their access to ships. Dr. Blacklock had already gained wide experience of malaria and the conditions in which it flourished in West Africa, but even he expressed concern at the magnitude of the problem.

However, the mission set about its task and as the result of the measures taken to implement the policy advised by Dr. Blacklock, namely, 'to neglect no means but to hit the anopheline with all we had got wherever found and in whatever stage of development', remarkable success in reducing the mosquito population, and consequently the incidence of malaria, was achieved. Dr. Blacklock acknowledged 'the ample supply of goodwill and co-operation—at first on the part of the Civil Director of Medical Services and, later, on the part of the Medical Officers of the Navy, Army and Air Force' without which such satisfactory results would not have been possible. The ports dealt with by the mission were Freetown, Bathurst, Takoradi, Lagos and Apapa, as well as a number of villages on the Bullom Shore.

Dr. Blacklock returned to England in October 1941, leaving Dr. Carmichael Wilson in charge of the operations.

In addition to anti-mosquito measures, prophylactic doses of mepacrine were issued to all personnel in ships from the time of their arrival in Freetown until several days after their departure.

Suppressive treatment was also given to all personnel in the shore establishments, and in Freetown most of the school children were also receiving this treatment. Dr. Blacklock paid a second visit to West Africa in the spring of 1944 and was able to report favourably on the results achieved in the campaign against malaria. He found the situation at Freetown greatly improved though it could not yet be described as a 'safe harbour from the mosquito-borne disease point of view, but that the port was fairly well in the way of becoming so'. Other West African ports, not all of them in British territory, needed more attention than Freetown.

He also referred to the difficulties in providing adequate protection for seamen and dealt with the question of protective measures in general and with the kind of discipline that would enable sailors to evade infection, and made specific recommendations for improving the anti-malaria organisation in the West African Colonies.

The Blacklock Report was communicated by the Secretary of State to the West African Governments in July 1944, with the result that appropriate steps were taken to implement the recommendations made to the greatest extent possible.

Far-reaching work was also done in West Africa by Muirhead Thomson, Gilroy, Ribbands and others in elucidating the problems of breeding of *Anopheles melas* and its control.

East Africa. During the period 1930–9, research units established by East African Governments had been engaged in studies of malaria, particularly in hyperendemic areas. On the outbreak of war, the specialised experience of malariologists and entomologists engaged in these investigations became available for military purposes and proved to be of great value in local operations. Some workers were seconded to the Army, where they played a leading part in the training of anti-malarial units for the task of controlling malaria under field conditions. Others, who were retained in their civil posts, rendered important services in a consultative capacity, their knowledge of local conditions being freely tapped by the military authorities. As a result, sickness rates due to malaria were kept at exceptionally low levels during the Abyssinia, Somaliland, Eritrea and Madagascar campaigns. D. Bagster Wilson—a Tanganyika Government malariologist who became consultant malariologist to the East Africa Command—Raper, Notley and other survey workers described the organisation and scientific experiences of their field units in a series of papers published in the *East African Medical Journal* between 1940 and 1945.

North Borneo. MacArthur in North Borneo worked on the malaria problem and was able to implicate *A. leucosphyrus*, a shade-haunting mosquito, and to show that control could be gained by opening up breeding grounds to sunlight. The papers dealing with this valuable work were hidden during the Japanese occupation and eventually dug up and recovered at the end of the war. An account of this appeared in the *Transactions of the Royal Society of Tropical Medicine and Hygiene*, and in the *Lancet*, July 27, 1946.

YELLOW FEVER

The work done on the control of yellow fever was of marked value to the war effort. The danger of the spread of yellow fever in Africa and to places outside presented a critical problem, especially with the extensive movement of Service aircraft. To delimit accurately the zone where yellow fever had occurred, intensive work was undertaken by the Rockefeller Yellow Fever Institute at Entebbe, and over 10,000 sera from residents of ten countries were examined. Findings showed that yellow fever had occurred recently in the Belgian Congo, Uganda, Anglo-Egyptian Sudan, Eritrea, Somaliland, Kenya and Northern Rhodesia. The disease had occurred as far east as the Red Sea coast of Eritrea and as far south as Balovale in Northern Rhodesia. When Italian Somaliland and Eritrea were occupied, surveys and control were undertaken at once. In Mogadishu (Italian Somaliland) incidence

was reduced from 85 per cent. to below 10 per cent. In Massawa (Eritrea) mass vaccination was done on a large scale (24,000 vaccinations).

In particular, the epidemic in the Nuba Mountains of the Sudan, in 1940, brought more clearly to the appreciation of medical officers and the Administration the threat from yellow fever to the East African ports, and after this epidemic the Kenya Medical Department vaccinated the entire population in a ten-mile strip along the Kenya coast—well over 300,000 received protective inoculation.

After the isolation of the yellow fever virus in Bwamba County in Western Uganda, the medical department of Uganda conducted a large anti-yellow fever campaign in the Bwamba County and the Toro Districts to the east of Uganda. This was done to prevent the possible eastward spread of the disease. The number of people involved was about 125,000. It is of interest to note that six years later approximately 90 per cent. were still immune.

The research at this time of Mahaffy, Haddow and their colleagues in Uganda must be remembered, incriminating as they did new vectors of disease and establishing the monkey reservoirs.

The elaborate arrangements made for control of aerodromes, from the point of view of insect-borne disease, were largely founded on advice from entomologists and others in the Colonial Medical Service.

VENEREAL DISEASES

Special measures also had to be taken to meet the large increase in venereal disease, which is apparently inseparable from war-time conditions.

The increase was most marked at ports and in harbour areas and affected not only the transitory population but also the indigenous inhabitants of the areas concerned.

The problem assumed special importance in the West Indies owing to the influx of American military personnel in large numbers. The question came before the Anglo-American Caribbean Commission and a joint intensive campaign against the infective stages was undertaken. On the American side a complete team with first-class equipment was sent to the West Indies. Similarly in other areas in which troops were accommodated or in transit, special measures were put in force in collaboration with the military authorities with the view of minimising the spread of infection.

Apart from the above-mentioned diseases, no special measures were necessitated by the needs of the war but every effort was made to maintain the existing machinery for the control of tropical diseases in general and to apply to their control any new methods which had been found effective during the war.

DICHLOR-DIPHENYL-TRICHLORETHANE (D.D.T.)

One scientific development which was of the highest importance in campaigns against insect-borne diseases occurring during the war years, D.D.T., was not a new discovery; it was synthetised by Zeidler, a German research chemist, in 1874, but its insecticidal properties were only brought to light in 1940–2 by the Swiss firm of Geigy, who used it on agricultural insects in Switzerland. It was brought to the notice of the British and American authorities in 1942 and its properties proved on examination to be of a very high order. Unlike pyrethrum, it was found to be extremely stable; surfaces treated with it remained highly toxic to a very wide range of insects, including flies, lice and mosquitoes, for long periods. It was also comparatively innocuous to human beings and animals. Its persistence or residual effect was such a novelty among insecticides as to constitute a completely new departure in the technique of insect control. It was first used by the British Army for delousing in North Africa and Italy and with great effect to combat the outbreak of typhus in Naples in 1943. It was afterwards used with spectacular results to destroy mosquitoes in malarious areas by the British and Indian Armies in Burma and by the American and Australian Armies in the South West Pacific Campaigns.

The Colonial Office interested itself in the subject from the outset and as soon as supplies became available, experimental quantities were sent to the medical departments of a large number of colonies.

Large-scale trials were first carried out in British Guiana for the control of malaria, with highly gratifying results. From Ceylon reports showed that the use of D.D.T. had effected a marked reduction in the malarial infection rates in labour camps.

NUTRITION

Taking the Colonial Empire as a whole, the effects of the war upon nutrition were less serious than had been expected. In some cases enemy action had interfered with imports and brought general disturbance of economic conditions. The supply of rice, the staple diet of many colonial peoples, was gravely affected when Burma and other Far Eastern territories fell into enemy hands. Efforts to make up for the deficiency by importing wheat encountered difficulties, less through insufficiency of supplies than to the fact that rice-eaters were slow to accommodate themselves to a changed diet.

In this connexion it may be noted that military service and the greater familiarity with Western ideas had a marked effect in breaking down habits and prejudices. There were in some respects changes in dietetic habits brought about by the common Army rations. Conservatism in the African, for instance, has to some extent been broken down, while in Ceylon, where maize became unobtainable during the

war, the Ceylonese took readily to atta (wheat flour). It is to be expected that these changes brought about during the war will have a beneficial effect, in that a fuller and more balanced diet introduced through war's necessities will remain permanent and improve the general standard of nutrition among colonial peoples.

ADDITIONAL SERVICES IN RELATION TO THE WAR CARRIED OUT BY MEDICAL DEPARTMENTS IN EAST AFRICA

Military Medical Services. Each medical department organised, equipped and mobilised medical units recruited from members of the department of all races. These formed the nucleus of the East African Army Medical Corps (E.A.A.M.C.), which provided the first medical services for the Forces in the East African campaign, and members of which later served in Burma.

Medical Examination of Recruits. The medical examination of African recruits for combatant and labour forces was undertaken by the civil medical services and very large numbers of men were examined.

Hospital facilities for the Armed Forces. In many centres the Forces had no military provision for the care of in-patients and these were therefore provided for by the Government hospitals.

Co-operation with Medical Authorities of the Forces. In many cases civil Government M.Os. initiated or advised on various measures required by the Forces, e.g. hospital accommodation, surgical facilities, public health measures in relation to cantonments, aerodromes and the like.

Civil Defence. The medical departments contributed largely to the casualty services of the Civil Defence organisations developed in a number of key-centres, especially ports. Many of the medical officers took part in the training and organisation of these services.

Prisoners-of-war and Interned Persons. The housing and health of prisoners-of-war and the hygiene of their camps provided problems for the medical departments: when these camps were finally organised there were usually doctors among the internees who were made responsible for the immediate medical care of the camp, but in fact the health organisation was usually under the control of the local health officers.

Refugees. The arrival of large numbers of Polish and Greek refugees from the Middle East into East Africa involved arrangements for the provision of camps and medical facilities on a large scale, and introduced new public health problems; the medical departments were concerned with providing the facilities mentioned in the previous paragraph, and were usually assisted by volunteers from local agencies such as the Order of St. John and the British Red Cross Society.

Supplies. War-time conditions having curtailed or completely stopped supplies of many medical stores, especially drugs, comforts and

dressings, efforts were made to procure as much material as possible locally, and research was instituted into means of making the best use of local products. An example of this was the 'totaquina' factory developed in Dar-es-Salaam and supplied with locally grown cinchona. A committee was formed eventually for East Africa to develop local substitutes for as many imported products as possible, and much useful work was done in the chemical laboratories of the medical departments. These laboratories also contributed to the important work of assessing dietary scales for combatant and labour forces, prisoners, refugees and the like. A number of colonies increased production of biological products (e.g. vaccine lymph and T.A.B. vaccine) for the large military and civil demands.

Training. Increased departmental liabilities and staff shortages as a result of the war brought about considerable extensions of the training of Africans in several directions, so that more of them could be employed as medical auxiliaries, e.g. hospital assistants, sanitary inspectors, orderlies and nurses, and laboratory assistants.

Large numbers of persons of all races were also trained by Government departments and voluntary bodies in medical measures directly related to the war, e.g. first aid, home nursing and civil defence work generally.

In many respects, the services rendered by the Medical Departments of the Colonial Office in East Africa were also freely made available to the Military Authorities in the West African Colonies.

CHAPTER 2

MALTA, G.C.

1940–1945

THIS account of the impact of the war on the civil population of Malta has been prepared by Professor A. V. Bernard, C.M.G., C.B.E., M.D., who was Chief Medical Officer of the Government of the Island throughout the whole period of hostilities. He was thus chiefly responsible for the organisation and administration of the Medical and Sanitary Services to enable them to cope with war casualties and the increased mortality and morbidity among the civil population due to malnutrition and the disruption of the normal mode of life.

TOPOGRAPHICAL AND DEMOGRAPHIC CONSIDERATIONS

'Malta and its Dependencies' is the official designation of a group of small islands situated in the Mediterranean Sea practically halfway between Gibraltar and Egypt. The group is 60 miles from the nearest point of Sicily and about 180 miles from the North African coast. Malta, the largest island, is about 17 miles long and 9 miles in extreme width; its area is just under 95 square miles. Gozo, a much smaller island, 27 square miles in extent, stands 2½ miles to the north-west of Malta, and between the two there is the tiny islet of Comino, 1 square mile in area.

The estimated population on December 31, 1939, was: Malta, 241,460; Gozo, 29,295, including about 50 persons living on Comino; total 270,755. Malta is therefore the most densely populated country in the world—2,545 per square mile. The density of the population in Gozo, however, is only 1,086 per square mile.

From the war point of view these figures are of special significance. Situated at a distance only a few minutes, as the bomber flies, from the nearest enemy country, the Maltese Islands were specially liable to frequent and sudden attacks from the air, besides the possibility of naval bombardment. Their restricted area and the density of the population ruled out the possibility of any dispersal to really safe areas within Malta itself, which, with its harbours, dockyard, fortifications, aerodromes and other military establishments (to be increased in number as the war went on) scattered all over the Island, bristled with legitimate targets for the enemy. An elaborate evacuation scheme had been prepared to provide for the transfer of the people residing in the towns around the harbours to other areas, but the scheme was never in fact put into effect. It was to apply especially to the inhabitants of the towns in the immediate vicinity of the naval dockyard, namely Vittoriosa, Senglea and Cospicua. What happened here may best be

gleaned from the following paragraph extracted from the Admiralty Official Account of the Naval War in the Mediterranean:

> 'When the raids began, however, and death and destruction rained down from Italian bombers upon Vittoriosa, Senglea and Cospicua (the Parish Priest of Senglea paced the main street at the height of the raids reading his Office, to calm and fortify his flock), 80,000 of the inhabitants rose up and evacuated themselves to friends and relations of their own choosing. They did it in 24 hours without panic or confusion, and it is said that wherever they went, crowding into the tiny stone cottages already full almost to capacity in the scorching heat of Malta's summer, they were received in the name of Christ the Compassionate by their friends; moreover, there is no recorded instance of profiteering or of advantage being taken of them in their plight. In this fashion Malta "took it".' (*East of Malta—West of Suez*, H.M. Stationery Office, 1943.)

Migration on a much smaller scale also took place from Valletta and other towns adjacent to the harbours to the interior of the Island, but many of these refugees returned to their homes, even to the dockyard areas, during the lull in the raids that occurred in the autumn of 1940. A general exodus of the populations of these areas took place later when the Luftwaffe started the intensive period of raids in January 1941. A number of people, estimated at about 3,000, went to Gozo, which being practically free from military objectives, was considered a 'safe' area. A few bombs, however, fell even on this island and caused some casualties. A certain number of families of Service men were evacuated to the United Kingdom before the war started and during its early stages.

The transfer of such large numbers of people to the already crowded towns and villages of the central parts of the Island brought about a serious sanitary problem which will be referred to later.

PROTECTION AGAINST THE EFFECTS OF AIR RAIDS

Before the beginning of the war, the policy of the Air Raid Precautions Authorities was directed mainly against the dangers of gas attacks. The ordinary Maltese houses, being built entirely of stone, were considered to provide adequate protection against anything except direct hits. The showers of direct hits that eventually came were not expected.

In A.R.P. Circular No. 1 the Government in 1939 issued instructions in detail for the preparation of a refuge-room in houses which would be proof against gas and blast. The Circular also contained instructions for the provision of shelter trenches, and also the general precautions which should be observed during air raids or gas attacks.

The recommendations with regard to digging trenches could only apply to outlying villages as few houses around the harbours had gardens where a trench could be dug.

The only effective shelters against high-explosive shells were the tunnels running under the massive bastions constructed by the Knights

of St. John. There were several of these in Valletta but very few in the dockyard area. When the bombing raids started many people flocked to them with bedding and household utensils and filled them to capacity. As these tunnels had not been fitted for use as dormitory shelters, sanitary conditions soon became unsatisfactory and urgent steps had to be taken to provide remedies. Apart from these tunnels, other places earmarked as shelters were stone buildings of a massive type, mainly old churches, several of which, unfortunately, were eventually demolished or severely damaged with fatal or serious consequences to people who had taken refuge in them. When the war started, basements or ground-floor rooms or spaces under the stone staircases in houses were fitted with wooden props and sometimes ferro-concrete roofs, but many of these too shared the fate of the other shelters. Only at Senglea had the excavation of deep underground shelters been started before the outbreak of the war. When the results of the first year's bombing showed the ineffectiveness of surface shelters, there was a big outcry for the provision of underground rock shelters, and, eventually, the excavation of such shelters was taken up on a large scale, a considerable amount of money being contributed for the purpose by the Imperial Government. The soft limestone of the Maltese soil is easy to dig and a considerable number of these shelters was ready by the time of the intensive bombing of 1942.

The hospitals did not receive priority in the provision of underground shelters and some of them were still without this protection when the war ended.

SCHEME FOR ESTABLISHMENT OF EMERGENCY MEDICAL SERVICES

Hospitals. Before the war the Health and Medical Services of Malta were the responsibility of two departments: the 'Public Health Department' under the Chief Government Medical Officer, and the 'Charitable Institutions Department' under a lay Controller, of which the hospitals and the district medical services formed part. In 1937 the hospitals and other medical services were amalgamated with the health services to form the 'Medical and Health Department' under the Chief Government Medical Officer.

The formulation of schemes to establish emergency hospitals and other medical services to operate in the event of war began in 1935, when Italy aroused apprehension by her attack on Abyssinia. In a letter dated October 14, 1935, the Secretary to Government stated that His Excellency the Governor had decided that the Chief Government Medical Officer's Assistant, Professor A. V. Bernard, should be in charge of the provision and organisation of hospital accommodation for civilian casualties in time of war. Steps were immediately taken to inspect buildings likely to prove suitable for adaptation as additional

hospitals, to prepare lists of furniture, bedding, clothing and all other requisites for such hospitals as well as of reserve supplies of drugs, vaccines and sera and other medical and surgical equipment, including clothing and other equipment necessitated by the menace of gas warfare.

All these materials had to be ordered from the United Kingdom; and the scale on which the order should be placed became, in view of the expenditure involved, the object of considerable discussion.

It was eventually agreed that furniture, including beds and bedding, should be obtained for 500 beds, but that drugs, vaccines, dressings and other surgical and medical requisites were to be provided for 2,000 beds.

The blockade of the Island lasted longer than had been expected, but small replenishments were delivered throughout the siege, and it was only by making use of the equipment ordered in 1935 that the hospitals and chemists' shops could be kept supplied with essential requirements until relief came. These stores were received in 1937 and kept in reserve, as were additional sera and vaccines obtained when the war became imminent. As a precaution against the destruction of large quantities of these supplies at one blow they were divided up and distributed for storage in the several departmental establishments throughout Malta and Gozo.

It was agreed that additional beds and other furniture would, in case of war, be obtained by local purchase and this was done when it became evident that war was inevitable.

For adaptation as emergency hospitals, boarding schools were selected whenever possible because they were easier to convert into hospitals.

The main plan was to have casualty hospitals suitably sited to serve the areas which were expected to be more heavily attacked, and base hospitals in safer areas to which casualties requiring prolonged treatment could be transferred. Three institutions of each type were fitted up when war was near. A number of other buildings were earmarked for similar use in case of necessity.

Thus 2,000 beds in addition to the beds in normal hospitals could be brought into use should circumstances have made this necessary, but fortunately this contingency never arose.

It may be interesting to quote the estimates which had been formed in 1935 of the number of beds required for casualties likely to occur in Malta from the scale of attack which, it was assumed, would occur:

	For Valletta & the Three Cities		For the Neighbouring Towns	
	Casualty Clearing Hospitals	Base Hospitals	Casualty Clearing Hospitals	Base Hospitals
At the start ..	700	350	600	300
By the 7th day	1,050	700	900	600
By the 14th day	1,400	2,100	1,200	1,800

The provision of beds on this scale was quite impracticable and was not attempted.

In 1937, Professor Bernard was appointed Chief Government Medical Officer and became therefore responsible for the whole medical organisation.

The normal hospital organisation of the Island was adapted to include the treatment of casualties. It was kept as fluid as possible, so that quick alterations could be effected to meet changes that might develop in the course of the war, and was thus able to cater successfully for all requirements brought about even by unexpected conditions.

Some departments of the ordinary hospitals were transferred to improvised establishments, and these hospitals were used for emergency requirements. A number of patients from the Mental Hospital and the Chronic Sick Hospital were transferred to hospitals in Gozo.

Hospital accommodation was found for minor cases of illness, which in ordinary times would not have required admission to hospital, but which could not be allowed to remain in dormitory shelters or refugee centres. Accommodation was also provided for a large number of aged and chronic sick who would normally not have required admission into an institution, but who, on account of the evacuation, or overcrowding and other conditions brought about by the war, could not conveniently stay with their families. Special wards for this purpose were prepared in certain hospitals and two emergency establishments for the same purpose were set up, one at the Archbishop's Seminary in Notabile, and the other, administered by the Education Department, in a school at Qormi. The inmates of the Chronic Sick Hospital were eventually all transferred to Gozo, and were accommodated at the Seminary and other institutions kindly placed at the disposal of the Government by the Bishop of that Island.

An emergency maternity hospital of 100 beds was established in a large wing of an orphanage (Cini's Institute) at Hamrun, which was still in course of construction when Italy declared war. Authority to pay a grant towards the completion of the structural works was obtained from Government on May 31, 1940, and the adaptation and equipping were rapidly pressed forward. The first ward was opened on June 19. The maternity department of the General Hospital consisted of 16 beds, but it was expected that more beds would be needed in the event of war. This hospital proved of great value; mothers of all classes sought admission to it and it was practically always full. It was the first hospital to be provided with an underground shelter which included a labour ward and an operation room.

Later on, maternity cubicles were provided in bomb-proof underground shelters in several villages. A convenient part of a rock-shelter was segregated and suitably conditioned for the confinement of mothers who preferred to remain near their homes rather than go to hospital.

They were allowed to come in a few days before the confinement was expected and to remain for about a week after the event. They were attended by their own midwife or doctor, unless they chose free treatment by the district midwife or district medical officer. The scheme worked satisfactorily; it made many mothers happy and no cases of sepsis occurred.

Special wards had been prepared at the Mental Hospital for the reception of cases of war neurosis. As in Britain, few cases of this type occurred in Malta. The following extract from the report of the Medical Superintendent of the Mental Hospital for the year 1940 is of interest:

> 'In Malta, air raids and the conditions resulting from them, such as mass evacuations and the resulting overcrowding in certain areas, constant apprehension and fear of impending danger, violent death of relatives, etc., did not unfavourably affect the mental health of the general population. Panic and hysteria, mass and individual, were markedly absent. People soon learned how to judge and avoid danger, and the imaginative exaggerations of the populace gave way to reasonable and adequate adaptation to reality. Only certain psychopathic individuals, so easily prone to mental disorder, reacted unfavourably. On the other hand, sudden pre-occupation about realities proved beneficial in those cases where pre-occupation upon purely "neurotic" complaints was rife.
>
> 'As a result the number of general admissions during the year under review did not show the increase expected. Only 18 cases (ten males and eight females) out of a total of 178 general admissions showed a history of having been affected by air raids or other war conditions. Of these, nine had already suffered from a previous attack of mental disorder and as such may be considered as constitutionally predisposed. In seven other cases factors such as heredity, involutional period, influenza, avitaminosis, and anxiety about ill-health had also contributed to the onset of the attack. This leaves only two cases which could be definitely ascribed as due to the influence of air raids and war conditions.'

Safety Precautions in Hospitals. The lower storeys were protected from blast and splinters by the erection of sand-bag or stone barricades. Operating rooms and X-ray rooms were improvised in basements. The operating rooms were placed underground when rock shelters were constructed.

The principal casualty hospitals were provided with gas decontamination chambers near their entrances. Emergency electric lighting plants were installed for use in case the main system went out of action (as it frequently did). Batteries of water cisterns, fed from the piped water system, were fixed on the roofs of all hospitals to ensure that running water was always available when the main system failed. One or two wards in each hospital were made gas-proof. Arrangements for a black-out at night were of course made.

The black-and-white sign, distinctive of civil medical establishments which are not entitled to use the red cross, was painted across the roofs of all hospitals.

First-aid and Decontamination Centres. These were provided in the more vulnerable districts, namely: three in Valletta, one each in Floriana, Cospicua, Senglea, Pawla, Zabbar, Sliema, Msida, Hamrun and Marsa. The rest of the Island was served by mobile parties from a central headquarters. A mobile party was also established in Gozo. Each station had, besides first-aid and decontamination personnel, a rescue squad working under a lay superintendent. A medical officer was attached to each station. These stations were under the Air Raid Precautions Department, the Chief Government Medical Officer being responsible for co-ordinating all medical arrangements.

Besides the above, the District Dispensaries in towns and villages of Malta and Gozo were organised to work as first-aid stations and each had a medical officer and a district nurse and all necessary equipment. Additional doctors and nurses were engaged to serve those villages which normally depended on the services of the doctor and nurse of a neighbouring district. Additional district medical officers were allotted to the larger districts. Courses in first aid and home nursing were held in all districts for volunteers who intended to serve in case of need. A first-aid station was also established near the Grand Harbour in the charge of one of the Port Medical Officers.

Transport. In addition to the normal departmental ambulances, a number of omnibuses were adapted for use in the emergency and distributed among the casualty hospitals for the transfer of patients from one hospital to another when any institution became pressed for space or for other requirements. The A.R.P. Department had also a fleet of locally made ambulances and improvised omnibuses for the transport of casualties from incidents to the hospitals.

Disposal of the Dead. The remains of persons killed outright were transported to the mortuary of the General Hospital at Floriana. When this mortuary was demolished, an emergency mortuary was fitted out in the bombed part of the hospital itself. Bodies were also brought into the mortuary of the Bugeja Hospital at Hamrun. Each body was examined by a medical officer to ascertain, as far as possible, the actual cause of death.

The arrangements that had been planned for the mass burial of casualties had fortunately never to be put into effect. The remains of all casualties were buried in the existing cemeteries and to obviate frequent journeys to the principal cemetery of the Island which was exposed to frequent bombing and had suffered considerable damage, some disused cemeteries in country districts were re-opened for use. An emergency cemetery was also formed in the bombed part of the Mental Hospital at Attard, and in the bombed Parish Church of Senglea.

Further arrangements for the burial of the dead are mentioned in connexion with the scheme prepared for special attacks.

Organisation and Training of Medical and Other Personnel. To co-ordinate the requirements of the Naval, Military and Civil authorities, a register of civilian practitioners available for war work was formed by the Chief Government Medical Officer. Medical staff required for the armed forces, the A.R.P. centres, and the civil hospitals and dispensaries was drawn from those on this register. A form was sent to all civilian practitioners requesting them to say whether they would be ready to serve in an emergency and to state what special line of work they preferred and in which part of the Island it was most convenient for them to serve. Dental surgeons volunteered to serve as assistant surgeons in case of need and underwent special training. Their services were not required as such but during the war several dental surgeons held free clinics in different centres of the Island for the dental treatment of shelterers and refugees. Twenty-three medical students passed their final examination at the University in June 1940. The last *viva-voce* examination was in progress at the very hour that Italy declared war at 5 p.m. on June 10, 1940. The Secretary of the University had proposed that a batch of six students should be taken each afternoon from that date. This would have prolonged the examination to June 13 ; the Chairman of the Examining Board insisted that the examination should be finished in one day, and so an additional twenty-three medical men were ready for service when war was declared. They were distributed among the casualty and other hospitals that same evening and proved their value when casualties started coming in a few hours later.

The additional nursing staff required for the emergency hospitals was drawn from among the numerous volunteers, men and women, who had been undergoing training under the auspices of the St. John Ambulance Brigade and of the Women's Auxiliary Reserve in accordance with a scheme which Professor Bernard, as Chief Surgeon of the Brigade, had suggested in 1936.

In March 1939, meetings of all medical practitioners were held at the Governor's Palace and were addressed by His Excellency the Governor. The scheme that had been prepared for the establishment of the emergency medical services was explained to them and those present expressed general approval. Courses of lectures on the treatment of war wounds and of gas casualties were given to medical men, nurses and members of kindred professions by Professor P. P. Debono, M.D., F.R.C.S., Senior Surgeon, and Professor J. E. Debono, M.D., F.R.C.P., Physician, of the Central Hospital. Professor Bernard gave a series of lectures on 'Chemical Warfare' which, in view of the scarcity in Malta at that time of books on the subject, were printed and published. A pamphlet in Maltese on first aid for war casualties including gas injuries

was prepared by J. Galea, M.D., D.P.H., Medical Officer of Health, and distributed among the population.

All doctors and certain other categories were supplied with general service respirators, anti-gas gumboots and steel helmets. Anti-gas protective clothing was also available. The civilian duty respirator was issued to other personnel. The civil population were supplied with the ordinary 'civilian' type mask and 'anti-gas helmets' were provided for babies. Trials were carried out with these helmets on babies in the out-patient departments and it was found that generally speaking they were well tolerated.

All members of the Medical and Health Services wore arm-bands (on both arms) with the designation of their office, e.g. 'Medical', 'Nurse', 'Midwife', 'Sanitary Inspector', etc. Doctors' cars were specially labelled and were entitled to relative priority on certain routes.

OUTBREAK OF WAR

When war was declared on September 3, 1939, the scheme relative to the hospitals and other emergency medical services was not completely ready to be put into effect. Fortunately, Italy abstained from coming into the war at that time and so the preparations could be continued. When broadcasts from the Italian Radio made it clear that Italy was going to join Germany, it would have been wise to mobilise the medical services and provide at least a skeleton staff in the emergency hospitals. But optimism continued to prevail with regard to Italy's intentions, and it was only after Mussolini had broadcast his declaration of war that, at 6 p.m. on June 10, 1940, the following signal reached the Medical and Health Office. 'Get hospitals ready—war is coming in six hours' time'. That same evening three omnibuses were supplied and sent round the Island collecting doctors, nurses, dispensers and other personnel and delivering them at their places of work. By 3 a.m., June 11, the emergency hospitals were ready for action. Just four hours later, at 7 a.m., the first casualties were received after the first enemy air raid that occurred shortly before. There were seven more attacks on this day including a severe one in the evening and although the strain on the casualty hospitals was acute, as work had to be carried on all day and night, the services went on without a hitch.

The following chain of hospitals was functioning at this time:

CASUALTY HOSPITALS

The Central Hospital at Floriana. This was the normal general hospital of the Island. By transferring a proportion of the ordinary patients to the Bugeja Hospital at Hamrun 100 beds were made available for casualties from Valletta and Floriana.

The Bugeja Hospital at Hamrun. This building was a private technical school. It was taken over in September 1939 and altered for use as a

hospital for 150/200 beds. Originally intended for casualties from the central districts, it soon became the principal casualty hospital of the Island.

The Blue Sisters' Hospital at St. Julian's. A private hospital run by the Sisters of the Little Company of Mary. The top storey of the building housed the Children's War Memorial Hospital. The greater part of the hospital, including the children's wards, was taken over by the Government, a certain number of wards being retained by the nuns for accommodation of private patients. The children's wards were transferred to the ground floor of the Sacred Heart Convent (a girls' boarding school) close by. Beds for 150 casualties from Sliema and surrounding districts were available at this hospital.

The Mater Boni Consilii School at Pawla. A girls' boarding school of the Sisters of St. Joseph. It was adapted as a hospital with 200 beds shortly before the war broke out to serve as a casualty clearing station for the dockyard area.

Casualties occurring in Gozo were to be treated at the general hospital in that Island.

BASE HOSPITALS

St. Aloysius' College at Birkirkara, a boys' boarding school kept by the Jesuit Fathers, was made ready for 400 beds for male patients.

The Sacred Heart Convent at St. Julian's, a girls' boarding school, and the *Rosary School* attached to it, both kept by the Sisters of the Sacred Heart, were equipped with 400 beds for female patients.

On June 25, the hospital at Pawla was closed down as it had become untenable owing to repeated bombing of the district, and the population of the dockyard area had been considerably reduced. Bugeja Hospital became the principal casualty hospital and the hospital at St. Aloysius' College at Birkirkara was equipped for surgical work. Later, two surgical wards were set up at the Cini Orphanage, where the emergency maternity wards had been established. The Central and the Blue Sisters' Hospitals continued to serve the district in their immediate vicinity. The former had to be evacuated for a few days in May 1941, owing to extensive bomb damage but essential repairs were quickly carried out and casualty and other activities resumed, mainly in the basements. An underground shelter, which included an operation room, was provided later in the year.

MANAGEMENT OF CASUALTIES

The instructions issued to the medical officers attached to first-aid stations were that serious casualties should be sent to hospital with the least possible delay and that only the minimal treatment necessary to save life or to cope with urgent conditions was to be given in the centres or dispensaries. The patients were given, when time permitted, a

casualty card on which were to be noted the nature and degree of the injury, if morphia or anti-tetanic serum had been given, if a tourniquet had been applied, and if the case required priority of treatment for haemorrhage or other reasons. Anti-gas gangrene serum was only to be given in hospitals. Casualties occurring not far from an operating hospital were to be carried there direct.

Six surgical teams were formed, each consisting of a receiving medical officer, an operating surgeon, an anaesthetist and other medical and nursing staff under the general direction of Professor P. P. Debono. Each team had its headquarters in one of the casualty hospitals, but all teams were ready to move to other hospitals where work became heavier and further help was required.

On arrival at hospital, patients were admitted to the reception ward and examined by the receiving medical officer. From here, according to their condition, they were carried to the ordinary wards, or to the operating room, or to the resuscitation ward if they were not in a fit state for immediate operation.

Up-to-date equipment, surgical instruments and appliances, drugs, sera, etc., were provided in every hospital. A consignment of 'Tor Tilters' with all-metal stretchers (easy to decontaminate) reached Malta just before the war broke out. A 'Tor Tilter' can be used as a carrier, operating table and bed, and a patient once placed on it need not be moved either for operation or for putting to bed. They could be used as additional operating tables when casualties were heavy. They were useful in the posture treatment of shock because of their easy mechanism which allowed any degree of 'tilting' of the patient, warmth being also easily obtained by placing kerosene or other heaters under the carrier.

Blood Transfusion. Blood transfusions were given with whole blood when necessary and a call for volunteer donors was made when war was imminent. In many instances doctors and other members of the staff acted as donors. The blood of would-be donors was typed and registered. A 'blood bank' was formed. Dried human blood plasma reached Malta very soon after it was available in England. On a Monday evening a reference to this preparation was heard in the B.B.C. news. A wire was sent to the Colonial Office next morning asking for details and, thanks to the authorities in England, a consignment of a hundred bottles was delivered by air freight on the following Saturday. It was found useful and effective in suitable cases.

Wounds were dealt with in accordance with the latest approved methods, and developments in this direction were followed in spite of the fact that the delivery of medical periodicals was greatly delayed and for some time none at all were received. But copies of medical circulars issued in England were sent by air and broadcasts from radio stations were also useful. Essential drugs, such as the newer 'sulpha' compounds, reached the Island by air or submarine.

COURSE OF THE WAR

The number of raids was so large and they continued over such a long period that it would be wearisome to describe the consequences of each raid and its repercussions on the medical services. With the slight changes already mentioned the arrangements remained the same up to the end of the war. Some of the emergency hospitals remained in use up to 1948, because the old General Hospital had not yet been reconstructed and the New Hospital (St. Luke's) had not been completed.

From June 11, 1940, up to August 1944, 3,343 alerts were sounded and at least half of them were actual bombing attacks. The raids varied in severity and of course were very unevenly spread in time and space.

From the time Italy entered the war on June 11 to the end of the month, raids were frequent and casualties somewhat heavy, the 11th and the 26th of the month being the worst days. During July the raids diminished in frequency and people began to learn the art of taking cover ; casualties were much fewer during this month and during August there were only a few slight injuries. Some more casualties occurred in September, none at all in October, and during November and December only one serious case and a few slight injuries came under treatment.

In January 1941, the Luftwaffe started its series of attacks on the Island, beginning with the onslaught on the aircraft-carrier *Illustrious* which had limped into the Grand Harbour after receiving severe damage while at sea. From that date raids were of frequent occurrence and heavy casualties were sustained. After a relative lull during October and November, the German and the Italian Air Forces combined in an intensive series of assaults in an attempt to force the Island to capitulate by exhausting the defences and breaking the morale of the civil population, the Island being at that time completely cut off from any means of receiving reinforcements and replenishments of munitions, food, or any other essential requirements. From December 1941, to the end of 1942, attacks on all parts of the Island went on with little cessation. On some days alerts sounded without respite nearly twice round the clock, thus on March 8–9 alerts took up 21½ hours out of the 24. From December 2, 1941 to April 15, 1942, there was only one raidless day and only nine raidless nights. This 'prolonged and prodigious' bombardment, as Mr. Winston Churchill called it, reached its peak during March and April 1942. During April, 300 persons including 72 children under sixteen years of age, were killed ; 329, including 70 children, were seriously injured; and 305, including 62 children, were slightly injured. The following extract from *Malta Strikes Back* (Gale and Polden, Aldershot, 1945), by Major R. T. Gilchrist, Intelligence Officer of No. 231 Infantry Brigade which formed part of the Garrison of Malta during the blitz, gives an indication of the weight of the attacks:

'Here are the figures for bomb tonnages dropped on various places in Malta during the month of April (1942). The total tonnage is greater

than any monthly tonnage of bombs dropped on the United Kingdom at the height of the blitz:

Ta Kali	841	tons
Hal Far	750½	,,
Luqa	804½	,,
Kalafrana	196	,,
Dockyard	3,156½	,,
Elsewhere	980	,,
Total	6,728½	tons'

From June 1940 to the end of 1942, over 14,000 tons of bombs had fallen upon the 95 square miles of Malta (only a few bombs fell on Gozo); an average of 147 tons per square mile. These figures assume greater meaning when the high density of the population of the Island is kept in mind. The ordeal of both the defending forces and of the population was enhanced by the fact that during 1942 the reduced rations and other effects of the siege were bearing heavily on everybody.

During 1943, the casualties were very few: 27 killed, 47 seriously and 54 slightly injured.

The following is a summary of war casualties from June 11, 1940 to December 31, 1943:

	Men	Women	Children under Sixteen	Totals
Seriously Injured	872	538	436	1,846
Slightly Injured	908	528	496	1,932
Died of Wounds	158	69	69	296
Killed	520	353	317	1,190
Missing, presumed dead	25	11	18	54

The fatal cases represent 5·7 per 1,000 of the population. The high proportion of women and children testifies to the danger to which all sections of the population were exposed.

The greater part of the population suffered severe hardships. Besides the mental strain of the ever-present danger, the many disturbed nights, the lack of any real respite between one attack and the other during which meals and other necessities of life could be attended to in some quiet, the environmental conditions that ensued can more easily be imagined than described. Some 24,000 buildings were destroyed or damaged and people had to live in appallingly overcrowded houses, or in any part that remained just habitable in damaged houses, in tunnels, caves or underground excavations. A considerable number stayed on in their native town or village, however severely it may have been bombed, rather than accept accommodation elsewhere. They slept and prepared and ate their meals, washed, etc., as best they could, but preferred to stick to their 'homes' to be near their place of work, especially as means of public transport were very restricted. Other essential services also were interrupted. In the towns around the harbour, water had to be

brought in tanks and the gas supply failed completely. The electric current was interrupted for several months, when the central station was severely damaged, and even the warning sirens had to be worked by hand.

An index of the sufferings of the people is presented by the high mortality from general (not infectious) causes that reached its peak in 1942. In addition to the 1,092 killed by bombs, a further excess mortality of 1,067 was due to inanition and physical strain. In that year the death-rate in Malta rose to 32·5 per thousand and the infant mortality rate to 345·15 per thousand births.

DAMAGED HOSPITALS

Notwithstanding the difficulties of the times, the frequent arrest of essential services, the dislocation of routine due to the incessant alerts, and difficulties of transport and of obtaining supplies, all hospitals, even the severely damaged ones, managed to carry on and to give the patients adequate and efficient treatment and care. Only scarcity of food and of medical supplies during the acute period of the siege affected adversely the well-being and the comfort of hospital patients, as it did that of the population in general.

Several hospitals adjacent to aerodromes and other military objectives, thanks to a merciful providence, escaped with fewer casualties than might have been expected; possibly the black and white diagonal sign, painted on the roofs, which was unofficially recognised by belligerent countries as indicating a hospital or a national monument, afforded some protection.

Some instances of the experience of these hospitals may be recounted here:

> The Leprosy Hospital situated a few feet from No. 1 target (the Luqa Aerodrome) was plastered with bombs of all calibres. Fortunately, most of these fell in the gardens and other open spaces round the buildings and only once did a patient receive a slight wound in the forehead by a splinter that entered through the window of a ward. Soon after a rock shelter had been provided, however, a considerable part of the hospital was destroyed. No further casualties were caused.
>
> The Hospital for the Aged and Chronic Sick, situated just beyond the Leprosy Hospital, with a population of about 1,500, had a similar experience. The mortuary (there was not even a corpse there on that day) and other outbuildings were demolished and all the glass and woodwork of the wards was shattered. There were no fatal casualties. Three members of the staff and one of the inmates were wounded. When the inmates were evacuated to Gozo, the place was occupied by the R.A.F. and other Services. By the end of the war very few of the buildings of this institution were left standing.
>
> The Mental Hospital situated a few yards away from the other aerodrome (Ta Kali) was extensively damaged. Out of a total population of some 1,000 mental and other patients and staff, the casualties amounted

to six patients killed and sixteen injured. A Sister of Charity and two nurses were killed while trying to persuade a mental patient to go to shelter during a heavy raid. Another nurse was wounded.

The General Hospital at Floriana stands above a military barracks. By the end of the war a large part of the building had been destroyed, but it continued to function for casualties and for other purposes. No casualties whatever occurred among the staff or patients. One night (May 3/4, 1941) a parachute mine exploded on the building and destroyed the whole of the left wing. The damage stopped short at the first occupied ward on that side. The mortar from the walls was blown off, but the roof and the walls remained standing and the occupants were spared. Several casualties occurred in the barracks below.

The Isolation Hospital patients were, at the beginning of the war, removed from the Lazzaretto in Marsamuscetto Harbour, which was taken over by the Royal Navy. They were accommodated in the basement and ground floor of the new General Hospital (St. Luke's) which was still in course of construction. The site of this hospital is on a tongue of land in the centre of Marsamuscetto Harbour. It had numerous 'near misses', but only once was a direct hit received; one orderly was killed and a nurse, two orderlies and two patients were wounded.

The Bugeja Casualty Hospital at Hamrun, an area considered one of the safest in the Island until anti-aircraft batteries were set up in the vicinity, remained immune from serious damage, although some buildings on the opposite side of the road received direct hits. The only casualty was one medical officer injured. A bomb, not a heavy one, once fell on the hospital. It grazed the outer wall of a surgical ward and demolished the wash house balcony. If it had fallen just three feet further in, it would have passed through the roof and exploded inside the ward containing some twenty bedridden patients.

Bombs fell on the Emergency Maternity Hospital a short distance away from the Bugeja Hospital and also on other hospitals in Malta, but little damage and no serious casualties were caused. A large-calibre bomb, that made a crater some twenty feet deep, fell on the tennis court between the two buildings of the Sacred Heart Schools at St. Julian's used as emergency hospitals. Only blast damage was caused in the buildings and no casualties occurred.

ANTI-INVASION MEASURES

During the second year of the war (1941), schemes were prepared to ensure the continuation of medical and health services in the event of a special attack on the Island from the air or sea or both. It was expected that if such an attack occurred, communication between the towns and villages would become impossible or so difficult as to render impracticable, for some days at least, the replenishments of food and other essential supplies, the conveyance of the sick and wounded to the proper hospital and of the dead to the normal cemeteries.

The basic idea of the arrangements proposed was to have self-sufficient medical and sanitary services in each town and village.

Normally, each district had its medical and health unit composed of the District Medical Officer, the District Nurse and the District Sanitary Inspector. Midwives, subsidised by the Government, or private practitioners, were available in all districts. This staff in a special emergency would have been augmented by the enlistment of medical practitioners living in the district. To provide additional nursing help, orderlies, stretcher-bearers and others, volunteered to train for these duties in case their help was needed,

In those districts where a hospital of any sort existed, arrangements were made to enable it to admit sick or wounded of any kind, as well as maternity cases, until conditions allowed of their removal to the proper hospital. Special emergency hospitals were prepared and equipped in three villages in the outlying parts of the Island. In other towns and villages the sick and wounded would have been cared for in the hostels that had been set up for refugees. Rock shelters were prepared in the proximity of these places to which patients could be carried during attacks.

The District Dispensaries were provided with a reserve supply of surgical equipment, drugs, sera and other requisites for use in the emergency.

Arrangements were also made for the interment of the dead within each district, if removal to the normal cemeteries became impracticable. Disused cemeteries and, in the old cities, vaults of churches were to be used wherever possible.

SANITATION IN SHELTERS AND REFUGEE CENTRES

Some serious problems of sanitation confronted the Health Department in connexion with the movement of populations that took place when Malta came into the front line of the war. As already stated, in the danger areas large numbers of people established themselves in tunnels, basements, crypts of churches, caves, etc., and shelters which had been prepared for temporary occupation during air raids became residential quarters. In the reception areas, refugees for whom living space was not available with local residents had to be accommodated in schools, old churches, convents and similar places. In some of these places even the most essential sanitary requirements were lacking and in others the conveniences that existed were quite inadequate for the number of people that had come to live there. Overcrowding continually increased as more dwelling houses were demolished or damaged. With bad environmental conditions, such as inadequate ventilation, dampness, lack of sanitary conveniences, were coupled difficulties for personal and domestic washing, for cooking of meals, etc.

All the services of the Department were expanded to cope with the situation. A system of medical and sanitary surveillance was instituted both for dormitory shelters and for refugee centres, additional medical

officers, sanitary inspectors and district nurses being engaged for the purpose. A course of instruction for sanitary inspectors had been started in August 1939. The final examination took place in July 1940 and 22 candidates qualified. These young men were immediately taken on for temporary duty. A course for district nurses which had also been in progress during the year ended at the same time. Ten candidates qualified and were similarly employed.

Medical inspections took place daily, the children being specially paraded for the purpose. When conditions permitted, no new entrants were allowed into the dormitory shelters before medical inspection. The district nurses paid special attention to cleanliness and detection of verminous conditions. Practically all cases of sickness, especially infectious conditions, were sent to hospital, improvised wards being established for the purpose in emergency and other hospitals, while the more serious infections were sent to the isolation hospital. Vaccination against small-pox, diphtheria and typhoid was offered free. Talks on health matters were given in shelters and centres, and were also relayed by the 'rediffusion' service. Leaflets were distributed and posters exhibited referring to cleanliness, prevention of infection, etc. Special warnings were stencilled on the walls of shelters and refugee centres.

Water supply from the mains or from approved wells was provided in or near dormitory shelters and refugee centres. Ablution rooms with shower baths and rooms for washing of clothes were set up wherever possible. The disposal of excreta was provided for by pail systems or trenches at first, but water-closets connected with the sewers or with cesspits were later provided in most places. Places were set apart for cooking of food.

Ventilation in tunnels was improved by the use of electric fans. Electric lighting was introduced when feasible. Measures were taken to reduce dampness as far as possible, by drainage, by filling up fissures in the rock and in other ways, and where necessary floors were paved with impervious material or otherwise conditioned and drained.

Subsequently, wooden bunks were provided in many of these tunnels to replace the bedsteads and other odd furniture which had been brought in by the shelterers.

Cleanliness, both personal and environmental, was enforced as much as circumstances permitted. Anti-flea mixture (carbolic soap-emulsion) was applied to floors periodically. Naphthalene-pyrethrum powder was used for beds and bedding. Spraying of floors and walls with disinfectant and insecticide solutions was carried out systematically. Beddings were inspected frequently and insistence was made on their being taken out of the shelters for airing and sunning during the day.

Soup kitchens were instituted and Government pasteurised milk was distributed free to necessitous families among shelterers and refugees.

Regulations were enacted providing for the appointment of 'District Commissioners' in evacuation areas and 'Protection Officers' in reception areas to control the conditions arising out of these migrations of people. The regulations contained provisions for the control of shelters and refugee centres, for the appointment of additional sanitary inspectors and for enforcement of sanitation in these places. Health Officers were given power of entry into any building at any hour for the purpose of estimating and controlling the accommodation available, etc. Special regulations were also issued for the cleansing, purification or destruction of filthy or verminous articles and for the removal to a cleansing station of verminous persons.

MATERNITY AND INFANT HEALTH

The special accommodation and care provided for maternity cases have already been referred to. An ante-natal clinic functioned at the Emergency Maternity Hospital, under the direction of Professor J. Ellul, M.D., F.R.C.O.G., the Senior Accoucheur of the General Hospital.

The normal infant health services were intensified as far as circumstances permitted. The 'Mothers and Infants Health Association', a private organisation subsidised by the Government, continued its activities with only a short interruption during the acute stages of evacuation.

The Government services were expanded to meet the situation that arose. The number of health visitors was increased from 18 to 34, the additional staff being detailed mostly to look after families in dormitory shelters and refugee centres. They paid frequent visits to these places and gave advice to newly confined mothers relative to their own health and that of the baby. Babies that seemed to require medical attention were taken to the District Medical Officers, unless they were under the care of a private practitioner. Beds were always available in the emergency babies' wards set up at the Sacred Heart Convent under Professor J. E. Debono. These wards also admitted patients of the Children's War Memorial Hospital.

One of the Emergency Medical Officers (a child health specialist) was detailed for infant welfare work. He paid special attention to those districts where the highest mortality rates appeared. Dormitory shelters and refugee centres were visited frequently and instruction on the care of infants was given to mothers. Individual examination of babies was carried out and directions were given for treatment in hospital or at the district dispensaries as necessary. One or two clinics per week were held in each district. At every clinic instruction was given to all mothers who attended for the first time; infants were examined and mothers advised regarding the condition of the baby and its requirements; progress of cases was noted and errors of diet, etc., were corrected.

This doctor, Professor W. Ganado, M.D., M.R.C.P., D.P.H., also delivered a series of lectures to mothers, to midwives, and to District Nurses, which was repeated in eight separate areas. Emphasis was laid on the necessity of breast-feeding and its advantages over artificial feeding especially in the circumstances in which mothers found themselves at the time. Two talks on 'breast-feeding' and 'artificial feeding' were broadcast on the 'rediffusion' system.

Infant mortality rose concurrently with general mortality. The disturbance of normal family life and the bad personal and environmental conditions resulting from the prolonged bombing no doubt acted adversely on the health of babies and toddlers especially, but the factor that appears to have contributed most to the high increase of mortality in these age-groups was the lack of proper food. Although the supplies of tinned milk available (at one time almost all the goats and cows had been killed) were restricted to infants and women in the last stages of pregnancy, there was not enough to give an adequate ration to babies. No infants' foods were available and not enough dried milk, even if the latter could have been suitably prepared under the impossible conditions in which most families lived. Figures in Appendix A show the rise of mortality from 1940 to 1942 and the spectacular decline in mortality that took place in 1943. The primary reason for the latter can only be attributed to the easement in the food situation that followed the partial raising of the siege at the end of 1942. There had been no improvement in environmental conditions. From this experience, it is permissible to presume that feeding and other personal considerations are a much more important factor in relation to infant mortality than the state of environmental sanitation. The old dictum that 'the rate of infant mortality is an index of the state of sanitation of a place' appears to require reconsideration.

THE FOOD SITUATION

Normally, considerable reserves of food and other commodities are kept in this Island Fortress and further reserves were obtained in the period preceding the war. During the first months of the war, therefore, the supply of food and other essentials remained satisfactory. As the Island, which depends on import for the greater part of the necessities of life, became more and more isolated from the outside world, scarcity began to tell and the reserves had to be heavily drawn upon. Ultimately it was realised that conditions were such that attempts to run convoys to the Island either from the East or the West were doomed to disaster and that only small essential supplies could reach Malta by bomber or submarine, and by a small ship which occasionally succeeded in passing through the enemy lines. From the early months of 1942, Malta had to rely practically on its own resources. In March, three supply ships that had succeeded in running the blockade were destroyed in harbour from

the air. In June two convoys attempted to reach the Island, one from the West and one from the East. Of the one from the West only two ships survived the air and naval attacks to which the convoy was subjected on its way to Malta, and the one from the East was ordered to turn back, as it had no chance of getting through under the barrage of bombs it encountered between Crete and the African Coast. The following excerpts from a broadcast made by the Lieutenant-Governor on June 20, give an idea of the supply situation in Malta at that time:

'If the enemy failed in his main purpose, he succeeded in part of it. He has delayed part of our much-needed supplies. Greater privations than we have known hitherto lie ahead of us here. Fresh supplies will come to us. You need have no fear of that. But we do not know when they will come. We got about 15,000 tons of stores in the two ships that arrived. It is a very small part of what we had hoped for.

'I have come here this evening to tell you plainly what our arrangements are. And I shall tell you the worst.

'Small quantities of vitally necessary supplies can reach us from time to time without all the difficulties and dangers that running of a convoy involves. But though small additions to our stocks help us they cannot really change the situation.

'Our security depends more than on anything else on the time for which our bread will last. In examining our position we calculated first the time for which our bread could be made to last. That calculation gave us a certain date. I shall call it the Target Date. I cannot tell you what that date is, but it is far enough to give ample opportunity for fresh supplies to reach us before our present stocks run out. England will not forget us and her Navy and Air Forces will see us through.

'The bread ration will remain as it is. Sugar will remain as it is, except that there can be no issue for the first period in July and the second period in August. Our stocks of edible oil are low. An issue can only be made once in every three periods. Soap and kerosene are two other necessities of which our stocks will not last at their present rate of issue as long as our stock of bread. We can only make one issue of soap in the second period of every month, beginning in July. Kerosene, in our present situation, is the most difficult problem we have to face. We can only issue the present ration once in every two weeks instead of once a week. One issue of rice and coffee will be made in the first period of July. Tea will be issued during the second period of each month.

'I come now to the fodder problem. Our stock position is such that no fodder can in future be made available except for horses used for transport and in much smaller quantities for very young pigs and rabbits. It will thus become impossible to maintain a larger part of the population of goats and sheep and cows or grown pigs. The rest will gradually have to be killed off. The very great reduction of the goat population will bring about a great reduction of raw milk. The use of tinned milk is already restricted to young children and to women with child. Our intention is that pasteurised milk shall be limited to hospitals

and school children. As raw goat's milk disappears from the market there will be no milk for the adult population.

'A drastic reduction of our present consumption of petrol will also be necessary.'

In November, five ships came in but the bulk of the stores were retained 'to rebuild the exhausted stocks'. There was some increase in the people's rations but it was only in the following month that substantial all round improvements could be effected.

Soon after the war had started, rationing of certain commodities began. This was gradually extended to all items—food, fuel, soap, matches, cigarettes, and as the siege continued, the rations became more and more meagre. The rationing of bread caused the greatest hardship; bread is the staple article of diet of the Maltese and the ordinary workman usually consumed from two to three, sometimes four, pounds a day. When the ration came down to a pound a day, manual workers were gravely affected. Their womenfolk performed a '*beau geste*' which should not go unrecorded—they passed their own rations to the men! Besides the high extraction flour, potatoes and maize entered into the composition of the bread. By June 1942, the position had become very precarious—the caloric value of the diet became dangerously low and the protective constituents, fresh meat, eggs, milk, butter, were practically unobtainable. The people had to subsist mainly on vegetable soup, some tinned meat or fish, a little fat and oil, and beans. The fresh meat available, predominantly goat or horse, was reserved for the hospitals and milk strictly rationed to people who were seriously ill and to infants. Even the black market eventually dried up. Baby and invalid foods were unobtainable and the reserves of medical supplies dwindled to very low levels. To obtain an ointment from a chemist, one had to give up one's ration of fat.

To supplement the ordinary rations and to make practicable the rationing of vegetables, as well as to give a chance to people, who would otherwise have had to go without one, to obtain a hot meal of some kind on some days of the week, especially at their place of work (all restaurants and coffee shops having closed down), the Government set up 'Victory Kitchens' in all parts of Malta and Gozo. At first this meal was obtainable daily but the Sunday issue was eventually cut out.

The following is a typical menu served by these kitchens:

Monday	– Macaroni with tomato sauce
Tuesday	– Scrambled egg powder
Wednesday	– Vegetable stew or tinned herrings
Thursday	– Stewed meat (usually goatflesh)
Friday	– Vegetable stew or tinned herrings
Saturday	– Macaroni with tomato sauce

Unfortunately, the 'mass production' methods indulged in in these kitchens and other shortcomings offset much of the utility of the

organisation but, at the time when hunger was being keenly felt, many people were thankful for this daily meal.

The following represents the average scale of rations per head that ruled during 1942:

Bread – Under one pound per day
Sugar – One pound per month
Edible Oil – Occasionally
Macaroni – One pound per month
Fats – One pound per month
Tinned meat– Half a tin
Tinned fish – Half a small tin
Cheese – Fourth of a pound per month
Tea – Eighth of a pound per month
Coffee – Fourth of a pound per month
Kerosene (for heating) – Half a gallon per month
Laundry Soap – Half a bar occasionally.

Later in the year, small amounts of powdered milk, dried eggs and chocolate were added.

The number of calories available from these diets per person per head with the later additions, were as follows:

Bread—819 calories for males between 16 and 60 years of age, and 670 calories for females and others.

Other rations—434 calories.

Victory Kitchen meals—261 calories.

Total—1,514 calories for adult males (16 to 60 years), and 1,365 calories for women and others.

In February 1943, the caloric value of the diet rose to 2,536 for adult males and to 2,060 for women and others. By this time two supplementary issues of milk were made for infants and children up to seven years. In April, a 'Child Feeding Scheme' for children over seven years was brought into operation; it was first started in the Government schools and later on extended to all other schools. For a nominal charge of one penny per day, milk or vegetable stew or macaroni soup and a biscuit with jam was issued to the children on six days a week. The rapid and sustained improvement in the health of the people that immediately followed the improvement of the diet is strikingly shown by the figures in Appendix A.

MORBIDITY AND MORTALITY

A rise in mortality among infants and old people manifested itself during the very first months after the war reached Malta. In fact the general death rate and the infant mortality rate rose to 22·69 and 276·45 in 1940 from 19·95 and 226·98 respectively in 1939. A further increase in mortality occurred in 1941 and a climax in 1942, when the general death rate reached the tragic figure of 31·97 per thousand and the infant

mortality rate that of 345·15 per thousand births. These increases in mortality were due predominantly to the physical discomforts and hardships the people had to endure. They reached their peak, in fact, during 1942, when the bombing was at its worst, and had produced intolerable living conditions, while the acute food shortage pressed heavily upon the physical resistance of the people. In that year the number of deaths exceeded that of 1941 by 2,159. Of these, 1,092 were bomb casualties. The balance of this excess must be ascribed to physical strain and inanition and was registered principally under diseases of the heart and arteries, cerebral haemorrhage, chronic nephritis and diabetes, and under 'congenital debility' in the case of infants.

In 1942, too, the birth rate, which on account of the disturbance of family life due to war conditions had been on the decrease since 1940, reached the low level of 25·15 from an average of 33 per *mille* in pre-war years. This combination of high mortality and low natality led to an actual decrement of life of 1,835 (Appendix A).

WAR DISEASES

Tuberculosis. Infectious diseases played little part in the increase of mortality except perhaps in the case of tuberculosis. This disease, which had increased in all countries subject to the trials of total war, could not but assume threatening proportions under the conditions that prevailed in Malta. The increase occurred both in respiratory and in other forms of the disease. The yearly incidence from 1937 to 1944 is shown in Appendix B. It will be noted that a rapid improvement set in, especially in 'other forms' as soon as the food situation improved after 1942. It presents a picture very similar to that of the incidence in England and Wales.

Enteric Fever. There was a sharp outbreak of enteric fever in 1942, attributed to living conditions that favoured the spread of this infection and to the irrigation of fields with crude sewage for the purpose of increasing the food supply. At that time, the incidence of the disease was high all along the Mediterranean. A more serious and explosive outbreak occurred in the summer of 1943. It was due to the contamination by sewage of one of the main water reservoirs situated in close proximity to an aerodrome.

A sewer passing under the aerodrome became blocked by debris. This aerodrome had been subjected to very severe bombing; and fissures in the soil and cracks in the walls of the reservoir that resulted allowed the passage of contamination from the sewer to the water. Fortunately, the pollution was detected early; necessary action was taken at once and the peak of the outbreak only lasted three days. But secondary cases continued to be reported for some time, and the total incidence for the year was 1,566 cases and 202 deaths. (Appendix C.)

Inoculation against the enteric fevers had been available free to the civil population for some years. In March 1943, regulations were enacted giving powers to the Chief Medical Officer to make inoculation compulsory for the inhabitants of any specified area over the age of two years. This Order was put into effect gradually and a large percentage of the whole population had been inoculated by the end of 1944. The value of this measure seems to be borne out by the low morbidity from enteric fever that was noted in this and the following years. A large school in Birkirkara, a town in the centre of the island, was adapted for use as a fever hospital and was ready to function just in time to meet the high prevalence of enteric fever in 1942.

Undulant Fever. The reduction in the incidence of this disease that occurred after 1940 is a striking proof of the part played in the aetiology of *Brucella melitensis* infection by the use of raw goats' milk. With the onset of the war two factors came into operation: more people started making use of pasteurised milk supplied by the Government, and of tinned milk. The supply of goats' milk was gradually reduced as these animals were slaughtered for food. Moreover, in 1943 and 1944, the Government bought up all the milk of the surviving animals in the Island of Malta and only allowed it to be sold after pasteurisation. This resulted in the negligible incidence of the infection in those years. With the relaxation of these measures after 1944 and the rapid multiplication of goats that ensued, the prevalence of the disease started rising again. A similar trend of events was not noted in the sister Island of Gozo where pasteurised milk was not in supply. There the incidence of the disease only came down when a large number of goats had been killed and it rose again when the goats re-multiplied.

Acute Anterior Poliomyelitis. This disease has always been sporadic in the Maltese Islands but there is no record of any epidemic incidence before the year 1942. No cases had been reported during this year until late November. During the last days of this month several cases were brought to notice from Malta and Gozo at the same time and the number of reports increased rapidly.

From the onset in November 1942, until the end of January 1943, there were 366 cases and 14 deaths in Malta and 40 cases with no deaths in Gozo.

The epidemic died out during February and March when only 15 more cases and two deaths occurred in Malta and none in Gozo; only four further cases and one death were reported during the next three months of 1943.

The 1–5 years age-group was principally affected and there were very few cases over 10 years. There was a marked preponderance of male cases.

No further cases were reported during the remainder of the year or during 1944. Another, but milder, outbreak of the disease occurred

between November 1945 and April 1946, which reproduced all the epidemiological features of the former outbreak.

From the knowledge that has accumulated about the incidence of this disease in different parts of the world during the war, it is now evident that the outbreak of 1942 in Malta was part of the pandemic that swept through most countries from that year onwards. Evidence is available that leaves no doubt that the infection was introduced into Malta from the Middle East. A batch of airmen arrived in Malta from Egypt in October 1942, and, as the infection was prevalent in that country at the time, it is permissible to presume that some of them were healthy carriers. These in their turn unconsciously spread the infection among the population generally and after a number of other healthy carriers had presumably been formed, overt cases of the disease occurred principally among the age-groups for whom this disease has a special predilection.

The outbreak of 1945 started shortly after the arrival in Malta of a large number of Maltese Dockyard employees who had been working in Egypt during the war; and the first case reported was that of a girl, who was a close contact of one of these men.

Ample circumstantial evidence is available to lead to the conclusion that the virus was disseminated by contact (droplet) infection rather than by water or food. (*a*) The beginning of the outbreak was simultaneous in both Malta and the sister Island of Gozo. It is inconceivable that the water supply could have become heavily infected in both islands at the same time and lead to such an explosive outbreak. In both islands the water sources consist of several separate springs or wells and the cases were widely scattered and not grouped according to any specific source. (*b*) The incidence of the disease was heavier in Malta where the overcrowding in dwellings, shelters, etc., and other circumstances that favour 'droplet' infection were much more pronounced than in Gozo. (*c*) The explosive onset is not incompatible with a contact method of spread. There was a striking example of this in Malta during the epidemic of influenza of 1919. (*d*) There is no evidence that any particular article of food that could have spread the infection was made use of in both islands at the same time shortly before the outbreak. (*e*) Conveyance of the infection by insect carriers is not indicated. November to April are the months when prevalence of the domestic and the biting flies is at its lowest and flies, especially *stomoxys calcitrans*, are more abundant in Gozo than in Malta. (*See* Medicine and Pathology Volume, Chapter 10.)

Cerebro-spinal Fever. For the spread of cerebro-spinal fever conditions in Malta (overcrowding, black-out, bad ventilation) were favourable, but the disease did not give much trouble. The incidence increased to 21 cases in 1941 and 26 cases in 1942 and resumed its normal average after that.

Scarlet Fever, *Diphtheria*, *Measles* and *Whooping Cough* were not affected by war conditions. A large number of cases of *influenza* (2,066) were reported during 1943, but only three deaths were registered, and the deaths from pneumonias during the same period were only about half of the average of previous years.

Murine Typhus made its first appearance in Malta in 1944 and became endemic. The rat population increased enormously during the war on account of the large accumulations of debris all over the island. This debris consisted of stones and other material from demolished buildings to which a considerable amount of garbage was added by thoughtless people. It therefore afforded ideal shelter and sufficient food for the rodents. Removal of these accumulations was not practicable owing to scarcity of man-power and transport. Gassing with both sulphur and hydrocyanic acid, as well as baiting and trapping, were tried, but the rats had their cover and breeding places so deep down under the heavy stones that these methods were not very successful. Rat poisons were scarce and were little used.

Bubonic Plague. In the later stages of the war, bubonic plague became prevalent all along the eastern and southern shores of the Mediterranean and was introduced into Malta in June 1945. The large rat population, already mentioned, facilitated its spread and cases soon appeared in several districts. The outbreak came to an end in June of the following year; there were eighty cases and twenty-two deaths.

Scabies. This minor horror of all wars was much in evidence, especially throughout the period of the siege. The lack of soap, the scarcity of water, the conditions under which most people lived, as well as the frequency of raid alerts, made personal cleansing a difficult and precarious procedure. As soon as circumstances permitted, and supplies of benzyl benzoate could be obtained, a clinic was started for the one-application out-door treatment of this condition. The results were very good, relapses reported being few. Patients' clothing was disinfected while the patients were being treated. Sepsis of the skin was also prevalent, favoured by the deficiency of vitamins in the diet. All these conditions speedily diminished as soon as the diet improved and means for personal cleanliness became again available.

Deficiency Diseases. Of the deficiency diseases, pellagra took the greatest toll of life and at one time was very prevalent among the inmates of the Mental Hospital. The number of deaths attributed to this condition was two in 1941, seven in 1942, thirty-nine in 1943, two in 1944 and one in 1945. From 1941 to 1945, six deaths were registered under rickets and eight under 'other avitaminoses'. Other pellagroid conditions as well as a few cases of nutritional oedema, came to notice, but they quickly responded to treatment. Signs of scurvy were reported mainly among old persons. Ulcerative stomatitis was for a time prevalent among children.

The general inanition during the siege broke the resistance of the very young and the very old and of those suffering from chronic ailments and, as already stated, the mortality due to this cause was registered under nephritis, diabetes, diseases of the heart and arteries, and under congenital debility in the case of infants.

THE MORALE OF MALTA

As one who was in constant touch day and night with the people, especially those in the areas most exposed to attack, Dr. Bernard records his impressions regarding the manner in which the population in general reacted to the ferocious bombardments and unending hardships of these times.

A people, temperamental by nature, used thus far to the pomp and glamour only of ceremonial martial parades, were suddenly confronted with dangers and ordeals of which they had never even dreamt before and faced them calmly and courageously. Others too, who have written about the war in Malta, have testified to the excellent behaviour of the people. That no panic did occur is proved by the fact that no consequences of such a happening were ever reported. The people made haste to move out of the danger areas as soon as the rain of bombs started, but, as already quoted from unbiased and official sources, this spontaneous exodus went on speedily but in astonishing orderliness. Even when the ineffectiveness of the 'shelters' provided during the initial stages of the war was realised, the people grumbled but accepted the danger with resignation. Quite naturally they asked for better protection and they took all the steps they could to reduce the risks to themselves and to their families. They continued to work hard and co-operate in the efforts to improve the defences of the Island and much was asked from them in this direction. Several thousands worked in the dockyard and thousands joined the Services, Malta having adopted conscription early in the war. A large number of men and women worked in the Civil Defence Services.

To reduce the waste of time that would have resulted from people taking cover all through the periods of 'alert', arrangements were made for special signals to be given when, during attacks, danger became imminent in certain areas. Such signals included a special siren wail from the Dockyard area and the hoisting of a red flag on the tower of the Governor's Palace in Valletta and other places. People rushed to shelter when these warnings were given without stampeding and stayed there as long as it was necessary, enduring patiently the discomfort and privations. The public rock shelters were just tunnels in many of which only standing room was available and regulations prevented the introduction of chairs. Sitting space became available in the course of time, but it was only in the later stages of the war that enough excavations had been made to allow sleeping accommodation.

The Maltese rock had the advantage of being easy to dig, but it was soft and porous and saturated with moisture, and in consequence, the dampness of these shelters was extreme. Experts from the United Kingdom came, saw and tried to suggest a remedy, but the only measure that could be taken was to lead the water that soaked out of the rock into pits in odd corners of the shelters. Shelters had to be cleared of water periodically and several had to be put out of use from time to time when the accumulation of water reached abnormal heights. Enough labour was not available to keep all shelters free from this trouble. Sanitary conveniences could only be provided in the vicinity of shelters; pails were sometimes allowed down in the shelters but they added to their mustiness and were a nuisance to the shelterers. Casualties occurred occasionally, when people had to emerge from shelters, for personal needs.

Patients in hospital bore the ordeal with resignation and with fortitude during attacks, and even those who could not take refuge in shelters, resignedly stayed in their beds, comforted by the doctors, priests, nuns and nurses, whose conduct was always exemplary.

For all this 'toil and sweat, tears and blood' did not break the spirit of the Islanders, and right through, even during the blackest hours when they saw friendly territory receding farther and farther from Malta and even distant resistance breaking down in British and allied territory, the conviction that somehow or other the tide would turn and victory would be achieved remained ingrained in their minds. They worked and grumbled, cursed and intensified their prayers. One of the major curses that came to notice was that of an old village woman. Running to shelter, she always looked up at the oncoming airplanes and shouted, 'May your petrol become water'.

A great contribution to the maintainance of the people's morale and fortitude was the solicitude for their well-being shown by the Governor, Sir William Dobbie, who kept constantly in touch with the population, unfailingly went to any stricken spot and frequently visited day and night shelters, refugee centres and hospitals. His successor, Lord Gort, was equally eager to share and diminish the sufferings of the people and assure for them the best that could be realised.

Malta's war story was an epic. It is hard to say when the Island passed from defensive to offensive operations, but her hardest time was from 1940 to 1942, especially in the latter year. In 1942 in trying to succour Malta, the British lost three cruisers, nine destroyers and two aircraft carriers, as well as merchant ships. El Alamein, followed by the victorious advance and the Anglo-American landings in North Africa changed the situation. By the end of 1942 the Navy had given food and stores to replenish Malta's stocks and the worst of her ordeal was over. H.M. the King awarded the George Cross to Malta on April 16, 1942.

APPENDIX A

Malta and Gozo: Vital Statistics

	1939	1940	1941	1942	1943	1944	1945
Deaths	5,385	6,144	6,444	8,603	5,578	3,700	4,016
Death rate (*a*) ..	19·95	22·69	23·74	31·97	20·49	13·25	14·01
Deaths under 1 year	2,027	2,435	2,231	2,336	1,775	1,275	1,584
Infant Mortality rate (*b*)	226·98	276·45	303·45	345·15	210·00	116·30	144·03
Births	8,930	8,808	7,352	6,768	8,452	10,963	10,998
Birth rate (*a*) ..	33·08	32·53	27·09	25·15	31·06	39·26	38·37
Natural Increment ..	3,545	2,664	908	(*c*)1,835	2,874	7,263	6,982
Estimated Population	269,912	270,755	271,359	269,090	272,121	279,187	286,596

(*a*) per thousand population
(*b*) per thousand births
(*c*) decrement

APPENDIX B

Tuberculosis Deaths (Civilians): 1937–44
Malta and Gozo

Year	Respiratory			Other Forms			All Forms
	Males	Females	Persons	Males	Females	Persons	Persons
1937	58	70	128	17	12	29	157
1938	69	59	128	8	17	25	153
1939	66	52	118	24	12	36	154
1940	86	53	139	23	21	44	183
1941	102	76	178	32	29	61	239
1942	131	96	227	57	60	117	344
1943	91	101	192	37	34	71	263
1944	73	73	146	20	16	36	182

APPENDIX C

Typhoid Fever: Cases and Deaths—1939–44

Month	1939		1940		1941		1942		1943		1944	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
January ..	7	—	20	4	38	5	21	2	40	2	40	2
February ..	3	—	8	1	16	2	8	—	17	2	34	1
March ..	6	—	3	—	32	3	8	1	21	2	9	3
April ..	1	—	8	2	7	—	10	2	12	2	4	—
May	1	—	8	2	6	1	16	5	18	4	8	—
June	3	1	3	2	12	3	67	5	26	3	15	—
July	32	4	8	5	14	—	110	18	48	7	23	2
August ..	37	6	55	5	52	3	145	9	813	89	51	1
September ..	49	7	32	—	62	6	243	18	314	56	87	2
October ..	60	5	47	3	45	5	201	18	150	25	47	3
November ..	42	5	30	1	30	4	93	18	63	8	27	—
December ..	41	7	75	6	25	7	76	3	44	2	16	1
	282	35	297	31	339	39	998	99	1,566	202	361	15

CHAPTER 3

HONG KONG

By SIR SELWYN SELWYN-CLARKE
K.B.E., C.M.G., M.C., M.D., F.R.C.P.
Formerly Director of Medical Services, Hong Kong

PREPARATION FOR WAR

HISTORICAL SUMMARY

THE British Colony of Hong Kong includes the island of Hong Kong ceded to Great Britain in 1841, the Kowloon peninsula on the mainland and Stonecutter's Island obtained by cession in 1860, and the New Territories over which a 99-years lease was secured from the Imperial Government of China in 1898.

Hong Kong Island is about 11 miles in length with an area of 32 square miles, separated from the Kowloon peninsula by a channel about a mile wide. The Kowloon peninsula, the hinterland to a depth of about 20 miles and the nearby islands forming the Leased Territories are approximately 360 square miles in area.

A little less than a century before the start of the war, Hong Kong was a barren island sparsely settled by a few thousand fishermen and pirates. It soon became an important centre of transhipment trade, and at the time of the so-called China 'Incident' of July 1937, when Japan invaded the five Northern Provinces, Hong Kong had developed into the fifth port in the world.

From the invasion of Manchuria in 1931, followed six years later by the operations in the Northern Provinces, it soon became apparent that Japan might continue her southward drive and ultimately attack Hong Kong. The Hong Kong Government took cognisance of the situation, and co-ordinated schemes for the active and passive defence of the colony were devised.

In the autumn of 1938, the Japanese landed in force in Bias Bay, captured Canton and advanced to the British frontier, within twenty miles of Hong Kong itself.

In August 1939, ample evidence was available in the form of troop concentrations, massing of guns and mechanised transport that the Japanese intended to cross the frontier with a view to capturing Hong Kong. When the Russo-German Pact was made, political reasons on the part of Germany were probably responsible for the postponement of the threatened attack by the Japanese on British territory.

Population. At the time of the cession of the island of Hong Kong in 1841, the Chinese numbered 6,000 and the Europeans about 2,000. With the additional territory ceded in 1861, the population increased to 119,321. In 1901, after the taking over of the Leased Territories, there

were 283,975 inhabitants. The expansion of trade and, to a lesser degree, the disturbed conditions in China after the overthrow of the Manchu dynasty and the foundation of the Republic in 1911, stimulated an increase in population to 456,739. In 1921 and 1931 the figure stood at 625,166 and 849,751 respectively. Fighting in the north, followed by the Japanese advance in southern Kwang Tung, produced a wave of immigration, the results of which were only partially influenced by the Japanese blockade of Hong Kong, which tended to direct the stream in the opposite direction, so that by the middle of 1941, the population figure stood at about 1,700,000, of whom rather over a third were refugees from war areas. The tightening of the blockade, the rise in the cost of living and the more imminent threat of war with Japan, assisted to a minor extent by the effect of the Immigration Restriction Ordnance, resulted in the population falling to between 1,500,000 and 1,600,000 when the Japanese started their attack on Hong Kong in December 1941.

Within a few weeks of the capitulation, the Japanese gave publicity to the fact that they proposed to reduce the number of inhabitants of Hong Kong to half a million—thus saving shipping which would have otherwise been diverted from their war effort in bringing in foodstuffs and other essentials for the population.

By repatriation (mostly forced), wholesale shootings and starvation, the population had fallen to a little over a million by 1942. By the middle of 1944, during which food prices had risen very considerably, there had been a further large drop to about 750,000, and with worsening conditions and frequent allied bombings, the figure had fallen still further to about 650,000 in June and 600,000 by August 1945.

CIVILIAN MEDICAL ORGANISATION

The Hong Kong Government Medical Department was divided into three main divisions under the Director of Medical Services, Dr. P. S. Selwyn-Clarke, C.M.G., M.C. These divisions were: Hospitals, Health and Investigation. The hospitals were administered by the Deputy Director of Medical Services, and were staffed by 42 medical officers and 348 nurses, dressers or male nurses, etc. The Professors of Medicine, Surgery, Obstetrics and Gynaecology, of the University of Hong Kong, acted as consultants in the Hospital Division. The Deputy Director of Health Services controlled a staff of 24 medical officers of health engaged in preventive work in urban and rural areas, port and social hygiene, and in school, maternity and child welfare work. These were assisted by 147 sisters, nurses, dressers and public vaccinators.

The third or Investigation Division was divided into two main groups: (*a*) The Bacteriological Institute with a bacteriologist and two assistants, and sharing the services of the Professor of Pathology, University of Hong Kong, who supervised autopsies in the public

mortuaries. Associated with the Bacteriological Institute was a malaria bureau staffed by the malariologist and his technical assistants.

(*b*) The Chemical (Analytical) Laboratory with the Government chemist and two assistants.

Associated with the Hospitals Division and under the direct control of the Director of Medical Services, though not forming an integral part of the Hong Kong Government Medical Department until the actual outbreak of hostilities with Japan, were a group of three Chinese hospitals and nine public dispensary clinics. These institutions were staffed with 27 medical officers and 138 matrons, sisters, nurses, dressers, midwives, dispensers, etc.

Apart from Government hospitals and Chinese hospitals over which the Government exercised some degree of control from 1938 onwards, largely as the result of having to provide a considerable subsidy annually, the Hong Kong Government Medical Department had friendly arrangements with the authorities of a number of private hospitals, some operated by missionary institutions and some by groups of private practitioners or by committees of business men and doctors.

About 300 private practitioners, mostly Chinese, and several hundred registered dentists (a mere handful being actual qualified dental surgeons), together with 731 private midwives and nurses, and St. John Ambulance members combined to augment the Government Medical Department staff.

Bed Accommodation. In the course of a detailed survey carried out in Hong Kong just before the war, it was ascertained that there were 2,939 beds for general purposes, a deficit of at least 3,000 taking the population at the time of the survey as approximately 1¼ millions. At that period there existed some 300 beds for dangerous infectious diseases out of a required (minimum) total of 1,250. Beds for 325 sick children were available in Hong Kong, although at least twice this number could have been readily filled. Only 383 beds were found to be available for women in childbirth, a deficit of at least 200 on a conservative basis. Laboratory and mortuary facilities which have been referred to briefly above, were quite inadequate before the war.

CONVERSION OF CIVILIAN MEDICAL FACILITIES TO WAR FOOTING

When war with Japan seemed inevitable, every possible effort was made to augment civilian medical facilities.

Hospitals. Plans were prepared to raise certain hospitals to the standard of casualty clearing stations, with full equipment for handling large numbers of wounded from air raids and long-distance shelling from land and sea. Seven hospitals were selected in each main sector of Hong Kong Island and the Kowloon peninsula, with a normal accommodation of 1,175 beds, and were prepared for the reception of 2,250 patients.

Concurrently other existing hospitals were enlarged to serve as relief hospitals and a number of premises were surveyed for conversion into hospitals should war break out, with the result that an additional 1,700 beds were made available.

One of the four principal Chinese hospitals was handed over to the military authorities, but the remaining three larger hospitals (one on the Island and the other two on the Kowloon peninsula) were retained by the Chinese for their seriously sick.

Accumulations of medical stores were formed at all hospitals and at points scattered over Hong Kong Island and the Kowloon peninsula so that the destruction of one or more stores would not deprive the services of essential materials.

First-aid Posts. In addition to casualty clearing and relief hospitals, some nineteen premises were taken over to serve as first-aid posts. For the most part, schools were used for this purpose, since it had been decided that it would be dangerous to continue schools during hostilities.

These first-aid posts were sited so as to ensure that wounded would not have to be carried for more than a mile in any district. A mobile first-aid unit was organised on each side of the harbour to be available to proceed to any area where casualties were heavy.

Ambulance Transport. Transport by hand stretcher, motor ambulance and converted lorries was arranged to enable casualty clearing hospitals to be cleared at the start of hostilities and periodically when wounded had received their major surgical treatment and were fit to be removed to relief hospitals, and for the transport of wounded from first-aid posts to the casualty clearing hospitals.

Brigaded with the ambulances and converted ambulance lorries were motor trucks for the conveyance of medical stores, food and fuel from central dumps and stores to the hospital raid posts.

SCHEME OF OPERATIONS

On Hong Kong Island there were three main areas, while the Kowloon peninsula was divided into Kowloon north and Kowloon south. Each area had an Area Medical Officer in executive charge of all medical and health services and this officer had with him the Area Medical Transport Officer and Liaison Communication Officers responsible for maintaining all forms of communication.

When an incident occurred, the A.R.P. warden reported the location, etc. to one of the Report Centres and thence to A.R.P. Headquarters. The Medical Communication Liaison Officer in turn reported casualties to the nearest first-aid post or posts and to the Area Medical Headquarters. In turn, the Area Medical Headquarters collated information and passed it on to General Medical Headquarters and to neighbouring Area Medical Headquarters, after taking such action as might be necessary to organise supplementary aid from other first-aid posts.

The staff of each first-aid post consisted of three private practitioners recruited specifically for the purpose and on eight-hour shifts, a varying number of first-aid parties of four members of St. John Ambulance Brigade stretcher bearers and a number of nurses, either members of St. John Ambulance Nursing Division or of an '*ad hoc*' organisation called the Auxiliary Nursing Service brought into being as a supplementary nursing service. The aim was to have groups of 144 St. John Ambulance Brigade personnel in every first-aid post, so that 72 would be on duty for twelve hours per day in shifts. In point of fact, circumstances necessitated the acceptance of a lower standard of staffing of the nineteen posts, some of which had but two doctors and as few as twenty-four stretcher bearers. A senior member of the Medical Department was seconded to act as Supervisor and Training Officer to the first-aid post personnel.

In anticipation of the possible cutting off of communications between the island and the Kowloon peninsula, a Principal Medical Officer was appointed by the Director of Medical Services for the peninsula and Leased Territories, who was given full powers in the event of being unable to maintain communications with Battle Medical Headquarters on the Island.

The Director of Medical Services (or Medical and Sanitary Controller as he was termed from September 3, 1939) was in intimate liaison with both the Civil Government and Military Headquarters and was responsible for keeping both informed of any important incidents, including the occurrence and disposal of casualties, and matters affecting the well-being of the community as a whole.

Dispersal Areas. In the hope of limiting the number of casualties from bombing or shelling, steps were taken to establish dispersal areas on the Hong Kong Island. These dispersal areas were situated in open country mostly on the north side of the Island and were planned to accommodate the inhabitants of the highly congested parts of the city. Cooked food, water, sanitary arrangements, a quantity of wooden planks for covering over slit trenches, and medical care were provided in these dispersal areas.

In order to familiarise the personnel employed and the general public, exercises were carried out before the declaration of war by Japan, in which relief hospitals were established, casualty clearing hospitals were partially cleared for the reception of wounded, first-aid posts were opened and stretcher and ambulance transport dealt with mock wounded. An exercise of this nature was actually completed satisfactorily six days before the Japanese attack.

SUPPLIES

With the experience gathered in the feeding and care of many thousands of refugees and destitute in Hong Kong, the Medical and

Sanitary Controller was in a position to make recommendations regarding food reserves. Rice, groundnut oil, soya beans, dried and salted fish, dried vegetables and salt were among the more important constituents of the siege rations for the bulk of the Chinese population, to which were added ghee, atta and curry for the relatively small Indian population.

For those consuming a Western dietary, flour, frozen and tinned meat, bacon, sugar, butter and vitaminised margarine, powdered milk, cheese, rice bran biscuits, etc., were stored.

Every effort was made to secure a reserve for a population of 1½ millions for a period of 130 days, although the war came too early to make this possible.

Stocks of fuel, for the most part on Hong Kong Island, were also laid in by importations and by extensive plantation cutting in the Leased Territories of the Colony.

But for the above-mentioned food stores, it is probable that the deaths from starvation in Hong Kong would have been far in excess of the very considerable number that did occur after the capture of the Colony by the Japanese.

PERIOD OF ACTIVE HOSTILITIES: DECEMBER 8–25, 1941

MOBILISATION

The long-expected blow fell on the morning of December 8, 1941 simultaneously with the destruction of the greater part of the United States Pacific Fleet at Pearl Harbour, and followed rapidly by the sinking of H.M.S. *Prince of Wales* and *Repulse* in Malayan waters.

Not long after midnight on December 8, warning was received by the Hong Kong Government that the Japanese troops were preparing to cross the border into British territory. The pre-arranged code word for the immediate mobilisation of all services connected with the active and passive defence of the Colony was broadcast to naval and military commanders and to all departmental heads and members of essential services. The Director of Medical Services recalled all doctors, nurses and midwives from isolated hospitals and public dispensaries in the Leased Territories. This staff brought with them the more valuable instruments and medical supplies and took up their allotted stations in Kowloon.

Approximately 1,000 stretcher bearers and nurses belonging to St. John Ambulance Brigade manned the nineteen first-aid posts on the Kowloon peninsula and on Hong Kong Island, where they were placed under the supervision of sixty private practitioners.

Lorries were converted into ambulances by means of pre-fabricated steel frames and these were employed in removing patients from previously designated casualty clearing hospitals to relief hospitals and to their homes. Some 140 private practitioners and 450 European and

Asiatic women members of the Auxiliary Nursing Service were posted to these civilian medical defence units. Emergency medical stores were established at various points on the Kowloon peninsula and on Hong Kong Island to minimise loss from bombing and shelling and to render it possible for hospitals and aid posts to be replenished as speedily as possible. A cleansing station was opened at Kowloon Hospital on the peninsula and a second and third at the Queen Mary Hospital for Western Hong Kong and at Happy Valley for Eastern Hong Kong. Fortunately, no gas cases occurred.

Medical transport parks consisting of ambulances and lorries for conveying medical supplies, food and fuel were established in the two main sectors on the peninsula and in the three sectors into which Hong Kong Island was divided.

Strenuous efforts were made to induce non-essential persons to leave the Island for the mainland and to evacuate densely crowded districts to dispersal areas in the hills and open country.

THE AIR RAIDS

The response to the appeal to doctors, nurses, ambulance and lorry drivers, stretcher bearers and auxiliary medical grades to report to their battle stations was immediate. Preparations were very near to completion when the first bombs were dropped by the enemy on Kowloon at 8 a.m. on December 8, 1941. Medical Headquarters had meanwhile moved into Battle Headquarters on the north side of the Hong Kong and Shanghai Bank Building, from which special wires had been laid to Military Headquarters, the government offices and civil defence services.

Numbers of civilian casualties resulting from the raid were collected by St. John Ambulance personnel and conveyed by ambulance to the Kowloon and Central British Casualty Clearing Hospitals on the mainland.

Air raids followed on Hong Kong Island, but casualties were relatively slight in the earlier stages of the fighting.

CAPTURE OF KOWLOON

In spite of the destruction of road bridges and railway tunnels and the courageous rearguard action of the British and Indian troops, including units of the Hong Kong Volunteer Defence Corps, the Japanese troops succeeded in advancing rapidly from the Sino-British frontier to the hills protecting Kowloon from the north.

Within two days the Japanese were able to capture the Jubilee Redoubt, an important strongpoint in these hills. As a result the main water supply for Kowloon and, in part, for Hong Kong Island which was derived from this region, was put completely out of action.

Finding that the Japanese had advanced still further by the afternoon of December 11, and had penetrated into the outskirts of Kowloon

itself, orders were given to withdraw most of the staffs of first-aid posts and subsidiary hospitals in the more advanced positions and to concentrate the personnel and more valuable equipment in the three main hospitals on the peninsula.

With the approval of the Governor and Commander-in-Chief, a personal appeal was made to the medical and nursing staff of units on the peninsula to remain at their posts to care for the wounded and sick, although the occupation of Kowloon by the enemy was a foregone conclusion by that time. The staff responded without a moment's hesitation. Among hundreds of workers, only two deserted their posts. In their partial defence, it must not be forgotten that there was no illusion as to the indignities and cruelties that they might suffer under the Japanese.

Within four days of the actual outbreak of war in Hong Kong, the whole of the peninsula was in Japanese hands and enemy batteries were established in Kowloon. These batteries shelled the northern face of Hong Kong Island, directing their fire on British battery positions and pill-box machine-gun emplacements guarding the shore line, ammunition, food and fuel dumps, transport parks and other military objectives. As the area is very restricted, it was inevitable that several hospitals and first-aid posts suffered considerable damage from both shelling and bombing. The Canossa Relief Hospital, for example, was completely destroyed; the main portion of St. Paul's Casualty Clearing Hospital was so damaged by large calibre shells that it had to be evacuated; two first-aid posts received so many direct hits that they had to be closed, and the Matilda Relief Hospital on the Peak had ninety shells, fortunately mostly of comparatively small calibre, on the building and in the garden. In the last named institution, the staff most courageously continued their work in the basement, the upper fabric having been riddled and the wards being quite uninhabitable.

It is of interest to note that some of the hospitals, including St. Paul's, suffered severe damage from Allied aircraft late in the Japanese occupation, and for the same reason, that is to say, their proximity to military objectives.

CAPTURE OF HONG KONG

After occupying Kowloon, the Japanese sent over a Peace Mission to Hong Kong. This was turned back with the answer that there would be no surrender. A similar reply was given to a second envoy a few days later.

THE MEDICAL SERVICES

On the night of December 18/19, the Japanese effected a landing at North Point and, a little later, at the north-eastern extremity of Hong Kong Island.

Soon after the Japanese landing at North Point, they entered St. Paul's Casualty Clearing Hospital and removed several of the British medical staff to North Point Camp which was converted in the earlier stages into a mixed internment camp for civilians and troops. Later, the Japanese allowed the doctors to return temporarily to the hospital for duty. As the advance progressed more hospitals and aid posts were captured, in some cases the non-European personnel being able to effect their escape.

At one hospital, an infamous incident accompanied the overrunning of the area on December 23. Several members of the nursing staff were criminally assaulted and had to be removed to the Queen Mary Casualty Clearing Hospital for medical treatment. A still worse outrage took place in another hospital where the Commanding Officer and another R.A.M.C. officer were killed while attempting to protect their patients and nursing staff. Patients were bayoneted and four nurses were criminally assaulted, three being killed. Apart from the killing of prisoners which took place both before and after the final surrender, there were comparatively few deliberate attacks on medical and nursing personnel.

After a hotly contested battle at the strategic centre of the Island, the Governor was compelled to agree to an unconditional surrender at 4 p.m. on December 25, 1941, after eighteen days' resistance.

During the period of hostilities the closest possible liaison was maintained between the civil medical and the military authorities.

To assist the latter authorities to meet their needs for beds for casualties, the Tung Wah Eastern Hospital was completely cleared of patients and civilian staff and became a military hospital for Indian troops; beds for casualties occurring in the Forces were reserved in the Queen Mary Hospital, War Memorial Hospital and in other institutions. In the Queen Mary Hospital alone, over four hundred out of the 1,200 seriously wounded admitted during the fighting, were members of the naval and military services.

THE SANITARY SERVICES

As well might be assumed, the sanitary services suffered serious disruption during the fighting. The normal arrangements for the disposal of nightsoil broke down, dumping into the harbour had to be resorted to and refuse depots had to be established at several points on the Island and peninsula.

As the Japanese advance continued, the formation of new dumps, even in built-up areas was unavoidable. At the time of the surrender the disposal of refuse became an almost insoluble problem and large heaps were to be encountered all over the town.

Bombs and shells which destroyed roads, bridges, and actual transport were also responsible for causing considerable damage to sewers and

drains, which became blocked with debris, the contents pouring over the roadway.

Electric power on the Island failed a week before the termination of hostilities when the Japanese took North Point. All water supplies dependent upon electric power for pumping failed at this juncture. The people were seriously inconvenienced and their health endangered by having to obtain water from polluted hill-streams and wells. Electric power for heating and gas being no longer available and coal and wood fuel at a premium, it was difficult to devise a satisfactory method of rendering water safe by boiling, and chlorination was impracticable, except in institutions.

A city without light or water, with many buildings in ruins, with streets and open spaces littered with refuse and with sewers blocked by shell and bomb, or by the lack of water for flushing purposes, presents a gloomy and depressing picture. Added to this, labour and transport for collecting and burying the dead constituted another problem.

Despite the manifold handicaps, the staff of the health department emulated their colleagues in the hospital service in their endeavour to maintain some degree of municipal hygiene; one measure after another had to be improvised in an attempt to cope with the situation.

CASUALTIES

Any close calculation of the number of casualties was impossible for several reasons. In spite of every effort made to preserve records of this period from destruction, the majority were lost owing to the deliberate policy of the Japanese to destroy all links with the previous British regime. Furthermore, the staff were only allowed to operate under sufferance by the Japanese after the capitulation, so that the bodies of persons who had died during the fighting (especially those on the hills and open country or under demolished buildings) were still being gathered up in March 1942, three months after the local war had ended. In fact, units of the Graves Commission operating in the Colony after the liberation, recovered a number of bodies that had not received proper burial.

During the actual fighting rather over 1,400 members of the Hong Kong garrison were killed, missing, believed killed or died of wounds, while 1,678 were wounded. The garrison numbered about 12,000; consequently the number killed represented about 11·6 per cent. of the total strength. The ratio among the civilian population was, of course, very much lower during actual hostilities.

It is estimated that about 2,000 civilians were killed or died of wounds during hostilities and about the same number of seriously wounded civilians received treatment in hospitals, lighter injuries being dealt with at first-aid posts. Only an approximate estimate is available of civilians who received first-aid treatment in the streets and at first-aid posts, owing to the records being destroyed. The figure given was 3,000. In

other words, the sum total of civilians killed, died of wounds or injured (seriously or slightly) during hostilities was about 7,000, a remarkably small number in view of the fact that about 1½ million persons were at risk.

PERIOD OF JAPANESE OCCUPATION—DECEMBER 1941–AUGUST 1945

PRELIMINARY PERIOD OF CHAOTIC CONDITIONS

Christmas Day, 1941 was, without any doubt, the most gloomy in the whole hundred years' history of the Crown Colony. Looting and unprovoked assaults on men and women were the disorder of the day. It must be remembered, however, that Hong Kong resembled Aladdin's Cave to the average Japanese soldier and the temptation to collect wristwatches, fountain pens, money and jewellery was no more easy to resist than had been the removal of *objets d'arts* by armed detachments of the Great Powers during the suppression of the Boxer Rising forty years earlier. Moreover, a considerable portion of the actual looting and destruction of property was carried out by the rowdy elements among the Chinese.

Later in the occupation period Chinese looters were responsible for removing from premises piece by piece, all wood, windows, floors, stairs, roofs, fences, seats, etc. sometimes at the risk of their lives. When it is recalled that conditions of living deteriorated so rapidly and to such an extent that tens of thousands died of starvation and that even cannibalism became a commonplace affair, it is difficult to blame these unfortunate people.

Unhappily, economic conditions worsened to such an extent that, to save the lives of their children, many of the poorest gave their bodies to the invaders in return for Japanese army or looted British rations. Immediately the unconditional surrender of Hong Kong had taken place, at 4 p.m. on December 25, 1941, the Japanese Military Commander issued an order prohibiting all pedestrian and wheeled traffic.

Many wounded still lay about the hills and scattered through the town; the streets were cluttered up with dead, debris from damaged houses and refuse; the sewers had been holed and blocked and their contents poured over the roadway; the water mains had been damaged by shell and bomb and no unpolluted drinking water was available; electric light and power had failed early in the period of hostilities.

MEDICAL ORGANISATION DURING THE OCCUPATION

The Director of Medical Services sought out the Japanese Commander and obtained permission to operate ambulances, hearses and refuse lorries and to carry supplies of food and fuel to the hospitals, aid posts and billets containing wives and children of volunteers, members of the essential services and others. This permission was not accorded so much from humanitarian reasons, but because the Japanese Military

Commander wished to protect his troops from dangerous infectious disease. Permits were also obtained for five members of the Waterworks Engineering Department to leave their billets to carry out repairs to the waterworks in order to secure a minimal supply for hospitals and the general public.

At the beginning of January, 1942, the Japanese Medical Authority established its own department. Having little knowledge of the framework of civil medical and health work, the Japanese Head caused the British Director of Medical Services to be appointed as 'Adviser'. This enabled him to move about the town and to persuade such of his technical, medical, nursing, health, investigation and cleansing staff as were needed to remain at work for the benefit of the community. The Japanese closed all banks and refused to pay medical and health personnel for several months; hence it became necessary for every effort to be made to induce the coolies and others on absolutely essential work to carry on without pay and with only a meagre ration of rice and fuel to keep them going. As can be imagined, this was no easy task. But this arrangement made it possible later to assist military and civilian interned persons, the widows, wives, children and dependants of volunteers in the Hong Kong Volunteer Defence Corps, and of persons in the camps or killed in action. In this way, food and medical care was provided for the 3,500 wives and dependants of volunteers and essential service workers who were accommodated in emergency billets in the mid-levels on Victoria Peak.

A few days after the surrender, the British Forces were interned in prisoner-of-war camps; they numbered about ten thousand, of whom about 2,000 were Indian troops.

Because of the overcrowded and insanitary conditions of these camps in the early stages, combined with under-nourishment, bacillary dysentery broke out.

On January 4, 1942, the Japanese authorities ordered the internment of about 1,600 'enemy' civilian nationals in Hong Kong and 500 on the Kowloon peninsula. Before this date, Sir Mark Young, Governor of the Colony, had been imprisoned in the Peninsula Hotel; he was subsequently removed to the north, and ultimately to Manchuria.

Mr. F. C. Gimson (later Sir Franklin Gimson), Colonial Secretary, and several members of the Executive Council were placed under detention in the town of Victoria. Some 400 residents with the late Sir Atholl MacGregor as their leader were confined, temporarily, to houses on the Victoria Peak, but the Director of Medical Services with the bulk of his staff was allowed limited freedom to carry on in the hospitals, etc. All the smaller groups were eventually interned. The accommodation provided at first for British, American and Dutch nationals consisted of low-class Chinese boarding-houses, some of which had been brothels. It is to be presumed that the Japanese made this selection with a view

to destroying what little remained of British 'face' or prestige. The rations issued at that time consisted of 8½ oz. of rice per day, occasionally a small portion of water buffalo, rarely any salt or oil and no vegetables. Pine logs were issued for fuel. The diet was a spartan one for those accustomed to European food.

In order to mitigate the hardships in some degree, the Director of Medical Services and his staff, while still at liberty, made every effort to distribute all manner of supplies to the boarding-houses. Six American nationals gave considerable help by driving ambulances and supply trucks during the period.

The Japanese authorities refused to allow the International Red Cross to function in Hong Kong for over a year. In consequence, it became necessary to create an informal welfare committee to raise funds, under cover, so that help could be given to interned persons and to non-interned wives and dependants of prisoners-of-war and civilian internees in the form of grants for subsistence, food, clothes, shoes, etc.

The overcrowded and unhygienic nature of the boarding-houses referred to above, situated amid congested and insanitary surroundings, was the subject of repeated representations to the Japanese.

At one stage it was proposed to rehouse all interned civilians on Kowloon peninsula, but eventually the authorities were persuaded to utilise the Stanley peninsula for the purpose and about 2,500 civilians were moved there from Victoria and Kowloon and from residences on Victoria Peak.

STANLEY CIVILIAN INTERNMENT CAMP, JANUARY 1942-AUGUST 1945

STAFF

It was fortunate that among the 2,500 individuals who were interned at Stanley, there were no less than forty doctors, two dentists, a distinguished biologist, six pharmacists, one hundred trained nurses, six masseuses, and a host of auxiliary nurses. These professional men and women consisted of Government servants, members of the staff of the Hong Kong University, private practitioners and the staffs of private and mission hospitals. All these individuals pooled their talents and resources and worked as a harmonious whole for the benefit and welfare of the entire community.

The Deputy Director of Medical Services was appointed Camp Medical Officer by the representatives of the internees and very soon after internment the medical organisation was established on a firm and co-operative foundation.

HOSPITAL

A three-storey building, formerly used for accommodating single Indian warders, was transformed into a very efficient, though poorly

equipped, hospital. The hospital had 74 beds, 37 for females and 37 for males, usually filled to capacity. The turn-over was rapid, patients having to be discharged early to make room for more acute cases. The number of new admissions per month varied between 90 and 150. Disorders of the alimentary tract including bacillary dysentery, accounted for most of the admissions. Operations were performed regularly, even after the electricity had been cut off and lighting was limited to the amount of daylight that could be reflected into the wound by means of a reflector.

The induction of anaesthesia often presented a serious problem owing to the shortage of chloroform and ether. Whenever feasible, spinal anaesthesia was the method selected.

Sanatorium. By 1943, the number of cases of open pulmonary tuberculosis had increased from 7 to 14. A small building, known as the Leprosarium, was cleared of its occupants and transformed into a sanatorium for the treatment of cases of pulmonary tuberculosis. Treatment was handicapped by the absence of radiography, but this did not prevent collapse therapy being regularly carried out. The only other treatment that could be given to these unfortunate sufferers was regular doses of sharks' liver oil, soya bean milk, peanut butter or margarine, according to available stocks held by the Camp Supplies Officer and the International Welfare Committee.

District Clinics. The camp was conveniently divided into three districts. The average population of each was about 850. Each district had a clinic or surgery which was in charge of a medical officer. Here daily out-patients were attended and surgical dressings applied. Here also were kept the records and the medical history sheets of every internee who attended, and daily returns were made to medical headquarters situated at Tweed Bay Hospital. Whenever necessary, patients were sent to the special clincs for further advice and treatment. In this manner a detailed record was kept of the state of health of all internees.

SPECIAL CLINICS

Surgical. A surgical specialist attended each morning from 9 to 12 in the out-patient department at Tweed Bay Hospital.

Nutrition. All cases attending district clinics and found to be suffering from symptoms attributable to lack of a suitable diet were referred to the nutrition clinic, which was in charge of a medical specialist and several assistants. The results of treatment were carefully watched and reported. The functions of this clinic had a two-fold advantage, firstly, the standardisation of diagnosis and, secondly, economy in the use of drugs, such as thiamin and nicotinic acid, and in the consumption of yeast and sharks' liver oil. Moreover, the physician in charge kept a detailed record of all food consumed, i.e., the daily rations as supplied by the Japanese, food purchased at the canteen, and food received from

time to time from the International Red Cross. It was possible in this way to correlate the incidence of avitaminosis and loss or gain of body-weight with the state of the diet throughout the period of internment.

Other special clinics were: ophthalmic, ear, nose and throat, dental, gynaecological, ante-natal, social hygiene, diseases of the skin, massage and electro-therapy.

Though a special clinic was not held for this purpose, one of the lady doctors made it her special work to attend to the health and welfare of infants and school children.

Drugs. At first, the drugs available were mainly those brought into the camp by the medical staff of the various hospitals. In addition, private doctors brought in a considerable supply from their personal stocks. The bulk of the stock contained in the small medical store in Tweed Bay Hospital was brought direct from the Queen Mary Hospital.

After a time replenishments became more difficult but, thanks to the efforts of the Medical Department, valuable additions were made, especially of preparations such as sulphanilamide and sulphapyridine, nicotinic acid, thiamin and 'multivite' capsules, the price of which in the open market had soared almost to impossible heights. The Swiss delegate of the I.R.C. sent in medicines occasionally, but at exorbitant cost, which made it necessary for the Camp Medical Officer to issue repeated instructions for the exercise of the strictest economy in their use. The most valuable additions to drugs and dressings were those received from the British and Canadian Red Cross Societies.

It would be ungracious to omit to mention that the Japanese authorities did, from time to time, send medical supplies into camp. Welcome as they were, the actual items were not always in response to specific requests, but appeared to be merely such stocks of preparations as they happened to possess. Perhaps the most valuable of their contributions was the supply of stationery. Until March 1943, prescriptions had to be written on scraps of paper, cigarette wrappings, etc. The medical notes of in-patients were recorded on the backs of temperature charts, and many of these had to be used over and over again.

Equipment. As in the case of drugs, most of the surgical instruments and other hospital equipment were brought into camp at the time of internment by various doctors and persons connected with the outside hospitals, but, again, the majority from the Queen Mary Hospital. It was possible by the pooling of equipment from all sources to provide for the hospital, including the operating theatre, and the district clinics. For weeks after internment, the Director of Medical Services, on his periodic visits, never failed to supply additional equipment—as for example, a microscope, a diathermy machine, etc. Repeated requests were made to the Japanese authorities for a portable X-ray set, but without success. During the first eighteen months nearly two hundred patients were taken into town to be X-rayed, but for the last two years no radiography

was permitted. Though frequently required, it was not possible to obtain a cystoscope.

Some very ingenious surgical appliances were manufactured at the camp workshop by the skilled engineers. They made excellent aluminium splints, bone-holding forceps and a high-pressure steam steriliser.

MISCELLANEOUS ACTIVITIES

Diet Kitchens. After the early months of internment it became very apparent that something would have to be done about making the diet as supplied by the Japanese more suitable and palatable for very young children, elderly invalids and those suffering from chronic peptic ulcers. The setting up of these special kitchens was made possible by the fact that there were available in the camp a number of electric cookers. The International Welfare Committee provided the extra foodstuffs. The district medical officer exercised general supervision, but a trained nurse—a specialist in dietetics—was in charge of each kitchen. She had the assistance of other women experienced in invalid cooking. These kitchens proved a great success. The time came when the electricity was cut off and firewood became scarce, and these kitchens were forced to close. A very definite deterioration in the health of many of the regular patients followed.

Milk. A limited number of 8-oz. bottles of unpasteurised cows' milk were sent into camp daily, though the supply was somewhat irregular and diminished considerably as time went on. This was kept for the hospital and children under five years of age. Full cream powdered milk was reserved for infants only but this supply was exhausted by January 1945. Thirty to forty pints of soya bean milk were made daily. This was reserved for use in the hospital and sanatorium and for debilitated out-patients.

Yeast. Next to loss of body-weight the earliest manifestations of food deficiency were those due to lack of vitamins B_1 and B_2. Owing to the difficulty of remedying this deficiency medicinally, it was decided to manufacture a limited quantity of yeast for oral administration. The daily dose of 3 to 4 oz. proved efficacious though the media consisted of weevil-infested flour, soya bean residue and sweet potatoes.

Medical Meetings. An association consisting of all doctors, dentists and pharmacists was constituted somewhat on the lines of the British Medical Association. A president and vice-presidents were elected annually, also a secretary. Many interesting and instructive papers were read. Minutes were duly read and confirmed and complete records of all discussions were kept.

Pathology and Bacteriology. The Government Pathologist continued his work in the camp to the best of his ability. His small bed-living room was his laboratory. He was severely handicapped by the lack of materials and technical equipment. His work was almost entirely

confined to the examination of blood films, sputa and stools, and doing red and white blood-cell counts. He was occasionally called upon to perform post-mortem examinations. Towards the end of internment the supply of bacteriological stains gave out. Malaria and pulmonary tuberculosis had to be diagnosed on clinical grounds alone.

Births and Deaths Registration. No time was lost after internment in opening fresh registers for the registration of births and deaths respectively. They conformed as closely as possible to the official registers kept in peace-time. Copies of the entries in the registers, in the form of birth and death certificates respectively, were made out and given to the interested parties. The death rate each year remained remarkably low; for instance, during the year 1943, there were only 18 deaths, and the majority of these were of persons over the age of 60. The infant and maternal mortality rates were so low as to be negligible.

In point of fact, only 127 deaths were recorded in Stanley Civilian Internment Camp in an average population of 2,500 over a period of forty-four months, which amounts to a death rate of rather under 14 per mille per annum. When it is recalled that there were many elderly people and young children in this population group (51 babies for example) and that the caloric value of the rations was under 1700 per head per day and very deficient in protein, fat and vitamins, this uncorrected death-rate, which is very little above that of peace-time England, reflects considerable credit on the medical, nursing, health and welfare staff in the camp, and on the efforts of welfare agencies in the town and non-interned Chinese and neutral friends who sacrificed their possessions (and sometimes their liberty and lives) in their efforts to mitigate the rigours of internment.

Vital Statistics. The population of the camp varied from a maximum of 2,863 in April 1942 to 2,400 in 1945 with an approximate average of 2,500. The main reductions were caused by the repatriation of U.S. Nationals in 1942 and Canadians in 1943. Children under sixteen numbered about 300 in 1942 and remained about that figure. Over sixteen, males exceeded females by about 50 per cent.

The annual birth and death rates per 1,000 were as follows:

Year	*Births*	*Deaths*
1942	8·3	11·3
1943	4·0	7·2 (excluding deaths by execution)
1944	5·2	16·0
1945 (8 months)	4·1	11·2 (excluding bomb victims)

The birth rate was naturally low as the majority of the married women in camp were wives of prisoners-of-war in military camps but in the circumstances it might have been lower. The deaths for 1945 do not include 14 internees who were killed by a bomb during an American air raid. The death rate was low, surprisingly low in fact, when one considers the conditions in camp and the high incidence of malnutritional

diseases. Several deaths were due to causes which could be regarded as the direct result of inadequate food supplies, while many others had an associated condition of malnutrition. That there were no deaths by suicide—or even murder—is remarkable in view of the serious overcrowding and the nervous strain resulting from the sharing of rooms by social and racial incompatibles.

THE INTERNATIONAL WELFARE COMMITTEE

The International Welfare Committee was brought into being in Stanley Camp to assist the Hong Kong Informal Welfare Committee which had been established in Hong Kong with the object of meeting the urgent requirements of civilian interned persons, prisoners of war and non-interned wives and families of inmates of these camps.

When the Japanese authorities rounded up the enemy civilians in Hong Kong in January 1942, for the purpose of interning them, many of the latter were without any personal possessions, clothes and household equipment of any kind. It became apparent in the Chinese hotels, which were the first stage of internment for many people, that some relief organisation would be necessary to provide the barest necessities for those who had lost everything. It was also obvious that the Japanese authorities were not prepared to make any distinctions in their treatment of infants, young children, the sick and the elderly among the interned community, and that some assistance would have to be given to those categories whose special needs were unprovided for, particularly in matters of diet.

As soon as the camp on the Stanley Peninsula was established, the representatives of the three national communities, the Dutch, American and the British, were asked to nominate representatives for a committee to deal with distress. A meeting was convened on February 4, 1942, and the International Welfare Committee thereupon came into being with Miss M. S. Watson as chairman. In July 1942, Mr. F. C. Gimson took the chair. Miss M. S. Watson became deputy chairman.

A small quantity of money and clothing had been collected and brought into the camp for immediate distribution. As soon as the camp canteen was established, arrangements were made for a very small profit to be added to the selling price of each article, this profit being handed over to the International Welfare Committee and distributed in the form of valuable foodstuffs on the advice of the medical panel. By far the largest part of the supplies received during the first year of internment were sent in by Dr. Selwyn-Clarke, who was allowed to remain in the town for relief and humanitarian work for sixteen months until his imprisonment by the Japanese authorities in May 1943.* By organising

* Dr. Selwyn-Clarke was condemned to death, but the sentence was not carried out. He remained in solitary confinement until removed to an internment camp on the Kowloon peninsula.

the Informal Welfare Committee, and keeping in personal contact with the Stanley Camp, he was able to arrange for the supply of foodstuffs, clothing, toilet articles, drugs and hospital supplies.

After his arrest this personal contact was lost, and the International Red Cross delegate took over the problem of supplies. The purchase of essential special diets, etc., became increasingly difficult and it was necessary for the Committee's panel of doctors to limit severely the quantities available for the sick and young children. The situation was relieved to a small extent with the arrival of British Red Cross parcels and supplies in November 1942, and the Canadian parcels in September 1944. A certain proportion of valuable foods was set aside for allocation by the medical panel, and by very careful distribution, was made to last until the Colony was relieved in August 1945.

INFECTIOUS AND INSECT-BORNE DISEASES

The diseases under this heading of chief concern to the camp were dysentery, diarrhoea, typhoid, tuberculosis, typhus and malaria.

Diarrhoea and Dysentery. In the early days of the camp, conditions favoured the spread of fly-borne disease, and the prevalence of diarrhoea and dysentery at that time was not surprising, particularly as many people had been infected in the Chinese hotels where they had been confined before entering Stanley. A large number of cases of diarrhoea could be attributed to an unsuitable and unaccustomed diet and possibly to bad cooking. In the absence of laboratory facilities, it is likely that many cases diagnosed as bacillary dysentery on clinical grounds were, in fact, cases of acute enteritis. The situation was at first serious with 350 cases of dysentery in the first three months of internment, but conditions improved and the total for the year was 410. Figures for 1943, 1944 and 1945 (8 months) were 191, 172 and 67 respectively. Although the dysentery was of some severity it responded rapidly to treatment with drugs of the sulphonamide group, of which there were limited supplies in camp. Only two deaths were certified as directly due to dysentery.

Typhoid Fever. Internees were inoculated against typhoid either before arrival in camp or shortly afterwards and again in 1943 and 1944. Fourteen cases of typhoid occurred, with one death.

Tuberculosis. Thirty-three cases were registered during the first year but many of these were old cases. Spread of this disease was favoured by malnutrition and overcrowding, but this was largely balanced by a good climate and an open air life. Only a comparatively small number of new cases were diagnosed and at the time of release only fifteen cases were receiving hospital treatment. There were seven deaths. That undernourishment was largely responsible for the steady deterioration of these patients' condition was clearly demonstrated by their rapid improvement on an adequate diet following the Japanese surrender.

Diphtheria. One case diagnosed as diphtheria occurred late in 1942. The authorities promptly provided anti-toxin. The source of infection could not be traced and it is remarkable that the patient's two children escaped infection, although they were at a very susceptible age, and lived in a small room with her and no protective treatment was given.

Scrub Typhus. There were nine cases of scrub typhus with four deaths. The severity of these cases and the high mortality rate suggest the possibility of Japanese River Fever. Cases occurred in late summer or early autumn and the evidence available indicates transmission by mites. Several cases among troops on manœuvres occurred in Hong Kong in 1941, and it is possible that incidence increased as a result of the Japanese occupation.

Malaria. In the early history of Hong Kong, Stanley Peninsula was notorious for malaria which caused a high mortality rate among British troops and their families. Although the nature and source of the disease were then unknown, its seasonal incidence was noted and it is recorded that troops were frequently billeted on board ships in Hong Kong harbour so as to avoid the deadly disease which attacked them in the autumn and early winter, if they remained ashore. The old cemetery inside Stanley Camp was a grim reminder of the results of uncontrolled malaria. At the time of the Japanese occupation, the area of Stanley Camp and its immediate surroundings were practically free of malaria, but to maintain the position, constant anti-malarial measures were necessary. The dangers of neglect were immediately appreciated but requests for permission to carry out such measures near the camp, repeatedly made to the authorities, were consistently refused until late in 1942, when the position became serious. All mosquito breeding-grounds inside the camp, and there were many as a result of hostilities and neglect, were dealt with early in 1942 and were permanently eliminated or kept under regular control. But the really dangerous anopheline breeding grounds were just outside the camp boundary and near Stanley village, and mosquitoes, unlike internees, could not be forced to respect barbed wire fences. Once permission was given to deal with several of these areas, an anti-malarial gang from the health staff was formed. Thus the work was undertaken by skilled men, all of whom rapidly became familiar with the localities concerned and the control measures required. When work was particularly heavy, the anti-malarial gang was augmented by volunteers and on some occasions it was possible to have as many as thirty men employed at a time. But the regular and systematic performance of this work, which is so essential for success, was never allowed by the Japanese. In one week, three outings might be allowed or it might be only one and more frequently none at all. Similarly, the number of workers allowed might be anything from three to thirty, the limitation in this respect being usually determined by the number of guards available to accompany the party. A working party of

three might be escorted by a Chinese supervisor and two Japanese and two Indian armed guards.

During 1942, there were 143 cases of malaria; in 1943, which was the worst year, 331 cases; in 1944, 151 cases and to the end of August 1945, 57 cases, a total of 682. The figures given may not be entirely accurate as lack of stains made microscopic confirmation impossible in the later periods but, taken as a whole, they present a reasonably true picture of the malaria situation. There was a shortage of quinine and relapses were common but there were no deaths. The last quarter of the year showed the highest incidence; *A. minimus* was the chief vector.

Other Diseases. One case each of cerebro-spinal meningitis and mumps were recorded. A mild epidemic of chickenpox with 57 cases occurred late in 1944 and early in 1945. Fortunately, there were no cases of smallpox or cholera. Internees were vaccinated against smallpox in 1942 and inoculated against cholera annually in early summer. Beriberi was very prevalent; over 200 cases occurred among Europeans before the end of 1942.

CONCLUSION

The period of internment, which lasted three years and eight months was one of difficulty, hardship and anxiety for the population of the camp, but, considering everything, the health of internees was generally more satisfactory than the most optimistic could have expected in the circumstances. Internees never lacked confidence and morale was high. There were occasional waves of depression, and the worst of these occurred shortly after the collapse of Germany, possibly due to an increased sense of frustration and isolation and impatience for an ending to the war which seemed so near and yet so far.

The presence of women and children, however unfortunate it may have been, gave the camp population the semblance of a normal community and may well have been responsible for its mental stability, as only one case of serious mental disorder occurred.

From a health point of view Stanley Camp must be regarded as extremely fortunate.

MEDICAL AND HEALTH CONDITIONS IN HONG KONG JANUARY 1, 1942 TO AUGUST 31, 1945

Below are extracts from a report by the Director of Medical Services, on Medical and Health Conditions in Hong Kong for the period January 1, 1942, to August 31, 1945.

VITAL STATISTICS

Births. It was not found possible to persuade the Japanese to appreciate the value of birth registrations for several months after the surrender. Consequently, the records available for 1942 are very incomplete. In the following table the figures for Hong Kong are for the last

six months of the year, whereas those for Kowloon relate to the last three quarters of 1942. The records for 1945 cover the first eight months of that year.

Births

Year	Hong Kong	Kowloon	Combined
1942	5,374	4,696	10,070
1943	10,244	10,488	20,732
1944	7,441	6,246	13,687
1945	1,811	1,901	3,712

In view of the incomplete nature of the records available, there would seem to be little purpose in calculating birth rates.

Assuming that registration in 1943 and 1944 was relatively complete, the marked fall in the number of births registered would more than justify the conclusion that the population fell very markedly in the occupation period.

Deaths. Death registration was also decidedly faulty during the occupation. On the other hand, records of burials were relatively more reliable. Many bodies of Europeans and Indians buried in January 1942 were of persons killed in action in the previous month. Every effort was made to collect and to give decent burial to such bodies after all possible steps had been taken to secure identification marks, which, if found, were handed later to the International Red Cross for transmission to the War Office in London through Tokio and Geneva. No records are available of the number of bodies of persons executed at Big Wave Bay, although these are believed to have numbered over a thousand.

Burials

Year	Hong Kong	Kowloon	Combined
1942	42,770	40,665	83,435
1943	19,301	20,816	40,117
1944	13,113	11,823	24,936
1945 (Jan-Aug.)	12,593	10,505	23,098

The very marked fall in the number of burials in 1943 as compared with that of 1942 is accounted for by a corresponding reduction in the population, resulting from the compulsory evacuation tactics employed by the Japanese. Since no question arises of the return of evacuated persons until after the collapse of Japanese resistance in August 1945, the actual increase in the number of burials in 1945 indicates a sharp rise in the death rate, probably from starvation.

CAUSES OF DEATH

Malnutrition. Abundant evidence was available both in the public mortuaries and in the patients admitted to hospitals that malnutrition, indeed, actual starvation, was the principal cause of death.

Acute Infectious Diseases. Acute infectious diseases were, on the whole, relatively unimportant in the list of causes of death. Records of the actual incidence of these diseases are incomplete, but it is of interest to note that no case of death from smallpox or plague was reported.

As regards cholera, the table given below shows the cases dealt with in the two main infectious diseases hospitals in 1942 and 1943. Apart from the three suspected but not proved cases of cholera admitted to Lai Chi Kok Infectious Diseases Hospital in 1944, no patients were diagnosed as suffering from this disease in 1944 or during the first eight months of 1945.

	1942		1943	
	Admissions	*Deaths*	*Admissions*	*Deaths*
Kennedy Town Hospital..	275	167	87	62
Lai Chi Kok Hospital ..	439*	247*	100	61
Totals	714	414	187	123

In 1942, the cholera outbreak was at its worst during February and March, although it continued until October in spite of a very intensive anti-cholera inoculation campaign. About 1,700 cases were known to have occurred. In the following year, no cases were recognised until June, the peak being reached in July and the outbreak ending in September.

The case mortality of cholera patients treated in hospitals amounted to 58 per cent. in 1942 and 66 per cent. in 1943. This compares with a rate of rather under 22 per cent. in 1941 under British administration.

Of the other acute dangerous infectious diseases, typhoid, dysentery, diphtheria and meningitis were represented in that order of importance in the two infectious diseases hospitals. The experience of these diseases calls for no comment except that the case mortality was very high. For example, some 36 deaths took place in 73 typhoid admissions to the Kennedy Town Hospital and 61 deaths in 101 dysentery admissions; the reason, however, is not far to seek, for the patients were suffering from a very advanced stage of malnutrition on admission and the Japanese failed to supply either adequate food or medicines.

It would be unwise to try to draw any definite conclusions from the statistics in relation to the incidence of dangerous infectious diseases during the Japanese occupation because reliable epidemiological studies were extremely difficult throughout this period, and the population was undergoing rapid reduction. All that could be fairly claimed would be that, despite the prevailing malnutrition (with its concomitant loss of powers of resistance to infection) and the progressive lowering in the standard of cleanliness, Hong Kong enjoyed relative freedom from epidemics during 1943, 1944 and the portion of 1945 covered by this narrative.

Deficiency Diseases. Beriberi, malnutritional oedema, loss of visual acuity (amounting to actual central nerve blindness in some cases), and other manifestations of dietetic imbalance or deficiency, became increasingly common during the Japanese occupation, so that it is understandable that the incidence in the general population of Hong Kong was very high.

* Figures are exclusive of the period January 1, 1942 to February 4, 1943, when Lai Chi Kok Hospital remained closed.

Tuberculosis. Associated with the considerable increase in the incidence of deficiency diseases, the tuberculosis death rate rose steeply during the occupation period. The disease appeared in many who had previously shown no outward sign of infection and, in the absence of adequate diet, the progress of the disease in individual cases was very rapid. Although the Hong Kong Anti-Tuberculosis Association could no longer function openly, it was found possible to rent two wards from the authorities of St. Paul's Hospital for cases of tuberculosis occurring among the wives or dependants of the interned in the various camps.

Venereal Disease. Several factors contributed to produce an increasingly serious situation in relation to venereal disease. The Japanese troops were not content with using common prostitutes, but forced others to their will. The invading forces lacked anti-venereal drugs and closed the civilian social hygiene centres, so that a large proportion of the community became heavily infected. Efforts to combat this state of affairs were limited to the provision of two 'red light' areas on Hong Kong Island, one for Chinese at West Point and the other for Japanese in Wanchai, and one similar area between Shamshuipo, Yaumati and Tsim Sha Tsui. Two clinics were opened in Wanchai and Tsim Sha Tsui, but treatment was limited practically entirely to Japanese, Formosans and Koreans, and even then there appeared to be an obvious shortage of reliable remedies. Already, by the spring of 1943, numerous cases came under notice of advanced *granuloma venereum* affecting Japanese military and civilians as well as prostitutes. Immediate steps had to be taken at the time of the Japanese collapse to reorganise social hygiene centres in Wanchai and Tsim Sha Tsui.

INVESTIGATION DIVISION

Malaria Branch. Six weeks elapsed after the surrender of Hong Kong in 1941 before the Japanese could be persuaded to allow anti-malarial work to be carried out. Even then the malariologist and such of his staff as could be induced to remain in Hong Kong were seriously handicapped owing to the fact that the Japanese made it very difficult for anti-malarial oil or the necessary tools to be secured.

Up to May 1943, when the malariologist was interned in Stanley civilian internment camp at the same time as the skeleton cadres of health officers and inspectors, an appreciable amount of anti-malarial work was carried out. Priority was given to the areas likely to affect the various internment camps and hospitals. The malariologist undertook anti-malarial work in Stanley Camp after his internment and it was largely due to his efforts and those of the health staff in the camp before his internment that the civilian internees were so free from serious outbreak of malaria. After May 1943, although a small handful of the anti-malarial inspectors remained at their posts, they were able to achieve very little because of the failure of the Japanese to supply oil,

etc. However, immediately the department was reorganised, the malariologist was able to employ his staff very usefully, aided by the particularly valuable co-operation of the British Naval, Military and Air Force Authorities. By August, 1945, malaria had become a serious menace and many areas on Hong Kong Island which had been rendered entirely free from anopheline breeding before the war were discovered to have become a hyperendemic area. About 70 per cent. of all patients attending the public dispensaries at Aberdeen and Shaukiwan, for example, were found to be suffering from acute malaria. But for the prompt pooling of resources of personnel and materials by the Civil and Crown Forces, it is probable that a very serious epidemic of malaria would have attacked all branches of the community in the last quarter of 1945, owing to the regrettable neglect of this problem by the Japanese.

Bacteriological Institute. The Bacteriological Institute remained open during the whole period of the Japanese occupation. In fact, the Japanese took over a teaching institution at 103, Austin Road, Kowloon, and established a second laboratory in the former maternity ward of the Kowloon Hospital. Although the institute rendered valuable assistance in the earlier months of 1942 by carrying out special tests for Tweed Bay Hospital, Stanley Civilian Internment Camp, St. Paul's and other hospitals, its activities were very largely devoted to the preparation of anti-cholera vaccine and the examinations of rectal swabs from would-be immigrants or contacts with cases of cholera and typhoid. The invading authorities refused to make any provision for the care and feeding of laboratory animals and the large majority of these had died before the retaking of Hong Kong despite the devoted sacrifices made by the staff of the institute. This state of affairs had a very depressing effect on Professor R. C. Robertson, M.C., formerly lecturer in pathology to the University of Hong Kong and medical officer in charge of the Victoria mortuary. After putting up a courageous fight, he found the situation too difficult and died in tragic circumstances in the summer of 1942.

Much of the cholera vaccine produced by the Japanese, especially in Kowloon, proved to be heavily contaminated and had to be condemned owing to its very serious effects in those inoculated with it. The anti-smallpox vaccine also proved to be without any potency whatever and had to be destroyed.

Chemical Laboratory. The chemical laboratory was taken over by the Japanese Military Authorities soon after the surrender in 1941, and ceased to be available for the examination of water samples, food, drugs or biochemical work. Since the Japanese Military Authorities refused any co-operation, a duplicate laboratory was fitted out in the same building and at considerable expense, although the bulk of the actual chemicals and apparatus had been seized from 'enemy' sources in the town. In view of the high prices charged for drugs (the importation of which ceased when the Colony was captured, with the exception of a

relatively small quantity of Japanese origin), the counterfeiting of drugs like atebrine, quinine, sulphanilamide and vitamins became prevalent. To give examples: eight out of ten samples of sulphapyridine needed for outbreaks of dysentery proved to be inert or heavily adulterated; ampoules of vitamin B_1 prepared by a reputable local Chinese firm of manufacturing chemists during the occupation contained only 6 milligrammes of thiamin hydrochloride instead of 10 milligrammes per cubic centimetre. The testing of powder, tablets and solutions purporting to contain thiamin chloride was of particular importance in view of the tendency to beriberi induced by a high proportion of broken rice in the rations issued to the internment camps and to the rapid increase in vitamin B deficiency among the general population.

Valuable work was also carried out by the senior Chinese member of the Government chemists' staff, under a very able and pro-British research chemist appointed by the Japanese. Both the officer concerned (David Louie) and his wife, who had been in the Government Nursing Service, were arrested by the Gendarmerie and later were executed.

Owing to the prompt action taken by the research chemist referred to above to prevent looting, both chemical laboratories were handed over practically complete when the Medical Department resumed control once more in August 1945.

HOSPITALS, OUT-PATIENTS' DEPARTMENTS, ETC.

Hospitals. Almost immediately after their entry into Kowloon, the Japanese took over the Kowloon Hospital and the Central British School Hospital. St. Theresa's Hospital was also taken over by the Japanese in December 1941, but was used as a military hospital for British troops for a few months in 1942–3. In 1944, the hospital was occupied by Japanese patients, mostly suffering from venereal disease. Finally, in August 1945 it reverted to the use of British (Indian) sick pending their evacuation by hospital ship to India. The Central British School Hospital was utilised for Japanese troops until the late spring of 1945 when it was handed over to the R.A.M.C. in place of Bowen Road Military Hospital on Hong Kong Island, which remained closed until the re-occupation of Hong Kong. The Kwong Wah Hospital with 200 to 300 beds was the only general hospital available for all sections of the community on the Kowloon peninsula. The Medical Superintendent and his staff laboured under exceptional difficulties as regards food and medical supplies, and the attitude of the Japanese was generally unfavourable. By exemplary courage, the Superintendent and his Matron kept the staff of the hospital together and the hospital rendered invaluable service throughout the occupation.

On Hong Kong Island the Japanese took over the Queen Mary Hospital a month after the surrender. During hostilities, some four hundred naval and military, and rather more than twice that number of

civilian casualties, were attended by the surgical unit in this hospital. Many of these patients were on extensions and fracture boards when the Japanese ordered the Director of Medical Services to evacuate the hospital. The removal was carried out (after ineffectual protests) to the R.N. Hospital, Bowen Road Military Hospital, University and St. Stephen's Relief Hospitals and to the Tung Wah Hospital.

Thereafter, the Queen Mary Hospital became an institution for Japanese wounded. It was finally evacuated by the invading forces early in September 1945. For some time before this, the hospital had been used largely as a barracks. The condition in which it was left beggared description. Much of the hospital equipment had been removed or destroyed and not one sheet was to be found. After a skeleton staff of doctors and sisters transferred from Stanley Internment Camp had worked hard for a period of four weeks, it was possible to re-open one floor (about 200 beds) of the hospital in October 1945.

The Japanese Naval Forces took over the Tung Wah Eastern Hospital from the British Military Authorities shortly after the surrender and Indian sick and wounded troops were moved to St. Albert's Military Hospital and later to Bowen Road Military Hospital. The Tung Wah Eastern Hospital was used chiefly for Japanese patients suffering from venereal diseases. After the transfer of Japanese to the Kowloon peninsula, the hospital was cleared and re-equipped.

During January, February and March 1942, the Matilda, War Memorial, University, St. Stephen's and Sai Ying Pun hospitals were evacuated. In April 1942, the Director of Medical Services obtained permission for the Sai Ying Pun Hospital to be re-opened for patients since the Tung Wah, Nethersole, St. Paul's and St. Francis hospitals proved inadequate to meet the needs of the population on the Island. Later, the Sai Ying Pun (General) and the Tsan Yuk (Maternity) hospitals were closed by the Japanese, allegedly owing to lack of funds available to the Japanese Medical Department. The Mental Hospital remained open throughout the occupation, although the rations made available by the Japanese were not enough to prevent most of the patients dying of malnutrition within a short time of admission.

The Infectious Diseases Hospital at Kennedy Town was maintained until 1944 when it was replaced by a group of private residences at Pokfulam. The whole of the hospital buildings and much of the Leper Settlement adjoining became ruinous and the former were eventually razed to the ground. Apart from the hospitals referred to in the foregoing paragraphs, small camp hospitals were established in the Shamshuipo, Argyle and Ma Tau Chung Military Internment Camps, and in Stanley Civilian Internment Camp (Tweed Bay Hospital).

Out-patients' Departments. Out-patient departments continued to function on a much reduced basis at St. Paul's Hospital until the staff quarters and other premises suffered serious damage from Allied air

bombardment in January 1945, and at the Nethersole, Tung Wah, Kwong Wah and, for limited periods, the Sai Ying Pun Hospitals. Out-patient activities at Queens Road, and in the out-patients' department at the Queen Mary and Kowloon Hospitals were restarted in September 1945, before the hospitals were actually ready to receive in-patients.

Public Dispensaries. The Japanese adopted the attitude that public dispensaries, like civilian hospitals, were unlikely to contribute to the Japanese war effort and so were unworthy of assistance. As a result, many of the public dispensaries closed down. The Kowloon City Dispensary, one of the best of its kind, was demolished during the widening of an airfield and the Hung Hom Dispensary was damaged during the successful bombing of Kowloon Docks by Allied aircraft. Chinese doctors were permitted to carry on private practice and were occasionally (and at irregular intervals) given a few medical supplies by the Japanese.

Welfare Centres. Although the staffs of the welfare centres were kept together in the hope that the Japanese would permit them to be re-opened, all such requests were refused.

SCHOOL HYGIENE

All schools were closed at the commencement of hostilities in Hong Kong in order to obviate loss of life from concentrations struck by shells or bombs, and because some of the schools were needed as relief hospitals, first-aid posts, medical stores and the like. For several months after the surrender, the Japanese refused to allow schools to re-open. Later, a small number were permitted on undertaking to teach the Japanese language. Little scope existed for school medical work with the possible exception of that carried out by the Hong Kong Informal Welfare Committee in premises hired from St. Paul's Hospital and loaned in Kowloon for the children of those interned in the military and civilian camps.

PORT HEALTH WORK

A general scuttling of shipping was most effectively carried out at the beginning of the Pacific War. From this date, port health work ceased and was only carried out in a perfunctory fashion by the Japanese Forces during their occupation and then only in cases where ships were reported to be infected with cholera.

SUMMARY

The period January 1942 to August 1945 was without doubt the blackest in the whole history of Hong Kong. Although the deaths from war injuries during the actual period of hostilities in December 1941, were comparatively few (1,400 Service personnel and more than 2,000 civilians) the deaths from violence and from starvation, particularly in 1942, rose to appalling heights. During the Japanese occupation,

the population fell from rather over one and a half millions to about half a million. The invading forces made it clear that they intended to bring about a reduction in the population to this figure. They achieved their object, but at what toll of pain and suffering!

The systematic starving of the bulk of the population over such an extended period—over three and a half years—may exercise a serious effect on the health of the community for many years to come, including an increase in the incidence of and deaths from tuberculosis. Hundreds of dwellings were destroyed by bomb, shell and fire during hostilities in 1941 and as the result of aerial bombings, but thousands of dwellings, and many valuable educational establishments (e.g., the University of Hong Kong, Kings and Queens Colleges, etc.) were irreparably damaged by looters whose activities could have been stayed by the Japanese.

General hygiene (including water purification plants) suffered marked deterioration during the occupation of the Colony by a race which claimed to possess a higher standard of hygiene than any other in the world. The community was deprived of most of its medical and health services, its chief hospitals being taken for Japanese troops, its maternal, child welfare and social hygiene clinics closed and vital preventive work against malaria neglected. There is, however, another side to an otherwise sorely depressing picture. The ruthless invaders have given the British an opportunity of proving to young China the sincerity of their belief in the policy not of so-called trusteeship (with its implication of superiority and patronage over an indefinite period) but of co-partnership in the reconstruction of a new and better Hong Kong.

LESSONS LEARNED

Just as in the United Kingdom so in Hong Kong, a serious miscalculation was made in the number of potential casualties from enemy air action.* The figure on which estimates were drawn up for bomb casualties was 50 per ton of bombs and it was assumed that the enemy might drop between 20 and 40 tons of bombs per day. It is not difficult to calculate that at this rate every available hospital bed in Hong Kong would be needed for bomb casualties in a few days, leaving no accommodation for persons wounded by rifle, machine gun, mortar and shell fire. In fact, such formulae were discarded during the preparation of the medical defence of the Colony, and the Medical Defence Committee worked on the basis of arranging as many beds for casualties as buildings, staff and equipment permitted.

The provision of beds proved to be quite adequate, but delay occurred at times in bearing seriously wounded to first-aid posts or mobile first-aid units and to the casualty clearing hospitals owing to lack of a sufficient pool of reliable St. John Ambulance stretcher bearers. Apart from this

* *See* Emergency Medical Services, Vol. I, in this series.

minor criticism, it can be said that the civil defence medical services functioned without a hitch, all branches working harmoniously and with complete disregard of safety or personal comfort.

Mention has been made of the plan evolved to encourage the dispersal of population. It was assumed that several hundred thousand Chinese would be willing to leave the overcrowded areas and install themselves in 'camps' in the hills. The idea arose from the example offered by Chungking and certain other cities in China where the population went to air raid shelters excavated in the hillsides or to tunnels and caves they themselves had dug out. The salient difference, of course, lay in the fact that the people of Chungking and such cities had a considerable time to reach shelters owing to the distance of Japanese airfields and the relatively long warning, and they would return to their normal home life (if their house escaped bombing) after the raid was over. In Hong Kong the potential airfields were within a minute or two of the city. It would have required far more provision of actual shelter and other amenities than was ever made in these dispersal camps to make them sufficiently attractive to induce the community to use them. Certain camps on precipitous hill slopes were never occupied and there were never as many as ten thousand persons in the whole of the dispersal areas which had been designed to hold between 300,000 and 400,000. In other words the Defence authorities failed adequately to appreciate the psychological make-up of the average Chinese who showed just as much reluctance to leave his daily haunts and to take to the almost bare hillsides as was the case with the average French and Belgian peasant in 1914–18 and the London cockney of 1939–45.

In brief, while the intention was excellent, and every possible step was taken to implement the plan by arranging for conducted parties to be transported by motor convoy and trams from congested districts to pre-arranged dispersal areas, the result by no means justified the time, trouble and expense devoted to this aspect of the civil defence scheme.

A serious problem arose as the result of the temporary eclipse of British influence in Hong Kong. It had always been assumed that the Forces of the Crown would be able to defend Kowloon and the Island of Hong Kong for a period of at least 130 days, by which time the United States Pacific Fleet based upon the Hawaian Islands, assisted by units of the British Fleet based in Singapore, would have arrived on the scene to lift the siege, with Generalissimo Chiang-Kai-shek engaging the Japanese Army in Southern Kwangtung. The story of Pearl Harbour and the fatal air attacks on our capital ships put an end to these hopes. It was never contemplated that the Colony would be compelled to surrender unconditionally after eighteen days' fighting, and no policy had been evolved to meet this eventuality. A few days after the Japanese landing on Hong Kong Island on December 18–19, the Defence Secretary (who bravely met his death in Stanley Prison in 1943, trying to shield

others involved in alleged espionage) did issue instructions to heads of departments to destroy all secret and confidential papers, but no general principles had been laid down for the guidance of Government officers or heads of the essential services as to what policy to adopt should the enemy prevail. It might be argued that any such guidance, even if restricted to departmental heads and heads of essential services, might savour of a defeatist policy if issued before surrender.

The Governor was closely confined soon after the surrender to the Japanese and the Colonial Secretary was under close detention, unable to move more than a few blocks distance from the quarters assigned to him, before his admission to the Stanley Civilian Internment Camp. Neither was therefore in a position to be able to issue instructions of any kind. In the absence of any previous instructions or set plan to meet the peculiar circumstances of this period, it was left to departmental heads of services to carry out such work for the benefit of the community as might be permitted by the restrictions on movement, etc., laid down by the Japanese Military Commander.

The problem was relatively simple in so far as the head of the medical and health services was concerned, for wounded had to be collected, dead to be buried, water, food, fuel and light supplies to be arranged, household and human waste to be removed, and so on. He obtained covering sanction for these activities subsequently from the Colonial Secretary. But a serious situation arose later when pressure was brought to bear by British and Chinese Authorities in Free China upon members of the medical and health staffs to leave Hong Kong, or to remain at their peril with the possibility of a charge of collaboration with the Japanese being levelled against them when the Colony was recaptured by the British troops.

In order to maintain a staff in the hospitals to prevent them from being looted and destroyed (as was the fate of many educational establishments), so that they might serve the general community, the widows and orphans of volunteers, the wives and dependants of prisoners-of-war and interned civilians, and that the health conditions in the town might not deteriorate so much as to foster epidemics of cholera, etc., nor adversely affect the various camps in which British troops and civilians were incarcerated, the Director of Medical Services adopted the line of persuading a skeleton medical and health staff to remain in Hong Kong. In these circumstances, he was enabled to assist the prisoner-of-war and civilian camps with supplies of food, drugs, vitamins, instruments, apparatus, clothes, shoes, bedding, seeds, crockery, cutlery and cooking utensils, gardening implements, etc., until arrested and imprisoned by the Japanese sixteen months later and charged with espionage.

In spite of the obviously necessary nature of this work, the Director of Medical Services did not escape charges of collaboration by the

uninformed—particularly in Free China. How much more serious might such charges have been in the case of those not taking part in work of a humanitarian character! It would appear, therefore, that clear directives might have been given to heads of departments and of essential services before the outbreak of hostilities with Japan, in order that they might be in a position to direct their staffs appropriately in the unhappy event of the enemy prevailing.

Finally, the hostilities and subsequent lengthy period of Japanese occupation of Hong Kong gave opportunities for the best and worst traits in the human character to be manifested. That most of the members of the medical and ancillary services in Hong Kong carried on the proud tradition of the profession under conditions of exceptional stress and more often than not ill-fed, ill-housed and ill-clothed and subjected to frequent humiliations and sometimes to ill-treatment, imprisonment, and even death, will always remain a source of justifiable pride to those who had the honour to work with and for them.

CHAPTER 4

A.—MALAYA

By R. B. MacGREGOR
C.M.G., M.R.C.P. Ed., M.B., Ch.B.
Director, Medical Services, Federation of Malaya

THIS account deals with the Malay Peninsula and the island of Singapore during the period from 1939 until the surrender of the Japanese in August 1945. It is written entirely from the civilian point of view, although there were many times during the campaign when military and civilian medical services were working together in the same hospitals and first-aid posts.

PREPARATIONS FOR DEFENCE

AREA AND POPULATION

The territory covered comprises the Malay Peninsula and the islands of Penang and Singapore. The Peninsula is about 500 miles long and 200 miles broad at the widest part and its area is about 50,000 square miles.

Communications taper to the single road and railway over the causeway linking Singapore island with the mainland in the south. Communications by road and rail are relatively good on the western side of the Peninsula, but very poor on the east. The population of the Peninsula was about 4,700,000 in 1941 and four-fifths of this population was in the western half of the Peninsula.

Singapore, with an area of 220 square miles, is at the southern tip of the Peninsula connected to the mainland by the causeway. The population of Singapore Island before the war was about 800,000, most of it in the City of Singapore on the southern side of the island.

The climate over the whole area is equatorial, hot and wet, with a rainfall of 100 inches a year, and an average temperature of 85° F.

The population comprised Malays, Chinese, Indians and a small proportion of Europeans. On the east coast, Malays predominated. In the large towns Chinese were in the majority, and in the well-developed rural areas the population was a mixture of Malays, Chinese and Indians. Over all, on the Peninsula, Malays numbered 2,200,000, Chinese 1,800,000, Indians 700,000 and Europeans (civilian) about 15,000. In Singapore, Chinese numbered about 600,000 and Europeans 12,000 civilians out of a total of 750,000.

MEDICAL FACILITIES EXISTING BEFORE THE WAR

The Hospital Services were well developed. The nine larger towns in the Peninsula each had a hospital of from 400 to 500 beds, reasonably

well equipped and staffed. In 28 smaller towns there were District Hospitals of from 100 to 200 beds. Excluding mental hospitals and special institutions for lepers, the normal pre-war hospital accommodation in Government Hospitals on the Peninsula amounted to just over 10,000 beds. The medical staff consisted of approximately 120 European medical officers, 180 Asiatic medical officers, 100 matrons and sisters, 700 nurses and 1,000 hospital assistants (male nurses). In addition to the Government Hospitals and medical staff, there were some 150 small hospitals on rubber estates with an aggregate of 6,000 beds.

Private medical practitioners in Malaya, excluding Singapore, numbered about 200 and about 1,000 qualified hospital assistants were employed on estates.

In Singapore, there was one large fully equipped General Hospital with a normal capacity of 850 beds, a maternity hospital of 200 beds and a pauper hospital with a further 800 beds. The staff in Singapore was proportionate, with some 30 European medical officers, including specialists, 60 Asiatic doctors, 60 matrons and sisters, 280 nurses and 180 hospital assistants. Doctors not in Government Service in Singapore numbered over 150. The College of Medicine provided reserves of skilled staffs for special services, such as blood transfusion.

PREPARATIONS BEFORE THE WAR

Preparations against the possibility of the war reaching Malaya were intensified as soon as the European war was declared.

These preparations may be considered under the headings of accumulation of medical stores, training of personnel, expansion of hospital accommodation and the provision of first-aid posts and an ambulance transport service.

Supplies. The ordering of large stocks of medical stores was one of the first actions taken. The need for this had been anticipated before the war and large supplies began to arrive in the country throughout 1939 and the early part of 1940. The level of the stocks which was aimed at was one which would provide at least eighteen months' supply at the ordinary rates of consumption for the medical needs of the country. In addition to these, further stocks were ordered of dressings, anaesthetics, antiseptics and other medicaments likely to be needed for war injuries. These supplies were dispersed in a number of separate stores throughout the country in order to reduce the risk of loss from bomb damage.

The stores position never gave any cause for anxiety throughout the campaign, which was so tragically short. Most of the stores fell into the hands of the Japanese but a proportion of them were available to the civil population during the Japanese occupation. One very serious loss occurred in Singapore, when the store in which ether and spirit were kept suffered a direct bomb hit and went up in flames. This

knocked out the principal reserve stock of anaesthetics, but enough remained for the hospitals to carry on until the capitulation.

Articles which could not be purchased were made locally. Shell dressings and first field-dressings were made by parties of women voluntary workers. They made, sterilised, and packed many thousands of these dressings, which were supplied not only to civilian aid posts, but also to the military forces. 'Thomas' splints and a large number of stretchers were manufactured in local workshops. The Singapore Harbour Board workshops were especially helpful and produced 1,000 army pattern stretchers.

Medical Personnel. The training of personnel for the expansion of hospital services and the provision of staff for first-aid posts was commenced under the organisation of the St. John Ambulance Brigade. The Brigade existed before the war in Singapore and Penang and in a few places up-country, but not on an extensive scale.

During 1939 and 1940 the St. John Ambulance Brigade was greatly expanded and ambulance and nursing divisions were established in all the larger towns. Classes in first aid and nursing were held systematically throughout the country and several hundred men and women of all nationalities obtained the certificate of the Association.

In 1941 it became evident that the organisation would have to be adapted to permit the employment of large numbers of first-aid workers on a paid basis under the direct administration of the local authorities, in a way that was not practicable within the organisation of the St. John Ambulance Brigade. Early in 1941, therefore, the St. John Ambulance Brigade was absorbed into the Medical Auxiliary Service, which was a division of the Government's Passive Defence Services.

Special recognition is due to the fine work done by the St. John Ambulance organisation in providing the basic training on which all the subsequent Medical Auxiliary Service was founded. The backbone of that Service was the trained men and women who came over to it from the St. John Ambulance Brigade.

The Medical Auxiliary Service eventually comprised first-aid parties, transport service, and rescue parties on the men's side, and nursing services for hospitals and first-aid posts, and catering services on the women's side. The total personnel of the Medical Auxiliary Service amounted to about 1,200 men and 800 women on the Peninsula and 1,700 men and 1,200 women when the organisation was at its full strength during the month of January 1942 in Singapore.

Blood Transfusion Service. The Blood Transfusion Service which was organised in the College of Medicine, Singapore, was under the direction of Dr. G. V. Allen, C.B.E., Principal of the College and Professor R. G. Scott-MacGregor, Professor of Physiology. It was started early in 1939 to provide a store of blood or plasma for war casualties.

Dr. Allen and Professor Scott-MacGregor were assisted by other qualified members of the staff of the department of physiology and of the General Hospital, Singapore, and a large number of voluntary workers from the St. John Ambulance Brigade and Medical Auxiliary Service.

The staff comprised three main sections. One dealt with the donors, their medical examination, blood grouping, the withdrawal of blood, sterilisation of instruments, and cleansing and sterilisation of bottles. The second section dealt with the preservation and storage of blood and the separation and pooling of plasma, together with the investigation necessary in selecting and testing technical methods. The third was the transport section, which consisted of twenty drivers for bringing donors and returning them to their homes, and for the delivery of blood and plasma to hospitals.

By the time of the outbreak of the war in Malaya, the Blood Transfusion Unit had completed the recruiting of 4,000 donors. This included the determination of the donor's blood-group, together with tests for haemoglobin and Kahn reaction and the physical examination of the donors.

The grouping of 35,000 men of His Majesty's Forces was carried out, and each man's group was stamped on his identity disc. Blood was withdrawn from 1,200 donors and the preparation, pooling and storage of plasma from these donors was completed.

Portable sets of equipment for transfusion were assembled, sterilised and packed. These sets were made from materials obtained locally, since transfusion sets could not be obtained by importation at that time. Each set consisted of a wooden box measuring about eleven inches in each direction. The box contained a zinc lining separated from the wood by half an inch of insulating material. There were compartments to hold ice and compartments on each side to hold either three or four bottles of plasma and the transfusion outfit. Needles for the transfusion sets had to be improvised locally from 'hollow wiring'. These transfusion sets were issued by the Blood Transfusion Unit to field ambulances and Army medical units.

The first large demand on the plasma bank was for the treatment of men from H.M.S. *Prince of Wales* and *Repulse* who were suffering from severe burns. As the fighting came down the Peninsula, the Blood Transfusion Service was worked to its fullest capacity. During December 1941 and January 1942 blood was taken from approximately 4,000 donors. The Blood Transfusion Service was able to maintain a supply of blood and plasma to the Army and the civilian hospitals up to the last day of the attack on Singapore, and all remaining plasma in the bank was distributed to military hospitals before the Japanese took control.

EXPANSION OF HOSPITAL ACCOMMODATION

Additional equipment and beds were supplied for all the larger hospitals. In general, the increase in capacity was 50 per cent. above the normal allocation. It was fortunate that there was a factory in Singapore which was able to make very satisfactory beds in adequate numbers; the increase in the provision of beds more than doubled the previous accommodation. Throughout the Peninsula, wherever there were estate hospitals situated within a reasonable distance of the larger Government hospitals, arrangements were made for the transfer of convalescent and chronic patients to these hospitals. This permitted the clearance of accommodation for casualties. In the larger towns subsidiary hospitals were improvised in any suitable buildings, usually schools. This development of subsidiary hospitals was carried out most extensively in Singapore, where the additions included five hospitals with a total of 1,000 beds.

ORGANISATION OF FIRST-AID POSTS AND AMBULANCE TRANSPORT

In the smaller towns the provision for air raid casualties was made within the ordinary hospital services. In the larger towns, such as Penang, Kuala Lumpur, and particularly Singapore, a system of first-aid posts was established, on the same lines as the first-aid posts and ambulance transport depots in the United Kingdom. In Singapore twelve such aid posts and depots were established, each about one mile distant from the next depot, except in the most densely populated parts of the town where they were closer. Each of these aid posts was intended to deal with an influx of about 100 casualties at any one time and to serve a population of about 50,000. The staff of the aid posts consisted usually of two or three doctors, who were private medical practitioners enrolled in the Medical Auxiliary Service, two or three trained hospital sisters, usually married women, and about 60 nurses. Most of these nurses had very little training before the outbreak of war, but it was very impressive to see how these young women, among whom the Chinese predominated, were able to cope with the work which fell to them during the attacks on Singapore. Within the first-aid posts there were also about 20 men, nursing orderlies, and a catering section of 10 to 20 women, who provided meals for all the staff of the aid posts, transport depots, and also for all the patients. This catering section became very important when the attack on Singapore was intensified and several of the aid posts had to function for a day or two at a time as self-supporting stations.

Ambulance transport depots were usually, but not always, attached to the aid posts. The typical station had six or eight ambulance buses, each capable of carrying four stretchers and ten sitting cases, and about twelve ordinary cars for sitting cases. The usual strength of a transport

depot was 80 men, stretcher bearers, and 20 drivers, including a few women. The drivers of the bus ambulances were usually the men employed by the traction companies. These men did very well during the heavy bombing raids.

For two or three months before the outbreak of war it was possible to organise intensified training of the staff of these aid posts and transport depots. The personnel was a mixture of all social classes and included all the nationalities found in Malaya. Among the Europeans, there were considerable numbers of the non-British races who were not eligible for service in combatant units. The British were for the most part elderly or physically unfit for combatant duties. The Asiatics, comprising Chinese, Eurasians, Indians and Malays, were drawn from all classes, heads of businesses, school masters, clerks and casual workers. These people working together showed a degree of comradeship and singleness of purpose which had never before been seen in Malaya.

The students of the College of Medicine and Raffles College deserve special mention. They were all enrolled in units of the Medical Auxiliary Service. Most of the medical students worked in the hospitals. The Raffles College students worked in the first-aid parties attached to their college, which became a subsidiary hospital. Their area bore the brunt of the battle in Singapore island, and they did valiant work.

CARE OF ORPHANS

An organisation under the direction of Dr. C. Williams and Mrs. Loveridge of the Child Welfare Society, was established in Singapore, with the help of the staff of the Child Welfare Society, to take care of children who were rendered homeless or whose parents were killed or wounded. This organisation took care of all the homeless children who were picked up by air raid wardens or first-aid parties. These children were cared for in an orphanage, which during the course of the bombardment of Singapore had to be moved from one building to another on four different occasions, and eventually the children were housed, partly in the Dental Department of the General Hospital and partly in a school, in a heavily shelled area, from which no further move was possible. In spite of these vicissitudes the children were unhurt, and when the Japanese took over in Singapore the organisation was able to carry on, until all the children had been disposed of to their homes or to the convent orphanage. In most cases a child was claimed by friends or relations within a day or two, and in spite of the large number of casualties in Singapore the number of children who had to be cared for was never more than 100 at any one time.

CIVILIAN MEDICAL STAFF TRANSFERRED TO THE FORCES

Additions to the medical staff by recruitment to the Medical Auxiliary Service were offset to some extent by the transfer to the Army of

medical officers from the Civil Government Medical Service. A special anti-malarial unit, consisting of three medical officers with special experience in malaria and one entomologist, was provided from the civilian medical department. Two medical officers for the Malay Regiment and ten medical officers for volunteer and R.A.M.C. units were provided from the civilian service. In addition, most of the younger European private medical practitioners served as medical officers with the volunteer forces.

ESTIMATION OF HOSPITAL AND FIRST-AID SERVICES TO BE PROVIDED

It was for a long time difficult to obtain any official estimate of the expected number of casualties for which the first-aid and hospital services should be planned. Eventually such an estimate was prepared, based on Royal Air Force calculations of the number of raids and weights of bombs which might be dropped per raid. This gave for Singapore an estimate of not more than 500 casualties at any one time, and an accumulation of up to 2,000 patients in hospitals before they could be cleared.

The estimates visualised only the effect of aerial bombardment, and, in Singapore, they were not very far from the truth for the earlier stages of the war. There was no allowance made in the preliminary planning for the possibility of the country being invaded and overrun. In practice, the provision in most places was determined by using to the full such personnel and accommodation as could be made available, rather than by any calculations of what the expected need would be.

The preparations in Singapore included the provision of dispersal camps in the rural parts of the island. These camps were intended to provide shelter and also medical facilities for people who were displaced from their homes by bombing or military operations. These dispersal camps for the most part proved to be useless. They were regarded by the population as probable target areas, and, in the later stages of the operations in Singapore, they were not accessible.

The protection of buildings against blast, and the provision of air raid shelters, was carried out on a very limited scale. Blast walls were built round the more vulnerable parts of the large hospital buildings and they proved to be of real value. Most of the first-aid posts were also protected by blast walls, and in one of the Singapore hospitals, Kandang Kerbau Hospital, the provision of steel shutters round the operating suite on an upper floor enabled work to go on continuously in spite of heavy bombardment. Throughout most of Singapore, however, there were no substantial air raid shelters and this undoubtedly increased the number of casualties.

THE CAMPAIGN IN MALAYA

The beginning of the Japanese attack on Malaya was marked by the bombardment and landing on the coast of Kelantan, in the northern extremity of the Peninsula, and the first air raid on Singapore.

An impression of the Kelantan landing, from the civilian point of view, is given in the following extract from the report of the Chief Medical Officer:

> At 1 a.m. on December 8, I was awakened by the noise of battle. Street lights were full on and I could not understand what was happening until a friend rang me up at about 4 a.m. saying there was an enemy landing. The Medical Auxiliary Service mobilised very quickly, but fortunately Kota Bahru town was not bombed, and up to the time I left, they were not called upon.
>
> At about 7 a.m. on December 9, a telephone message came from the Commissioner of Police to get out of Kota Bahru without delay. The noise of battle seemed to come in from all directions. All European civilians were sent inland to Kuala Krai.

There were few civilian casualties in Kelantan. Provision was made for them in the hospital at Kota Bahru, where the local staff were able to deal with them, and at Kuala Krai, a small town some forty miles inland, where Dr. Geale, an elderly European private medical practitioner, elected to remain after the British forces had withdrawn. He was eventually arrested by the Japanese and kept prisoner in Kelantan for a year before being sent to Singapore for internment. According to him, the number of seriously wounded among the civilians in Kelantan was very small.

In Singapore, the first Japanese air raid occurred about 4 a.m. on December 8. There was no previous warning, and street lamps and the lights of the docks and the railway station remained on during the raid. It was remarkable that the casualties were so few. Much of the damage done was in the business area in the centre of Singapore which, at that time, held very few people. One group of bombs, however, fell in the densely populated Chinese area, near the Chinese Secretariat building. The staff of the Medical Auxiliary Service attached to that station acted with very commendable speed. Although they were not at that time mobilised, those members who were living near got the station opened within a few minutes, and casualties were brought in or sent to the General Hospital, which was only half a mile away, with very little delay. The first raid caused about 60 deaths and 150 admissions to hospital. One stick of bombs fell across the hospital grounds but, fortunately, did not cause any material damage. Four bombs fell in the grounds between buildings without damaging any of them. Two other bombs fell on the roof of the principal operating theatre and on the main sterilising plant. Both, however, failed to explode. The general effect of this raid was to wake up thoroughly the whole organisation

for dealing with air raids, and to establish confidence, because the damage done was very much less than might have been expected in the circumstances. Patients were received in the hospital within a short time, and the staff had several successive days without further raids to complete the treatment of these patients. Conditions were much more favourable than for later casualties and there was time to take full advantage of the lessons which this raid taught.

The next phase was the air raids on Penang, the first of which occurred on December 11. During the previous two days Japanese planes had flown over the town without launching any attack, and the population had come to regard them with curiosity, instead of seeking cover. This time the town was heavily bombed and the crowded streets machine-gunned by low-flying planes early in the forenoon. The following is taken from the report of Dr. L. W. Evans, C.B.E., Chief Medical Officer, who was in charge of the medical arrangements in Penang and who remained there after the British civilians and troops had been evacuated:

> All ambulances and medical personnel sent to these areas continued to work throughout the raid and, in a short time, every aid post was filled. Removal of cases to the General Hospital from the aid posts was done continuously and expeditiously; minor cases were dealt with and the canteens were kept busy day and night. The pressure of urgent work made the keeping of accurate records in the aid posts impossible, but it was estimated that not less than 1,000 cases, including many with minor injuries and mild shock, were dealt with as a result of that first raid. More than 700 casualties were treated at the General Hospital.
>
> This raid was sufficient to cause a general exodus of the population, and further raids on the following day caused fewer casualties, though two or three hundred were collected and dealt with.
>
> Later, because of the disorganisation of telephone services, locating casualties was difficult and many patients were taken to the General Hospital by passers-by or made their way there direct.
>
> It was eventually decided to withdraw the staff of all the divisions of the Medical Auxiliary Service to the General Hospital, where their services could be more profitably employed.
>
> The medical officers worked tirelessly and the women's units were excellent throughout, the canteen staffs working day and night. The Chinese ambulance drivers, though having no connexion with the Medical Auxiliary Service, never hesitated to take out their vehicles, even during raids, and remained on duty until the end.
>
> Raids over the town continued for two days after its evacuation by British troops, and many casualties were brought in on December 17 and 18. The Medical Auxiliary Service continued to work till the evening of December 19, when on the arrival of the advance units of Japanese troops, the Medical Auxiliary Service was disbanded.
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> *Evacuation of Penang.* On December 13, European women and children were ordered to leave Penang. Hospital sisters were given the

option of going and it was made clear to them that if they did not avail themselves of the opportunity no other might occur, and also that no stigma would be incurred by leaving. On December 15, all European patients, military and civilian, were evacuated, and on December 16 there was a general evacuation of all Europeans from Penang, leaving the hospital in charge of Dr. L. W. Evans.

After the evacuation the hospital continued to function satisfactorily, though there was some petty looting. The destruction of the power station hampered the cooking of meals in the hospital and cooking had to be done by improvised methods.

Everything went on smoothly, until the Japanese forces formally occupied the island on the morning of December 20. Dr. Evans was interned in the prison. The staff continued to conduct themselves well under difficult and depressing circumstances. There was no question of the loyalty of most of them. They continued their work under the new régime, with evident reluctance, as there was no alternative but unemployment.

Progress of the Campaign down the Peninsula. The progress of the campaign down the Peninsula was a melancholy story of retreat. Hospitals in turn changed from being civilian hospitals to Army clearing stations, field ambulance stations, regimental aid posts, and, as the retreat continued, they passed into the hands of the enemy. Most of the civilian patients requiring treatment were evacuated along with the military patients to the next hospital down the line. Those able to move went back to their homes, and others were left to the care of local staff. There were a few instances of panic evacuation by the staff, but in most places they remained faithful at their posts, in spite of the withdrawal of the European staff, under military orders. In most cases they were allowed by the Japanese to continue looking after the civilian patients without much help but without interference.

This same story was repeated all the way down the Peninsula. By the end of December the Japanese troops had infiltrated into the State of Pahang on the east coast. There the civilian casualties were very few indeed. Equipment which was likely to be useful was removed from the hospitals and with the help of military transport was sent to Johore and eventually to Singapore. On the west side of the Peninsula, the attack swept through Perak. Ipoh suffered its first severe air raid, which brought into hospital some 60 cases needing major surgery. Fortunately, by this time the medical staff in Ipoh had been reinforced by surgeons withdrawn from Kedah. It took three surgical teams, working nine hours continuously, to deal with patients from this raid. There were succeeding raids in Ipoh and here difficulties were encountered because of the temporary demoralisation of some of the local staff. The hospital servants, seeing that retreat was in progress, sought safety in their own homes, and towards the end of the attack in Ipoh, the qualified medical staff, both European and Asiatic, had not only to do their own work,

but had to deal with the washing of blood-stained operation towels, and eventually to bury the dead. On December 23, the European staff were ordered by the Army to leave Ipoh and the hospital was handed over to a military unit. About 230 major air raid casualties were treated in Ipoh.

Kuala Lumpur. The medical facilities here had been expanded to provide 1,600 beds with four operation theatres. Included in this provision was one complete subsidiary hospital (Tanglin Hospital) which previously had not been in use for some years. To begin with, the surgical work in Kuala Lumpur was that of a base hospital. As time went on, work became that of an advanced hospital and finally front line casualties were being admitted. Most of the cases were military. Although there were many air raids on the town and its outskirts, civilian casualties were not heavy. The staff at this time was augmented by the complete staff of the 27th Indian General Hospital, which eventually took over the hospital in Kuala Lumpur when the civil services had withdrawn. A few days before the withdrawal, large quantities of surgical equipment were sent by rail to Singapore, where it proved to be of the utmost value. Withdrawal from Kuala Lumpur was completed on January 10. On the eve of the departure the staff had to be reinforced to deal with air raid casualties from Kuala Lumpur and the surrounding areas. There were about 50 patients requiring major surgical treatment. Withdrawal continued through Seremban, where for some time a military field unit worked along with the civilian staff of the hospital. Malacca was the next major hospital to be left. It had been occupied by an Australian General Hospital which had withdrawn some days before. The civilian European staff was compelled to evacuate, and as in other places, the hospital was taken over by the Asiatic qualified staff who continued to run it up to the time of the entry of the Japanese and throughout the Japanese occupation. Again, large quantities of useful equipment were evacuated to the south and eventually all that was left under civil Government control was the hospital at Johore Bahru and Singapore island.

Johore Bahru Hospital went through the stages of being a civil and military hospital, a field ambulance and a regimental aid post. Here also, arrangements were made for the Asiatic staff to take over the care of the remaining patients before the hospital was abandoned.

SINGAPORE

After the raid on December 8, 1941, there was a period when the Japanese air attacks on Singapore were infrequent and of no great severity, so far as the civilian population was concerned. The hospitals and aid posts were fully mobilised, and all the arrangements for dealing with casualties worked well.

'Blackout' presented problems peculiar to the Tropics, because of the open structure of buildings. At first shaded lights were used, but it soon became apparent that in hospital wards and admission rooms, and in the operating rooms in aid posts, bright lighting was essential if work was to be done rapidly. Wherever the structure permitted, windows and verandahs were closed with blackout screens of cardboard in wooden frames. This made the wards deplorably hot, but work could be done effectively. Fortunately, most of the operating theatres in the hospitals were air-conditioned. The hospitals' first experience in the treatment of a large number of burns came when some 50 men from the *Prince of Wales* and *Repulse*, all badly burnt or scalded, were brought in for treatment after the sinking of these ships. At that time there was no lack of staff or equipment for their special treatment, and they all recovered.

By the beginning of January, raids were more frequent, but the general attitude of both officials and the general public was one of preparation for a long siege. For example, special efforts were made to extend the cultivation of food crops, and to guard against the risk of beriberi by the compulsory 'fortification' of bread with rice polishings.

In the second half of January, daylight raids became common, and were so regular in their arrival that it was possible to arrange the day's routine accordingly. About ten o'clock in the morning and about three in the afternoon a flight of Japanese bombers, usually numbering 27 planes, came over, flying in formation in a clear sky with apparently nothing to stop them. Most of these raids were directed against objectives on the outskirts of the town. They all caused some civilian casualties, especially the raids on the dock areas, but the number of admissions to hospitals was on an average under 100 a day.

The staffs of the hospitals and aid posts were being steadily reinforced, as medical officers and nursing staff from places further north were driven back to Singapore. By the middle of January, all the civilian European medical and nursing staff, the European private medical practitioners, and a large number of Asiatic medical auxiliary personnel from the northern part of Malaya, had been withdrawn to Singapore. Before the end of the month the medical staff from Johore had also come in, and all the civilian Government resources were concentrated on Singapore island.

Terror raids, directed on the centre of the town, were rare until the last phase of the attack. There was, however, one exception on January 21, when daylight raids on the centre of the town caused about 300 deaths, and 600 seriously wounded patients were admitted to the hospitals in the course of the day.

There was nothing in the nature of the injuries that calls for special comment. Head wounds were relatively rare, or it may be that there were few who survived such wounds. Injuries on the back and buttocks

were very common, probably sustained when crouching in drains and slit trenches. When the injured were brought out from the rubble of shattered houses they were covered with the dust of pulverised plaster and rubble. It was surprising how few fires broke out, in spite of the amount of timber in the structure of the flimsy tenements of China town.

The methods adopted in dealing with the wounded were the same as those which proved effective in Britain. The minimum of treatment was given in first-aid posts, except for the control of haemorrhage, the treatment of shock and the relief of pain. Cases of trivial injury were kept there till they could go home, and all other cases were sent to one of the major hospitals. There were three of these hospitals, and patients were sent to the nearest of these first, and then, as soon as the situation became clear, to the hospitals where the load was least.

Treatment in the hospitals comprised the most important work of preliminary sorting, followed by thorough operative treatment and the application of plaster-of-paris casing whenever this was practicable.

During the early phase, which lasted until the first week in February, the system worked admirably. The surgical teams were at full strength, working in shifts of four hours on and eight hours off. The hospital wards were full, but the staff was adequate. The absence of any means of getting rid of the accumulation of patients who needed long-term treatment was a difficulty, but apart from this, it might have been possible to go on for a very long time under conditions as they were then.

The medical and nursing staffs were working splendidly. The Asiatic hospital servants, mostly Chinese, also worked remarkably well. There was never any sign of their being afraid to turn up for duty, or to keep on working during raids. In this respect there was a striking difference between Singapore and some of the places up country. Perhaps this was because on the mainland there was evidence of retreat everywhere. Perhaps it was because in Singapore arrangements had been made to provide ample rations for hospital attendants and their families within the hospital grounds. One incident that did much to confirm them in their resolution occurred on the night of January 29. A heavy bomb dropped within a foot of the wall of the largest hospital tenement, and failed to explode. If it had exploded, at least a hundred of the servants and their wives and children would have been killed. As it was, this was taken as a token that the Fates were on their side. It is possible that they were influenced by the example of the senior members of the staff, who were working so hard to deal with patients who were mostly Chinese.

Last Phase. During the first week of February, raids became more frequent and came nearer to the centre of the town, as the Singapore docks became one of the most heavily bombed areas. By the end of the week, the naval base on the northern side of the island was abandoned, and the Japanese were seeking other targets.

Shelling of Singapore town, from Japanese guns on the mainland, began on February 7, and the Tan Tock Seng hospital, because it was in the direct line of fire, was one of the first places to be hit. That day the hospital staff was further reinforced by about 120 stewards and cooks from the ship *Empress of Asia*, which had been sunk when approaching Singapore two days before. They did very valuable work as cooks and ward orderlies during the last hectic days.

On February 9, the Japanese landed on the north side of Singapore island. During the week that followed, the front line moved nearer to the city of Singapore. Air raids and shelling went on intermittently all day long. The emergency hospitals and first-aid posts on the outskirts of the city had to be abandoned as they came under fire. Their patients were sent back to the centre of the town where the hospitals were becoming crowded with both military and civil patients. By February 12, the hospitals and aid posts in the outer suburbs had been abandoned, and their patients and staff brought in to the centre. From nearly every hospital and aid post that remained, complaints were received that batteries of our guns had taken positions in the adjacent grounds, and were drawing fire on the hospitals. Doubtless this was unavoidable; there was so little open space left anywhere.

Remarkably few of the medical staff or patients were killed by shelling, but it knocked out a large number of the ambulance cars and made transport very difficult.

On February 13, instructions were given that women doctors and nursing staff should leave Singapore. All the women in the Army nursing service had already gone. About half of the European women doctors, matrons, sisters and medical auxiliaries decided to leave. The remainder volunteered to carry on and take whatever might be coming. Nearly all the Asiatic nurses volunteered to remain at their posts. Those who left suffered tragic losses. They were bombed at the docks before embarkation. Their ship was bombed and sunk, and many of those who survived were lost when the ship which rescued them was also sunk. One woman medical officer and forty matrons and sisters of the Civil Medical Service lost their lives during their attempt to escape from Singapore.

The Tan Tock Seng Hospital, situated on the north-east side of Singapore town, had to cease admitting patients on February 12, and on the 13th, with the help of military transport from two field ambulances that had established themselves at the hospital, all the patients and staff were withdrawn. This hospital had dealt with over 5,000 patients up to the end of the first week in February. After that date records are not available.

On February 13, two medical students who remained at the Tan Tock Seng Hospital were hit by shell splinters. They died of their wounds and when they were being buried by a party of their fellow

students, in a slit trench near the Medical College, shells fell on the burial party and killed twelve more students.

The Kandang Kerbau Hospital, normally a maternity hospital, situated on the eastern side of the centre of the town, was now the only hospital left, in addition to the General Hospital. Up to February 13 it had dealt with about 1,000 patients. On February 14 and 15, this hospital was subjected to heavy bombardment by artillery and air raids. The building was modern, of strong reinforced concrete, with steel shuttering on the windows of the operating suite. During the afternoon of February 15 there were over 80 direct hits on the hospital buildings, but work went on without a break. Casualties kept pouring in during the last two days. All the beds were filled, and patients lay on mats on the floor. Eventually, nearly all the floor space, under the beds and between them, was occupied by a collection of mangled men and women for whom little could be done beyond giving morphine and water. About 600 badly wounded patients were admitted on the last two days. On the last day, daylight faded with all the buildings holed, cars and trucks burnt out in the grounds, but with the electric light and two water points still functioning.

The General Hospital, Singapore, up to February 11, 1942, had admitted 15,000 wounded. Among these at least 1,000 military patients had been treated in the hospital. The staff had been reinforced by both Australian and Indian Army Medical units. For the last three days, no accurate records are available. The stock of admission record cards was exhausted when the total number for the Singapore hospitals reached 20,000. During these three days about 700 patients were admitted daily. At the time of capitulation, on the evening of Sunday, February 15, there were 3,400 patients in the hospital. Its normal accommodation was for 800 and its war capacity was supposed to be 1,600. There was an overflow of some hundreds of patients in the adjacent prison buildings, which had been emptied of their criminal inmates on the day before surrender, to make room for patients driven in from the hospitals and aid posts which were under fire. Of the patients in the General Hospital, 1,100 were military cases, transferred from field ambulances or brought in straight from the front line.

Food. In spite of siege conditions, the large number of patients and the fact that all the staff and their families were fed by the hospital, there was never any difficulty or anxiety about food. Kitchens had been extended and the staff augmented. Large stocks of foodstuffs were kept in the hospital, and the task of feeding about 7,000 people daily was accomplished successfully.

Water. The critical factor in the last days was water. Before the outbreak of the Japanese war additional tanks and cisterns were fitted in the hospital. These were supplemented by concrete tanks in the grounds, which were kept filled. But these were only enough for a

few days. On February 12 the water pressure dropped, due either to the Japanese having obtained control of the reservoirs or to damage to pipes. By the 15th there was just enough water for drinking, the preparation of food, and the minimum needs of the operation theatres. The sewage disposal system was not working. In the operation theatres, lack of water made the use of plaster-of-paris impossible, linen could not be washed, and one basin of water had to serve for the washing of hands for several operations.

Burials. There were two large excavations in the General Hospital grounds which had been intended to serve as ponds for a reserve water supply. One was a square cavity on a hill beside the maternity ward. The other was a trench about 100 feet long and ten feet wide and deep, immediately in front of the main block of the hospital. These holes never reached the stage of being used for their intended purpose as reservoirs, but they solved the problem of burials.

In the last week the arrangements for the transportation and burial of bodies in the town were breaking down, and the hospital had to bury its dead and those brought in to the mortuary from the surrounding district. The farther excavation, about 250 yards from the main hospital, served as a burial place until February 13. Then the burial parties came under shell fire; several men were killed, and all burials had to be done in the common grave in front of the hospital. It is estimated that 1,000 bodies, soldiers and civilians, men, women and children, Christian, Muslim and Hindu, Australian, British, Chinese, Indian and Malay were buried in these common graves.

SURRENDER

At 8.30 p.m. on February 15, the message came through that Singapore had surrendered. It became possible to open up some of the blackout screens and let a breath of air into the crowded wards. The staff was exhausted and dispirited, but they had to carry on through the night trying to deal with the great number of patients who were still waiting for their help.

It is appropriate to mention here a few of those who were outstanding among the many who worked with great devotion during the trying weeks before the surrender.

Dr. L. W. Evans, who remained in Penang, Dr. G. A. Ryrie and the Lay Superintendent, the late Mr. C. H. Hewatt, who remained with the lepers in the settlement in Sungei Buloh when the Japanese came in; Miss M. Brebner, Matron of the General Hospital, Singapore, and Mrs. R. Cherry, head of the Auxiliary Nursing Service, who were killed on the s.s. *Kuala* when leaving Singapore; Dr. J. H. Bowyer, Chief Medical Officer of the Singapore General Hospital, who died after imprisonment by the Japanese Military police; the leaders of the surgical teams, C. S. Wilson, B. M. Johns, E. C. Chitty, J. K. Munro,

D. E. C. McKie, J. A. P. Cameron and the late E. S. Lawrie; Miss K. Stewart, Assistant Matron, Dr. Balhetchet, of the Tan Tock Seng Hospital; Miss I. D. Brown and Miss E. M. Hill, who were outstanding among the operation theatre sisters; staff nurses Quental, Benjamin, and the sisters Neighbour; Drs. C. C. B. Gilmour and D. A. B. Hopkin, for their work in organising the first-aid posts; and Mr. Ponnampalam, Head Hospital Assistant at the General Hospital, who was accidentally killed while on duty there.

ESTIMATE OF THE NUMBER OF CASUALTIES

In Singapore the number of civilians who were killed or died of wounds, and who were identified and recorded, amounted to about 3,500. During the last week accurate records could not be kept. Bodies were buried where they were found, and many hundreds were not identified. It is probable that the total number of civilians who were killed or died of wounds in Singapore between December 8, 1941 and February 15, 1942 was between six and seven thousand.

The number of wounded admitted to the hospitals was over 20,000 before the records system broke down, and the total is probably about 25,000. Those treated in the first-aid posts, many of whom were passed on to the hospitals, must have numbered over 40,000.

On the mainland, casualties were less severe, and it is estimated that for the Malay Peninsula and Penang Island the total of civilian deaths from air raids and battle casualties during the period of the Japanese invasion was between three and four thousand.

THE JAPANESE TAKE CHARGE

On Monday, February 16, orders were issued by the Japanese headquarters that all the hospitals, with their stores and equipment were to be cleared of patients and handed over. The Japanese had detailed maps and a list of medical institutions. This included the General Hospital and Tan Tock Seng Hospital. By a fortunate accident the Kandang Kerbau Hospital was omitted and was allowed to work undisturbed for another week. The Tan Tock Seng Hospital was already empty, but the General Hospital had to be cleared within 48 hours. The Japanese high command agreed that patients in the General Hospital should be transferred to the Mental Hospital buildings. These buildings had been partly emptied ten days before and could have provided reasonable space and equipment for the patients who were to be transferred. But when the move began it was found that the most useful part of the buildings had been occupied by a Japanese field unit. They had taken possession of the central buildings, with the stores of medical equipment and food, the kitchens, operation theatre and laboratories. They left nothing but the empty shells of wards.

There were 3,400 patients to be moved. The 1,100 military patients were moved to the improvised Army hospitals; 700 were moved to the Mental Hospital; and the rest, all who were able to walk, found their own way home. There were still four large aid posts in the town which were allowed to continue with their work, and for a week or two they became small hospitals.

The transfer of 700 patients from the General Hospital to the Mental Hospital building was a grim business. Ambulance transport was provided by the Army, but all the rest of the work had to be done by the senior members of the regular medical staff and of the Medical Auxiliary Service. Now that the battle was lost, the hospital servants, both at the General Hospital and the Mental Hospital, had faded away to fend for themselves.

The only equipment that could be taken was what could be carried on stretchers along with the patients and concealed under their blankets. At the Mental Hospital there were no beds, no utensils, no water and no food.

Very valuable assistance in the way of providing food was given by the inmates of the Leper Settlement, which is adjacent. They gave abundantly of their stocks of rice, and vegetables, pork and eggs from their farm. They had been supplying farm produce to the General Hospital also during the last week when other sources of fresh vegetables had failed. Under the leadership of the head patient, Mr. Yeo Kim Eng, who has since been awarded the British Empire Medal, the lepers did a great deal to help.

Order soon emerged from the chaos at the Mental Hospital. The General Hospital was cleared, not within the 48 hours demanded by the Japanese, but in less than three days.

By the afternoon of February 18 the General Hospital was empty and the Japanese were moving in. The hospital had been cleaned as far as was possible, but it was dirty and depressing. The sky was overcast with the smoke of oil tanks which had been burning for several days and the air was heavy with the stench of uncovered corpses.

On February 17 the greater part of the European population was assembled to be sent into internment. Some of the medical staff went then, and most of them during the few weeks that followed.

A few Sanitary Officers and other specialists remained out of internment for a year or more.

CONDITIONS DURING THE JAPANESE OCCUPATION

The account of conditions outside the internment camp has been derived from the stories of Asiatic members of the medical staff who were allowed to carry on with their work. Most of the hospitals, and the rudiments of a public health service, were kept going under Japanese direction. The staff was for the most part the pre-war Asiatic staff, and

as far as conditions allowed the work was continued on the same lines as before the war. The Japanese gave scant help in the way of supplies or personnel, but they did pay the staffs, provided a limited amount of food for patients, and interfered very little except in the larger towns.

In the smaller towns of the mainland, the hospitals did very useful work with the help of the local medical and nursing staff and often with the benevolence of the local population.

Few records have been kept for this period; but the records of births and deaths have survived, and they seem to be fairly accurate. Both in Singapore and in the Federation of Malaya there was a steady increase in the number of deaths, year by year, from 1941 to 1945, and a reduction in the number of births, so that in 1944 births and deaths are almost balanced.

There were many deaths in Singapore from mass executions. The true number will never be known, but it has been estimated that those who were executed and those who were taken for forced labour and did not return amounted to about 20,000.

In the Federation, the number of civilians who did not return from forced labour in Siam is estimated to be about 60,000.

Epidemics were not of the severity that might have been expected. In Singapore, immediately after the surrender, there was a bad outbreak of bacillary dysentery which lasted for about two months. A very extensive campaign of inoculation against cholera and typhoid was carried out. Dr. R. Green, bacteriologist of the Institution for Medical Research, made the vaccines and directed the inoculation. This was carried out systematically until almost the whole population of Singapore was treated. There was no outbreak of typhoid, nor of cholera except for a few local cases traced to infection from a ship. With conditions as they were, both cholera and typhoid were to be expected, and it is probable that the inoculation did much to prevent them.

Malaria appeared in 1942 and 1943 in parts of Singapore which had been free from it for many years. On the mainland, malaria assumed epidemic form in 1943. The Senior Malaria Research Officer summed up the situation as follows:

> 'There seemed everywhere to be the same story, the breakdown of control in 1942 and social dissolution and chaos from semi-starvation in 1943. This was followed by epidemic malaria and the decimation of the labouring population by deaths and the transfer of active adult males for forced labour in Siam and elsewhere. The survivors returned to an uneasy equilibrium with their environment in 1944 and 1945, as they became immune to the malaria and grew their own food under the lash of hunger. Perhaps too there was some lessening of vector breeding from the growth of cover over streams and seepages in some areas of the *A. maculatus* country.'

Starvation was soon added to malaria, even in places that normally would grow all their own food. The following is an account of a typical Malay peasant area which had been under observation for many years:

> 'The advent of the Japanese rudely disrupted the balance of the peasants' lives. Confiscation of half the rice stores in 1942 was followed by compulsory felling of jungle to plant subsidiary crops of tapioca. This led to a severe epidemic of malaria in 1943, the after-effects of which have not yet disappeared. Forced male labour to construct an aerodrome nearby depleted the labour reserves of the valley, so that not only did forced cultivation of the hillsides cease, but the ricefields could not be tilled. Compulsory planting of Taiwan rice instead of the native strain proved a failure, and aggravated an already desperate state. The neglected state of the ricefields led to pest increase, and wild pigs ravaged the depleted crops.
>
> 'All these factors, combined with repeated attacks of malaria, caused a state of ill-health which till recently interfered with the daily round and left the people a prey to intercurrent disease. The surrounding jungle was the hide-out of Chinese guerillas and bandits, who preyed on the peasant for food and money. There was charge and counter-charge of betrayal. Pent-up hatred, inflamed by the teachings of a religious leader, burst out in the period between the Japanese surrender and the British re-occupation and resulted in a massacre in the Chinese village settlement by the Malay community. There were few survivors. When the valley was revisited in the middle of 1946 there were signs of physical and mental deterioration. There were many ruined and dilapidated houses, the ricefields were still ill-weeded and only partly cultivated. Chronic malaria was universal, with much oedema and malnutrition. There was a high incidence of yaws, skin disease and worm infection. The people were depressed and clamoured for medicine.'

Another example of conditions under the Japanese is given in the record of the Central Mental Hospital for the Malay States. This institution had 3,500 patients when the Japanese took control. There were over 1,000 further admissions, by transfer from Sumatra. When the British returned less than 500 patients remained. A few had been discharged, but nearly 4,000 had died from dysentery and beriberi.

An account of conditions at the Sungei Buloh Leper Settlement has been written by Dr. Gordon Ryrie, who remained with his patients when the Japanese came in. The following extract begins from the time when the British withdrew from Kuala Lumpur:

> 'The electric lights went out and the telephone ceased. Up to the last moment drugs from the Central Medical Store, cases of condensed milk, flour, salt and sugar were taken in and also masses of seedlings and plants from the Agricultural Department. The Settlement area was now crowded with refugees from Kuala Lumpur and efforts to quell their undisciplined terror took up time that could ill be spared. The approach of Japanese invading troops terrified the patients, and it was

necessary to restrain mass hysteria. Once or twice bands of looters had to be dispersed; and looting in the Leper Settlement area was wholly prevented—in very marked contrast to what was going on all around. On January 8 the Japanese forward troops came in.

'It is not possible to give a picture of the Settlement during the Japanese occupation without reference to the background of general conditions. The Japanese held the towns and villages; they seldom ventured into the jungle. Their rule was conducted with an almost incredible inefficiency.

'This period divided itself into three stages, initial confusion, economic plundering, and a period of political terror. As their régime got under way, the Japanese plundered and drained the resources of the land as a short-term policy. When this process was complete, the political police dominated the country, replacing robbery with terror. Both patients and staff went through a time of tense anxiety during this period. The Japanese were extremely afraid of leprosy, but their temporary desire to have the local population on their side prevented the extermination of which they gave frequent hints. There were some very pardonable lapses, both among the staff and patients, at this time, but on the whole morale remained surprisingly steady. Of enormous value was the continued, if now quite unfounded, faith in the presence of a European.

'The period of exploitation gradually ended. The Superintendent was given a dollar a month per patient for meat and vegetables and an irregular supply of rice, sugar and salt. Vegetable gardening for all able-bodied patients, including women and children, and also firewood gangs, had already been started. To preserve morale, treatment had to go on. Injections were given of weak potassium permanganate; clinical examinations and weighings were continued, anything to keep up the semblance of the usual routine.

'Treachery was everywhere and the Japanese had spies installed as well as armed agents looking for a chance to shoot. Anti-British propaganda was unceasing and clever. Bands of armed robbers owing neither mercy nor allegiance to any man roamed the countryside. Sudden raids from drunken bands of Japanese soldiers were frequent and difficult to control. There was no news.

'It was impossible to keep figures, for all documents were dangerous. Suicides became relatively frequent, between 30 and 40 during the two years 1942 to 1943. Towards the middle of the year typhoid appeared and was prevalent in the surrounding district. Antiseptics began to run short, and the sores aggravated by deficiency disease became a serious problem. Bandages were impossible to obtain. Anti-malarial work was completely neglected and malaria, mainly subtertian, soon became prevalent, with a high incidence of cerebral cases. Quinine supplies were inadequate and each day patients who were to be allowed to die untreated had to be set apart. People from the countryside crowded in asking for quinine, and on more than one occasion their dead bodies were found on the roadside.

'Sepsis became uncontrollable. On entering a hospital ward the smell struck one like a physical wave. Men begged for amputation on the

slightest sign of sepsis, knowing that it was their only hope of clean bandages.

'Beriberi, pellagra, ulcers and other manifestations of deficiency were common. There were no coffins and it was not possible to prevent wild dogs from clawing up the graveyard. The death rate rose to over 250 per mille per annum. Of 2,550 lepers who were being cared for at the onset of the invasion, less than 1,300 remained alive after two years of Japanese "Co-prosperity".'

On Christmas Eve, 1943, the Japanese police removed Dr. Ryrie from the Settlement and sent him into internment. From that date, the story is continued by one of the patients:

'Dr. Ryrie and Mr. Hewat were interned. Patients were eating dogs, rats and giant snails, the last costing $6 per 100. The ration was about five ounces of rice and about the same amount of tapioca. Some patients were reduced to living skeletons, others bloated beyond recognition (the effects of a tapioca diet with nothing else), and 95 per cent. contracted malaria. There were no medicines, no medical appliances, little or no hospital staff as most of the staff was prostrated. The deaths rose to two or three every day till death became a matter of course, and by the time liberation came over 1,500 patients were dead. As for the Settlement, the once beautiful grounds had vanished and "lallang" in full growth was in evidence everywhere. The Settlement had reverted to jungle.

'Came liberation. The Japanese had surrendered and the oft-repeated cry, "When will the British return?" was answered by the arrival of the British Military Administration, bringing food and clothing. Not yet a year. The jungle has once more been transformed into a model township and a visitor who had not seen the results of the Japanese occupation would find it hard to believe the war had ever touched the Settlement.'

Sanitation in the cities and townships deteriorated steadily and the disposal of refuse was hampered by lack of transport; dumping was carried out ineffectively, and fly breeding increased. The disposal of nightsoil by using it as a fertiliser in market gardens became the general practice. Enteric fever became more common; in 1944 in Kuala Lumpur there were 420 recorded cases of enteric fever, ten times the average yearly figure.

Food became increasingly difficult to obtain, except for those who could afford to pay exorbitant prices in the black market. There was a rationing system which was reasonably effective in the towns, with an issue of about four to six pounds of rice a month. Cultivation of tapioca and sweet potatoes was compulsory. Most of the population were able to avoid acute starvation, though they became thoroughly sick of their diet of tapioca and sweet potatoes. The old and the infirm died of plain starvation. Semi-starvation was fairly common among all classes. Indian labourers on rubber estates were most affected. They were thin and showed oedema; ulcers on the legs were very common. The typical picture was of sub-clinical beriberi and hypoproteinaemia.

CONDITIONS FOUND ON THE RETURN OF THE BRITISH ADMINISTRATION

The conditions found when the British Administration returned were typical of semi-starvation, dirt and neglect. Beriberi was uncommon, but oedema, ulceration and anaemia were general.

Malaria by this time was reduced to a lower incidence than in normal times, as immunity had developed in those who had survived the epidemics in 1943.

Yaws, which had become uncommon before the war, was rampant among the Malays in the more remote districts, nearly every child and a large number of adults showed florid lesions. Scabies, common enough before the war, but always in a very mild form, had become severe and almost universal among the rural Malays.

The insanitary conditions found in the town of Kuala Lumpur were typical:

> 'The streets were very dirty; there was no street or domestic electric lighting; the water supply was unpurified and was running to waste from defective pipes; food was very scarce. All anti-malarial work was neglected, and malaria-carrying mosquitoes were breeding in the concrete drains. Such nightsoil removal as was done was the work of the vegetable gardeners. The public market was full of hawkers and unauthorised stalls. The incinerator was useless and there was no scavenging or conservancy.'

Hospitals. Most of the pre-war hospitals were still working but they were very short of equipment and drugs. The lack of mattresses, sheets, blankets, mosquito nets and clothing was desperate and hospital diets were inadequate. The local staffs were weary and undernourished, but they gave enthusiastic support to the relieving forces. Large quantities of equipment, stores and drugs were supplied from Army and Red Cross sources, and by the end of the British Military Administration period hospitals were adequately supplied with basic necessities.

INTERNMENT

On February 17, 1942, most of the British European civilians in Singapore who were not employed in essential services were assembled and made to walk to the first internment camp, which consisted of a police station and a group of houses at the seaside about seven miles from Singapore. Very little transport was provided, and most of those going into internment could take with them only as much as they could carry. There was overcrowding and great distress from lack of food, bedding and sanitary arrangements. The number sent to internment on the first day was 1,379. During the next two months this number was increased to 2,600.

Changi Prison. On March 6, 1942, all the internees were marched to the Convict prison at Changi, a distance of about twelve miles. This

is a long-term convict prison with normal accommodation for 600 prisoners.

The first lot of internees numbered 2,600, and by April 1943 the number had risen to 3,179.

For over two years the average population was 3,000. There were 350 women and 50 children, who were segregated in one section of the prison.

The first and most serious problem was overcrowding. Each cell, measuring about eleven by nine feet, had to hold three men, and all the dining rooms, work rooms and corridors had to be used for sleeping accommodation. Each man had to live, eat and keep his belongings in a space of about thirty-five square feet.

Sime Road Camp. On May 1, 1944, the internees were moved to a hutted camp at Sime Road. Here there was a welcome escape from prison walls, but the overcrowding was even worse. Numbers were increased by sending in Jews and Eurasians. The population rose to 4,500 and the average allocation of space was about twenty square feet.

The internees were allowed to make their own arrangements for the internal running of the camp. Supervisors, quartermasters and technicians were elected. There was no lack of expert skill. There were over 80 medical men and women, there were engineers, agriculturalists, electricians, blacksmiths, butchers, bakers, cooks, teachers, nursing sisters and musicians. The development of amateur skill kept pace with the professional direction. As time went on and the various occupations became organised, the prison became a workshop and a university with courses ranging from philosophy to bee-keeping. A ship's captain and a mine manager, both well advanced in years, revived the coopers' craft and made tubs that kept the camp supplied with containers for rice. An entomologist showed great skill in making spectacle frames from tooth brush handles.

This existence went on as happily as was possible with poor food and close confinement until October 10, 1943, the notorious 'double tenth', when the Japanese military police raided the prison and a reign of terror began. Over 50 internees were removed to close imprisonment and torture, and fourteen of them died. All activities in the camp other than essential work were stopped. The secret wireless sets were removed and rumour replaced the tonic of authentic news until near the day of liberation.

Sanitation. The health problems were overcrowding, latrine accommodation and food. The lack of clothing was not important, one garment was enough; the lack of boots or shoes was more serious, especially for those engaged on heavy work, but most people managed to have one serviceable pair of shoes. The climate provided all the warmth that was required, except on wet nights, when it became evident that

even at sea level in the tropics an undernourished man can suffer badly from cold.

Although the jail was provided with a good water-carriage sewage system, it was not practicable to use most of the 'squats', which were in crowded sleeping quarters. Bore holes and improvised troughs over drains were very effective. At Sime Road camp, the bore hole system solved the problem.

The one by-product of slum life from which there was no escape was bed bugs. They multiplied in spite of the efforts of many health officers, in spite of the solid concrete structure of the building, and ample facilities for washing.

Food. Lack of food was the great problem. Internment was an experience of slow starvation, an experiment in the production of dietary deficiencies, in which there were many skilled observers, but unfortunately no 'controls'. Even in the earliest stages, when the Japanese rations were relatively generous, it was evident that the dietary was unbalanced and that deficiency diseases were likely. A standing camp committee on nutrition was established, under the chairmanship of Dr. G. V. Allen, C.B.E. It concentrated quickly on growing as much green food as possible, and there is no doubt that this saved many lives. Starting in Changi with a production of 2,000 lb. of vegetables a week in January 1943, the output of vegetables was raised steadily to 17,000 lb. a week in May 1945.

The sections that follow are quoted from the paper by Dr. G. V. Allen and Prof. R. G. Scott-MacGregor in the *Proceedings of the Nutrition Society*:

> '*Vitamin Content of the Diet.* From the early days, when an outbreak of beriberi was threatening and throughout all periods of internment, the vitamin content of the diet was a serious problem. The committee strongly urged the purchase through the Neutral Agent, whenever possible, of rice polishings, groundnuts and green dhal. They were stored in the camp and issued in such quantities only as would maintain the vitamin B_1 values in the diet at a level at which there should be no immediate threat of an outbreak of beriberi. When the Japanese issued in the stores a certain percentage of unpolished, undermilled or parboiled rice, additions of special sources of vitamin B_1 did not need to be great, and stocks could be built up, but when highly polished rice was issued and undermilled rice could not be obtained from the Japanese, the issue of polishings, nuts or pulses had to be raised. Rice polishings were dried and stored in tin-lined chests made in the camp. The drying was carried out in a rotating drum adjusted over a charcoal fire in such a way that the temperature of the polishings did not exceed 80° C. Without this treatment polishings deteriorated rapidly. Stored rice polishings, groundnuts and green dhal were constantly examined for any signs of deterioration during storage.
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> 'When the green leafy vegetables in the camp gardens and also in the

private gardens of internees in Sime Camp were produced in large quantities they made a very significant difference to the dietary values, affording a particularly useful supply not only of vitamins A and C but also of vitamin B_1 and of the vitamin B_2 complex.

'*Red Palm Oil.* During the early period of internment when the supply of vegetables was extremely low, red palm oil was issued to avoid a lack of vitamin A in the diet.

'*Salt in the Diet.* In 1943 the Japanese made drastic cuts in the salt issue which caused the salt content of the diet to fall from a value sufficient for living and working in the tropics to one of 5 g. per head daily. The manufacture of salt in the camp at this period provided a source of the greatest importance and prevented severe salt deficiency.

'*Protein in the Diet.* The total protein in the diet was maintained by the addition of the rice polishings, nuts and pulses and, towards the end when protein values were low, the larger quantities of green leafy vegetables contributed a most significant addition and supplied a high variety of essential amino-acids at a time when there was no means of adding protein to the diet. The supply of animal protein, originally maintained when it was possible to purchase eggs and extra dried fish, became very low in the last year.

'*The Energy Value of the Diet.* During the greater part of the first two years of internment, except for certain weeks of rice shortage, the supply of cereals was such as to maintain the energy value of the diet at values approximating to 2,000 calories or over per head per day. During the last year of internment the maintenance of the energy value of the diet became a serious problem. Not only were cuts made by the Japanese in the rice ration, but the sacks provided were often well under the nominal weights and no allowance for this loss was permitted. The Japanese rations allowed 100 g. rice supplements to workers in certain fatigues, but their ration scale penalised men non-workers. This category included invalids and the incapacitated, whose numbers were increasing at an alarming rate. Women and children were equally affected and some of them were receiving rations containing little more than 1,000 calories per day during the last months. Red palm oil was of value during this period to supplement not only the low fat content of the diet but also the energy value. Sweet potatoes and cassava (tapioca) also were added, but were obtainable only in limited quantities. The cassava, which was being grown extensively in the gardens, was not due to yield on a large scale until a later period, but it appeared to be the intention of the Japanese that, when the crop of tapioca was ready, it should serve to substitute rather than supplement rice in the diet.

'The conclusions to be drawn from a survey of the camp diet are, that, if the camp had been forced to rely on the Japanese ration issues alone for its food supply, there would have been severe outbreaks of dietary deficiency diseases, and every reason to doubt the survival of many of the internees for three and a half years of internment. The addition to the diet of rice polishings, nuts and pulses, in the early days when these were obtainable, and of vegetables grown in the camp during the later periods, did much to prevent this.'

HEALTH

Although the average age of the camp inmates was 44 years at the commencement of internment, the mortality was under 10 per cent. for the whole period, in spite of poor diet and overcrowding. The health measures adopted were successful in checking outbreaks of dysentery, though cases were always present throughout internment, and malaria and tropical typhus occurred in the Sime Road Camp.

Signs of dietary deficiency diseases were present in some form or other at all periods. Beriberi appeared after three months of internment and, by July 1942, there were 30 clearly established cases, but after the end of 1942, as a result of improvement in the diet, there were no further cases except a small number which appeared during the last year of internment.

Signs of deficiency of the vitamin B_2 complex appeared in 1942, but it was in 1944 and 1945 that outbreaks of pellagra occurred. Septic skin infections and ulcers, present throughout internment, were worst in 1942 and again in 1945. A wave of cases showing amblyopia (nutritional retrobulbar neuropathy) reached its maximum in 1943.

Oedema and other signs suggesting dietary deficiency were present also. The oedema appeared frequently in the form of swollen ankles in many apparently healthy individuals; it appeared to be due to a variety of underlying causes. The only one of these which was clearly established was that in which the oedema arose from the addition of salt to the diet in excess of physiological requirements when the supply of salt allowed this to be done. Oedema cleared up in these cases when the individual omitted extra salt. A group of individuals was weighed and given extra salt. All showed an increase in weight within the next four days and 5 out of 7 showed visible oedema; a control group did not exhibit these changes.

In order to obtain information for the Medical Reference Committee, observations were made at intervals on 150 male internees of different ages and physique, selected to afford an average sample. The following information was obtained:

Weight. The average figures were before internment, 172 lb.; in 1942, 152 lb.; in 1943, 148 lb.; in 1944, 140 lb.; in 1945, 132 lb.

Height. A loss of height varying from $\frac{1}{2}$ to 1 in. was found in many cases. This was presumably due to loss of muscular tone, together with absorption from ligaments, joints, intervertebral discs and heel pads.

Blood Pressure. Systolic pressures appeared on the average to be lower than would have been expected before internment. Many individuals who claimed to have had a high blood-pressure before internment showed a value close to the average but, in certain pathological cases of established hyperpiesia falling outside the physiological group, the blood-pressure did not decline, and some of those affected died during internment. Many of the systolic values were in the nineties; some appeared

to be even lower. During the course of internment the average systolic pressure rose slightly. Differences between age groups were not great. Diastolic pressure did not appear to be much below normal values during most periods of internment but the average value fell towards the end of internment.

Haemoglobin and Red Blood Cells. The haemoglobin values measured by the Tallquist method gave an average of 80 per cent. in November 1942, August 1943, and October 1944; during the last year haemoglobin values above 80 per cent., or red blood cell counts above 4,000,000 were extremely rare in internees.

VITAL STATISTICS DURING INTERNMENT

The number of deaths over the whole period of three and a half years from February 17, 1942, until August 27, 1945, was 214. The average population during this period was 3,484, giving a death rate of about 17 per mille per annum. Even allowing for the fact that there were hardly any young children in the population at risk, this death rate was very much lower than might have been expected. During the last year, however, there was evidence of rapid deterioration, and there were many who could not have gone on much longer under these conditions.

EPIDEMIC DISEASE

There were two outbreaks of diseases which are of interest as examples of how conditions which are due to bad environment can rapidly be brought under control.

Malaria. In May 1944, a fortnight after the internees were moved into the camp at Sime Road, cases of malaria began to occur, and there were 300 new cases during the first six months. Permission was obtained to carry out mosquito surveys round the camp, and extensive breeding places of *A. maculatus* were found. With no more equipment than a few spades, a mop and a can of oil, the breeding places were brought under control, and during the succeeding period new cases of malaria seldom exceeded ten each month.

Tropical Typhus. This disease appeared at the same time. The camp was overgrown with 'lallang', which is a tall coarse grass, and was overrun by rats. The cutting and burning of lallang and the trapping of about 2,000 rats brought tropical typhus under control. There were in all 37 cases with seven deaths.

MEDICAL STAFF

The camp had an ample supply of medical officers. There were 80, including specialists in nearly all branches, and about 50 matrons, nursing sisters and nurses. Camp hospitals were organised separately for men, and for women and children. It was only in the last few months that nursing sisters were allowed to work in the men's hospital,

where their presence was a great help to morale, as well as being of the utmost practical value in directing and supplementing the work of the amateur male nurses. In addition to the camp hospitals, there were four dispensaries in different parts of the camp where medical treatment of a 'general practitioner' type was given.

Conditions of particular interest which were encountered in the course of internment were as follows:

SURGICAL CONDITIONS

Inguinal Hernia was one of the most perplexing conditions in camp. Many internees were not given time by the Japanese to get their trusses before being taken into internment. Others had trusses which soon ceased to fit them. Through rapid wasting and loss of abdominal fat and muscle tone, the majority developed direct inguinal hernia as a result of strain. It was possible to control the early cases by means of trusses improvised in the camp, but other selected cases had to have an operation at a time when conditions were not satisfactory. A type of Brooke's truss was made from wood and sorbo-rubber, with rubber belts cut from the inner tubing of motor tyres.

Peptic Ulcers on the whole fared badly under internment conditions. Condimented and coarse foods, long intervals between meals, smoking to allay hunger, and the shortage of drugs all helped to aggravate the condition. Operation was performed in many with good results, but it was noticeable that, as nutritional deficiencies became more frequent, there was a rise in the incidence of perforated peptic ulcer.

Appendicitis was of comparatively low incidence in the camp until January 1945. Forty appendicectomies were performed in camp during the whole period of internment without mortality. The high incidence in January 1945 occurred almost entirely among Jewish internees who had recently been brought into the camp.

Olecranon Bursitis in Changi was caused by trauma to the elbows while lying on the concrete of the cells or on the ground. Several methods of treatment were tried, but the condition in many cases resolved itself naturally.

Popliteal Bursitis occurred in Sime Road Camp following posterior strains of the knee joint.

Ganglions, arising from the dorsal and dorso-lateral surface of the wrist, were prevalent in those who were using heavy tools, sawing or gardening, and responded usually to the 'seton' method of treatment.

Dupuytren's Contracture of the Palmar Fascia. This condition was frequent in those who were doing hard manual work. The degree of contracture varied from a slight flexion of the fourth and fifth fingers to complete flexion into the palm. The thumb was chiefly involved in other cases.

Lesions of the Supraspinatus Tendon and Bursitis. The carrying of heavy baggage, and unusual occupations causing shoulder strain, led to several cases of severe supraspinatus tendinitis. In one advanced case with attritional changes, calcification of the tendon occurred. Aeroplane splints were made in the camp and worn during treatment.

Snapping Thumb and Fingers. This disability, which interfered greatly with writing and led to considerable discomfort, was caused by trauma in persons who had some focal sepsis or tendency to fibrositis. The flexor tendon was constricted in its sheath opposite the metacarpo-phalangeal joints where there was localised tenderness.

Sepsis in Wounds. The danger of sepsis in operation wounds under internment conditions was an early problem and continued to cause anxiety in view of the conditions under which aseptic surgery had to be attempted. A room which was a busy surgical dressing room during the day, and a dormitory at night, had to be cleaned out each time that an operation took place. Attempts were made on several occasions to get better accommodation but without any result.

In the early stage of internment, sulphonamide powder was used as a prophylactic in wounds but it was found that though it prevented sepsis, it appeared to delay the healing and coaptation of the tissues. The lack of operating gloves was greatly felt until the arrival of Red Cross supplies in March 1945. The incidence of sepsis in wounds during the last six months of internment was much reduced.

Nutritional Ulcers usually involving the lower third of the leg and the foot were very prevalent. During the time that internees were adapting themselves to the altered conditions of living, multiple ulcers were common; they usually responded well to treatment, but healing became noticeably slower as the physical condition of the internees deteriorated. Immediately after arrival in Sime Road Camp there was an improvement generally, and ulcers were less troublesome, but this temporary improvement was only short lived. As the food deteriorated, ulcers again became prevalent and were of a more severe nature than before. Dense, black, tenacious sloughs formed, causing intense pain and sleeplessness. In many cases this was followed within eight to ten weeks by the onset of acute toxic peripheral neuritis. These were probably cases of diphtheritic infection.

EAR, NOSE AND THROAT

Certain types of cases which are commonly seen in normal times—for example, acute otitis media, acute mastoiditis and para-nasal sinus infections—were comparatively rare. This was attributed to the relative freedom of the camp from upper respiratory infections. On the other hand, the malign influence of a prolonged period on a deficient diet was revealed in the number of cases of otorrhoea due to a dermatitis of the external auditory meatus, and the failure of response to local treatment

of many cases of chronic otitis media. The almost immediate response of many of these cases to the improvement in diet after hostilities ceased was significant.

A profuse and persistent rhinorrhoea, accompanied by nocturnal salivation, caused considerable worry to many internees until they were reassured that it arose from the unbalanced high carbohydrate diet. Many cases of para-nasal sinus pains, eustachian obstruction with aural pain, and certain cases of persistent headaches could, almost certainly, be traced to the same cause, as the majority showed a greater or less degree of oedema. There were comparatively few cases of other ear, nose and throat diseases of a serious nature with the exception of an unusually high proportion of deaths from bronchial carcinoma.

EYE CONDITIONS

It is interesting to note that in the general population of Singapore, after capitulation to the Japanese, infantile keratomalacia disappeared almost completely. This disease was very frequently seen before the war, and it was due in most cases to feeding babies on a diet of sweetened condensed milk, deficient in vitamin A. As the price of tinned milk became prohibitive, mothers were forced to breast-feed their children. This resulted in the disappearance of the disease. Cases of nutritional amblyopia appeared among the general population in August 1942. These conditions were similar to those described among internees.

Within the internment camp, the most notable eye defect was an outbreak of deterioration of vision accompanied by bilateral centro-coecal scotomata. It was not possible to discover the specific deficiency responsible, but the cases occurred at the same time as other deficiency conditions such as angular stomatitis, burning feet, scrotal eczema and paraesthesia affecting the limbs. Tobacco appeared to be a factor, as all the camp cases occurred in smokers, and no non-smoker was affected. There were 145 cases, of whom only two were women.

Cataract. A number of slowly developing cases of cataract occurred and it is probable that malnutrition played an important part in their causation.

Ophthalmia with Preauricular Lymphadenopathy. This condition at times became mildly epidemic. It was characterised by an inflammation of the conjunctiva, usually unilateral, with painful and tender enlargement of the corresponding preauricular lymph gland. Nearly all cases developed corneal complications in the form of multiple erosions, and a few cases also showed a mild iritis.

SOME MEDICAL DISEASES

In the physician's division the commonest conditions treated were dysentery, tropical typhus, malaria and deficiency diseases.

Of nutritional deficiency diseases the following were noted: Beriberi, which occurred in 1942 when the diet was relatively rich in carbohydrates and poor in everything else; with an improvement in the vitamin content of the diet in July 1942, beriberi disappeared. Oedema was common during the initial period and again during the last year. Sores at the angles of the mouth with a sore tongue and dermatitis of the scrotum: this syndrome appeared in the middle period of internment, and at the same time neuritis of a pellagrous type appeared in about 50 patients. In June 1944 there was an outbreak of pellagra characterised by the classical type of rash. There were about 300 cases of this condition.

SKIN CONDITIONS

The most interesting was pellagrous erythema, proceeding to pigmentation and scaling, often complicated by blistering and sepsis. The erythema yielded rapidly to treatment by marmite, nicotinamide, or multiple vitamin capsules. About 300 cases of this condition were seen. Faulty nutrition, but apparently not lack of nicotinic acid, played a large part in the occurrence of the following conditions: blood blisters, subcuticular haemorrhages, a nodose type of erythema and ulcers with purple areolae and adherent gangrenous sloughs. Scabies was common because of overcrowding and pediculosis was also very prevalent. Dermal mycoses were frequent, especially pityriasis versicolor, and also all forms of septic dermatitis including impetigo, furunculosis, septic sores and ulcers. The healing of septic conditions was in most cases slow, because of low protein in the diet.

DENTAL CARE

Three dentists maintained a dental clinic which was kept hard at work during the whole of internment. They were permitted to bring into the camps a fairly large stock of equipment, filling materials and local anaesthetics obtained by purchase in Singapore during the early months of internment. This included a foot-engine with burrs, stones, etc., and also a supply of cement, alloy and other materials used in conservative dentistry. This made it possible for a considerable amount of permanent work to be done. Over 300 broken dentures were repaired during the first year.

The effects of faulty nutrition were seen in oral ailments such as gingivitis, Vincent's infection, dying pulps, and multiple haematomata. Deep gingival interproximal cavities became very common due to a diet restricted chiefly to rice, while the ever-present grit in the food caused extensive attrition. Many teeth were broken or had fillings damaged by granitic chips in the food. On the other hand, the incidence of caries among the children, which had been very high at the beginning of internment, gradually lessened and at the end was very

low, which seems to indicate that the diet during internment was more nearly physiological, in relation to dental health, than the average pre-war diet.

It was found that the dentures of most internees eventually failed to function properly because of extensive absorption of bone and soft tissues.

PHARMACY

There were fourteen pharmacists in the camp, and most of them worked in the central or in the 'block' dispensaries. Supplies of drugs were very limited. At the beginning of internment some stocks were brought in, and during the first year further supplies were obtained secretly, by gift and purchase from Chinese in Singapore. In the later stages, until some Red Cross supplies arrived in 1945, there was a desperate shortage. Insulin became unobtainable, and three men with diabetes died when the stock of insulin was exhausted. Quinine had to be very strictly rationed.

Much ingenuity was shown in making or improvising medicines from local materials. There was a lode of fairly pure kaolin in Sime Road Camp, from which a mixture for dysentery and a lotion for skin diseases were made. Surgical spirit was made by fermenting rice and distilling the product in a home-made still, which produced 95 per cent. alcohol. Magnesium carbonate was made from sea water and soda ash. Calcium carbonate was made from wood ash, and used medicinally and as tooth powder. Sodium salicylate was made from salicylic acid and ash, and sodium iodide from iodine, nails and soda ash. A very useful laxative of the senna type was made from a cassia that was grown for the purpose. Natural rubber latex, obtained from a few rubber trees in the camp grounds, treated with a few drops of ammonia, was used for making bandages for the treatment of leg ulcers.

MENTAL HEALTH

Throughout the whole period of internment, the absence of any serious mental abnormality was very remarkable. There were a few instances of deterioration from the normal standards of decent conduct—of men who would grovel in a gutter for a cigarette end or a scrap of food, or who failed to keep themselves clean. But these were very exceptional.

There were only two suicides, and this, in a population of over three thousand, nearly all middle-aged, over a period of three and a half years, is less than would be expected from the same population in normal times. There were only three or four cases of psychosis, and psychoneuroses and psychosomatic diseases appeared to be rarer than in normal civil life. In many respects life in the internment camp had the features which are supposed to be curative in a mental hospital.

The diet was not stimulating, there was no alcohol, the sexes were segregated, there was plenty of physical toil which served as occupational therapy, there was little need to make decisions, and nothing to be gained by worrying about the future since nothing could be done about it.

The mental effects of internment became more evident after release when the ex-prisoners returned to work. Many of them suffered to a greater or less extent, from inability to make decisions, or to undertake work where they would be alone. They were unable to accept responsibility and to cope with difficulties calling for mental effort. In most cases this phase passed within a year.

CONCLUSIONS

From the civilian medical point of view most of the minor contingencies of the Malayan campaign were foreseen, and the arrangements made to deal with them were effective. The major risks of retreat, defeat and surrender were apparently never foreseen. If they were, plans based on these possibilities were never passed down to civilian medical levels.

The policy for the construction of air raid shelters varied in different parts of the country. In Singapore the congestion of buildings in China town made the erection of surface shelters difficult, while the high level of the subsoil water, and the danger of mosquito breeding, made trenches impracticable in the low-lying parts of the city. The bombardment of Singapore showed that a great measure of protection was obtained by sheltering in the lower floors and basements of strongly constructed buildings. Dispersal camps were useless; trenches a long way from the densely populated parts of the town were of little value. Reinforced surface shelters, within existing buildings, or on the covered way alongside the shops, might have saved many lives in Singapore. Possibly the cost was prohibitive, and the materials and labour required might have been more usefully expended on other defensive works.

The lack of water in Singapore during the last few days was not in itself a decisive factor, for the enemy had already reached the town; but a prolonged defence, without securing the water supply, would have been impossible.

In matters of surgical treatment there was ample proof that the best policy was to send all serious cases to hospital as quickly as possible, without delay at first-aid posts. At the hospitals, careful selection of cases in the admission room by an experienced surgeon, provision for resuscitation and transfusion, and early thorough operative treatment gave the best results. Time was of the utmost importance, and the speed of effective treatment of patients depended on the speed and organisation of the surgical teams.

The period of Japanese occupation showed how rapidly the public health could deteriorate after the breakdown of the unobtrusive but constant precautions which are normally taken to preserve a healthy environment. The lessons of internment were the converse of this; under conditions of environment which were thoroughly bad, the application of knowledge and skill and sheer hard work kept the chance of survival much higher than would have seemed possible. Given the opportunity to grow accessory foodstuffs, it was possible to improvise a substitute for almost everything except the essential energy value of food.

ACKNOWLEDGEMENTS

This account contains material taken from reports written by many medical officers, only a few of whom are mentioned in the text. To all of them, and to all the men and women of the Medical Services, Asiatic and European, of all grades, who showed great loyalty and devotion to duty during the war, grateful acknowledgment is made.

B.—NORTH BORNEO

By H. WANDS
M.B., Ch.B.
Deputy Director of Medical Services

THE MEDICAL SERVICES DURING THE JAPANESE OCCUPATION

The Japanese landed at Jesselton on January 8, 1942, and met with no resistance. In consequence little damage was done to property and there was no loss of life. Subsequent landings took place at Kudat and at Sandakan.

The attitude of the invaders was that public services should be maintained as normally as possible and in consequence medical officers were allowed to continue at work. They were interned in their homes and not allowed to communicate with the townspeople. They went about their duties normally and the Medical Officer, Sandakan, was allowed to visit the jail, the mental hospital and the pauper institute. Petrol, however, soon ran out, all British stocks having been destroyed before the landing, and a share in a bicycle was all a medical officer could expect in the way of transport. Rare visits to the leper settlement were latterly allowed, but, finally, to prevent communication with prisoners-of-war, the lepers were removed to Boaan.

As the armies advanced, pseudo-medical personnel were introduced to supervise the working of the hospitals but they did little, apart from spying on the staffs to prevent possible communication with outsiders, especially internees or prisoners-of-war. One Japanese surgeon, however,

passing through Sandakan, did an excellent amputation through the mid-third of the thigh of a fisherman who had been machine-gunned from the air before the landing.

A retired Japanese doctor, who had formerly practised among the Japanese in Tawau and had been on occasion employed part-time at that port by the Chartered Company, was brought from retirement in Japan and with the rank of colonel took charge of Sandakan Hospital and the Principal Medical Officer's office there. He was courteous and interfered little with the work in the out-patients' department or the wards, but he did not interfere either when the army removed practically all the stores held in the central medical stores, Sandakan, in 3-ton lorries. These included a two-years' reserve stock for the colony, and after that there was a steady diminution in the amounts of drugs and dressings available for the community, culminating in a veritable famine in such necessities as anti-malarial drugs, anæsthetics, morphine, lint, wool and gauze. The looting of stores and equipment contributed to the shortage and later there was also an increasing scarcity of beds and bedding. As a result the efficiency of the hospital service was gravely impaired and credit must be given to those of the subordinate medical staff who so loyally carried on their work under the greatest difficulties and hardships.

Salaries and wages were cut by the financial experts of the Japanese Military Administration and, as prices continued to rise, the subordinate staff suffered considerable hardship and a greatly lowered standard of living.

In the later stages of the occupation, troops occupied the wards at Sandakan and were very efficiently bombed out, with the result that little of the hospital remained standing.

In Jesselton events took a similar course to those in Sandakan. The medical officer working under Japanese supervision continued his work with steadily dwindling resources until finally interned. The hospital subordinate staff carried on under increasing difficulties similar to those experienced at Sandakan, and with similar devotion to duty. In the 'double tenth' rising three dressers were killed after being arrested for their part in an ineffective uprising based on the rumour that a landing by the Allies was imminent.

MALNUTRITION

Among the labouring classes malnutrition soon became evident. Beriberi increased at first, later to be reduced as the reserve stocks of rice disappeared and other foodstuffs substituted were eked out by potato tops, *kangkong*, *sayor bayam* and other greenstuffs. In the later stages of the occupation there was widespread oedema—a hunger oedema—which lowered greatly the patients' power of resistance to intercurrent disease.

A large proportion of the population suffered from ulcers of the legs. These were indolent and in the absence of good food and proper dressings, would not heal. After the re-occupation the distribution of food and reasonable care caused rapid healing even in ulcers that had persisted for many months. The absence of drugs, sanitary supervision and suitable housing led to a great increase of ankylostomiasis and other worm infestations, which in turn lowered the health standard of a large proportion of the population, in many of whom malaria, ankylostomiasis and malnutrition were co-existent. In such circumstances death supervened in a great number of cases, but the scattering of the population and the neglect in maintaining the registration of births and deaths rendered impossible the making of even an approximate estimate of the death rates.

The policy of the invaders towards mental patients and lepers was one of deliberate neglect. The former were turned adrift and left to fend for themselves, with the result that few survived. One leper was executed for assisting prisoners-of-war, others were severely beaten for being suspected of communicating with prisoners-of-war and internees, and finally the whole community was transhipped to Boaan Peninsula, dumped in a cocoanut plantation, and left to manage as best they could. Rations were delivered on rare occasions only, and for most of the period of their exile these lepers subsisted on fish they caught and cocoanuts. They had to construct their own shelters, had no medicine or medical aid of any kind, with the result that many died and, in all the survivors, disease was increasingly prevalent. Thus, because of its loyalty, this little community of unfortunates was made to suffer a prolonged period of hardship and starvation.

The population by this time had scattered or lived in the town intermittently. Trade dwindled to nothing, and local produce was requisitioned by the occupation troops, to the detriment of those who had not gardens of their own, or were not related to gardeners. Even the gardeners were definitely short of food, as imports of rice had long ceased. In the town many died and hunger oedema became an everyday disease.

A state of affairs similar to that in the two main centres prevailed in Beaufort, Interior and Kudat. The Medical Officer, Beaufort and Interior, Dr. M. C. Clarke, had in a circular ordered his staff in outstation dispensaries to assist the enemy in no way whatsoever. For this he was severely beaten, and paraded through the town as an example of what happened to individuals who resisted the Japanese. Later he was released to work in Jesselton until interned.

At Tawau, Dr. Blaauw was allowed to remain at work, and did so until forced to make his escape by Allied bombing, and by the possibility of being murdered by the enemy as they retreated. He, with his family, was picked up by the incoming Australian Army, and brought to Labuan.

Throughout the Colony the attitude of the occupying troops, and their deliberate stripping of the population of the very barest necessities of life, effectively negatived their 'Greater East Asia New Prosperity Sphere' propaganda, and apart from a relatively few misguided individuals, the population remained loyal, and the members of the staff of the medical department showed no mean example.

THE RE-OCCUPATION

In the bombing preceding the re-occupation, the hospital offices, wards and stores were practically all destroyed and temporary buildings were constructed so that the work of the hospital could go on. Pending this reconstruction, the work was carried on in two badly damaged wards that were still standing. All credit must be given to the subordinate staff for their work under great difficulties.

Most of them were back at work in temporary or damaged hospitals and dispensaries at the first opportunity and did sterling work for long hours every day in overcrowded temporary wards in which most beds held two patients, a patient lay on the floor between beds, while on the verandahs the sick lay in rows!

An ambulance sent from the Sandakan Hospital at Sim Sim to collect sick people lying on the sidewalks of the streets came back to the hospital loaded, and for two days ran back and forward to the town bringing in at each trip six or eight people found collapsed or ill in the streets.

The very generous medical supplies given by the Army, and food brought to those who had suffered from prolonged semi-starvation, worked wonders; there was a remarkably rapid return to normal, and the numbers on sick parades and of admissions to hospital fell steadily. Cases of chronic malaria, prolonged ankylostomiasis, other helminthiases, and chronic dysentery over a long period, however, recovered very slowly, and the widely distributed lesser degrees of debility persisted in many who, feeling not too ill, carried on without any treatment other than a gradually improving diet.

CHAPTER 5

A.—BRITISH SOMALILAND

By T. F. ANDERSON
O.B.E., M.D.
Senior Medical Officer

THIS short account of the work of the Medical Department in British Somaliland during the war is necessarily subject to certain limitations owing to the loss of records covering the period from September 1939, to early in 1944. It is possible that some records may be in the archives of Medical Headquarters in Nairobi, but most of the documents which arrived there from Somaliland have been examined and little of any value has been found. Consequently, this narrative has been compiled from information supplied by people who were in the country at the time. In this connexion the assistance of Mr. Adan Ismail, B.E.M., Chief Somali Medical Assistant, and of Lt. Colonel O. Brooke, D.S.O., O.B.E., who commanded a company of the Camel Corps at the battle of Tug Argan was of considerable importance. Mr. Adan Ismail's contribution has been particularly valuable as he was engaged in medical work in Somaliland throughout the war, including the period of the Italian Occupation.

THE PRE-WAR MEDICAL SERVICE

Before the war, the Medical Department of the Protectorate was centred in Berbera, under the administration of a senior medical officer, assisted by four European medical officers, and a number of Indian assistant and sub-assistant surgeons. There were no European technicians or nursing sisters. Approximately 227 hospital beds were available for the native population.

The largest native hospital in the country was situated at Berbera, with small subsidiary hospitals at Burao, Hargeisa, Boramo, Erigavo and Zeilah.

The only permanent military force was the Somaliland Camel Corps, consisting of two companies of local Somalis and one company of Nyassaland troops. Military medical personnel were confined to a few Somali and Nyassa dressers on the strength of the Camel Corps. Military patients were admitted to the nearest civil hospital.

THE WAR BEFORE THE BRITISH EVACUATION

During August 1939, when war appeared to be imminent, the Somaliland Camel Corps were deployed in two main defence positions, Sheikh Pass and Tug Argan near Darburuk, with troops covering

Burao and Hargeisa up to the Abyssinian frontier. All officials, except the District Commissioners in out-stations were initially evacuated to Berbera, but later they returned to their normal duties. The staff of the hospitals at Hargeisa, Burao, Borama and Zeilah were also transferred to Berbera, one dresser only being left in each to safeguard the equipment. Medical officers and most of the other Europeans in the country were given commissions in the Army.

On September 4, 1939, two advance dressing stations were opened; one at Darburuk, on the road between Hargeisa at Berbera, and one at Hudisu, at the bottom of the Sheikh Pass on the road between Berbera and Burao, in order to serve the main defensive positions. Each of these was manned by one of the Protectorate medical officers, an assistant surgeon, and Somali dressers.

As Italy did not declare war immediately, the two medical officers in charge of the advance dressing stations returned after a few weeks to Hargeisa and Burao, to re-open the civil hospitals. The two advance dressing stations remained open with sub-assistant surgeons in charge. European and Indian wives were evacuated from the Protectorate in May 1940.

By this time there were six Colonial medical officers, all of whom were serving in the Army.

On June 10, Italy declared war. On the next day, two Italian planes bombed Berbera; a few people were killed. Casualties were admitted to Berbera Hospital. Before the evacuation, bombing raids on Berbera by three Italian planes were of almost daily occurrence. After the first raid, however, casualties were very light as the bombing was mainly against the dock area, and also a large proportion of the native population, deeming that discretion was the better part of valour, fled to the interior.

Zeilah, Hargeisa and Burao were bombed occasionally but the Italians appear to have avoided bombing native quarters. Casualties were few and damage slight.

On the declaration of war by Italy, the military authorities decided that the frontier could not be held. Consequently, troops were withdrawn to defensive positions covering Berbera, the main position being Tug Argan, about 50 miles from Berbera on the Hargeisa—Jigjiga road, in which direction the main Italian thrust was anticipated.

The Camel Corps had now been reinforced by a brigade consisting of units from East Africa, namely: 1st Battalion Kings African Rifles, 1st Northern Rhodesia Regiment, 1st E.A. Light Battery and 2nd Battalion, The Black Watch, and the 2nd Battalion, The Punjab Regiment which had been sent from the Middle East.

The Italians advanced into Somaliland in August. The main columns advanced on Hargeisa from Jigjiga, while subsidiary advances took place towards Burao from Dagabur, towards Erigavo from Bendir Kassim, and in the direction of Zeilah and Borama from Jigjiga.

The main engagement occurred when the Italians attacked our main defensive positions at Tug Argan near Darburuk. The battle continued without cessation for three days, after which, in the face of greatly superior Italian forces, it was decided to evacuate the country.

The medical organisation at this time was as follows:

An advanced dressing station was stationed at Darburuk, from which casualties were evacuated to a main dressing station at Brigade Headquarters half-way between Darburuk and Berbera. From there they were sent back to Berbera Hospital which was manned by Protectorate medical officers, and Indian and civilian Somali staff. They were held in Berbera Hospital for a few days only, as they were evacuated by hospital ships which called at Berbera about twice a week. These arrangements worked well in practice, and as a result very few of our casualties fell into enemy hands.

There are no official figures of the civilian casualties, but the table below gives the approximate numbers killed and wounded as the result of attacks from the air:

	Killed	*Wounded*
Hargeisa	6	15
Berbera	45	125
Burao	1	6
Totals	52	146

The evacuation was carried out successfully, as it was not contested by the enemy.

ITALIAN OCCUPATION

The occupation of Somaliland by the Italians lasted for nearly seven months, from August 21, 1940 to March 14, 1941. The occupation was entirely military, and such hospitals as were set up in the country were military.

The headquarters of the Italian forces was at Hargeisa. Here the hospital was taken over immediately, and re-opened for Italian and native troops. The accommodation was greatly enlarged by the erection of tents, and Italian military equipment was supplied. Berbera and Burao and other smaller hospitals were eventually taken over as military hospitals.

In December, the Italians, evidently anxious to impress the local inhabitants with the benefits of their rule, opened out-patient facilities for the local Somalis. For this purpose, as many of the Somali medical staff as could be found were induced to resume medical work. The senior compounder, Mr. Adan Ismail, who had been interned, was put in charge of the work in Hargeisa, and others were found work in the smaller hospitals. Hospital beds were not provided for the local population, except for a few emergency cases.

BRITISH RE-OCCUPATION

When the main advance of the British forces into Abyssinia approached Jigjiga, the Italians in British Somaliland were in danger of being cut off from their base. They started to evacuate the country on March 14, 1941, and by the nineteenth, all had left the main centres. The General Commanding, and the remainder of the troops escaped capture by retreating across country. The first British troops entered Hargeisa on March 19, 1941.

The subsequent development of the medical department involved the gradual separation of the civil and military organisations. At first, all hospitals were taken over by the army and used as military hospitals. This was necessary because the Berbera–Hargeisa–Jigjiga road became the main line of communication for our forces operating in Ethiopia. From the re-occupation until the end of the war, at first large, though later diminishing, military forces were maintained in the country, which was administered by a military Government.

As soon as the Italians left, there was an immediate and remarkable return of government servants, including medical dressers, who had been in hiding in the interior, to resume their former employment. These men were posted to the various hospitals throughout the country.

When the tide of war receded, it was found that there was practically no equipment. Everything had either been removed by the Italians or looted by the local Somalis. Hospitals were re-equipped from army sources and shortly after the re-occupation, out-patient treatment was started in all hospitals. It was some time before accommodation could be provided for the local people in hospitals because of the overriding needs of the army for hospital accommodation. As soon as possible part of the available accommodation was set aside for Somalis, and hospitals were run for civil and military patients combined. Thus the Belgian casualty clearing station which took over Hargeisa hospital had a small tented section for native civilians.

Unfortunately, medical officers who had served in the country before the war did not return, and consequently medical work among the natives had to be started by army officers in addition to their normal duties.

Later, the civil and military medical organisations were separated. The Civil Medical Department was staffed by Somali dressers, a few Indian assistant surgeons, and by military medical officers whose whole time was devoted to civilian duties.

THE MEDICAL SERVICE AT THE END OF THE WAR

By the end of the war with Japan in August 1945, considerable progress had been made in rebuilding the medical service. The inadequate nature of the pre-war service was recognised and a greatly increased establishment was approved, which included twelve medical officers,

five nursing sisters, and a number of European technicians, and a greatly increased native staff. As the country was still under a military administration, European staff were appointed by the army and held military rank. Military hospitals were set up, thus releasing the civil hospital buildings which reverted to civil use. These were found to be inadequate in size, and were enlarged by the provision of tents or buildings of a temporary nature. A scheme for the rebuilding of all hospitals with a grant from the Colonial Development and Welfare Fund had been evolved, but had not yet been put into operation. A training scheme was also started for dressers and nurses, to fill the greatly increased number of vacant posts.

EFFECTS OF THE WAR ON PUBLIC HEALTH

As might well be expected the social effects of the war were profound. A primitive nomadic population, in a country which had previously had few contacts with the outside world, was subjected to no less than three sudden and violent influxes of alien troops. One of the most important effects was a distaste for the nomadic way of life shown by the younger generation, who were attracted by the high wages offered by the army to both recruits and labourers. There was a marked drift to the towns, which soon became greatly enlarged by the erection of temporary dwellings, and grossly overcrowded. The diet of the town dwellers, particularly those in regular employment, compared very unfavourably with that of the nomad, who normally had an abundance of meat and camel's milk. As a result, under-nourishment and tuberculosis increased. There was a serious famine in 1943, primarily due to a failure of the rains, but aggravated by the interference with normal trade occasioned by the war, and by cessation of the importation of foodstuffs.

The most important direct effect of the war on the health of the people was the marked increase in prostitution and venereal disease. This was perhaps inevitable, when it is considered that large numbers of alien native troops employed by the Italians and by ourselves were quartered in the country for practically the whole duration of the war. This was one of the many social evils caused by the war, and one which will have a profound effect on the health of Somalis for many years to come.

B.—PALESTINE

By Colonel Sir GEORGE W. HERON
C.M.G., C.B.E., D.S.O., R.A.M.C. (ret.)
Director of Medical Services

THE ASSISTANCE AND CO-OPERATION OF THE CIVIL GOVERNMENT IN PALESTINE

At the outbreak of the war in September 1939, the country was, like England, unprepared to face the difficulties and problems of a great war. It lived to a great extent on imported products, such as about half of its grain, nearly all its meat, a large proportion of its dairy produce, eggs and poultry, potatoes, nearly all of its textiles, wood, metal and manufactured articles. Neighbouring countries almost at once prohibited exports to safeguard their own interests, so that staple food supplies had to be imported under Government auspices. What was of prime importance was to place the country, for three years swept by a revolution, on a peaceful basis with organised supplies, industry, public security and good health to meet the expected rigours of war.

The state of health of the civil population was satisfactory. An organised health service existed, precautionary measures against epidemic disease had long been established and the general state of sanitation in the principal towns, though not ideal, was under constant control. Public establishments and trades and industries dealing with food, restaurants and cafés had been brought up to a sufficiently high standard in relation to public health to protect the public from disease. Water supplies, except in villages, were safe, and the dangers of enteric fever and dysentery had been reduced to a minimum in municipal areas.

NUTRITION

At the outbreak of the war, the Director of Medical Services was appointed Controller of Supplies and caused an ordinance to be enacted giving powers to exercise control in respect of food supplies, to import on Government account and to control distribution.

In its early stages, the garrison was not large, its food requirements were small and imports from Australia to Palestine were comparatively easy, so that the country was not called upon by the Army during the first two years of the war to supply other foods than vegetables, fruit and fresh produce. Later on, the much increased Army was supplied, except for flour, rice and sugar, almost entirely from local sources, and also absorbed the greater part of the produce from neighbouring countries on which the civil population had previously relied.

In spite of the civil government's efforts to increase local production, in 1942 and 1943 there was an acute shortage of meat and potatoes, a strict rationing of bread and, as a result of local army contracts, the prices of all produce rose to an exaggerated extent and raised the index

figure of the cost of living from 100 in 1939 to 258 in 1944. This rise in cost had the effect of raising the price of labour employed on army works and of enhancing the price of rations purchased locally.

The civil government, however, succeeded in meeting its supply problems and, by means of food subsidies, which in 1944 cost 3½ million pounds per annum out of a Government total budget of 15 millions, maintained a price level which compared very favourably with similar conditions in Syria and Egypt. An indication of the success of the control was that a Government nutrition survey showed no material deterioration between 1939 and 1942, and a marked general improvement between 1942 and 1943.

By the stimulation of local production of food products, by loans to farmers and other forms of assistance, the productivity of the country was materially increased and to that extent reduced the call on shipping to supply the civil needs of the country.

The control, the subsidies and increased production did, in fact, result in maintaining the nutrition of the public and helped to keep an often turbulent country peaceful, and so to relieve the armed forces from the need to cope with internal disaffection.

THE PREVENTION OF DISEASE

One of the anxieties of the Army was the avoidance of any deterioration of the health of the civil population with its possible ill effects on the troops, as large numbers of susceptible troops were introduced from the United Kingdom, from Australia and New Zealand, and some from America.

Malaria. For many years past there had been developed by the Department of Health a successful epidemic service and a general malaria control. The majority of the marshes had already been reclaimed and annual clearances of 'wadies' and water courses was the rule, thus eliminating mosquito-breeding places. In the towns, meticulous measures had succeeded in reducing the malaria incidence to nil. There remained, however, a number of dangerous zones unsafe for military encampments.

A map was drawn up by the Department of Health, Sanitary Engineering Section, indicating each dangerous malarial area or potentially malarial zone, and with that guidance the military medical authorities were able to advise as to suitable camp sites. When camps were established, each such area received special care to prevent anopheles mosquito breeding, and camp medical officers were advised on the correct measure to observe.

The special danger zone of the Jordan Valley and the extensive marshes of Lake Huleh (Waters of Meron) was a prohibited area for camping and only those situations near Lake Tiberias which the Department of Health declared as safe were occupied by troops.

In a campaign it is not always possible to subordinate strategy to the dictates of health. It happened, therefore, that concentrations of troops had to take place or military works be carried out in dangerous zones. But, in such cases, the Department of Health was forewarned and having before the war made a close survey of such zones and having prepared in most cases reclamation and maintenance schemes, it was only a matter of implementing these schemes with the financial assistance and labour of the Army to clear these zones of the malarial menace. For instance, a desirable site for a convalescent camp at Kafr Vitkin on the coast was dealt with by the clearance of anopheles mosquitoes and control of a river and marshes within a few months.

A large marsh area north of Haifa, extending over some ten miles, was selected for stores and workshops near the meandering Naamein river, an area which was everywhere malarious. Before the war, a scheme had been drawn up, and the Army required it to be executed in four months. The Department of Health undertook to do it and, within four months, had reduced the mosquito catch to nil. This scheme, part of a permanent one, costing some LP.35,000, to which the Army contributed a proportion, was afterwards completed at a further cost of LP.20,000, and resulted not only in complete protection of the troops and the civilian population, but reclaimed some 800 acres to good agricultural land. Only once, for three months, during a diversion for completion of the scheme, was there any recurrence of malaria, which was overcome by maintenance and protective measures.

Short practical courses in malaria control were given to R.A.M.C. and R.A.A.M.C. personnel by Mr. Samaha, the Sanitary Engineer of the Department of Health, who was a graduate in sanitary engineering in America and had carried out large reclamation works in Palestine, and by the late entomologist of the Department, Dr. Shapiro; and these courses resulted in a much more meticulous malaria control within the vicinity of camps.

By close co-operation between the Department of Health and the Military and Air Force Authorities, the incidence of malaria was insignificant, and, where it occurred, could be ascribed to the overruling by the combatant officers of the advice given to them by the medical authorities.

The control in general in Palestine was an instance of successful co-operation between the military and civil medical authorities and, in particular, between the principal adviser in malaria to the G.O.C. Middle East, Brigadier J. A. Sinton, V.C., M.D., F.R.S., I.M.S. (ret.), and the Director of Medical Services of the Government of Palestine and his staff.

A military malaria unit was established in Palestine which, besides giving the civil authorities all possible assistance, held a watching brief over the activities of the Department of Health, and was able to indicate

from time to time points of danger, which that department was only too ready to eliminate.

Smallpox. The co-operation of Army and civil health authorities was evident in many other fields. Fortunately, the country was well vaccinated. An occasional case or limited outbreak of smallpox occurred, introduced on one occasion by returning Mecca pilgrims and on another by travellers from Syria, where a very considerable epidemic of smallpox raged for some time, but the disease never extended beyond the confines of the initial infection in Palestine, and presented no danger to troops.

Typhus. Typhus in epidemic form was not prevalent, and the only serious outbreak occurred among imported Egyptian labourers within the boundaries of Sarafand cantonment. Energetic combined measures, for which army mobile disinfecting machines and mobile hot water shower units were introduced, soon put an end to this outbreak.

Plague. As is the case of other infectious diseases, the Department of Health was able to suppress or to reduce the menace both to the Army and civil population. In both Jaffa and Haifa there were small outbreaks of bubonic plague and, although the rat infection was likely to lead to a recurrence, the outbreaks were satisfactorily kept under control. In the interests of shipping at the important port of Haifa, one of the principal naval and supply bases of the Middle East, the control of plague was of great importance and drastic measures of control were adopted. A number of supply ships were 'de-ratted' by the Government 'Clayton' installation and these precautions were effective.

Venereal Disease. As regards venereal disease, the story is not so happy. The Department of Health was not, in the past, authorised to maintain any effective control over prostitutes. The only measures permitted were to establish free treatment centres, while the police were empowered to close down brothels. The Army demanded more drastic measures, which the civil authorities were not allowed to adopt. The Army authorities had, therefore, to adopt measures themselves in conjunction with the civil police, but these were not entirely successful.

THE CENTRAL LABORATORIES

During the first two years of the war when the R.A.M.C. had not yet established all their services in Palestine, the central laboratories of the Department of Health were in a position to carry out for them the greater part of the bacteriological work and to undertake chemical analysis of different kinds. The Army was throughout supplied with antirabic vaccine prepared at the Central Laboratories, and several of their medical officers had been given short periods of instruction in its use. Rabies is prevalent in parts of Palestine and a number of soldiers were bitten by dogs and invariably received antirabic treatment. It is of interest to record that the antirabic vaccine from the Department's

laboratories, which was so successful in its results, was selected by the War Office for supply to the British Forces for the invasion of France.

Vaccine lymph prepared in the Department's Vaccine Institute from the outbreak of war was supplied to the Army for local use. The Department also expanded its production to supply the Army of the Middle East and to accumulate a reserve of five million doses for use in any newly occupied territory. The breakdown of the Egyptian Government supply and the proved efficiency of the Palestine Department of Health's supply, even after a permissible dilution to half strength, made it very acceptable to the Army medical authorities.

CONCLUSION

In this country of Palestine, exposed to the constant menace of tropical disease, it always was the endeavour of the Department of Health to set the stage during the war to the best of its ability, so that the principal actors might have the opportunity of prosecuting the campaign under the best conditions of health. The disorganisation resulting from epidemics of disease and the wastage of man-power has, in many a campaign, been the deciding factor. In the Palestine zone the Government trusted that their efforts to create for the military authorities a sense of security in health conditions proved of value in the prosecution of the war.

C.—CYPRUS

By H. M. SHELLEY
F.R.F.P.S., M.R.C.P.
Director of Medical and Health Services

The war had little significant effect on the general health of the people of Cyprus. Fortunately, problems did not arise connected with major outbreaks of epidemic and infectious disease.

The work of the Medical Department was greatly augmented by the need to organise an A.R.P. service, to give anti-gas training to civilians, and to make provision to receive those who might be rendered homeless following air raids. An Emergency Nursing Service was started and the training of the volunteers was undertaken in the local hospitals. In addition to these many additional duties, the normal routine work was carried on.

The supplies of medical stores had to be dispersed to various parts of the island and this created complications in making issues and arranging deliveries.

The major problems which developed as a direct result of the war were as follows:

(1) During the second half of the war there were difficulties created by shortage of certain essential commodities, which had to be overcome.

(2) Housing was a formidable problem in the main towns. A large number of Army officers were billeted in private houses, a large influx of labourers came to the towns from the villages and accommodation had to be provided for all.

(3) In 1941, the evacuation of the civilian population from the towns to remote villages was sponsored by the Government. There thus arose a risk of overcrowding in the villages with the associated danger of the transmission of infectious disease by the introduction of non-immune persons into an environment with a high carrier rate for enteric organisms. Sanitary conditions in the villages were primitive and created a further risk of widespread dysenteric disorders. A survey revealed that only 20 per cent. of village houses in the plains had any latrine accommodation.

Single rooms were leased to families and corridors and sheds were used as sleeping places by villagers who preferred to lease their rooms and thereby make a little money. These dangers were augmented by a drought during the year 1941 when water supplies became greatly reduced, thereby increasing the risk of the onset of infectious disease. The Medical Department took immediate measures to meet these possibilities. An intensive inoculation campaign with T.A.B. was started immediately, the construction of latrines commenced on a large scale, and legal power was obtained to permit the officers of the department to control overcrowding and to maintain a reasonable sanitary state in the evacuation areas. Water supplies were treated regularly.

(4) Probably as a result of the conditions mentioned above, the incidence of typhoid fever reached its highest peak in 1942 and 1943, since when the incidence of the disease gradually diminished.

(5) In 1942, measles assumed epidemic proportions all over the island. Previously, the disease had occurred in sporadic form and was mild, but on this occasion it proved to be a virulent outbreak, and the infant mortality rate almost doubled.

(6) Whooping cough assumed epidemic proportions in 1943 and was severe in type.

(7) To meet the possible needs of civilian casualties, 500 beds were made available in the main hospitals and steps were taken to prepare beds for use in selected emergency hospitals. A well trained nursing staff of volunteer workers was available in the first two years of the war, but when evacuation of the civilian population began, the personnel of this service was greatly reduced. In association with the emergency

hospital facilities, a blood transfusion team was organised and trained.

(8) *Air Raid Precautions.* In all towns and villages A.R.P. teams were trained from 1940 onwards, and regular exercises were held. Air raids were made on Skouriotissa, Famagusta, Nicosia aerodrome, and Paphos, but as practically all the bombs were dropped haphazard, most of them fell in open country and the total loss of life did not exceed a dozen civilians.

(9) *Refugees.* More than 15,000 refugees from the Greek islands arrived in the island during the period 1941–4. They travelled in small fishing boats, and caiques and arrived in a dirty and verminous state, suffering from exhaustion and exposure. The Medical Department undertook the whole care of these people, providing them with food, clothing and shelter. They were received in improvised reception stations and the delousing and cleansing necessary was a heavy strain on the department because the arrangements had to be made at a moment's notice. All the refugees on arrival were immunised against smallpox and typhoid. In 1944 an UNRRA representative took administrative control of the refugees, but the medical care of these people still remained the task of the department. It speaks highly for the emergency measures adopted that not a single case of dangerous infectious disease occurred among 15,000 people, many of whom were living under improvised and primitive conditions.

D.—GIBRALTAR

Based on Extracts from Official Reports

DURING the year 1939 the usual medical activities continued in Gibraltar, but Air Raid Precautions and measures to cope with the medical needs of the war, which appeared to be imminent, began to absorb a progressively larger proportion of the time and attention of the medical and nursing staff. A large number of local ladies, members of the St. John Ambulance Nursing Divisions, and also a number of the Christian Brothers of Ireland, were trained to a high degree of efficiency; but they were all evacuated before their services could be put to use. Plans were made to expand the Colonial Hospital, which was the chief civil hospital, in order to accommodate 700 patients, and the new hospital for tuberculosis, which had been built from funds raised partly by private subscription and partly by Government grant, was completed. This hospital, which is now known as the King George V Chest Hospital, could not be put to its designated use and was earmarked at the outbreak of war as headquarters for Imperial Censorship; but in June 1940, it was transferred to the War Department as an emergency hospital.

From the outbreak of war until May 1940, ordinary civilian medical activities continued, interspersed with air raid alarms and first-aid exercises; but no war event of importance occurred. The first casualties admitted to the Colonial Hospital were 36 American merchant seamen from a torpedoed vessel. Towards the end of May 1940, the decision was taken to evacuate the women and children and sick, aged and redundant males. In round numbers, 16,000 persons were evacuated in 1940 and 700 in subsequent years. In June 1940, the mental patients were all evacuated. (See The Civilian Health and Medical Services, Volume I, Part I, Chapter 9.)

The civil hospitals were soon busy with the reception of refugees from France and with the care of torpedoed and injured merchant seamen. In July 1940, two extra medical officers arrived to assist with air raid casualties and the Isolation Hospital was taken over by the military authorities. In the latter part of July and throughout August a number of air raids occurred resulting in the admission of 27 cases to hospital. After a lull two big air raids occurred on September 24 and 25 with, fortunately, light casualties. During these raids substantial damage was done to the new King George V Hospital. The total casualties in 1940 were nine killed and 36 injured.

At the end of October 1940, an agreement was made with the Military Authorities whereby the Colonial Hospital became available for the admission of military cases, and R.A.M.C. personnel was provided to overcome the staff shortage. At the end of November 1940, the King George V Hospital and the Mental Hospital were taken over by No. 10 General Hospital, and because of this increase of medical strength, the two extra civilian medical officers were released.

The arrangement whereby the Colonial Hospital was used partly as a civil hospital and partly as a military hospital was somewhat unusual; and it is interesting to give some details of how the arrangement worked. The hospital remained under the direct control of the Senior Medical Officer and a military liaison medical officer was in charge of the military detachment. The Officer Commanding the military hospital paid a weekly visit to inspect the military patients and detachment. The work of the hospital was carried out by the Senior Medical Officer and his staff with the assistance of the military medical officer as anaesthetist. The Colonial Hospital supplied beds, bedding, equipment, instruments, drugs and supplies. The Military Authorities provided, in addition to the liaison medical officer, over half the hospital staff other than medical officers, and they took over control of the kitchen. In addition to ordinary civil out-patient and in-patient work, the Colonial Hospital took in, for one week in every four, all surgical and medical military admissions for Gibraltar; it provided lodging for military families evacuated from Malta, escaped Allied prisoners-of-war, torpedoed naval ratings, enemy prisoners of high rank and their escorts, and

spies under arrest and their guards; and it received all sick and wounded merchant seamen, whose number increased as the war progressed. An arrangement such as this would seem to offer ample opportunity for friction; but, owing to the good will of all concerned, the experiment worked smoothly.

From the beginning of 1941 onwards, the Colonial Hospital was the only civilian medical institution and even that was taking a prominent part in the military organisation. During the next three years the work remained much the same; some modifications were made in the military work; sometimes all types of cases were admitted, sometimes only convalescents, and once, for a brief period, the Colonial Hospital became the military venereal diseases hospital. In September 1942, one medical officer was transferred on promotion and was not replaced. In April 1943, the Senior Medical Officer went on sick leave and was afterwards invalided. Another military medical officer was lent to the hospital and the staff thus became two civil and two military medical officers. In the middle of 1943, the number of civilian nursing sisters fell to six and the loan of four Q.A.I.M. nursing sisters became necessary. The situation with regard to nursing orderlies and other hospital staff became worse because of the impossibility of finding replacements and the strength of the R.A.M.C. detachment had to be increased.

During 1943, the dearth of civilian medical practitioners began to be severely felt. It became necessary to appoint one as Assistant Port Medical Officer, and another left for the United Kingdom to undertake a course of study in children's diseases, as recommended by the Committee on Medical Reorganisation. Fortunately, the health of the population remained good, although there was a considerable outbreak of mild dysentery towards the end of the year which coincided with a small epidemic of influenza. The end of the year 1943 marked the nadir of civil medical practice in Gibraltar, all categories of medical staff being at the lowest ebb. It also marked the production of the report of the Committee on Medical Reorganisation, which was intended to serve as a guide for the rehabilitation of the medical services. This was necessary when the evacuated civil population returned, and was designed to be put into operation gradually during the coming year.

The year 1944 saw the gradual return of the Colonial Hospital to civil use; but the Isolation, King George V and Mental Hospitals remained in military occupation. The principal event of the year was the partial repatriation of the women and children and old people who had been evacuated in 1940; a total of 9,158 returning during the year. The staff position was improved by the appointment of a new Matron in April and the arrival of a new Senior Medical Officer in October. All the Q.A.I.M. nursing sisters were replaced by new staff from the United Kingdom, at the end of July. Two private practitioners returned to Gibraltar, but this was to some extent balanced by the departure of

another to undertake a special course of postgraduate study in diseases of the chest. At the Colonial Hospital the military ward was put into use for women and children, and in the latter part of the year a maternity ward was opened. The out-patient department became progressively busier, and clinics for special diseases were inaugurated. In the town, schools were re-opened ; and school medical inspection became possible in a small way when a Health Visitor arrived at the end of October. The Medical Officer of Health opened a clinic twice a week for babies and young children. Tuberculosis, owing to the continued use of the King George V Hospital by the military, became a difficult problem, and a ward had to be set aside at the Colonial Hospital for cases of pulmonary tuberculosis; in order to enable this to be done, the nursing sisters' recreation room had to be taken over. The position as regards locally recruited nursing and domestic staff became considerably easier; and at the end of the year eight nurses who had received some training while evacuated to Jamaica were engaged.

The return of the civil population and the overcrowded conditions in which a proportion of the people lived gave rise to a number of medical problems and to a natural anxiety lest an epidemic should break out. But fears of such an event proved unfounded and the health of the civilian population remained satisfactory. In fact, the only important medical event was the occurrence of two cases of smallpox with one death early in the year before the repatriation began.

E.—CEYLON

1939-1945

THIS account of the medical aspects of the impact of the war on Ceylon was prepared from the records of the Medical and Sanitary Services in the Department of Civil Defence and other relevant documents by Dr. D. M. de Silva, O.B.E., Divisional Medical Superintendent, Medical and Sanitary Services, who was A.R.P. Controller, Colombo, and Assistant Civil Defence Commissioner during the war.

TOPOGRAPHY

The Island of Ceylon lies at the southern extremity of India, between 5° 55′ and 9° 55′ of North Latitude, and 79° 42′ and 81° 53′ East Longitude. It is separated from India by the narrow Palk Strait, which is crossed by Adam's Bridge, a series of islands and sand banks, with shallow water between. The island is pear shaped and approximately 270 miles long and 140 miles wide at its greatest length and breadth, and has an area of approximately 25,332 square miles. The population at

the 1931 census was 5,306,871, and at the 1946 census 6,657,339, which is an increase of 25 per cent.

RESOURCES OF THE MEDICAL AND HEALTH SERVICES 1941–5

The figures below give some indication of the Government Hospital, Medical and Health resources which were organised into the island's A.R.P. Casualty Services and Air Raid Hospital Services, and co-ordinated with the A.R.P. and Civil Defence scheme for each local area, under the local A.R.P. Controllers.

By 1945 there were 145 general hospitals with 11,279 beds and 13 special hospitals with 4,046 beds for a population, excluding the tea and rubber estates, of some 5¾ millions. On the estates, most of which had their own medical services, there were, in 1945, 97 hospitals with 2,368 beds, for a population of approximately 800,000. In addition, there were 250 central dispensaries in charge of apothecaries, 188 branch dispensaries, 427 visiting stations and some 722 estate dispensaries.

In 1945, the Department of Medical and Sanitary Services employed 2,700 doctors, apothecaries and nurses, and 3,750 midwives, attendants, orderlies, etc. making a total establishment of 6,450. In that year this staff treated 511,177 hospital cases and 7,107 cases at dispensaries, for an approximate expenditure of Rs.20,096,032.

THE PRELIMINARY ORGANISATION OF PASSIVE AIR DEFENCE

The early 'appreciations' in the nineteen-thirties did not expect that Ceylon would become involved in any future world war, except indirectly, and thus the early planning made provision for only rudimentary schemes of 'Passive Air Defence'.

In December 1938, Dr. Fitzroy Keyt, Assistant Director of Medical and Sanitary Services (ret.), was appointed Air Raid Precautions Officer to organise the passive air defence of Colombo, and was succeeded in February 1939 by Major C. H. Bradley, M.C., Acting Second Assistant, Department of Public Works. The general scheme of defence was laid down at a meeting of the local defence committee on February 15, 1939. The scheme was essentially a voluntary one, with a warden service, volunteer fire brigade and first-aid posts at the ten municipal dispensaries, the staff being provided by the British Red Cross Society, St. John Ambulance Brigade, and a number of volunteers. Private practitioners were also enrolled to provide reliefs for the Municipal Medical Officers at the dispensaries. This defence scheme came into operation on the outbreak of the war.

THE COLOMBO A.R.P. AND CIVIL DEFENCE DEPARTMENT

On December 3, 1940, Dr. de Silva, was appointed Deputy A.R.P. Officer, in addition to his duties as Assistant Port Health Officer, Colombo. Earlier in the year, he had been on leave in England, and

attended a course at the Civilian A.R.P. School, Falfield, Gloucestershire, and qualified as a Special Instructor. He was thus able to bring to Ceylon a knowledge of the technique which, some months later, was used in England.

In September 1941, the State Council instructed Dr. de Silva to visit India, to study the developments in A.R.P. and Civil Defence in the cities and rural areas of the Provincial Governments and the Government of India, and to submit proposals for a revised scheme of A.R.P. and Civil Defence for Colombo. Dr. de Silva left for India on December 5, 1941, and was in Madras when Japan entered the war. The situation being fundamentally altered by the Japanese attack on Pearl Harbour, he recommended to the Government that Lt. Colonel A. J. Reeve, Director of Operations and Training, Civil Defence, Government of India, be invited to Ceylon to advise on the new A.R.P. Scheme. He also recommended the placing of orders for certain basic A.R.P. equipment with the Government of India. These recommendations were accepted, and he returned to Colombo with Lt. Colonel Reeve on December 24, 1941. After four days' intensive work, a complete A.R.P. Scheme for Colombo was prepared and presented to the Chief Secretary on December 28. This scheme was accepted by Government and came into operation forthwith.

The Civil Defence Service for the whole island, which included A.R.P. measures, the evacuation of civilians, and the maintenance of the essential services was placed under Mr. O. E. Goonetilleke, C.M.G., Auditor General (later Sir Oliver Goonetilleke, K.C.M.G., K.B.E.), as Civil Defence Commissioner on January 1, 1942.

The casualty service of the Colombo A.R.P. Scheme, at its peak in October 1943, consisted of 13 first-aid posts, 60 full-time first-aid parties, 30 ambulances, 53 cars for sitting cases, 2 mobile first-aid posts and 10 decontamination squads. The total establishment included 3,115 whole-time paid personnel and over 16,000 part-time volunteers, controlled by the Officer-in-Charge, his Deputy and two whole-time Staff Officers.

The A.R.P. organisation for the rest of the island was divided into approximately 100 areas, each in charge of an A.R.P. Controller. Colombo, Galle, Jaffna and Trincomalee were constituted 'Areas' for the establishment of an A.R.P. Service under the Defence (A.R.P. Services) Regulations of January 6, 1942, and an Order made under Regulation 10, with whole-time A.R.P. Controllers. In the remaining areas simpler schemes involving a volunteer wardens' service, a casualty service, a fire-fighting service and a communication service were in operation and the controllers included 15 Emergency Assistant Government Agents, 7 chairmen of Village Committees, 11 landed proprietors and 5 chairmen of Urban Councils.

The strength of the casualty service approximated 10,000 of whom about 130 were whole-time paid personnel, the remainder being part-time

volunteers. Some 639 ambulances, rescue lorry drivers and attendants and 995 volunteer car drivers were also attached to the schemes.

A serious handicap in the early months of the war was the local dearth of first-aid handbooks, literature for A.R.P. and first-aid training of the staffs of the first-aid posts, etc. Reprints of the available A.R.P. 'Lecture Notes on First Aid' by Dr. de Silva, were printed by the Government and many thousands of copies were issued for training purposes in all parts of the island. The training of all personnel was thus organised and developed on approved lines, the services of Government medical officers, private registered medical practitioners and trained instructors being utilised as they became available.

THE HOSPITAL CASUALTY SERVICES

The Director of Medical and Sanitary Services (Dr. S. F. Chellappah, O.B.E.), on July 14, 1941, appointed a departmental committee on air raid casualty services:

(*a*) To report on the arrangements that should be made at the General Hospital, Colombo, for treatment of air raid casualties.

(*b*) To draw up a subsidiary scheme for the passive defence against air attack of the premises of the General Hospital, Colombo.

(*c*) To submit detailed proposals (including estimates of cost) for the evacuation and accommodation of the patients occupying the wards at the General Hospital, Colombo, and the Lying-in Home, Colombo, which had been earmarked for the use of naval patients in the event of an emergency.

The members of the committee appointed were:

Dr. E. A. Blok, A.D., M.S., Chairman.
Dr. R. W. Willenberg, Medical Supt., General Hospital, Colombo.
Dr. D. B. D'Alwis, Div. Medical Supt., Colombo.
Dr. V. Gabriel, Senior Surgeon, General Hospital, Colombo.
Dr. J. R. Blaze, Senior Physician, General Hospital, Colombo, with
Dr. D. M. de Silva, Asst. Port Health Officer, Deputy A.R.P. Officer, as Secretary.

The committee held four meetings in July 1941, and its report was submitted to the D.M.S.S. on August 4, 1941. The following summarises the main recommendations of this committee, which at the time were treated as 'secret':

(*a*) Evacuation of patients from the General Hospital, Colombo, to make room for naval casualties should be made before the emergency, to hospitals and other institutions in potentially 'safe areas' at:

Ragama Convalescent Home	250	temporary	beds
Eheliyagoda Hospital	400	,,	,,
Karawanella Hospital	100	,,	,,
Watupitiwela Hospital	100	,,	,,
Total	850	,,	,,

(*b*) Temporary wards to be provided for accommodation of approximately 250 casualties on the site proposed for the new out-patient department.

(*c*) Four private nursing homes in Colombo to be organised as casualty clearing hospitals:

Frazer Nursing Home;
Private General Hospital;
Dr. Rutman's Private Hospital;
Dr. Spittel's Nursing Home.

(*d*) The following school premises to be organised for reception of air raid casualties after treatment at the casualty clearing hospitals:

St. Benedict's College, Kotahena;
St. Peter's College, Bambalapitiya;
St. Thomas's College, Mount Lavinia;
Royal College, Cinnamon Gardens;
St. Joseph's College, Maradana.

(*e*) The necessary allocation of transport required for the air raid casualty service be brought to notice of the Military Transport Officer.

(*f*) The substantial Suisse Hotel premises, Kandy, at present vacant, to be organised for accommodation of air raid casualties in association with the Kandy Civil Hospital.

(*g*) Casualty clearing hospitals to be organised in potentially 'safe areas' (outside Colombo Municipal limits) at:

Negombo Civil Hospital;
Lunawa Hospital;
Kegalle Hospital;
Kurunegala Hospital;
Galle Hospital.

(*h*) Base hospitals to be organised in potentially 'safe areas' for the reception and treatment of the various casualties sent on from the casualty clearing hospitals (all the hospitals listed having access facilities both by road and rail):

Chilaw Hospital;
Panadura Hospital;
Kalutara Hospital;
Kandy Hospital;
Matale Hospital;
Gampola Hospital;
Matara Hospital;
Balapitiya Hospital.

At a conference held on January 23, 1942, at the General Hospital, Colombo, 'To discuss arrangements for the efficient provision of medical services in an emergency', the Civil Defence Commissioner informed the conference that Dr. W. G. Wickremasinghe, Assistant Director of Sanitary Services, had been appointed Officer-in-Charge, A.R.P. Hospitals, and that he would act under the direction of the Civil Defence Commissioner, and would be responsible for making all arrangements

that were considered necessary. Dr. Wickremasinghe accordingly drew up his detailed A.R.P. Hospital Casualty Services Scheme.

On return from a visit to India, Dr. Chellappah took personal charge of all A.R.P. Services at Government Medical Institutions. He appointed Dr. H. E. Schokman, Senior Medical Officer, Headquarters, to have general charge, under his supervision, of all A.R.P. arrangements at the Government Medical Institutions in and near Colombo. Detailed arrangements for the reception and treatment of air raid casualties at the General Hospital, Colombo, were also drawn up and issued.

THE APRIL 1942 AIR RAIDS ON COLOMBO AND TRINCOMALEE

On the morning of April 5, 1942 (Easter Sunday), Colombo was attacked by carrier-borne aircraft, from an enemy force of aircraft carriers, battleships and supporting vessels; the attack commenced about 7.50 a.m., and lasted for some fifty minutes. The enemy aircraft attacked the Ratmalana Aerodrome and railway workshops and the Colombo Harbour area in three waves consisting of some 80 planes and were repulsed with the loss of 24 planes brought down and 20 or more damaged.

The subsequent findings showed that 84 persons had been killed or died of wounds, while 77 had been injured in the raid, and affirmed that the Colombo A.R.P. and Hospital Air Raid Casualty Services had functioned efficiently during the raid.

On April 8, 1942, an enemy force was again detected approaching the East Coast, and an air attack on Trincomalee and China Bay areas developed, the attack being made by bombers, escorted by fighters, in three waves. Some 36 civilians were killed and 96 injured in these raids.

Post-raid disorganisation was evident in both Colombo and Trincomalee in the periods following the raid. Valuable lessons were learnt from these raids and the A.R.P. and Civil Defence Services were amended and developed to meet further emergencies. These, however, proved to be the only major air raids on Ceylon.

AIR RAID CASUALTIES TREATED AT THE GENERAL HOSPITAL, COLOMBO, APRIL 1942

The scope of the General Hospital Air Raid Casualty Services has been indicated above. At the time of the raid, the major personnel on duty included no less than 73 doctors, assisted by nurses, medical students and attendants. Sixty-five casualties were admitted from the Colombo area, on April 5, 1942, and 15 after the Trincomalee raid, on April 8. Fifteen deaths occurred, giving a total admission of 80 air raid casualties with a mortality rate of 18·8 per cent. Of the 15 casualties injured at Trincomalee on April 8, five were admitted on April 11, and the remainder on subsequent dates up to April 21, 1942.

One of the aims of the A.R.P. Casualty Service was to reduce to a minimum the time interval between the injury to the individual and his subsequent admission as a casualty to a first-aid post or casualty clearing hospital. The air raid on Colombo commenced at 7.50 a.m., lasting some 50 minutes, and between 9 and 10 a.m., 16 casualties were admitted to the General Hospital by the Colombo A.R.P. ambulances, 14 casualties between 10 and 11 a.m., 12 between 11 a.m. and 12 noon, and 5 casualties were delivered in the course of the afternoon, making a total of 47.

It will be thus seen that more than one-third were admitted within the first hour and nearly two-thirds within two hours of the end of the raid, the A.R.P. Casualty Service and ambulances working as called out, both during the raid and after. The efficiency and speed with which the casualties were brought in from the Colombo area to the General Hospital on April 5, 1942, was highly satisfactory.

Of the casualties in the Colombo area, it was found that about half were on board ships or in boats when they were wounded. In a series of 38 cases which were studied, the injuries of 10 were caused by machine-gun bullets and 28 were caused by bombs. Thirty-five out of 48 fractures were compound and comminuted, and the fractures were mainly of the extremities, 21 in the lower limbs and 11 in the upper limbs. Some wounds were associated with the presence of metallic foreign bodies in tissues and body cavities. There were four cases of 'blast' injury. The fifteen fatal cases presented the clinical picture of a severe degree of shock and collapse. In many of the casualties, blood loss was probably reduced to a minimum by the efficient first aid rendered and the quick collection and despatch of casualties by the A.R.P. ambulances.

The accepted principles for the resuscitation of air raid casualties were followed, and the value of a blood bank was confirmed. Operations were carried out under general anaesthesia, and mainly consisted of complete excision of damaged tissues (débridement), cleansing of wounds, manipulation of bones, reduction of fractures and fixation and suitable splints. Skeletal traction was applied when necessary. Five amputations were performed. All casualties who had serious injuries received sulphonamide treatment, either orally or by intra-muscular injections. The mortality from abdominal wounds was very low.

Seven of the fatal cases were mental cases from Angoda Mental Hospital, and about half of the deaths were due to shock from injuries of extreme severity. All these casualties died within a period varying from four to nine hours of admittance to hospital.

VITAL STATISTICS

The following table summarises some essential vital statistics for the ten-year period including the war years:

	Birth rate	Death rate	Inf. Mort. rate	Mat. Mort. rate
Ceylon 1939	36·0	21·8	166	18·2
,, 1940	35·8	20·6	149	16·1
,, 1941	36·5	18·8	129	15·3
,, 1942	36·7	18·6	120	14·4
,, 1943	40·6	21·4	132	13·3
,, 1944	37·1	21·3	135	13·7
,, 1945	36·8	22·1	140	16·5
,, 1946	38·4	20·3	141	16·5
,, 1947	39·4	14·3	101	10·6
,, 1948	40·6	13·2	92	8·2

The table below gives the annual deaths from certain diseases of special interest, during the five year period 1940–4:

	1940	1941	1942	1943	1944
Anaemia	1,972	1,993	2,240	2,429	2,712
Dysentery	2,870	2,546	2,275	2,217	1,925
Diarrhoea	6,761	6,603	6,313	7,094	7,354
Ankylostomiasis ..	1,606	1,456	1,696	1,461	1,568
Enteric Fever ..	939	1,112	982	1,150	1,566
Infantile Convulsions	12,216	10,168	10,100	11,287	11,800
Malaria	9,169	7,113	5,413	6,765	5,606
Pulmonary T.B. ..	3,299	3,843	3,157	3,174	3,141
Pneumonia	9,007	11,849	6,689	8,119	8,588
Influenza	1,898	1,807	1,645	2,153	2,228
Diphtheria	55	39	59	26	37

GENERAL OBSERVATIONS AND CONCLUSIONS

The island fortunately suffered little in comparison with many other parts of the British Commonwealth, but the above narrative will, it is thought, show that the measures taken to meet possible contingencies were on sound lines and would have proved their efficiency, had greater demands been made upon them.

PART II

The Medical Services of the Ministry of Pensions

By A. SANDISON, O.B.E., B.A., B.Sc., M.D.
DIRECTOR OF MEDICAL SERVICES

CHAPTER 1

HISTORICAL SURVEY UP TO THE WAR OF 1939-45

THE history of the Medical Services of the Ministry of Pensions in the War of 1939–45 is the story of the re-expansion, extension and adaptation of the organisation created to deal with the casualties of the War of 1914–18. An account of its birth and development up to 1929, will be found in Chapter XXI of the Casualties and Medical Statistics Volume of the Official History of the War, 1914–18. Some knowledge of this past history is needed for the understanding of the Ministry's work in the War of 1939–45.

THE FUNCTIONS OF THE MINISTRY OF PENSIONS

This Ministry was established by the Ministry of Pensions Act, 1916, to unify the administration of pensions, grants and allowances awarded on account of disablement or death through service in the Armed Forces. As from February 15, 1917, the Act provided for the transfer to the Minister of Pensions of the powers and duties of the Service Departments in these matters. The provisions were the same for the three Services and for convenience the whole scheme was commonly referred to as the Royal Warrant.

In 1921, these powers and duties in relation to claims arising out of peace-time service were re-transferred to the Service Departments, but the Ministry's responsibilities in connexion with claims arising out of the War of 1914–18 and earlier wars remained unchanged.

On the outbreak of the War of 1939–45, an Act was passed, giving the Minister of Pensions the same powers in relation to the Armed Forces as he had for the War of 1914–18, and also power to make pension schemes for the Mercantile Marine. A further Act gave him the entirely new power of awarding compensation to Civil Defence personnel and civilians. A new Royal Warrant was drawn up for the Forces and pension schemes for the Mercantile Marine and Naval Auxiliary personnel, and for the Civil Defence Service and civilians. Details of these are given in Chapter 2.

DEFINITIONS OF MINISTRY OF PENSIONS TERMS

Certain words and phrases have a technical meaning in Ministry of Pensions' practice and it may be convenient to define them here.

'*Disability*' denotes solely the actual wound, injury or disease for which a claim to compensation is considered, and is to be carefully distinguished from

'*Disablement*' which means physical or mental injury or damage, or loss of physical or mental capacity suffered by reason of a disability or disabilities.

'*Entitlement*' is the recognition by the Ministry, after consideration of both medical and non-medical evidence, that a disability is due to war service, either as 'attributable to', or 'aggravated by', and such a disability is called an 'Accepted Disability'.

Assessment. The assessment of a disability for pension purposes is the estimate of the degree of disablement it produces. It is expressed by a percentage, 100 per cent. representing total disablement. The assessment appropriate to any particular disability is determined by estimating how far the disability causes a lack of physical or mental capacity for the exercise of the necessary functions of a normally occupied life which would be expected in a healthy person of the same age and sex. This estimate is made on general functional capacity and not with reference to capacity, or failure of capacity, to follow any specific trade or occupation, or earning capacity in that trade or occupation.

ESTABLISHMENT OF MEDICAL SERVICES

The duties laid on the Minister called for medical advice. For each disability claimed as due to war service the questions arose: (1) was it, in fact, attributable to, or aggravated by, that service; (2) what was the degree of disablement; (3) what treatment was needed, and how and where could it be given? These questions were in many ways new to the profession, and to answer them, and their varied supplementaries, the Ministry, in December 1917, formed its own Medical Services Division under a Director-General with a whole-time medical staff. Its main functions were:

To advise on the medical aspects of entitlement, to determine the assessment of disablement, and to arrange and conduct the necessary medical examinations and boards.

To ensure that the medical and surgical treatment, and necessary appliances, required for war disablement were provided either by the Ministry, or by other agencies, and to provide for the medical administration involved.

To provide the organisation and specially trained medical staff required for the skilled provision, fitting and supervision of artificial limbs.

By March 31, 1920, 1,420,000 ex-service men, nearly 25 per cent. of the total who served, had been granted pensions or gratuities for war disablement. To fulfil its function the Ministry had, therefore, to provide for medical examinations on a very large scale and arrange for specialist and other treatment for every variety of wound and disease.

The medical examinations were first conducted by the recruiting medical boards of the Ministry of National Service, which utilised the services of general practitioners throughout the country. On April 1, 1919, the Ministry took over the medical staff of the Ministry of National Service and, during that year, while substantially expanding its own whole- and part-time medical staff, also added to the number of its own hospitals, and widely extended its provision for all forms of treatment, including treatment with training, and for the supply of artificial limbs and other appliances.

In the year April 1, 1919, to March 31, 1920, the Ministry held over a million medical boards, directly controlled 46 hospitals, comprising nearly 10,000 beds, and reserved 2,500 beds in other hospitals. The discharges from institutional treatment during the year were 167,000, leaving 118,000 still receiving such treatment. Some 19,000 artificial limbs and 45,000 other appliances, e.g. surgical boots, invalid chairs, artificial eyes, etc. were supplied.

In June 1919, the administrative medical work of the Ministry was largely decentralised from headquarters to 11 regional offices situated in large towns in Great Britain and Ireland. At headquarters the Medical Services were divided into branches to deal with:

Medical Boards and the selection and appointment of medical personnel.

Provision of medical and surgical treatment, including the management of Ministry hospitals and clinics.

Provision of treatment concurrently with training and the establishment of special institutions for the purpose.

Provision of medical supplies and equipment, artificial limbs and appliances.

The Nursing Service.

MEDICAL BOARDS

Functions. The normal function of a Ministry of Pensions Medical Board is to inform and advise the Minister, on the basis of all available records and their own clinical examination, concerning:

The clinical history and condition of a pensioner or claimant on account of a disability or disabilities related or claimed to be related to war service.

The particular evidence on which the Board base their opinion on the relation, if any, of a disability to war service.

The degree of permanent or temporary impairment of function produced by a disability, with particular reference to the amount of that impairment resulting from war service as distinct from that due to other factors.

The nature of any treatment which may be necessary to restore health, or to repair the function, or prevent the deterioration of a damaged organ or limb.

Types. The Boards were originally of three types:

'*Primary Boards*': for the examination of claimants to pension.

'*Re-survey Boards*': for re-examination shortly before the expiry of current pension, or on a claim that the pensioned condition had become worse and merited a higher assessment.

'*Appeal Boards*': for examination of those who were dissatisfied with the result of a Primary Award or Re-survey Board.

Personnel. Each Medical Board was originally composed of three medical men, one of whom acted as chairman, but later on the number was reduced to two. The advice of specialists was obtained either by including them on the Board, or by separate examination and report. An Appeal Board did not include members of the Board against whose decision the appeal was made. The doctors forming the Board were mainly local general practitioners, most of whom had themselves served in the war and thus had experience of service conditions. They were appointed and paid on a sessional basis. Co-ordination and general guidance were provided through the Ministry's whole-time regional and headquarters medical officers.

Entitlement and Assessment. Entitlement and assessment raised many problems, particularly in relation to diseases. The service origin of a wound was usually obvious and assessment of the degree of impairment of function relatively simple; but for diseases a decision, both on entitlement and assessment, often called for a new approach. Certain general principles were stated as guidance in determining entitlement; and, on assessment, the Royal Warrant laid down certain fixed assessments for a few well-defined disabilities, to which other assessments could be related. To secure uniform and equitable application of these standards and principles, whole-time medical officers at headquarters known as Assessors, reviewed and, as needful, discussed with the Boards directly, or by correspondence, their recommendations on entitlement or assessment in the light of the medical and other experience which was rapidly being gained.

To obtain the most authoritative medical guidance on these matters, the Minister appointed, in 1919, a Ministry of Pensions Disability Committee. Its members included the Presidents of the Royal Colleges of Physicians and Surgeons, the Secretary of the Medical Research Council and other eminent medical men, with the Director-General of Medical Services of the Ministry of Pensions, as chairman. This committee, in conjunction with senior officials of the Ministry, considered and advised upon the medical aspects of the existing principles, standards and regulations relating to entitlement and assessment. The committee, with its specialist sub-committees, held frequent meetings up to 1922 and, on its advice, medical memoranda were issued to the Boards. The practice of the Ministry in entitlement and assessment thus developed along lines approved by the highest medical authority. Early in 1920 these

memoranda were brought together in a booklet for the guidance of Medical Boards, to which amendments and additions were made from time to time. During the War of 1939–45 it was completely revised and reissued in 1941 and 1943.

Final Awards. The 1919 Warrant for other ranks, and the corresponding 1920 Warrant for officers, provided that pensions should be temporary at the outset, except where the disablement had already reached its final condition. It was, however, considered an advantage both to ex-servicemen and the community that claims for disablement should be made and disposed of by a lasting settlement as soon as possible after discharge from service. In this connexion the Government was advised in 1920 by a committee of eminent physicians and surgeons that a period of seven years from a man's discharge from the Service would be a generous limit to allow for the manifestation of practically all ailments properly ascribable to war service. In 1921, when less than 5 per cent. of the total number of pensions were permanent, the War Pensions Act 1921, was passed, which limited to seven years from discharge the period within which claims to pension on account of disablement by war service could normally be made, and provided for a final settlement of admitted cases. The time limit of seven years which, with certain exceptions, the Act enforced, enabled the Ministry to effect a permanent settlement for the great majority of pensioners, and 90 per cent. of the total claims on the Ministry had been made by 1923.

'Final Awards Boards' were accordingly set up to consider, in appropriate cases, both prognosis and assessment on a long term view. Final awards could not be altered except through appeal to a Pensions Appeal Tribunal, specially constituted under the Act. When, however, medical evidence and observation subsequently showed that the disablement did not maintain the stability anticipated, but seriously worsened, authority was available for a re-consideration of the final award on the report of a specially convened Medical Board.

Statistics of Boarding. The boarding work from 1919 to 1939 is shown below:

TABLE I

Ministry of Pensions—Medical Boards 1919–1939

Financial year	Numbers boarded
1919–20	1,051,102
1920–21	1,259,899
1921–22	888,026
1922–23	613,171
1923–24	457,555
1924–25	288,012
1925–26	137,132
1926–27	89,837
1927–28	46,127
1928–29	47,424
1938–39	2,682

IN-PATIENT HOSPITAL TREATMENT

Need for Hospital Provision. Soon after its formation the Ministry had to find accommodation for patients suffering from pensioned disabilities, such as neurasthenia, for which the available civil hospitals had no suitable provision, and although arrangements were made for the treatment of ex-service cases on a capitation fee basis in many civil hospitals, it was soon clear that the available accommodation was inadequate. This shortage became acute after the Armistice, when the military and auxiliary hospitals, in which the majority of the patients had been treated, were demobilised.

Ministry Hospitals. The Ministry therefore set up a hospital service of its own, partly by taking over some military hospitals, and partly by establishing hospitals in suitable centres so that by 1921, it was maintaining 67 hospitals with a total of over 13,000 beds. By 1929 the number of these hospitals diminished to 17, with some 3,000 beds, and of these 9 continued as Ministry Hospitals up to and during the War of 1939–45. The following account briefly reviews the early development of the nine hospitals which continued as Ministry Hospitals up to and during the War of 1939–45:

> Early in 1925 Queen Mary's Hospital, Roehampton, which till then had been purely a limb fitting hospital, was reorganised to take the place of Shepherd's Bush Hospital, a local authority building which had been the chief orthopaedic hospital. Later in that year Mossley Hill Hospital, Liverpool, originally an American hospital, was purchased and refitted and at the end of 1926, Queen Alexandra Military Hospital, Cosham, was transferred to the Ministry of Pensions for use as its principal neurological hospital.
>
> In 1927, Chapel Allerton Hospital, Leeds, was built and took the place of Beckett's Park Hospital, Leeds, for Ministry patients.
>
> In 1928, Edenhall Hospital, Edinburgh, the property of the Scottish Red Cross, which had been used by the Ministry for neurological cases, was re-equipped. In the same year the Ministry gave up its use of Castle Leazes Hospital, Newcastle, and transferred the patients to Dunston Hill Hospital, where three new wards and a theatre were built.
>
> In 1931, on the closure of Blackrock Hospital in Southern Ireland, Leopardstown Park Hospital, Dublin, which up till then had been a neurological hospital, was adapted for the use of all types of patients in that country.
>
> In 1933, on the closure of Maghull Hospital, Liverpool, which had been used for epileptic patients, the Ministry's hospital at Chepstow took over the epileptics and transferred its own general and medical cases to Rookwood Hospital, Cardiff.

Capitation rate Hospitals. In addition to its own hospitals the Ministry reserved some 5,000 beds, distributed in 46 civil hospitals, to a few of

which financial aid was given for the extension of accommodation on condition that the Ministry had a first claim on the beds thus provided. Most of the principal civil hospitals throughout the country continued to admit Ministry cases on a capitation fee basis, but the accommodation thus available was limited by the needs of the civil population.

Mental Diseases and Tuberculosis. Mental cases were dealt with by the Lunacy Authorities, local and central, and for the treatment of tuberculosis the provision made by Local Health Authorities was used.

When a patient for whom the Ministry was responsible passed to the care of the Lunacy Authorities, he was classified as a 'Service Patient' with the legal status of a private patient and the Ministry arranged for special amenities (including good quality civilian clothing) in the mental hospitals, which were also regularly visited by Ministry specialists.

The Ministry also supplemented the facilities of the Local Health Authorities by the use of wards in its own hospitals, for the observation and diagnosis of suspected tuberculosis and for the treatment of non-respiratory tuberculosis. The Ministry also made arrangements for the treatment of officers in sanatoria, or at home, in this country. Treatment was also provided in sanatoria in Switzerland and the South of France, and the patients there were visited by a medical officer of the Ministry. After about 1926, such treatment abroad was approved only in a few special cases, as results of treatment of pulmonary tuberculosis in Switzerland generally showed little difference from those obtained in this country.

Neurasthenia. The aetiology and treatment of war neuroses presented a new and perplexing problem of the War of 1914–18 which continued through the inter-war years and on which much concentrated effort was spent in the War of 1939–45. The Ministry had completed a special investigation on some 5,000 cases shortly before the War of 1939 began, and a special committee, under the chairmanship of Lord Horder, was appointed to advise on the policy to be adopted. An account of these developments will be found in Chapter 2. Here it is adequate to say that following the War of 1914–18 the Ministry set up special clinics and institutions, in which occupational therapy had no less important a place than psychotherapy.

Epilepsy. Accurate diagnosis was a main difficulty and a hospital of 300 beds, at Maghull, Liverpool, was maintained until 1933 both for diagnostic investigation and treatment. The true epileptics were also treated in various epileptic colonies.

Facial Wounds. In the treatment of these the Ministry was a pioneer, and at Sidcup Hospital, under its aegis, nearly 3,000 facial operations were done between March 1920 and April 1925.

Diabetes. With the introduction of insulin therapy the Ministry set aside a special ward in its hospital at Orpington for this treatment.

After 1921 the Ministry's need for hospital accommodation declined, and, whereas in 1921 upwards of 135,000 were provided with in-patient treatment, the corresponding figure for 1938-9 was 7,222 of which 6,231 were treated in Ministry hospitals. These figures are exclusive of cases of certifiable mental disease and tuberculosis, which are treated in mental hospitals and sanatoria provided by the appropriate authorities. At the outbreak of the War of 1939–45 the Ministry was maintaining nine hospitals with 1,523 beds. Four of these hospitals were Crown property, two others were held on trust as gifts, two were rent free, with special financial arrangements in the case of Queen Mary's (Roehampton) Hospital, and one was held on lease at a rental. Table II shows the extent of in-patient accommodation provided by the Ministry :

TABLE II

Hospital Provision: Statistics 1921–46

	Hospitals directly controlled by Ministry of Pensions		Hospitals reserving beds for the Ministry of Pensions		Total number of beds available
Year ending March 31	No.	Beds	No.	Beds	
1921	67	13,225	46	5,378	18,603
1929	17	3,093	22	2,005	5,098
1939	9	1,523	—	—	1,523
1946	12	4,463	—	—	4,463

OUT-PATIENT TREATMENT

Out-patient clinics were set up for the treatment of various specialised conditions, e.g. aural, cardiac and ophthalmic diseases, for which existing facilities were inadequate for the Ministry's requirements. These numbered, in 1921, 319 for surgical cases, 48 for neurasthenia, 61 for tropical diseases, 36 for aural, 24 for ophthalmic and 19 for cardiac diseases, and in that year they dealt with some 285,000 out-patients. By 1929, however, only 2,700 were receiving treatment at clinics as out-patients and, at the outbreak of the War of 1939–45, the number had fallen to 1,370.

LIMB FITTING CENTRES

The Ministry established limb fitting centres throughout the country where officers and men who had suffered amputation of a limb through war service attended for the supply, repair and renewal of their artificial limbs. The limb makers' workshops were stationed either at or near to limb fitting centres. At each centre there was a surgeon-in-charge, assisted by a number of other surgeons specially selected and trained for the work. Full details of the limb fitting service of the Ministry will be found in Chapter 5.

CONCURRENT TREATMENT AND TRAINING; CONVALESCENT CENTRES

In its early days the Ministry provided vocational training for men whose war service disablement prevented them from resuming their pre-war occupation, but in 1919 responsibility for this provision was transferred by Order in Council to the Ministry of Labour. The Ministry of Pensions, however, remained responsible for the training of those whose treatment requirements, or a liability to relapse, prevented regular attendance at a continuous course of training, or employment under ordinary industrial conditions.

In order to combine training with medical treatment, convalescent centres, with a total accommodation for 3,800 patients, were established by the Ministry in convenient parts of the country. The training was adjusted to the needs of treatment and to the man's physical ability. The medical officer in charge was aided by expert instructors and the training was both theoretical and practical. Sick quarters, nursing and physiotherapy services were provided in the centres. In 1923, 7,400 cases were dealt with in these centres but by the end of 1925 the need for them had passed and the last centre, at Rednall, was closed down.

Remedial Workshops and Massage Service. Remedial workshops were attached to the Ministry's Orthopaedic Hospitals and a Ministry Massage Service was established to serve hospitals and clinics, which in 1921 had a personnel of 730, all of whom had seen war service and some of whom were blinded soldiers trained at St. Dunstan's.

Optical Appliances Department. Soon after its inception the Ministry took over from the War Office the provision of spectacles for serving members and pensioners and also supplied the needs of other Government Departments. A special centre set up for the making of artificial eyes was also established. There was little falling off in this work during the inter-war years and when the armed forces again expanded there was greatly increased demand to meet their needs. In 1937 the Service Departments requested that a new type of spectacle frame, with flat side members, for wearing under gas masks, should be supplied. Table III shows the effect of this request on the supply of spectacles:

TABLE III

Supply of Artificial Eyes and Spectacles by the Ministry of Pensions: 1935–9

	Eyes	Spectacles
1935–6	3,782	1,236
1936–7	3,827	1,606
1937–8	3,700	2,908
1938–9	3,738	8,010

NURSING SERVICE

In June 1919, the Ministry of Pensions set up its own Nursing Service, with Her Majesty Queen Alexandra as President, and under the direction of a Matron-in-Chief. Except for junior ranks, only applicants with war service were considered and, with few exceptions, the posts offered were in the rank held in the Services. The Ministry's Service was confined to single women and widows until this limitation was removed in 1942, and contracts were signed for six or twelve months. In December 1919, a Principal Matron was also appointed.

In addition to the trained staff a number of untrained assistant nurses were employed, mainly supplied from the V.A.D. Headquarters. The Ministry also made extensive use of male orderlies for nursing duties.

At its peak the Service numbered 1,740 fully trained nurses and over 900 assistant nurses, apart from nursing orderlies and Table IV shows the number of female nursing staff at certain inter-war years :

TABLE IV

Ministry of Pensions Nursing Service

	1920	1921	1923	1925	1930
Matrons	42	79	51	34	15
Sisters	183	561	241	182	218
Nurses (including Asst. Nurses)	499	967	410	252	
Tota!s	724	1607	702	468	233

In July 1939, the nursing strength was 175 female nurses and 280 male orderlies.

ARRANGEMENTS FOR BOARDING AND TREATMENT ABROAD

The Ministry's responsibilities extend beyond the British Isles, since for pensioners living abroad and for all former members of the Imperial Forces who returned to the Dominions or elsewhere, the Ministry is as much responsible as it is for the ex-service men at home. Indeed there are pensioners scattered in more than 100 different countries. In Canada the Ministry established an office in Ottawa on April 1, 1926, with its own medical and lay staff to serve pensioners living in that Dominion and in the U.S.A. In other Dominions, in the Colonies and in foreign countries (other than the U.S.A.), the Ministry had its own appointed Overseas Pensions Agents. In Australia, New Zealand and South Africa, the Dominions Pension Authorities act as Agents, utilising for ex-Imperials the same machinery as has been set up for their own Forces. In any Colony where there is a British Military Station, the Military Authorities act for the Ministry. In other Colonies the Colonial

Treasurers act, while in foreign countries the British Consuls are the Pension Agents.

Each of the Ministry's Agents is responsible for the payment of pensions and is authorised to provide all the benefits available under the War Pensions System to pensioners living at home. The Ministry alone makes new or revised awards and the Pensions Agent arranges for any necessary medical examination and treatment and institutes local enquiries.

GENERAL DEVELOPMENTS IN INTER-WAR YEARS

After the peak years from 1920 to 1923 the number requiring hospital treatment gradually diminished. By the early 'thirties most of the disabilities for which pension had been given had stabilised and hospital provision was needed mainly for chronic or recurrent conditions and 'flares'. Of all surgical cases treated in hospital in 1934, two-thirds had a septic reactivation in the site of old gunshot wounds, two of these dating back to the South African War of 1900.

The rate of decrease of in-patient and out-patient hospital treatment for all disabilities was remarkably even year by year after 1921. From 1928, surgical cases diminished more slowly than medical. Neurological and epileptic cases did not begin to decrease steadily until 1925; in both the rate of decline slowed up in the years 1929–31. Tropical diseases and tuberculosis showed a remarkably uniform decrease. The number of mental patients remained almost constant. The out-patient figures showed broadly the same features as the in-patient, but the rate of decrease was more rapid, particularly between 1923 and 1928.

PENSION POSITION IN 1939

Between the War of 1914–18 and the beginning of the War of 1939–45 awards of pension, or gratuity, were made to nearly a million and three-quarter persons. Of these over 400,000 were still receiving pensions in September 1939. Table V gives more detailed figures :

TABLE V

Pensions Roll

	Aggregate number compensated 1914–39	Maximum number drawing compensation at one time (1920)	Pension roll at outbreak of War of 1939–45
Officers	80,200	40,298	21,500
Nurses	3,070	1,455	880
Non-commissioned Ranks	1,618,000	1,159,000	401,500

The difference between the figures for 1920 and 1939 is due to deaths, and the removal from the pension roll of those whose war disablement

TABLE VI

Disablement Pensions in Payment at March 31, 1939

Disability group	Other Ranks	Officers	Totals
Complete Blindness	770	48	818
Wounds			
Head	16,319	1,031	17,350
Face	11,283	652	11,935
Neck	2,006	212	2,218
Chest	9,596	695	10,291
Abdomen	3,470	145	3,615
Perineum	1,401	51	1,452
Back	5,475	331	5,806
Upper Extremities (not amputation)	64,063	2,411	66,474
Lower Extremities ,, ,,	48,378	2,769	51,147
Fracture of Femur	5,662	280	5,942
Multiple wounds	2,372	828	3,200
Amputations			
Amputation of one Upper Extremity	8,442	287	8,729
Amputation of both Upper Extremities	273	2	275
Other Amputations of Upper Extremities	5,279	39	5,318
Amputation of one Lower Extremity	21,076	794	21,870
Amputation of both Lower Extremities	806	27	833
Other Amputations of Lower Extremities	1,142	26	1,168
Amputation of one Upper and one Lower Extremity	150	5	155
Other Multiple Amputations	36	4	40
Diseases			
Dysentery	2,082	190	2,272
Enteric	155	8	163
Malaria	1,933	85	2,018
Trench Fever	294	13	307
Rheumatism	10,662	422	11,084
Pulmonary Tuberculosis	21,119	1,132	22,251
Tuberculosis not Pulmonary	2,200	104	2,304
Affections of Respiratory System	23,117	783	23,900
Organic Disease of Heart	13,223	526	13,749
Functional Disease of Heart	14,122	459	14,581
Nephritis	5,488	122	5,610
Gastric Ulcer	1,706	219	1,925
Appendicitis	420	30	450
Other Diseases of Alimentary System	3,568	230	3,798
Hernia	1,487	64	1,551
Neurasthenia	25,626	3,195	28,821
Epilepsy	2,639	89	2,728
Tabes Dorsalis	385	27	412
Other Organic Nervous Diseases	2,365	128	2,493
Insanity	9,960	279	10,239
Diseases of Eye resulting in complete Blindness	98	3	101
Other Diseases of Eye	7,212	303	7,515
Diseases of Ear	13,819	663	14,482
Debility	3,013	173	3,186
Diabetes	153	41	194
Flat Foot	764	25	789
Frost Bite	1,380	15	1,395
Gas Poisoning	1,736	158	1,894
Miscellaneous	8,214	553	8,767
Diseases of Veins	3,545	223	3,768
Diseases of Joints	4,705	371	5,076
Arteriosclerosis	365	25	390
Bilharzia	33	7	40
Loss of Eye	9,057	214	9,271
Totals	404,644	21,516	426,160

was cured, or so ameliorated that compensation by continuing pension was no longer appropriate. Claims for pension, however, were still being initiated in 1939, over 21 years after the end of the War of 1914–18 hostilities. They were nearly all on account of ailments common to the civil population, such as bronchitis, rheumatism, asthma, tuberculosis, heart troubles, but included a few cases of war wound and injury. There were very few cases in which serious doubt arose on the question of relation to war service, and to deal with such cases, the Ministry referred them to one or more of a panel of independent medical experts, nominated as eminent in their profession by the Presidents of the Royal Colleges of Physicians and Surgeons, and their advice on the entitlement was accepted by the Ministry.

Table VI shows further details of the disablement pensions still in payment at March 1939.

CHAPTER 2

PREPARATIONS FOR EMERGENCY

EXTENSION OF RESPONSIBILITIES

As stated at the beginning of Chapter 1, the outbreak of the Second World War renewed the duties and responsibilities which the Ministry exercised during and after the War of 1914–18 and extended them to include provision for members of the Mercantile Marine and Fishing Fleet as well as for the regular Services and their auxiliaries. Further, the Ministry was made responsible for the compensation of civilians in respect of death or disablement by war injury and joined with the Emergency Medical Service in providing treatment. These new responsibilities were reflected in the following legal provisions:

EX-SERVICE CASES

The Pensions (Navy, Army, Air Force and Mercantile Marine) Act, 1939, passed on September 3, 1939, provided by Order in Council for the transfer to the Minister of Pensions of the powers and duties of the Service Departments relating to the pensions of the Fighting Forces.

The actual provisions for the pensions of war-disabled members of the Army are contained in 'Royal Warrants'. There are Orders in Council and Orders by His Majesty making identical provisions for ex-members of the Naval and Air Forces.

The same instruments contain provision for the award of pensions to widows, parents and other dependants of deceased members of the three Services.

In addition, provision is made for allowance for the wives and children of disabled members of the Forces, and for the payment of certain supplementary grants to meet special contingencies, e.g., regular attendance on the pensioner, and, at a later date, such contingencies as unemployability, inability to resume the former occupation or to follow one of equal standard, extra wear and tear of clothing due to the pensioned disablement and the education of children. Special allowances are also payable during periods of approved treatment and when a pensioner has to abstain from work following treatment. A widow with a child may also be eligible for an allowance to assist her in the payment of rent and rates.

The main condition governing entitlement to pension, stated briefly, became, in the course of war, that the disablement should have been attributable to or aggravated by war service, or death should have been attributable to or hastened by such service (see Cmd. 7699, Cmd. 7096).

THE MERCHANT NAVY, FISHING FLEETS, COASTGUARDS AND PILOTAGE, LIGHT VESSEL AND SALVAGE SERVICES

The Minister was empowered by the Pensions (Navy, Army, Air Force and Mercantile Marine) Act, 1939, to make schemes applying the Naval War Pensions Order, with any necessary modifications, to mariners, coastguards and members of the pilotage, lightship and lighthouse tender services etc., and, by the Pensions (Mercantile Marine) Act, 1942, to marine salvage workers.

The Minister's powers were at first limited to the award of compensation for disablement or death resulting from 'war injuries' or for 'detention', but, upon the passing of the Act of 1942 provision was made for compensation in respect of additional injuries, known as 'war risk injuries'.

CIVILIANS

The Personal Injuries (Emergency Provisions) Act, 1939, empowered the Minister of Pensions to make a scheme for the payment of compensation in respect of injuries sustained by civilians, and the scheme was known as the Personal Injuries (Civilians) Scheme.

Broadly speaking, the disablement must have been caused by enemy action (war injuries) or by injuries sustained on duty by members of Civil Defence Services (war service injuries) and death must have been the direct result of such injuries.

PROCEDURE FOR LODGING CLAIMS

For men invalided from the Forces and for deaths during service where the man left a widow, the Service documents were referred automatically to the Ministry by the Service Departments for consideration. For invalided persons no formal claim to pension was necessary, but widows were expected to make a claim on the appropriate form which was sent to them automatically by the Service Department.

In other cases, e.g. claims arising after discharge from the Forces and civilian cases, a formal application was necessary.

Steps were taken to ensure that, as far as possible, the Service documents were referred to the Ministry of Pensions in sufficient time to enable a decision to be reached regarding the pension before the termination of Service pay and allowances.

In civilian cases, there were local arrangements during the war for the earliest possible payment of injury allowances where incapacity for work lasting seven days or more was medically certified to be due to war injury or a war service injury. Payments were made on the spot by officers of the Assistance Board, acting as agents of the Ministry of Pensions.

The injury allowances or special temporary allowances were followed by the payment of pension in appropriate cases.

War-injured civilians were entitled to free treatment under the Ministry of Health's Emergency Medical Services scheme.

It was early realised that in order to avoid hardship it was essential that the claims to pension by men of the Mercantile Marine should be dealt with promptly. For this reason all port authority officials and shipping companies were approached and asked to report to the local office of the Ministry of Pensions immediately a sick or injured member of the Mercantile Marine or Fishing Fleets had been landed at one of our ports, so that a medical report could rapidly be obtained and the Ministry's responsibilities for treatment carried out. Where feasible, the man was seen by a medical officer of the Ministry or a doctor acting on behalf of the Ministry.

EVACUATION OF H.Q. FROM LONDON

Preparations were made in 1938 for the evacuation of the bulk of the Ministry's London Headquarters to Rossall School, near Liverpool, which was earmarked for this purpose. On September 3, 1939, evacuation started and on October 25, a medical and lay staff went to Rossall. By June 1940, the medical staff evacuated to Rossall, with additions by direct recruitment, numbered 15 and a Director of Medical Services was appointed in charge. In October 1940, the increased bombing led to an almost complete evacuation of London H.Q. and the D.D.G.M.S. and the other Ds.M.S. went to Rossall, only the D.G.M.S. and his personal staff remaining in London. By this time the accommodation at Rossall was becoming inadequate and it was arranged that the evacuated Ministry H.Q. should be moved to hutted accommodation which was being specially built at Norcross, near Cleveleys, and St. Annes, Blackpool, with accommodation for a staff of some 3,500. The transfer was gradually effected as the accommodation became available and by December 1, 1940, was completed, 1,700 staff being accommodated at Norcross and 1,500 at St. Annes.

LIAISON WITH EMERGENCY MEDICAL SERVICE (see E.M.S. Volume I, Chapter 4.)

Hospitals. In 1939 the E.M.S. was set up by the Government under the Minister of Health, primarily to deal with the expected large numbers of civilian air raid casualties, and with this Service the Ministry was necessarily closely connected. In July 1938, Dr. (later Sir) John Hebb, the D.G.M.S. of the Ministry of Pensions, was transferred to the Ministry of Health as the first Director-General of the E.M.S. The closest liaison was established with the E.M.S., particularly in connexion with the provision of hospital accommodation, which is dealt with in Chapter 3.

Documentation. (See E.M.S. Volume I, Chapter 3.) It was of great importance to have agreement with the E.M.S. on the completion of the

documentation required by the Ministry of Pensions. The Ministry's decision on claims for pension, whether for Service or civilian casualties, had to be made on all the medical and lay evidence available, and it was no less necessary to have full information on the civilian than on the Service casualties. Agreement was reached with the E.M.S. whereby their records of casualties would be as complete as possible, and include the points on which the Ministry particularly needed information, and the first record would be made at the occurrence of the casualty or as soon after as possible. The E.M.S. authorities then issued to their hospitals and medical officers certain Ministry of Pensions forms to be completed by the E.M.S. hospital staff for the following types of cases:

Civilian Casualties. Those sustaining injury (physical or otherwise) caused by enemy attack.

Those members of a Civil Defence organisation sustaining physical injury in the course of performing their duty.

Members of the Mercantile Marine or any passenger suffering injury as the result of enemy action.

In order to reduce the number of times the personal particulars of a casualty had to be written out, and to keep his successive records conveniently together, a large stout envelope (M.P.C.47) was used. On its cover were to be recorded the identification particulars and, in sequence, the transfers from one form of treatment to another, or transfer as in-patient from one hospital to another, or as in-patient to out-patient at the same hospital. The M.P.C.47, with all relevant documents inserted went with the patient. On discharge, or death, it went to the Casualty Records Section of the Ministry of Pensions, with, for discharges, certain specially completed forms for the use of that Ministry.

Service Patients. When Service casualties or sick were sent on discharge to their units, or to R.A.F. Sick Quarters, an M.P.C.47 was transferred with the patient, but if on discharge from a civilian hospital they were not sent to a Service hospital, or convalescent depot, or to R.A.F. Station Sick Quarters, the M.P.C.47 was sent to the Casualty Records Section of the Ministry of Pensions. On the death of a member of the Services, M.P.C.47 was forwarded to the Casualty Records Section.

This M.P.C.47 procedure proved effective in collecting, keeping together and eventually making available to the Ministry of Pensions that continuous medical history of events following the casualty which was so important to the Ministry in its dealing with claims for entitlement.

LIAISON WITH SERVICE DEPARTMENTS

The nature and content of the reports of the Invaliding Medical Boards of the Services were of particular importance to the Ministry in its consideration of entitlement to pension, and the Ministry

medical staff kept in close touch with the medical branches of the Services to ensure that the detailed information needed by the Ministry was appreciated by the Service invaliding boards. As a result of this liaison, copies of the Ministry's instructions to medical boards were distributed, in 1941, to all Service Medical Departments and the details to be included in their medical reports were mutually agreed. Throughout the war, medical and lay officers of the Ministry of Pensions met their opposite members in the three Service Departments for discussion of common problems and difficulties as they arose and, for their further mutual assistance, pamphlet (M.P.M.369) was circulated in 1945 to all medical officers of the Service Departments, which summarised the developments and changes in the general principles and practice of entitlement and assessment up to that date.

Precise factual evidence relating to the actual circumstances in which a wound or injury occurred or a disease developed is of particular importance to the Ministry. Normally, this formed part of the documents received by the Ministry from the Service Departments, but it was often necessary to get supplementary evidence on adverse Service conditions. For this purpose, it was agreed that the war diaries of units and formations should be made available to the Ministry when required, and also that individual units would make enquiries on conditions of service, contact with infectious diseases, etc., when requested by the Ministry (A.C.I. 2044/41 ; A.C.I. 145/41).

Continuity of Treatment. In the early stages of the war, arrangements were made, in conjunction with the Service Departments and the Ministry of Health, to ensure that when a member of the Forces was invalided while still needing medical treatment, this should be provided on a continuity basis, without waiting for and without prejudice to the Ministry's decision on entitlement to pension. Up to the end of 1946, over a quarter of a million treatment recommendations, received from the Service Departments under this arrangement, were dealt with by the Medical Services Division.

Towards the end of 1945, following discussions with the Service Departments, agreement was reached on further provision to be made for the treatment of Service personnel who, at the time of their invaliding or release, were receiving in-patient hospital treatment.

These arrangements may be summarised as follows:

> The 'Eight Months Rule'—Service personnel who were detained in hospital for in-patient treatment were eligible to be retained on full pay and allowances for a period of up to eight months from the date of first absence from duty, even although they were already due for release or had been found unfit for further service.
>
> The 'Long Term Treatment Scheme'—the eight months period was extended in the case of personnel suffering from disabilities attributable to or aggravated by service, so as to enable the individual concerned to

be retained in the Service on full pay and allowance until finality of in-patient medical or surgical treatment was reached, subject to an overriding time limit of 2½ years (i.e. thirty calendar months, excluding notice leave).

LIAISON WITH MINISTRY OF LABOUR AND NATIONAL SERVICE

Recruitment Boards. The medical boarding of recruits was the responsibility of the Ministry of Labour and National Service. The Ministry of Pensions was, however, no less interested in these boards than in the invaliding boards of the Services, for in deciding on the effects of war service definite knowledge of the physical and pathological condition on recruitment is essential to clear judgment. Effect was given to the particular concern of the Ministry in the standards for recruitment and the content of the recruiting boards by the appointment of a Ministry representative on the Medical Advisory Committee, under the chairmanship of Lord Horder, set up by the Minister of Labour and National Service in order to advise him on the medical aspects of recruitment.

In October 1941, the Ministry of Labour and National Service announced details of an interim scheme for the training and rehabilitation of disabled persons. An inter-departmental committee, which included two representatives of the Ministry of Pensions, had been set up to study this problem. Its full report (Cmd. 6415) was published in January 1943, and stated that 'it is in the interest of the country, as well as that of the disabled citizen, that he should get back to suitable employment as soon as possible—not to any employment but to the most skilled work of which he is capable'. With this end in view, arrangements were made for officers from local offices of the Ministry of Labour and National Service to interview patients in hospital before discharge and to discuss with the patient and his doctor the form of employment he would both like and be able to follow on his discharge. The Ministry of Pensions welcomed such action and took every opportunity of providing at its hospitals the training combined with treatment which would enable pensioners to commence work with the least possible delay on discharge.

A specialised staff was appointed to supervise bedside occupations, bed exercises, and the departments set up for occupational therapy. Physical training, deck quoits, swimming, tennis, cricket, etc., were encouraged, under supervision, and classes held, or individual tuition given, in belt-making, pewter work, typewriting, carpentry and many other activities. A close liaison was maintained between the hospitals and the Ministry of Labour, as well as with Local Education Committees. Lectures for adult education, and explanatory talks on Government centres and the scheme for the training and resettlement of disabled persons were frequently given.

Before discharge to civilian life the advice of the local representative of the employment exchange and of the rehabilitation officer was made easily available to each patient. All Ministry hospitals had libraries, with books ranging from light fiction to technical volumes, and activities such as the staging of plays by the patients and staff, and the production of their own magazines, were encouraged. Some hospitals had their own cinema projectors and for most, mobile film units were available for the benefit of those unable to leave their wards or beds.

MEDICAL MAN-POWER

It had been decided that in the event of war, the Ministry of Health should be responsible for the allocation of available medical personnel as between the needs of the Services and the civilian population. In this task they sought the co-operation of the British Medical Association and with it a Central Emergency Committee was established to which a representative of the Ministry of Pensions was appointed. At the outbreak of war this committee became the Central Medical War Committee and the Ministry was also represented on its Services Sub-committee.

WAR NEUROSES

Advisory Committee set up. During and following the War of 1914–18, the incidence and treatment of war neuroses, commonly described as 'shell-shock', became a major problem. In 1920 the Army Council appointed a committee, on which the Ministry was represented, to investigate this condition and to record for future use the facts as to the origin, nature and remedial treatment of 'shell-shock'. This committee made it clear that the nervous disorders arising during the war differed in no material way from those well known in civil life, and reported that 'the term "shell-shock" had been a gross and costly misnomer' and advised that it should be abolished. They further reported that the constitutional factor in those with 'war neuroses' was of great importance and that in the great majority there was already a congenital or acquired predisposition to excessive reaction.

With the past history in mind, it was fully realised that if another war came, history would be likely to repeat itself and the Ministry would again be faced with the problems inherent in war neuroses, problems which experience had shown to be prolonged and complex. Consequently, in 1938, the Minister appointed a committee to advise him on the policy to be adopted towards neurosis cases in the light of the experience gained in the inter-war years. The committee included Service representatives and leading neurologists with Lord Horder as chairman.

It had before it the results of an analysis of 5,000 Ministry of Pensions cases of 'Neurasthenia' from the War of 1914–18.

Report of the Committee. The committee endorsed the findings of the 1920 'shell shock' committee and agreed that, whereas previously it had been considered that the nervous disorders classified as 'shell-shock' had their origin in the physical effects of concussion by high explosives or by poisoning by war gases, this view could not be justified, since precisely the same disabilities, and in the same proportions, occurred not only among men who had not been subjected to such exceptional exposure but also among those who had not been oversea.

They were agreed that the War of 1914–18 produced no new nervous disorders; those which occurred had previously been recognised in civil medical practice.

The findings of the committee were made known in October 1939, and their recommendations were published as a Memorandum, entitled *Neurosis in War Time*, which was circulated throughout the medical profession.

CHAPTER 3

REGIONAL ORGANISATION: MEDICAL PERSONNEL AND THE NURSING SERVICES

REGIONAL ORGANISATION

To simplify general administration it had been agreed that the Ministry should adopt the same regional divisions as the Civil Defence Organisation. This made necessary the forming of three new regions, with headquarters at Cambridge, Reading and Tunbridge Wells, each with a Commissioner of Medical Services in charge of the medical work.

The Ministry's regions thus came to number 14, of which 12 corresponded to those of Civil Defence, the remaining two being in Northern Ireland, with headquarters at Belfast, and in Southern Ireland, with headquarters at Dublin. It is seldom realised that, despite the separation of Eire from the United Kingdom, the Ministry of Pensions throughout has maintained in that country its own independent lay and medical organisation, with regional offices and sub-offices, and a Ministry hospital of 80 beds at Leopardstown Park.

The general increase in the Ministry work as the war advanced called for a considerable expansion of the regional organisation and it became necessary to open additional whole- and part-time sub-offices, each responsible to the main regional office, and to make additional use of medical examination centres.

In 1941 whole-time sub-offices were opened at Aberdeen, Norwich and Wrexham and eight new medical examination centres in various towns. In 1942 whole-time sub-offices were opened at Blackpool and Bristol and a further ten medical examination centres, and 1943 saw the addition of a further five medical examination centres.

Later, the volume of work increased to such an extent in certain areas that it became necessary to increase the number of main regional offices and, in January 1945, whole-time sub-offices which had been opened at Liverpool and Glasgow were given the status of regional headquarters. In August 1945, further decentralisation of the work in London became necessary and the whole-time sub-office for North London was made a regional headquarters. London thus was served by two regional headquarters, London North, at Gordon Street, N.1. and London South at Great Smith Street, S.W.1. In addition to these main regional changes, more whole-time and part-time sub-offices were opened as time went on and, by December 1945, the regional

medical organisation included 17 regional headquarters offices, six whole-time sub-offices and 40 medical examination centres.

Boarding and other Medical Examinations in the Regions. Some idea of the increase in the regional work which necessitated the expansion outlined above is given in the following table. Detailed figures appropriate to this table are not available for the early days of the war:

TABLE VII

Regional Medical Examinations

Half year ending	Boards	General clinics	Limb fitting	Appliances	Other treatment	Totals
Dec. 1941	32,146	10,197	14,471	4,687	1,884	63,384
June 1942	33,172	14,011	13,540	5,091	1,525	67,339
Dec. 1942	39,949	16,184	14,956	6,164	1,293	78,546
June 1943	37,774	17,578	15,829	6,649	1,627	78,457
Dec. 1943	32,378	21,172	20,394	7,323	1,693	82,960
June 1944	38,791	28,971	23,557	8,719	2,038	102,076
Dec. 1944	41,523	34,021	26,186	8,979	2,060	112,769
June 1945	56,151	37,805	33,461	10,776	2,076	140,269
Dec. 1945	80,075	40,556	34,512	11,542	2,049	166,734
June 1946	115,115	40,953	35,777	12,764	2,786	207,395
Dec. 1946	180,095	37,773	33,749	12,727	2,884	267,228

Table VIII analyses the medical boards undertaken by the Ministry. It will be seen that in the early months of the war the bulk of the boarding work was in respect of members of the Mercantile Marine but, as the effect of the air attacks on this country began to be felt, and before heavy battle casualties had occurred, the proportion of civilian boards increased, reaching a peak in the quarter ended September 1941, when over half the total boards were of civilians.

MEDICAL PERSONNEL

At the outbreak of war the administrative medical staff of the Ministry numbered about fifty, nearly all with many years of established service. In addition there were the resident medical officers and visiting consultants at the Ministry's hospitals and a considerable number of general practitioners and specialists employed on a sessional basis for medical boards and domiciliary examinations. The administrative medical staff, under the control of the Director-General of Medical Services, included the grades of Deputy Director-General, Director, Principal Medical Officer and Medical Officer.

With the onset of war, doctors were at once recruited to the Medical Officer grade and by March 31, 1940, the total whole-time medical staff (including hospital medical officers) was 126. At March 31, 1945, the number was 261.

Dr. H. Lightstone, D.S.O., M.C., was Director-General at the outset of war and was succeeded, after his death in February 1942, by Dr. (later Sir Walter) Haward, O.B.E.

TABLE VIII

Services, Mercantile Marine and T124 (Officers and Other Ranks) and Civilians

Quarter ended	Numbers				Percentages			
	Services	Mercantile Marine	Civilians	Totals	Services	Mercantile Marine	Civilians	Totals
1939:								
December	463	—	4	467	99·2	—	0·8	100·0
1940:								
March	249	857	45	1,151	21·6	74·5	3·9	100·0
June	423	753	235	1,411	30·0	53·4	16·6	100·0
September	544	1,353	196	2,093	25·9	64·7	9·4	100·0
December	789	1,787	492	3,068	25·7	58·3	16·0	100·0
1941:								
March	1,343	1,827	2,863	6,033	22·2	30·3	47·5	100·0
June	4,002	1,973	5,650	11,625	34·4	17·0	48·6	100·0
September	6,592	1,737	8,473	16,802	39·2	10·3	50·5	100·0
December	7,569	1,521	6,254	15,344	49·3	9·9	40·8	100·0
1942:								
March	9,772	1,223	4,878	15,873	61·6	7·7	30·7	100·0
June	11,616	1,164	4,519	17,299	67·2	6·7	26·1	100·0
September	12,677	1,344	4,500	18,521	68·5	7·2	24·3	100·0
December	14,881	1,874	4,673	21,428	69·5	8·7	21·8	100·0
1943:								
March	14,683	2,046	4,222	20,951	70·1	9·8	20·1	100·0
June	11,237	2,126	3,460	16,823	66·8	12·6	20·6	100·0
September	9,065	2,162	3,670	14,897	60·8	14·5	24·7	100·0
December	12,105	2,153	3,223	17,481	69·3	12·3	18·4	100·0
1944:								
March	13,762	2,311	2,897	18,970	72·5	12·2	15·3	100·0
June	15,306	2,190	2,325	19,821	77·2	11·1	11·7	100·0
September	12,094	2,457	3,244	17,795	68·0	13·8	18·2	100·0
December	16,689	2,362	4,677	23,728	70·3	10·0	19·7	100·0
1945:								
March	19,860	2,750	5,559	27,989	70·3	9·8	19·9	100·0
June	20,823	2,474	4,865	28,162	73·9	8·8	17·3	100·0
September	25,620	3,287	5,849	34,756	73·7	9·5	16·8	100·0
December	36,575	2,886	5,858	45,319	80·8	6·3	12·9	100·0
1946:								
March	45,602	2,671	6,961	55,234	82·6	4·8	12·6	100·0
June	52,407	2,155	5,319	59,881	87·5	3·6	8·9	100·0
September	68,111	2,152	4,073	74,336	91·6	2·9	5·5	100·0
December	100,639	2,093	3,037	105,769	95·1	2·0	2·9	100·0

The type of doctor chiefly required by the Ministry as medical officer was the general practitioner with ten or more years of wide clinical experience, and it was from this group that recruits were mainly obtained. But as the claims of the Services for doctors became more and more urgent, the Ministry necessarily released as many as possible of its staff for war service and its recruitment became restricted to those ineligible for the Services, by reason of age or some other cause, and use was made of 13 alien doctors as hospital residents. In all its appointments of medical staff the Ministry conformed to the policy and desires of the Central Medical War Committee, on which body it was represented by one of its Directors of Medical Services.

There was necessarily an increase in the higher administrative medical staff. The evacuation to Norcross, Blackpool of the greater part of the Ministry's staff created a need for two Deputy Directors-General, one at Norcross and one in London. Additional Directors of Medical Services were appointed and by 1945 they numbered seven.

The Principal Medical Officers were increased to 38, including one as Medical Inspector of mental hospitals where there were Ministry

patients (the great majority pensioners of the War of 1914–18), one appointed as a general medical consultant and one in medical charge at the Ministry's Canadian office in Ottawa. Several of the Principal Medical Officers had specialist experience and qualifications in psychotherapy, cardiac diseases, orthopaedic surgery, etc.

The general pre-war distribution of medical duties was maintained. At the headquarters at London, Norcross and Cheltenham, the Directors controlled the general work of their branches, aided by Principal Medical Officers and Medical Officers. In the regions a Principal Medical Officer, with the title of Commissioner of Medical Services, was responsible for the medical work of the region, aided by a small staff of full-time Medical Officers and a large part-time staff of doctors employed on a sessional basis as specialists, chairmen and members of medical boards and as examining medical officers for domiciliary examinations in outlying districts. This sessional regional medical staff came to number about 1,700 general practitioners and 800 specialists employed on boards, and some 600 general practitioners employed as examining medical officers in various localities throughout the country.

In the Hospital Service, each hospital had under its Medical Superintendent a resident staff of specialist, senior and junior medical officers, and a visiting consultant staff. The total resident medical staff of the hospitals averaged about 80 and the visiting staff about 220.

The Limb Services had a staff of principal medical officers and medical officers at the Roehampton and Leeds main centres and in each region one or more of the medical officers, who had been trained in limb surgery, dealt with the work of the regional limb centres. For all newly recruited medical officers, an eight weeks' course in limb fitting at Roehampton, with regional training in surgical appliances was added to the normal two months' training at Norcross, unless for some special reason it was not required.

Medical officers were freely interchangeable between the headquarters, regional and limb service branches of the work and a number of administrative medical officers were also employed for certain periods in hospital work as medical superintendents or resident clinical staff. The aim in the service was to make each officer capable of taking on at short notice any of the many and various duties of his grade and to give each a practical experience, in turn, of headquarters, regional and limb service work. This ideal was largely attained, despite the difficulties which war-time housing shortages increasingly added to the 'moves' of officers.

Throughout the war, however, the difficulties in recruitment kept the number of whole-time medical officers below that really required for the steadily increasing work, and the pressure on all was severe.

The duties of the administrative medical officers increased in complexity as the war progressed. The experience of the War of 1914–18

and the years between the wars had provided a well-tested approach to the problems of entitlement and assessment but the new war raised its own problems in the causation of disability. Although the general outlines were similar, the details were often new; medical knowledge and experience were growing, and medical officers had to keep abreast of new developments and bring fresh minds both to new questions and to old questions in a new guise. Particularly was this needed in the preparation of medical statements for the Pensions Appeals Tribunals, where not only a knowledge of medicine but an appreciation of the legal subtleties of evidence and proof were essential. In the clinical regional work, the new war differed from the old in the appearance of claims from civilians of both sexes, and also from a much larger number of ex-service women so that, for the first time, women doctors were appointed to the Ministry's staff. The regional officers were in constant touch with numerous other authorities, governmental, local authority and others and much of the work of the medical staff was in maintaining a close, friendly and promptly efficient liaison with these bodies for mutual help.

NURSING SERVICES

As stated in Chapter 1, the strength of the Ministry's Nursing Service in July 1939, was 175 female nurses and 280 male orderlies. The proposed increase in hospital beds in preparation for an emergency, called for an addition of 320 to the female nursing staff, and arrangements were made with the Central Emergency Committee for the Nursing Profession for the allocation of members of the Civil Nursing Reserve to Ministry hospitals in the event of an emergency.

On the outbreak of the war, additional staff was obtained, as required, from the central pool of the Civil Nursing Reserve and later, on the appointment of Regional Nursing Officers by the Emergency Medical Services in May 1940, through the respective Regional Nursing Officers.

In the summer of 1940, however, not enough C.N.R. nurses were available for the Ministry's needs and authority was obtained to increase the complement of the Ministry's own Nursing Service by 30, and for this additional staff to be obtained by direct recruitment. In August of that year a number of trained and student nurses from the training school of the Middlesex Hospital were transferred to Stoke Mandeville under the E.M.S. Scheme for work in that hospital.

With the rapid expansion of the nursing staff and the consequent increase in administrative responsibilities, the post of Matron-in-Chief, which had lapsed in the inter-war years, was restored in January 1941. In August of that year the E.M.S. Scheme for the training of nursing auxiliaries was extended to certain Ministry hospitals and a considerable number of nursing auxiliaries passed through the intensive courses of training held in these hospitals.

A year later, married women became eligible for the first time for appointment to the Ministry's Nursing Service and from October 1943, part-time nurses were also employed.

The following Table shows the growth of the Ministry's Nursing Service (female) throughout the war:

TABLE IX

Date	Trained nurses			Assistant nurses	Nursing auxiliaries		Totals
	M.O.P.	C.N.R.	From Middlesex Hospital	C.N.R.	C.N.R.	From Middlesex Hospital	
Dec. 1939	181	32	—	9	14	—	236
,, 1940	187	144	20	69	201	62	683
,, 1941	178	158	20	71	275	77	779
,, 1942	168	163	13	74	418	80	916
,, 1943	191	142	16	79	465	83	976
,, 1944	227	141	19	79	516	106	1088
June 1945	242	121	24	121	432	104	1044

In addition, from 1941, the male nursing orderlies numbered from 400 to 450.

CHAPTER 4

HOSPITAL PROVISION

EXISTING HOSPITALS : EXTENSIONS TO PRE-WAR ACCOMMODATION

SOME time before the war, plans were prepared for increasing the accommodation in the Ministry's hospitals as required. In August 1939, the number of beds in the Ministry's nine hospitals was 1,523; it was proposed to increase this to make a total of about 4,500 available beds, the proposed increase of beds being limited to the eight hospitals in Great Britain, and excluding the hospital at Dublin (Leopardstown Park). Some of this additional accommodation was at once provided by reducing the space between the beds and by using recreation and other rooms as wards. In this way, some 860 beds were added and on September 29, 1939, the available beds were 2,385. The rest of the new accommodation was proposed by building extensions as follows:

TABLE X

Ministry of Pensions Hospitals: Proposed Extensions

Hospital	Equipped beds pre-war	Maximum beds possible in existing buildings	Beds in new buildings proposed	Total new beds
Edenhall, Edinburgh	102	137	192	329
Dunston Hill, Newcastle	120	163	224	387
Chapel Allerton, Leeds	157	204	288	492
Mossley Hill, Liverpool	194	285	156	441
Rookwood, Cardiff	88	134	180	314
Chepstow	140	210	336	546
Cosham, Portsmouth	303	516	416	932
Roehampton	414	552	528	1,080
Totals	1,518	2,201	2,320	4,521

The original plans for these new buildings were to a certain degree modified as the war progressed, and details of the available beds at various stages of the war are shown later in this chapter.

LIAISON WITH E.M.S.

The Ministry co-operated closely with the E.M.S. in the provision of hospital accommodation and the main arrangements for hospital accommodation made between them were, briefly:

ENGLAND AND WALES

Cosham and Dunston Hill Hospitals. As part of the extensions to hospital accommodation of all kinds throughout the country, the

accommodation at the Ministry's hospitals at Cosham, Portsmouth (303 beds) and Dunston Hill, Gateshead (120 beds) was to be made available, from the outbreak of war, for admissions of patients through the E.M.S. scheme, but the hospitals were to remain staffed and administered by the Ministry. At the onset of war all the patients at Cosham were to be transferred either to the Ministry's hospital at Chepstow or, as was to be done with all suitable patients, to their own homes. To free Dunston Hill Hospital for the E.M.S., its patients were to be moved to the Ministry's hospital at Edenhall, Edinburgh (102 beds). These transfers were made on September 1, 1939, and Cosham and Dunston Hill then became available to the E.M.S. for civilian and Service cases, the Ministry reserving to itself the power to admit, as necessary, ex-service cases for which it became responsible. The plans for increasing the beds at Cosham to 890, by the construction of eight hutted wards, were completed and the new wards occupied by August 1941.

Roehampton Hospital. A number of beds at Queen Mary's Hospital, Roehampton, was made available to the E.M.S. for maxillo-facial and other special surgical cases among civilian and Service casualties.

Stoke Mandeville. At the request of the Ministry of Health, in August 1940, the Ministry undertook to manage, on behalf of that Department, the *ad hoc* hospital at Stoke Mandeville which had been constructed and equipped for use under the E.M.S. The control of admissions remained with the E.M.S. but the Ministry of Pensions was responsible for appointment of all staff, the provision of treatment and the general administration. Originally intended to provide 600 beds, its accommodation had been extended to 1,100 beds. In addition to acting as a general hospital, Stoke Mandeville provided for much specialised work. Three wards, each of 36 beds, were set aside for a Jaw Injury and Plastic Unit and in January 1941 the hospital was graded 'Fracture A'. (See E.M.S., Volume I, Chapter 5.) In June 1942, 20 beds were allocated for cleft palate cases from the Hospital for Sick Children, Great Ormond Street, W.C. A close relation was established with the Middlesex Hospital, whereby some of its student-nurses did part of their training at Stoke Mandeville Hospital, under the supervision of Sisters of the Middlesex Hospital. On April 1, 1946, the hospital was finally taken over by the Ministry of Pensions.

Ronkswood. Included in the E.M.S. building scheme prepared before the war was a new 600 bedded hospital at Ronkswood, near Worcester. This was opened in March 1942, the Ministry of Pensions having agreed to administer it for the E.M.S. on the same basis as the hospital at Stoke Mandeville; in December 1942 the hospital was classified 'Fracture A'. This hospital acted as a reception base for D-day casualties. It was handed over to the Ministry on April 1, 1946.

Chepstow. An *ad hoc* hospital (quite distinct from the existing Ministry hospital), which was intended to be managed by the Ministry of Pensions

in the same way as Stoke Mandeville and Ronkswood, was also built by the E.M.S. at Chepstow, but this plan was changed, and the hospital never came within the Ministry of Pensions organisation.

Provision of Special Centres. The E.M.S. hospital scheme included the provision of special centres for particular forms of treatment and these were available for the treatment of pensioners. The Ministry of Pensions also set up special centres in its own hospitals, e.g. maxillo-facial and plastic units at Stoke Mandeville and Queen Mary's, Roehampton, while Roehampton was also classified as an Orthopaedic Centre.

In particular, the Spinal Injuries Centre at Stoke Mandeville for the treatment and rehabilitation of paraplegic pensioners merits special mention. It was started in 1944 and became eventually the largest spinal centre in the United Kingdom, with 120 beds. A full account of the valuable work done there will be found in Chapter 10 of the volume on Clinical Surgery in this series.

SCOTLAND

There were numerous discussions with the Department of Health for Scotland and its E.M.S. on the joint utilisation of hospital accommodation but eventually no special arrangements of the kind made in England were found necessary. Arrangements were, however, made for additional accommodation to be made available to the Ministry for war casualties at Erskine Hospital (Princess Louise Scottish Hospital, Glasgow). The hospital suffered a certain amount of damage by enemy action during the air raids on the Clyde in the spring of 1941, but fortunately there were no casualties either to the patients or the staff.

For the rehabilitation stage of treatment, a new building was erected and opened by the Ministry of Pensions on June 2, 1944.

Since the cessation of hostilities, additional blocks have been added which have increased the number of beds from 200 to a potential of 400, all reserved for the treatment and care of disabled ex-servicemen.

NORTHERN IRELAND

The Ministry of Pensions had no hospital of its own in Northern Ireland, but by mutual agreement, the Ulster Volunteer Force Hospital at Craigavon provided treatment for disabled war pensioners in Northern Ireland between the World Wars of 1914 and 1939. To meet the Ministry's additional treatment needs created by the War of 1939, under a special arrangement with the Board of Management a small additional hospital, known as Galwally House, was equipped to provide extra beds for the treatment of war-disabled pensioners.

ADMISSION OF SERVICE PATIENTS TO MINISTRY HOSPITALS

At the outbreak of war the E.M.S. became responsible for the treatment of all serving members of the Forces in this country (with the

exception of infectious and mental cases) where admission to Service hospitals was not practicable, and the Ministry's hospitals received any of those for whom entitlement to pension had been conceded or who were under medical consideration. In June 1940, however, the Ministry agreed to take into their hospitals Service surgical cases of a severe type likely to be boarded out as invalids requiring prolonged hospital treatment. Such admissions were restricted to cases of gunshot wounds and burns, these being *prima facie* 'attributable', and cases in which entitlement was certain.

EFFECTS OF THE INVASION OF FRANCE, 1940

The heavy fighting in France in the spring of 1940 foreshadowed the arrival in the United Kingdom of a large number of cases likely to be discharged from the Forces as unfit for further service. At the same time, pressing demands were being made on the hospital accommodation available for serving soldiers and it was expected that many cases would have to be transferred rapidly to Ministry hospitals. Although the extensions at existing Ministry hospitals had been started, there was little prospect that they would shortly be available for use, nor was it thought that the additional beds thus provided would be enough to meet the Ministry's needs. The Minister therefore decided to obtain other accommodation, and in May and June 1940, the following six hotels were acquired for adaptation and equipment as hospitals:

Newquay—'Headland', 'Victoria', 'Atlantic', and 'Great Western', providing 807 beds in all.

Llandrindod Wells—'Pump House' and 'Ye Wells', providing 500 beds. A small private hospital at Esher—'Hawkshill' with 50 beds was also obtained and taken over on June 3, 1940 to be run as an annexe to Queen Mary's Hospital, Roehampton, for officers and nurses.

In establishing these additional hospitals, regard was paid to obtaining accommodation outside areas liable to air raids, more especially as several of the Ministry's existing hospitals were in vulnerable areas. A number of patients were early transferred from Queen Mary's, Roehampton, which had been bombed on two occasions, to the new hospitals at Newquay and Llandrindod Wells.

The headquarters of the Newquay group was the 'Headland' which dealt with medical cases, both medical and surgical cases being admitted to the 'Victoria'. At the 'Atlantic' a special physiotherapy department was started at which physiotherapy instruction was given, and in August 1941, alterations were made to provide an orthopaedic theatre; the hospital was graded 'Fracture A' in October 1941. In October 1943, a ward of the 'Victoria' was given over for use by the American Army until, in May 1944, they were able to transfer their patients to their own hospital nearby. One of the converted hotels at Newquay, the 'Great Western', was never used as a hospital by the Ministry of Pensions, but

in October 1940, at the urgent request of the Ministry of Health, was handed over to the Local Authority for use as a reception centre for evacuees, and later, as a Municipal Feeding Centre.

Although it was the original intention to use these Newquay hospitals for cases which had passed the acute stage but still needed medical and surgical care before convalescence, in fact, all types of cases were admitted.

Childwall, Liverpool. The Childwall Children's Orphanage at Liverpool, a 270 bedded Institution, was requisitioned for the Ministry of Pensions in December 1940, under the E.M.S. Scheme as an adjunct to Mossley Hill Hospital which had been badly damaged in an air raid on November 29, 1940, and since then not used as a hospital. As it was again severely damaged in an air attack on May 2–3, 1941, attempts being made to repair the hospital were abandoned.

SUMMARY OF THE EXPANSION OF HOSPITAL ACCOMMODATION

In these various ways the total of hospitals and beds under the Ministry's control expanded as shown in Table XI:

TABLE XI

Expansion of Ministry Hospitals: 1939–45

	Ministry Hospitals	Beds Available
August 1939	9	1,523
September 1939	9	2,385
,, 1940	13	3,324
,, 1941	18	5,065
,, 1942	18	5,900
,, 1943	17	5,849
,, 1944	16	5,607
,, 1945	16	5,309

CLOSURE OF REQUISITIONED HOSPITALS

The hospital at Esher was finally closed in December 1945, to be taken over by the Surrey County Council as a post-natal hostel. The Newquay group of hospitals was finally closed in March 1946, and the patients transferred to Musgrove Park, Taunton, which was administered in conjunction with the Somerset County Council. In March 1946, the Llandrindod Hospitals were also closed.

AIR RAID DAMAGE AND CASUALTIES

In the late summer and autumn of 1940, the Ministry hospitals suffered from the incessant air raids. At Roehampton, on September 25

and October 11 the hospital was damaged, but it was not until the night of November 29 that casualties were caused. On that occasion, a high explosive bomb fell and destroyed much of the administrative block of the limb fitting centre with one fatal casualty.

As mentioned above, the Mossley Hill Hospital, Liverpool, was seriously damaged on the night of November 29, 1940. It was struck by two parachute mines. Two patients sustained minor injuries and the wards and nursing staff quarters were rendered uninhabitable. Fifty-five of the patients were transferred to their homes and the remaining 40 evacuated to Chapel Allerton. Repairs were put in hand and it was expected that the hospital could be restored as an 80 bedded institution by June of 1941. Unfortunately, the hospital was again hit on the night of May 2–3, 1941, and further extensive damage caused. Of the staff of six who were on the premises, two were killed and three were injured. After this incident, it was decided that the hospital should be closed and that extensions and improvements be carried out at Childwall, which would enable it to take the place of Mossley Hill.

On October 14, 1940, Hawkshill Hospital, Esher, was also damaged, but fortunately not sufficiently seriously to interfere with the main services of the hospital.

On March 10–11, and again on the night of March 11–12, 1941, the Ministry hospital at Cosham was damaged in an air raid, but fortunately there were no casualties and the damage did not prevent the hospital carrying on its main services.

INVASION OF FRANCE, 1944

Some time before D-day, certain Ministry hospitals were selected to act as casualty receiving stations or base hospitals and preparations were made to deal with the expected casualties. Some idea of the volume of work undertaken by these hospitals is given by the experience of one acting as a base hospital with a total available bedstate of 594. For the immediate months following the invasion of Europe this hospital recorded a monthly turnover of 1,228 patients and the average number of major operations carried out per month was 266. During this period the bulk of the work was surgical; medical cases were fewer although a fair number of cases of anterior poliomyelitis from the African fronts and malaria and dysentery from the Italian fronts were treated. Another of the Ministry hospitals, which was acting as a casualty receiving station, between June 6 and July 5, 1944, admitted 2,400 battle casualties and evacuated approximately the same number to base hospitals. Between June and October of that year, 4,659 patients were admitted to this hospital—of these 24 died and the remainder were sent to base hospitals. During this phase non-battle casualties or pensioners were not admitted to these special-duty hospitals, except temporarily in emergency, but were sent on to the nearest Ministry hospital which was

not acting as a casualty receiving or base hospital. To aid the existing Ministry personnel, additional medical staff was sent to the casualty receiving stations during the emergency, but base hospitals carried on with their own staff.

NUMBERS TREATED IN HOSPITALS 1939-46

Details of the numbers of war pensioners treated in various types of hospital from the beginning of the war to the end of 1946 will be found in the Tables which follow:

TABLE XII

Wars 1914 *and* 1939: *All Cases—Allocation of In-patients Treated: October* 1939 *to December* 1944

Quarter ending December 1939

Type of hospital	Patients in Receipt of Pension Allowances					E.M.S. patients	Grand totals
	War 1914	War 1939					
	Services	Services	M. Marine	Civilians	Totals	War 1939	
Ministry hospitals	700				700	492	1,192
General hospitals and special institutions	872				872		872
Sanatoria	158				158		158
Mental hospitals	5,516				5,516		5,516
Totals	7,246	—	—	—	7,246	492	7,738

Year ending December 1940

Type of hospital	Patients in Receipt of Pension Allowances					E.M.S. patients	Grand totals
	War 1914	War 1939					
	Services	Services	M. Marine	Civilians	Totals	War 1939	
Ministry hospitals	2,818	163			2,981	4,688	7,669
General hospitals and special institutions	1,012	78			1,090		1,090
Sanatoria	380	438			818		818
Mental hospitals	5,689	—			5,689		5,689
Totals	9,899	679	—	—	10,578	4,688	15,266

TABLE XII—*contd.*

Year ending December 1941

Type of hospital	Patients in Receipt of Pension Allowances					E.M.S. patients	Grand totals
	War 1914	War 1939					
	Services	Services	M. Marine	Civilians	Totals	War 1939	
Ministry hospitals	2,629	2,280			4,909	7,207	12,116
General hospitals and special institutions	754	309			1,063		1,063
Sanatoria	299	2,833			3,132		3,132
Mental hospitals	5,457	11			5,468		5,468
Totals	9,139	5,433	—	—	14,572	7,207	21,779

Year ending December 1942

Type of hospital	Patients in Receipt of Pension Allowances					E.M.S. patients	Grand totals
	War 1914	War 1939					
	Services	Services	M. Marine	Civilians	Totals	War 1939	
Ministry hospitals	2,977	4,656	40	833	11,377	7,595	18,972
General hospitals and special institutions	898	1,973					
Sanatoria	315	6,364	9	20	6,708		6,708
Mental hospitals	5,211	46	—	—	5,257		5,257
Totals	9,401	13,039	49	853	23,342	7,595	30,937

Year ending December 1943

Type of hospital	Patients in Receipt of Pension Allowances					E.M.S. patients	Grand totals
	War 1914	War 1939					
	Services	Services	M. Marine	Civilians	Totals	War 1939	
Ministry hospitals	3,303	6,585	203	976	16,266	9,879	26,145
General hospitals and special institutions	917	4,282					
Sanatoria	322	8,481	54	47	8,904		8,904
Mental hospitals	5,003	150	7	22	5,182		5,182
Totals	9,545	19,498	264	1,045	30,352	9,879	40,231

TABLE XII—*contd.*

Year ending December 1944

Type of hospital	Patients in Receipt of Pension Allowances					E.M.S. patients	Grand totals
	War 1914	War 1939					
	Services	Services	M. Marine	Civilians	Totals	War 1939	
Ministry hospitals	2,906	7,833	433	672	21,020	19,570	40,590
General hospitals and special institutions	1,123	8,053					
Sanatoria	292	11,121	246	93	11,752		11,752
Mental hospitals	4,834	437	22	67	5,360		5,360
Totals	9,155	27,444	701	832	38,132	19,570	57,702

Year ending December 1945

Type of hospital	Patients in Receipt of Pension Allowances					E.M.S. patients	Grand totals
	War 1914	War 1939					
	Services	Services	M. Marine	Civilians	Totals	War 1939	
Ministry hospitals	2,502	9,075	530	1,089	25,480	13,771	39,251
General hospitals and special institutions	1,140	11,144					
Sanatoria	263	10,871	499	133	11,766		11,766
Mental patients	4,709	714	42	84	5,549		5,549
Totals	8,614	31,804	1,071	1,306	42,795	13,771	56,566

Year ending December 1946

Type of hospital	Patients in Receipt of Pension Allowances					E.M.S. patients	Grand totals
	War 1914	War 1939					
	Services	Services	M. Marine	Civilians	Totals	War 1939	
Ministry hospitals	2,843	13,852	504	954	32,713	4,917	37,630
General hospitals and special institutions	1,271	13,289					
Sanatoria	235	8,260	577	207	9,279		9,279
Mental hospitals	4,614	1,055	41	83	5,793		5,793
Totals	8,963	36,456	1,122	1,244	47,785	4,917	52,702

TABLE XIII

Wars 1914 *and* 1939*: All cases—Numbers of Out-patients, with and without Allowances, Treated October* 1939 *to December* 1946

Period	War 1914	War 1939		
	Services	Services	Mercantile Marine	Civilians
Quarter ending December 1939	1,668	—	—	—
Year ending December 1940	2,188	88	—	—
,, ,, ,, 1941	1,806	915	—	—
,, ,, ,, 1942	1,931	3,899	12	74
,, ,, ,, 1943	2,240	8,349	48	30
,, ,, ,, 1944	2,777	17,829	87	34
,, ,, ,, 1945	2,888	29,504	196	229
,, ,, ,, 1946	3,463	39,161	311	471

A.G.3 (Statistics).
June 15, 1950.

CHAPTER 5

LIMB FITTING SERVICE

THE activities and development of the Limb Fitting Service of the Ministry of Pensions during the war are best described in relation to the following periods : September 3, 1939 to May 31, 1940 ; June 1, 1940 to the end of 1943 ; and the years 1944 and 1945.

PERIOD I.—SEPTEMBER 3, 1939 TO MAY 31, 1940

At the outbreak of the War of 1914–18, there was no organised limb fitting service in this country, nor were there any limb fitting centres, but at the outbreak of the War of 1939–45, the Ministry's Limb Fitting Service was in being. This comprised a headquarters administration, the Roehampton Limb Centre with limb factories attached, and fifteen provincial limb fitting centres, staffed with trained limb fitting surgeons and fitters. The annual output of new artificial legs was approximately 5,000 and that of artificial arms approximately 500.

THE PRODUCTION OF WAR-TIME PROSTHESES, OR SIMPLIFIED LEGS AND ARMS CAPABLE OF RAPID PRODUCTION

In June 1938, discussion took place with the Ministry's contractors on how the existing arrangements for the supply of artificial legs could be extended to provide for the large number of casualties war might produce.

It was feared that the demand might be such as to make it impossible to continue supplying articulated limbs in the first instance. A provisional prosthesis, in the form of a peg leg, was decided upon which should give satisfactory service until a permanent articulated leg could be supplied. For this, willow was selected, as giving the best surgical results, and because it was obtainable in this country. Peg legs for above-knee amputations would have no knee joints, and for below-knee amputations the peg would have a plain joint only. Vulcanised fibre and leather were selected for the making of corsets.

This provisional prosthesis could be manufactured at all the provincial centres if the main factory at Roehampton was destroyed by enemy action, and it was estimated that, with all centres manufacturing, the output of these pegs could be stepped up to 25,000 per annum. The output of permanent articulated legs, which was then approximately 5,000 per annum, given the materials and labour, could be increased to 10,000 per annum.

It was arranged that discarded or condemned artificial legs should, wherever possible, be reconstructed and adapted for use in an emergency and they were thereafter collected and stored. The Ministry's limb

contractors also agreed that the contractual conditions regarding the condemnation and replacement of maintained legs should be less strictly observed during the war period, thus prolonging the life of a number of limbs. Provisional arrangements were also made for an increased supply of Wantage type crutches.

In September 1939, arrangements were made with the suppliers of artificial arms, under which a simplified and more standardised arm was introduced and put into production.

COURSES IN LIMB FITTING FOR MEDICAL OFFICERS OF THE MINISTRY

While the number of trained limb fitting surgeons in the Ministry was sufficient to deal with peace-time requirements, reinforcements were desirable and courses of training in limb fitting, of six to eight weeks duration, were therefore arranged at Roehampton. Between the outbreak of war and May 1940, twenty-five medical officers, for the most part recently recruited to the Ministry, received instruction in limb fitting, and were allocated to the provincial centres.

THE WORK OF THE LIMB FITTING CENTRES

On the outbreak of war the attendance of patients at the centres diminished and at Roehampton fell by about 200 per month. The number of new war cases was small, chiefly amputations resulting from accidents during training in this country. The surgical staffs, and the limb makers were, therefore, able to deal with all the new cases arising in this period, and maintain the supply of new limbs and repairs to old ones, without having to take emergency measures. By January 1940, underground air raid shelters had been constructed at Roehampton to accommodate all the staffs working in the limb factories and in the centre, together with any patients in attendance.

LIAISON WITH OTHER MEDICAL DEPARTMENTS

Soon after the outbreak of war, at the request of the Director-General of the Emergency Medical Services, a memorandum on amputations and stump treatment was prepared by the Ministry of Pensions Limb Fitting Service and issued to all E.M.S. hospitals on September 12, 1939. (E.M.S./Gen./296.)

PERIOD II.—JUNE 1, 1940 TO DECEMBER 31, 1943

LIAISON WITH THE SERVICES

In August 1940, it was arranged that all amputation cases for whom the Admiralty or Air Ministry accepted responsibility should be supplied with one limb pending decision upon entitlement, and from November 1940, all naval cases were transferred for limb fitting to Roehampton. In this same month an Army Council Instruction directed that all

Service amputation cases in Military hospitals were to be transferred to Ministry of Pensions hospitals.

Notifications were received from time to time from the War Office, giving the numbers of Service amputation cases arriving in South Africa, to which country many cases were at that time being evacuated from other parts of Africa.

Emergency Medical Services, Ministry of Health. The number of amputation cases admitted to E.M.S. hospitals was notified to the limb fitting service for the information of the limb contractors. It was arranged in June 1940, that Service amputation cases should be transferred at the earliest possible moment from E.M.S. hospitals to those of the Ministry of Pensions. For air raid casualties among civilians it was arranged that one limb should be supplied to all who lost a limb through enemy action, and by March 1941, limbs could be supplied in duplicate.

Children up to 14 years of age or over, if still attending school, who lost limbs other than by enemy action were supplied with artificial limbs on a contributory basis by the limb fitting service acting on behalf of the Ministry of Health.

In 1942 the memorandum upon amputations and stump treatment referred to under Period I was revised, illustrated, and re-issued to E.M.S. hospitals as Supplement 7.

Liaison between Roehampton and the Provincial Centres. In October 1940, a limb surgeon from the Roehampton centre began to make regular visits to all the provincial centres to co-ordinate the work, and at these visits patients on whom a consultation was desired were called to the centre. In 1942, limb surgeons' conferences were held at Roehampton, attended by surgeons from all the provincial centres.

Liaison with Service and Civilian Surgeons and Medical Practitioners, by means of Lectures and Demonstrations. In August 1941, a lecture-demonstration upon artificial limbs and amputation stumps was given by invitation at the University of Edinburgh to members of the Department of Health for Scotland, medical officers serving in Scotland, and civilian surgeons. This was the first of a series of lectures of this type given in University Medical Schools, and to audiences including Service and civilian surgeons. Such lectures were given at Glasgow, Liverpool, Manchester, Leeds, Birmingham, Newcastle-on-Tyne, Nottingham, Cardiff, Swansea, Oxford and Exeter.

In 1942, an address was given to the Annual Meeting of the British Orthopaedic Association in Liverpool, and lectures were given in Edinburgh, Dundee, Aberdeen, Glasgow, Inverness and Belfast. An address was also given to the Army School of Hygiene at Aldershot. Visits were paid to Roehampton by those attending the British Post-Graduate School of Medicine and by parties of R.N. Surgeons.

In 1943, lecture demonstrations were continued at Roehampton for Service medical officers, students from the London teaching hospitals, nursing sisters and physiotherapists, and in September, the opening address to the Annual Congress of the Chartered Society of Physiotherapists was delivered by a member of the limb fitting service on the subject of stump treatment and preparation for limb fitting.

German prisoner-of-war camps were visited by limb surgeons with a view to the provision of limbs for prisoner amputees. The types of limbs provided were the 'war-time prostheses' described under Period I.

LIAISON WITH THE MINISTRY OF LABOUR, CIVIL AUTHORITIES AND EMPLOYERS OF LABOUR

Ministry of Labour. In February 1941, the Ministry of Labour undertook to provide vocational training for disabled ex-servicemen, and supervise their ultimate settlement in various forms of occupation. For amputation cases, consultation between the Ministry's Limb Fitting Services and the Ministry of Labour led to a scheme whereby, when a patient had completed his course of training in the use of his limb, the limb surgeon reported to the Ministry of Labour on his physical capabilities as affected by his disability.

The Ministry of Labour Disablement Rehabilitation Officer (D.R.O.) visited the limb centres training schools each week, and interviewed all patients who wished to discuss their future prospects. Service and civil air raid casualties were included in this scheme.

On final discharge from the centres, the arrangements made to provide vocational training and/or employment took effect. When the patient had been settled in employment, this was notified to the appropriate centre so that his progress under the new conditions could be watched. This liaison proved of benefit to patients, not only by virtue of its practical results, but by its aid to morale in the early stages of limb wearing.

To implement the vocational training scheme for the Service disabled, it was necessary that the D.R.Os. of the Ministry of Labour, who would have to find suitable employment for these patients, should be well acquainted with the capabilities and potentialities of those fitted with and trained in the use of artificial limbs. Parties of D.R.Os., therefore, paid visits to the Roehampton Limb Fitting Centre every week for several months in each year, where lectures and demonstrations were given.

In November 1942, a further scheme was introduced, under which artificial limbs were supplied on a repayment basis to male civilians aged 14 to 65, and to women, up to 60. The only condition governing the supply of the limb was that the amputees should be enabled to return to, or engage in, a useful occupation; housewives were eligible under this scheme. All employable persons were therefore able to obtain a limb and

a duplicate, and receive all the facilities of fitting and training at the Ministry's Limb Fitting Centres which were available to Service cases.

Civil Authorities and Employers of Labour. In order that the two schemes above referred to should succeed, and the greatest possible number of persons disabled by amputation secure employment, the Ministry of Labour in 1942 asked the Ministry of Pensions to allow lay members of the public, and particularly employers of labour to attend the medical lecture demonstrations then being given in many cities throughout the country. This proposal was agreed, and two lectures were given to mixed audiences. It was found, however, that neither the medical nor the lay audiences were best served by this means. Special lectures for lay audiences only were therefore arranged in which the functional value of artificial limbs in relation to the degree of disablement was emphasised, and the purely medical and surgical aspects of the problem omitted. Particular interest attached to the lay lecture given at the Mansion House, London, on October 14, 1942, presided over by the Lord Mayor, and attended by the Ministers of Labour and Pensions, and 500 industrialists and employers of labour. This was followed, in November of that year, by a lecture demonstration given in the House of Commons to Members of the House. A lecture was also given at Roehampton to members of the Trades Union Council and, during 1942–3, to lay audiences in fifteen of the chief cities and towns in England, Scotland and Wales.

As a result of these meetings, employers became aware, many for the first time, of what could be undertaken by wearers of artificial limbs, and were concerned to provide employment of the most suitable type. A close liaison was thus established between employers and managements of industrial undertakings and the various limb fitting centres, which has persisted ever since with resulting benefit to the patient.

LIAISON WITH THE ALLIED FORCES

It was arranged in 1940, that members of the Polish, Belgian, Free French, Czechoslovakian, Dutch and Norwegian Forces should be treated in regard to limb supplies in the same manner as British serving personnel. In October 1943, representatives of the Dominion and Allied Governments then in London visited Roehampton, and saw the various activities carried on there. Visits were also made by their medical officers at various times to Roehampton and other centres.

Australia. In 1942 arrangements were made with the Australian Army Headquarters in London, whereby medical officers of that Service could attend Roehampton for short courses in limb fitting, and several officers took advantage of this in 1942 and 1943.

In January 1943, senior representatives of the Australian headquarters staff visited Roehampton and this visit was followed in April by an

arrangement whereby artificial limbs could be provided to repatriated Australian prisoners-of-war who were awaiting return to Australia. A number of these were fitted at Roehampton, and also some who were not ex-prisoners, but for whom fitting in England was desired.

South Africa. The liaison with the South African Government Limb Factory at Johannesburg, which began by correspondence and visits during the inter-war period, was continued during the War of 1939–45. Documentary information on various aspects of stump treatment and limb fitting was sent to South Africa, and visits were paid to Roehampton by officials from the Union. Many British serving personnel evacuated to South Africa were fitted with artificial limbs in that country, before returning to Britain.

United States. Many medical officers of the U.S. Army Medical Corps visited Roehampton for lectures and demonstrations, and in June 1943, the Consulting Orthopaedic Surgeon to the European Theatre of Operations visited Roehampton, and showed a film he had made to illustrate the surgery of an amputation and limb fitting and manufacturing methods. The latter part of this film had been taken in the limb factory at Roehampton, and a copy of the film was given to the Limb Fitting Centre.

Greece. In 1941, a request was received from the Greek Government for information regarding limb making and limb fitting. Representatives of the limb fitting service visited the Greek Embassy in London, and discussed their requirements. Full reports, specifications and descriptions of limbs were prepared and despatched, together with samples of various types of limbs; the latter, however, never reached Greece.

Liaison was later established with U.N.N.R.A. concerning the handling of Greek amputees.

Malta. Through liaison established with the Chief Government Medical Officer, a Maltese boy, who had lost both legs through bombing, was flown to England, fitted with artificial legs and trained in their use, returning to Malta in May 1943.

THE NEED FOR ADDITIONAL CLINIC AND WORKSHOP ACCOMMODATION AT LIMB FITTING CENTRES

Clinical. During the early part of the war, the normal attendances at the centres decreased, especially at Roehampton, and were not balanced by the arrival of new casualties. Although a number of new cases followed Dunkirk and the preceding fighting, the numbers to be dealt with put no undue strain upon the existing accommodation ; nor did the casualties which occurred in the early part of the North African campaign, as many of these were evacuated to South Africa and were supplied with limbs in that country.

By July 1942, however, there was need for extra accommodation at Roehampton for additional staff and patients, on account of both the

increasing service casualties, and the many civilian casualties, including women and children, who required treatment and limbs as a result of the 1940–1 bombing. Plans were prepared to expand the centre to double its accommodation; this extension, which provided for examining rooms for six surgeons, accommodation for additional technical and lay staff, and a demonstration theatre to seat 250 people, was taken into use on November 17, 1943.

Because of the distances to be covered, and the difficulties of travelling in those days, a part-time limb centre was opened in Plymouth on March 18, 1943 to serve the extreme S.W. Region, and save patients the long travelling to Exeter.

Limb Factories. To obviate the serious repercussions which might result from destruction of the main factories at Roehampton, shadow factory accommodation was provided in Richmond in 1941.

At the outbreak of war, two of the firms who were manufacturing artificial arms were given accommodation in the buildings in which artificial legs were manufactured, but the amount of new work arising by late 1940 made it necessary to provide them with additional factory space. In 1941, therefore, a permanent brick built arm factory was constructed, which, being found insufficient, was expanded in 1943 to almost double its size. Further details upon limb production are given in the section relating to that subject.

THE USE OF PHOTOGRAPHY FOR EDUCATIONAL PURPOSES AND AS AN AID TO MORALE

Still Pictures. For some years it had been the custom at the Roehampton Centre to take still photographs of the more interesting and instructive aspects of limb fitting.

Some showed patients with amputations at various levels, who had been successfully rehabilitated. These photographs were frequently shown to individual patients to illustrate their probable future appearance and activity and their value in this direction became so apparent that certain enlargements were made for exhibition in the patients' waiting rooms. In December 1943, 17 sets of 27 photographs each, were distributed to all the limb fitting centres. The negatives of these films were lent to the Ministry of Information at their request, and giant enlargements were made and exhibited at the 'Back to Work' Exhibition in London in March 1944.

Cinema Films. It was thought the value of such photography would be enhanced if cinema films were used, and, indeed, a request was received from Canada, in 1943, for cinema films illustrating the preparation and treatment of amputation stumps.

In June 1943, all the necessary equipment for film making was issued to the Roehampton Centre, and cinematography commenced. Numbers of primary amputations were then arriving at various hospitals in this

country and films were prepared for exhibition to patients to raise their morale and give them hope.

Two films of 400 ft. each were made, the first showed the abilities of leg wearers, and the second of arm wearers. They were first exhibited to an audience including Ministers of the Crown, Members of Parliament and the Press, and although they were amateur productions they were very favourably received, and many requests for their loan were later received. Sufficient copies were made to distribute and show them to new amputation cases in all the Ministry's hospitals. Their first showing to a large audience of primary cases at Roehampton had a most marked and beneficial effect.

PRODUCTION OF ARTIFICIAL LIMBS BY THE MINISTRY'S CONTRACTORS

The production of new limbs, and repairs to existing limbs previously referred to was maintained, and the contractors were able to deal with incoming work during the early period of the war. At the outbreak of war a staff of 300 was employed in the leg factory at Roehampton alone, and for some time this number was sufficient.

The numbers of orders received for new artificial legs during the first year of the war was 4,070. In 1941 it had increased to 4,542, and in 1942, 5,627 orders were received, rising to 6,738 in 1943.

Only eight orders were received for new arms for primary cases during the Period I, but from June 1, 1940, to the end of 1943 the number had increased to 1,314.

The position regarding materials for limb making was, at the outbreak of war, satisfactory, but in October 1939, it was intimated that N.A. Alclad 1780, used for the manufacture of sockets for metal artificial legs would no longer be available, and N.A. Alclad 23.S. would have to be used instead. By December 1940 it was no longer possible to use 3 per cent. nickel steel for forgings.

Until enemy air action over England began in 1940 there was no noticeable change in the production of artificial limbs in the factories. With the onset of bombing, production was slowed by the absence of many employees on account of bombing incidents in their home districts, and also by time lost in taking shelter during working hours. In addition, some delay occurred in dealing with work from the provincial centres because of delays and disorganisation of transport due to bombing incidents and heavy military traffic.

In the year ending December 31, 1940, there were 94 alerts during working hours at Roehampton, and the number of alerts recorded by day and night staffs of the limb makers at Roehampton was 417.

On September 25, 1940, 14 incendiary bombs penetrated the roof of the Roehampton factory, and in November a small fire was caused by incendiaries in the limb fitting centre and limb store; the fire was

soon extinguished, the damage to equipment being negligible. On October 11, a high explosive bomb fell at the corner of the factory, stripping the roof in many places, but causing no casualties to personnel. On the night of November 29, a high explosive penetrated and exploded in the office of the managing director of the leg manufacturing firm, killing him, and destroying much of the administrative block. The material damage done in this, and in minor incidents, had but little effect on production. During the rest of this period no further damage was sustained and the time lost owing to alerts was on the whole, negligible.

In 1943, the existing contract with the leg contractors having expired, a new contract was negotiated on slightly different terms, but the principle of maintenance was continued for those cases to which the scheme applied.

THE WORK AT THE LIMB CENTRES, TRAINING SCHOOLS, ETC.

Artificial Arm Supplies. During the inter-war years, artificial arms were supplied at Roehampton and all the provincial centres. In all the latter, except two at which the arm makers maintained their own representatives, the leg contractors acted as agents for the arm makers. This system was satisfactory since there were then few new primary cases, most of the work consisting of the repair and replacement of existing arms; but by September 1941 the arrival of new war primary cases had made this agency method of representation no longer satisfactory.

There were insufficient trained arm fitters in the country to staff all the provincial centres, so it was decided to centralise arm supplies for new arm cases at three main limb centres, Roehampton, Leeds and Glasgow, and from January 1942 onwards new war arm cases attended at, or were admitted to, these centres alone.

Training in the use of Artificial Arms. Before new war cases of arm amputation became numerous the necessary training was provided by the arm makers, but as the number of new cases increased it became more difficult for the arm makers to give adequate training.

In December 1941, patients with a first artificial arm were trained in the curative workshops at Roehampton, but increasing numbers made necessary further developments in arm training. In 1943 it was decided to appoint a specially trained Arm Instructor at each of the three arm centres, and to form a special Arm Training School at those centres. The further development of these schools is referred to under Period III.

Training in the Use of Artificial Legs. As with artificial arms, the training in the use of artificial legs was given during the inter-war years by the limb fitters, supplemented when required by advice and instruction from the limb surgeons. Increasing numbers made it necessary for

further provision to be made for this training, because the accommodation in the fitting rooms, while sufficient in the inter-war period, did not permit of fitting and training being carried out in the same place.

Early in 1942 it was arranged that patients living nearby should attend the limb centres daily for walking instructions given by the centre staffs, while those living further away, together with all double amputations, were admitted to Ministry hospitals for the purpose.

Training of Limb Surgeons. During the period 1940–3, 67 medical officers of the Ministry's staff attended the Roehampton Limb Centre for courses of six weeks' instruction in limb fitting.

PERIOD III.—JANUARY 1, 1944 TO DECEMBER 31, 1945

LIAISON WITH MEDICAL AUTHORITIES

The liaison with the Services and the Ministry of Health referred to under Period II continued during this last period of the war.

The liaison between Roehampton and the Provincial centres developed. All the provincial limb fitting surgeons visited Roehampton in turn for periods of one week each for refresher courses and discussions with the Roehampton staff.

Liaison with Service and civilian surgeons and medical practitioners by means of lectures and demonstrations continued, but were in the main confined to Roehampton. Many parties of medical visitors attended there from time to time for lectures and exhibitions of the Ministry's films on rehabilitation. Among them were members of the British Post-Graduate School of Medicine, Sister Tutors and Nursing Association members, medical students from the teaching hospitals in London, the medical staff of the Royal Herbert Hospital, Woolwich, the Chartered Society of Physio-therapy, the Hospital Almoners' Association, the London School of Medicine for Women, the British Orthopaedic Association and Congress Members of the British Red Cross.

Lectures were given at Bristol to the Bristol Council for the Disabled, and in London to a large audience comprising medical officers of the United States Army, arranged by the British Council. A lecture was also given at the Headquarters of the British Red Cross to their headquarters staff.

LIAISON WITH THE MINISTRY OF LABOUR AND CIVILIAN ORGANISATIONS

The liaison with the Ministry of Labour was intensified, and parties of Disablement Rehabilitation Officers continued to attend Roehampton for lectures and exhibition of films. Addresses were given at various Rotary Club meetings in the London neighbourhood. A meeting was held at Sheffield under the chairmanship of the Lord Mayor, at which addresses and demonstrations were given to a large audience of industrialists on the re-absorption of amputees into industry. In Period

II, reference was made to a scheme for the supply of artificial limbs to civilians on repayment, to enable them to return to useful occupation. This scheme began in November 1942, and in that year five legs were ordered under it. In 1943, 526 legs and 137 arms were ordered; in 1944, 1,136 legs and 197 arms, and in 1945, 1,282 legs and 385 arms.

The Deputy Postmaster General, Chief Medical Officer and Regional Directors of the General Post Office visited Roehampton Limb Fitting Centre in the spring of 1944. This was followed by a conference at the General Post Office on the placing of employees of the Post Office invalided from the Services with amputated limbs and on the employment in the Post Office of new entrants so disabled.

Members of the limb fitting centre staff visited the General Post Office and the Holborn Telephone Exchange, to study the various operations performed there, to decide what work could be done by those wearing artificial arms, or what adaptation of the artificial arms would be necessary to enable arm wearers to continue at work.

With a similar object visits were also paid by limb surgeons to various furniture making and upholstery factories in London, and also to a weaving factory in Wales, and certain appliances were evolved for use with artificial arms for those engaged in, or entering, those trades.

LIAISON WITH THE ALLIES

In the period 1944–5, liaison with Allied Forces medical staffs was greatly intensified, mainly through visits paid to the Roehampton and other centres.

Australia. Technicians came from Australia and entered the factory of the Ministry's leg contractors to study limb making methods at Roehampton. In December 1944, three surgeons selected by the Australian authorities attended at Roehampton for a two months' course in limb fitting. The centre was also visited by the Director-General of Army Medical Services, Australian Forces. In August 1945, the Australian Red Cross presented a television set to the Roehampton limb fitting centre, which was installed in the patients' main waiting room.

Canada. An officer of the Canadian Army Medical Service took a course in limb fitting at Roehampton. At the invitation of the National Research Council, an orthopaedic surgeon and a limb surgeon from Roehampton visited Canada in February 1944, to attend the International Conference on Amputations. The conference opened in Ottawa, and further sessions were held in Toronto. Representatives from Canada, Great Britian, U.S.A., U.S.S.R. and Australia attended. Many of the delegates visited the United States after the Conference.

New Zealand. In August 1944, an orthopaedic surgeon from New Zealand visited Roehampton and took a two months' course in limb fitting.

India. In June 1944, a conference was held at the War Office, attended by representatives of the War Office, Indian Army and Limb Fitting Service to consider the treatment of British serving personnel in India who had lost limbs. In August 1945 three Indian Army Medical Service surgeons and one technician attended for a two months' course in limb fitting at Roehampton.

France. Frequent visits were paid to Roehampton by members of the French Army Medical Corps and members of the French War Staff and Embassy Staff in London, and lectures, demonstrations and film exhibitions were given.

Holland. A number of serving officers and soldiers of the Dutch Army were fitted with limbs at Roehampton, and two surgeons from Holland attended for a two months' limb fitting course. Frequent visits were paid by many Dutch surgeons to the Roehampton Centre.

Russia. In March 1945, two Russian surgeons visited Roehampton for one month to study limb fitting methods in the clinic and workshops.

Palestine. Visits were paid to Roehampton by representatives of the Jewish Agency on the provision of limbs for members of the Jewish Brigade, and some cases were brought to England and fitted with limbs. Roehampton also corresponded with civilian surgeons working in Palestine about a number of patients.

Greece. Greek surgeons visited Roehampton and were given demonstrations and film exhibitions, one surgeon taking a two months' course in limb fitting.

Gold Coast, West Africa. A medical officer of the Colonial Service, about to take up duty in West Africa, attended for a course in limb fitting in 1944.

Czechoslovakia. In March 1944, Madame Benes, wife of the President, visited Roehampton Limb Fitting Centre with her staff, and in September 1945, a visit was also paid by the Czechoslovakian Minister of Health.

America. The Ministry's surgeons who attended the International Conference on Amputations in Canada were invited by the Surgeon-General to visit the U.S.A. as the guests of the U.S. Army. Several amputation centres in the U.S.A. were visited and addresses were given to the staffs. Civilian hospitals dealing with amputations were also visited, and conferences held with the headquarters staff of the Veterans' Association in Washington. Several private limb factories were visited, and meetings were held with the President of the United States Limb Makers' Association. During their stay in the States the Ministry surgeons were received by the Deputy Secretary of State at Washington.

In April 1944, a Conference was held in London between War Office representatives, United States Army surgeons and lay staff, and representatives of the Ministry of Pensions on the possibility of limb fitting for wounded United States personnel in this country, and this

was followed by an extensive interchange of information. A number of United States personnel were fitted with limbs in this country, and a British Ex-Service man amputee of the War of 1914 was loaned to the United States Army for the purpose of visiting their hospitals in this country to demonstrate the uses of an artificial limb.

In June 1945, representatives of the U.S.A. Physiotherapy staff in England visited Roehampton. Liaison was also established with the United States Naval Hospital Amputation Centre in California, whose Superintendent maintained close contact thereafter with Roehampton.

Turkey and Cyprus. Visits were paid by surgeons from these countries.

VISITS FROM TECHNICIANS

Before the outbreak of war technicians from Holland spent over six months in the Roehampton leg factory and two from Egypt had spent two years. During the war, thirteen Polish technicians were two years at the factory, while three engineers from Russia were there for three months.

During the years 1944–5 periods of over six months were spent in the leg factories at Roehampton by engineers and technicians from the following countries:

Canada, Australia, Malta, Norway, New Zealand, Kenya, Gold Coast, Nigeria, Yugoslavia and India.

Technicians from allied countries received instruction in the arm making factory at Roehampton. Eleven visited from Holland, fourteen from India, nine from Russia, two each from New Zealand, Nigeria and Poland, and one from Yugoslavia.

Complete specifications and descriptions of manufacturing processes prepared by the Ministry's leg contractors were supplied to Russia with advice on the acquiring and assembly of the necessary equipment for setting up limb factories.

ACCOMMODATION AT THE LIMB CENTRES AND FACTORIES

In February 1944, a new limb fitting centre extension at Roehampton was officially opened by the Chinese Ambassador, and in the same year plans were prepared for a new and enlarged centre at Leeds. The centres at Manchester and Cambridge were enlarged and in April 1944 an entirely new centre was built and opened at Reading. In August 1944 additional accommodation was provided at the centres in Birmingham, Nottingham and Aberdeen, and an entirely new centre was opened in September 1945 at Tunbridge Wells to serve the south-east region.

By the latter part of 1945 considerably increased accommodation for the leg factory had been provided at Roehampton, a new wood mill having been built, and a new leather shop, in which 85 operatives were housed.

PHOTOGRAPHY

Copies of the Ministry's first two films on rehabilitation of the amputees were taken to Canada for exhibition there and afterwards lent to the United States.

These films were designed mainly for the encouragement of patients, and as a further useful development, films were prepared to illustrate various treatment methods connected with the preparation for limb fitting, while a new film was made, early in 1944, to illustrate stump bandaging and stump exercises. Later, two more films were made, one showing the preparation and treatment of the lower extremity stump, and the training in the use of the limb, and the other illustrating the type of treatment applied to amputations of the upper extremity.

Various institutions asked for the loan of these films and certain private film companies became interested, one of which made a film for public exhibition, based upon the Ministry's first two films. The British Empire Service League purchased five copies of each of the films, and copies were asked for by the New Zealand Government; the Medical Adviser to the Secretary of State for India, for use in India; the War Office for use at the Royal Army Medical College; and the Dutch Government. Cinematography became a regular feature of all demonstrations given by the Limb Fitting Service. The taking of still photographs continued, and a series was made to illustrate the fitting of limbs to children suffering from congenital absence of a limb, or from infantile paralysis, and other photographs prepared to show special points of training.

THE PRODUCTION OF LIMBS BY THE MINISTRY'S CONTRACTORS

During the last period of the war (1944–5), the number of employees working in the leg factory was nearly double that at the outbreak of war, the increase being necessary to cope with the increasing numbers of primary amputations.

In 1944, 8,629 new leg orders were received, while in 1945 the number increased to 12,061. The repairs executed in the leg factory averaged approximately 45,000 per annum, covering repair work of every type from all sources. In the arm factory in 1944, orders were received for 1,051 first issue new arms. In 1945 this number increased to 1,445.

Despite the increase in staffs in the factories, it was still not possible to reduce the time lag in the completion of orders for new limbs and repairs, because of the circumstances referred to in Period II and because the inexperience in limb manufacture of the new staff slowed down the total output, and probably counter-balanced the time gained by the decrease in air raids.

Interference by air raids during 1944 had little effect upon production in the factories. The total number of alerts was 38, only one during

working hours. There were no incidents affecting the limb factories at Roehampton.

Supplies of material changed little during the period, but in March 1944, as the supply of natural rubber was discontinued, synthetic rubber was taken into use.

There were no special alterations in the contract for the supply of artificial legs, but one of the four separate firms manufacturing arms for the Ministry at the outbreak of war ceased to function ; and the remaining three combined in 1944 to form one organisation. This made it possible to standardise in a way which made for simplicity and greater efficiency.

THE WORK AT THE LIMB CENTRES AND TRAINING SCHOOLS

Arm Training Schools. With the supply of a first artificial arm, each patient was offered a course of training in its use, during which he could ascertain which appliances were most suitable for future needs. There were very few refusals of this period of training, the length of which varied from ten days to a month according to amputation level and progress.

The new Arm Training School was opened at Roehampton in July 1944, and in 1945, schools were formed at Manchester and Cardiff to supplement those at Roehampton, Leeds and Glasgow. The training given was functional only, and no attempt was made to give vocational training, which was dealt with at a later date under the Ministry of Labour Rehabilitation Scheme. The recreational side was not neglected. Opportunity was given for patients using artificial arms to practice golf, cricket and other sports. A well-known golf professional visited Roehampton and gave a demonstration and instructions to many patients who had lost an arm or a leg.

In the latter part of 1945 an average of 91 patients per month were passing through the Arm Training Schools.

Training in Walking with an Artificial Leg. Instruction continued and was intensified at all the limb fitting centres to those supplied with a first artificial leg. At Roehampton for instance, the number passing through required a staff of three instructors, two male and one female. The work was not confined to training in walking, but included all the general and remedial treatment necessary for toning up the body in preparation for the wearing of artificial limbs.

Special apparatus and treatment were designed for dealing with joint deformities. Music by radio and radio-gramophone was made available at the centres, as this was found to be of great aid in teaching rhythmic gait and movement.

In the walking schools every effort was made to prepare the patient, as far as possible, for the normal exigencies of daily life. Stair climbing, walking over obstacles and rough ground, cycling, entering and dismounting from an omnibus, falling down and recovering from falls were

all included in the training curriculum, which developed a feeling of confidence in the patients. Ball games, table tennis, badminton, net ball, darts and other games were introduced to render more interesting the necessary but more regimented types of training.

The average period required for training depended upon the levels of amputation, and the presence or absence of other disabilities. Single thigh amputations required twenty-eight days and double below-knee amputations twenty-three days.

The number passing through all the training schools during the latter part of 1945 averaged 313 patients per month.

In centres in which training was a whole-time occupation, ex-Army Physical Training Instructors were employed. Where the number to be trained did not constitute a full day's work for an instructor, disabled ex-servicemen were appointed to act as part-time instructors and part-time members of the clerical staff.

The periods spent by the patients in walking training schools had the additional advantage of frequently bringing to light a need for minor fitting adjustment which could be made before the patient left the centre.

In 1944–5, an additional ten Ministry medical officers received instruction in limb fitting.

The effect upon the centres and the contractors of the number of new primary amputations requiring limb supplies during the war has been already indicated. The following figures give the increase in numbers during the three periods. They relate only to the supply of the first issue of a limb to a primary amputation:

TABLE XIV

First Issue of Limbs to Primary Amputations: September 3, 1939 to December 31, 1945.

Issued for	Period I Sept. 1, 1939 to May 31, 1940		Period II June 1, 1940 to Dec. 31, 1943		Period III April 1, 1944 to Dec. 31, 1945		Totals Sept. 1, 1939 to Dec. 31, 1945	
	Legs	Arms	Legs	Arms	Legs	Arms	Legs	Arms
Service Departments	15	3	2,479	965	5,392	1,448	7,886	2,416
Civilians	–	–	767	229	191	74	958	303
Mercantile Marine	–	–	86	9	15	3	101	12
Ministry of Labour and National Service	–	–	201	27	1,910	499	2,111	526
Ministry of Education	–	–	19	7	113	67	132	74
Totals	15	3	3,552	1,237	7,621	2,091	11,188	3,331
	18		4,789		9,712		14,519	

In addition to the supply of new primary issues, the centres had much other work to do: for example, the surgical examination and treatment of stumps, the supply of duplicate limbs to the 1939 war cases and the renewal and repair of old limbs supplied to 1914 war cases and others.

An indication of the total monthly output, which includes the supplies of new primary limbs for all centres, is given by quoting the average monthly combined output for all centres taken over several months in the year 1945, including supplies of new primary limbs:

New legs	982	New arms	182
Repairs to legs ..	3,269	Repairs to arms ..	192
Repairs to limbs sent through the post			1,829
Cases handled per month			4,609
Examinations by the limb fitting surgeons			5,751

The work of those centres affected by bombing fluctuated considerably in 1944–5, and the attendances were at times materially reduced.

LIMB RESEARCH DEPARTMENT

The period following the War of 1914–18 was the most significant in the evolution of the modern artificial limb. Before 1914, amputations were not common and there was no wide interest in artificial limbs. During the war, however, no less than 40,000 men had limbs amputated and with the development of the mechanical age an increasing flow of civilian accident cases added to the numbers. During the War of 1914–18 there was, for the first time, a concerted medical and technical attention to artificial limb problems. This concerted approach was entirely the work of the Ministry of Pensions. The Ministry provided for the training of what are now known as limb fitting surgeons and the present close integration of medical and technical resources has evolved from the early arrangements improvised by the Ministry in the rush of heavy casualties. The new activity naturally led to a sharp advance in design. Light metal legs began to replace wooden ones. Mechanical knee joints, ankle joints and other contrivances reflecting the action of walking were the subject of much experiment and gradually satisfactory types emerged. In the 1930's, following the trial and error of the earlier period, design tended to become stabilised but later with the large increase in the number of cases because of the War of 1939–45, the quest for improvements revived.

In 1944 the Minister appointed a Departmental Committee under the chairmanship of Sir Brunel Cohen to consider the design, development and use of artificial limbs. Two of the most important recommendations were the formation of an experimental department at Roehampton and the appointment of a small standing committee to supervise technique and research and advise on improvements in artificial limbs. The Minister acted on these recommendations and a research unit was set up

at Roehampton in charge of a medical officer of the Ministry who was also a qualified engineer. A standing advisory committee was set up under the chairmanship of Sir Charles Darwin, K.B.E., M.C., Sc.D., F.R.S. From this point systematic research has been carried on. Old ideas have been retested using modern materials, new ideas from both within and outside the Roehampton circle have been explored. Many improvements have resulted. The work of limb fitting centres from the clinical aspect will be found in Chapter 21 of the volume on Clinical Surgery in this series.

CHAPTER 6

NOTEWORTHY DEVELOPMENTS DURING THE WAR

NEW LEGISLATIVE PROVISIONS

THE Royal Warrant introduced in September 1939, laid down that pensions could be paid only in respect of disablement certified to be directly attributable to or materially aggravated by war service, or death certified to be directly attributable to or materially hastened by war service. This implied the existence of evidence and a reasonably high standard of proof. In the early months of the war the Ministry was mainly concerned with invalidings from the Forces on account of various everyday ailments. Few of the men concerned had actually seen active service. The high standard imposed by the strict interpretation of the Royal Warrant involved the refusal of a large number of claims and in the latter half of 1941 the Minister announced a wider interpretation which permitted the acceptance of many more claims. The amendment provided broadly, that where effective service was found to have caused a degree of aggravation in a previously existing condition (excluding neurosis and psychosis) the fact of discharge resulting from that condition should be regarded as material aggravation, if the claimant had been graded A1 on enlistment.

The White Paper, 1943. In 1943, the Government carried out a comprehensive review of the war pensions provisions and made a number of changes. These were published in a White Paper (Cmd. 6459), 'Improvements in War Pensions: 1943'. At this time there had been considerable discussion of the principle expressed in the slogan: 'Fit for Service, Fit for Pension' which implied that if a member of the Forces was discharged with a disability, he should be pensioned whether or not the disability was caused or aggravated by service in the medical sense. The Government declined to accept this principle and adhered to the long-established view that before pension could be granted the disability must be shown to have some causal connexion with service. The White Paper, the provisions of which came into operation on August 16, 1943, introduced three main changes from the previous policy, each of which had a considerable bearing on Ministry procedure and radically altered the process by which entitlement to pension was determined. Firstly, the onus of proof was, in effect, transferred from the claimant to the Ministry and, except where the disability was not recorded on entry to service, if it was proposed to reject the claim, evidence had to be produced by the Ministry that the conditions under which the member served did not affect the onset or progress of the

disability. As a corollary to this, the second main change required that the benefit of any reasonable doubt should be given to the claimant. Thirdly, it was no longer necessary for aggravation of a disability to have been 'material' in extent before pension could be granted. Any degree of aggravation, no matter how slight, was sufficient cause for basing the claim to pension and, provided the Ministry could not discharge its obligation to disprove any connexion with war service, the whole extent of disablement was acceptable for assessment purposes or invaliding. These legislative provisions, of course, resulted in a considerable increase in the number of cases accepted for pension with a concurrent addition to the Ministry's responsibilities for medical boarding and treatment provisions. Details of the increased number of awards involved will be found in Table XXVI in Chapter 7.

Further Amendments in 1945. With the end of hostilities a further review of the war pensions system was carried out by the Government and a number of amendments were promulgated at the end of 1945. (Command 6714). The rates of pension were raised. The conditions governing the award of allowances for wives and children were altered so that the allowances became payable whatever the date of the marriage or the birth of the children. The maximum allowance for attendance was increased from twenty shillings to forty shillings a week. A special unemployability allowance of ten shillings a week had been introduced in 1943 for payment to those men and women whose severe disablement by war service made it unlikely they would ever be able to obtain employment. This allowance was later increased to twenty shillings a week, and then to thirty shillings a week.

To those partially disabled, who in consequence of their disablement were prevented from following their former occupation, or of following or being trained for one of equivalent standard, the Government introduced a special hardship allowance of eleven shillings and threepence a week or such less amount as would bring the existing pension up to the 100 per cent. rate. The allowance was later increased to twenty shillings per week.

A clothing allowance was also introduced to compensate pensioners who wear artificial limbs for additional wear and tear of clothing. The allowance was originally £5 a year for a double and £3 a year for a single amputation. The rates were later raised to £8 and £5 a year respectively.

Pensions Appeal Tribunals. A system of appeals to independent Pensions Appeal Tribunals against decisions of the Ministry was in operation after the War of 1914–18, and in the early years of the War of 1939–45 there arose a growing demand for a similar system. In August 1943, the Pensions Appeal Tribunals Act, 1943 was passed, providing for appeals on both entitlement and assessment issues. That portion of the Act enabling entitlement appeals to be heard was immediately

brought into force and the tribunals commenced their sittings in October of that year. Tribunals on entitlement matters consisted of a legal member as chairman, a medical member and a lay member. The lay member varied according to the type of appeal for hearing, depending on whether the appellants were officers, other ranks, members of the Mercantile Marine or members of a Civil Defence organisation. Pensions Appeal Tribunals were entirely independent of the Ministry, being appointed by the Lord Chancellor in England, the Lord President of the Court of Session in Scotland and the Lord Chief Justice in Northern Ireland. In accordance with the rules of Procedure of Pensions Appeal Tribunals, each presentation to the tribunal required the preparation of a reasoned 'Statement of Case' setting out all the relevant information pertaining to the appeal, including extracts from the Service documents dealing with the medical and other history during service, the appellant's own supporting statement and the Ministry's reasons for not admitting the claim. The appellant was given an opportunity of examining the statement in detail and of commenting on it before the papers were sent to the tribunal. At the hearing of the appeal, the appellant could appear in person, so that if he so desired, he was able to elaborate his claim and discuss points with the tribunal. An appellant was also permitted to have the assistance of a trained representative of his trade union or of the British Legion or officers' association or a member of any war pensions committee or any other person, whether holding any legal or other qualification, whom he could appoint to assist him for the purpose. Although this procedure allowed for the full consideration of the appellant's case, the Act of 1943 also provided a right of appeal on a point of law against the decisions of tribunals to the High Court in England, to the Court of Session in Scotland and to the Supreme Court in Northern Ireland.

Section 5 of the Pensions Appeal Tribunals Act, 1943, enabling appeals against the assessment of the degree of disablement to be heard did not become operative until July 1946. These assessment tribunals consisted of two medical members, one of whom acted as chairman, and a lay member. The tribunals were empowered to increase or decrease an assessment of the Ministry or to set aside the finality of an assessment. Their functions differed in one important respect from those of the tribunals on assessment set up after the War of 1914–18. Whereas the latter heard appeals against only final assessments or decision, the present Assessment Tribunals concerned with the War of 1939–45 assessment appeals, were empowered to deal with appeals lodged against either interim assessments (two years after its first notification) or final assessments.

The institution of the Pensions Appeal Tribunals added to the work of the medical services, since the medical issues in tribunal cases had to be restated and presented in a legal form. Expert knowledge, both of the

interpretation of the pensions instruments and of aetiological medicine was required, and a special headquarters staff was set up to deal with this branch of the work.

Between June 20, 1943 and December 28, 1946, a grand total of 83,074 appeals were received by the Ministry, of which 7,089 were in respect of death and 75,985 disablement.

War Pensions (Special Review) Tribunal. The desire of the Government to ensure that claimants to pension received the fullest possible benefit from the new entitlement standards and appeal procedure is illustrated by the special arrangements which were made in 1946. In that year certain judgments were delivered in the courts which had an important bearing on entitlement generally and the new principles were, of course, applied by the Ministry and the tribunals to cases considered after the judgments had been delivered.

There was, however, a large number of cases in which the refusal of the claim by the Ministry had already been confirmed by the Pensions Appeal Tribunals, a decision which was legally conclusive in the absence of an appeal to the High Courts within a specified period. In view of the representations made regarding these judgments of the High Court and the Court of Session and in order to ensure that, in cases disallowed by the Pensions Appeal Tribunal before August 1, 1946, there should be no grounds for any feeling of injustice, it was announced by the Minister on July 25, 1946, that on application such disallowed cases would be reviewed by a special tribunal in the light of these judgments and, if allowed, would be treated in the same way as if they had been allowed by a Pensions Appeal Tribunal. This procedure produced a considerable number of applications and each case had to be re-investigated by the Ministry and the entitlement reviewed in the light of recent judgments before presentation to the War Pensions (Special Review) Tribunal. A sub-section of Medical Services Division was set up to deal with these cases.

PREPARATIONS FOR DEMOBILISATION

The special committee set up to advise the Minister of Labour and National Service on the problems presented in the recruitment of personnel to the Armed Forces was also intimately concerned in the equally large problems associated with demobilisation and plans were early put in hand to advise the Minister on such problems. The Ministry of Pensions required that medical examination before demobilisation should provide an authoritative record of the member's condition on leaving the service so that it might be compared with that on entry, for it was on such comparison that entitlement to pension was decided. Early in 1942 discussions were held with the Service Medical Departments to decide how best these requirements of the Ministry might be met. As a result of the discussions and after consultation with the special

committee, agreement was reached on the details to be entered on the release form A.F.W. 3149 by the Boards undertaking the medical examination of members before demobilisation and notes for the guidance of such boards were prepared and issued as a pamphlet M.P.M. 361 in October 1944.

The success of the Normandy landings and the subsequent rapid advance through France gave hope of an earlier end to the war than had at one time been expected. Realising that the claims to be expected on demobilisation would throw a heavy additional burden on the Ministry, it was decided that further staff and accommodation would be required. Standard Government buildings at Cheltenham were therefore requisitioned for the Ministry, which provided accommodation for a large staff. This accommodation was taken over in October 1944 and release work there started by June 25, 1945.

All three classes of release—Class A, those found surplus to military requirements, Class B, those released on grounds of national importance and Class C, released on compassionate grounds—could, of course, make claim for disability pensions. All personnel released were medically examined and a report furnished on A.F.W. 3149, a special form A.F.X. 21 being filled in by those claiming a disability pension.

Some idea of the magnitude of the task involved in dealing with these demobilisation claims is given in the following table:

TABLE XV

Services Releases

Quarter ending	Awards
September 29, 1945	2,957
December 29, 1945	9,083
March 30, 1946	22,035
June 29, 1946	31,016
September 28, 1946	28,353
December 28, 1946	24,770
March, 29, 1947	15,378
June 28, 1947	9,535
	143,127

Up to the end of June 1947, approximately 41·5 per cent. of the awards in the release groups had been given for the results of trauma. Comparative analyses of disabilities on release and invaliding will be found in Chapter 7.

The rapidity with which demobilisation advanced and the inclusion in the release of general duty medical officers had by February 1946, resulted in there being insufficient military medical officers available to carry out in full the requirements of A.F.W. 3149 in accordance with M.P.M. 361. It therefore was necessary to employ civilian practitioners and

some modification of the form was required. It was decided that in exceptional circumstances Part I of the form should be completed in full, but that Part II, which contains the medical report of a detailed clinical examination, should be replaced by a *pro forma* which covered the essential points required by the Ministry. In such exceptional circumstances the full clinical report required was limited to any disability that was discovered. Where no disability was found, an endorsement of the form to that effect was required.

MEDICAL EXAMINATION OF PRISONERS-OF-WAR

It was not until the surrender of Italy, in September 1943, that prisoners-of-war began to be repatriated to the United Kingdom in any numbers, but following the German collapse in N.W. Germany, Holland and Denmark in May 1945 and the surrender of Japan in the following August repatriation occurred on a large scale. A large proportion of these returned men required to be medically boarded and the Ministry, in agreement with the Service authorities, undertook to help in this work and complete the necessary boards before the termination of the 42 days' release leave, and in fact, agreed to deal with approximately two-thirds of such cases. The Ministry of Labour and National Service also agreed to assist by augmenting the supply of Boarding Medical Officers necessary for this purpose in the Regions; 67 such medical officers were employed on a sessional basis. The following table shows the monthly total of medical examinations of these ex-prisoners-of-war undertaken by the Ministry:

TABLE XVI

Medical Examinations by Ministry of Pensions of Ex-Prisoners-of-War—1945

Month	Number of medical examinations
May	13,521
June	32,160
July	17,870
August	3,237
September	596
	67,364

Repatriates. If considered unfit for further service, the normal invaliding procedure was followed, and on receipt of the member's invaliding documents the Officer-in-Charge of Records completed them as far as he was able directly he received information that discharge had been authorised, and despatched them to the Ministry of Pensions. The Ministry of Pensions returned the documents to O.C. Records

upon receipt from him of notification of disembarkation of the member. The O.C. Records thereupon completed the documents and returned them again to the Ministry. The documents when first sent were accompanied by a note to the effect that they related to a soldier who was to be invalided when repatriated, so that the Ministry of Pensions could consider entitlement to pension before actual discharge. Thus there was a minimum of delay in entitlement decisions and all such cases were handled with the utmost expedition at all stages, as it was essential that there should be no break between cessation of service allowances and the issue of pension, or the provision of further treatment. The following table shows the first awards, disablement and invalidings, made to prisoners-of-war covering the period April 1944, to the end of December 1946, with comparative figures for the three Services Departments:

TABLE XVII

Prisoners-of-War
First Awards: Disablement and Invalidings

Period	Navy	Army	R.A.F.	Totals
To April 1, 1944	29	1,956	10	1,495
From April 2, 1944 to March 31, 1945	42	1,943	33	2,018
Quarter ending June 30, 1945	19	975	26	1,020
September 29, 1945	43	4,226	38	4,307
December 29, 1945	101	9,647	89	9,837
March 30, 1946	63	7,221	77	7,361
June 29, 1946	91	1,939	88	2,118
September 28, 1946	74	909	105	1,088
December 28, 1946	52	548	52	652
Totals	514	28,864	518	29,896

Coding of Disabilities. After the end of the War of 1914–18, it was soon realised that a great deal of valuable clinical material was lost to medical research on account of the inadequacy of the disability coding system. The old coding procedure used during that war included a large number of conditions included for record purposes under a single code number; and extraction of a sample of cases of any particular disability was a long and laborious procedure. Steps were taken in 1920 to introduce an expanded code system of fifty-four different items. This fifty-four-item code was in operation at the onset of the War of 1939–45, and although it was fully realised that a much more detailed system of code records would be of great advantage, the shortage of medical man-power and the need for the utmost economy allowed of no alteration in the long-established procedure. However, the Government realised the importance of the unification and standardisation of code records; and the Medical Research Council appointed a special committee, including

a representative of the Ministry of Pensions, to draft a code classification of diseases which could be applied to the medical records throughout the country. In 1943, the results of their labours were published under the title 'Provisional Classification of Diseases and Injuries for Use on Compiling Morbidity Statistics'. The code evolved was based on the International List of Causes of Death and each code number was fully cross-indexed with the International List. At the request of the Ministry of Pensions a special series of code numbers was introduced dealing with amputation.

Unfortunately, the financial and man-power situation and the consequent limitation of the Ministry Statistical Department did not permit of the use of the fully expanded edition of the new code, but a condensed version of the code, which enumerated 156 different items, was brought into use in 1943. This condensed code is shown in the appendix, and it is on this that the figures in Chapter 7 are based. As a result of the introduction of this code, record keeping was greatly facilitated and, when the present man-power and economy restrictions are eventually lifted, access will more readily be available to the wealth of clinical material contained in the Ministry files.

TREATMENT OF TUBERCULOSIS

In general, the provisions made by local health authorities were utilised for the treatment of tuberculosis. The Ministry supplemented these facilities by the use of wards in its own hospitals for the observation and diagnosis of suspected tuberculosis and for the treatment of non-respiratory tuberculosis.

Although the Ministry had no sanatoria of its own, agreement had been reached after the War of 1914–18 for certain sanatoria to reserve beds for ex-officer war pensioners on a capitation basis. At the outbreak of war, the capitation arrangements were adequate to meet the needs of pensioners ; but as the war advanced there was a call for more accommodation for such cases ; and in November 1943, a conference was held to discuss how best to make provision in sanatoria. As the possibility of obtaining new buildings was extremely remote, it was decided to press for extensions to existing sanatoria. It was eventually arranged that the Ministry should have a prior claim on accommodation at the King Edward VII Sanatorium, Midhurst, for sixty patients in return for financial assistance in extending the existing accommodation. At the same time, arrangements were made to use the sixteen-bedded hospital at Scio House, Putney, administered by the Red Cross, which had previously been used for chronic cases of pulmonary tuberculosis contracted in the War of 1914–18, as a clearing house to provide suitable institutional treatment pending admission to a sanatorium. This arrangement was supplementary to, but in no way replaced, the normal procedure for admission to a sanatorium.

TROPICAL DISEASES TRAINING CENTRE

At a conference with representatives of the School of Hygiene and Tropical Medicine, held in March 1945, it was agreed that the Queen Mary's Roehampton Hospital, which had special facilities for the treatment of tropical diseases should serve as a training centre for medical personnel in these subjects, use being made of the wards set aside for these conditions. Subject to the finding of the necessary nursing and technical staff, the Ministry agreed to set aside approximately 100 beds for cases of tropical disease. It was arranged that there should be two teaching courses a year, each of three months, and that a clinical assistant, nominated by the Tropical School, should be appointed by the Ministry as a member of the hospital staff. It was, of course, understood that no patient should be made the subject of demonstration or teaching without his consent.

OPTICAL APPLIANCES

At the outbreak of the War of 1939–45, the activities of the Optical Appliances Department fell into two classes—(*a*) Spectacle making and repairing and (*b*) Artificial eye making and fitting.

The department was responsible for the supply and repair of (*a*) and (*b*) to the war pensioners, the Armed Forces and in a small measure to other departments. Some idea of the volume of this work which descended on the Ministry at the commencement of the war can be obtained from the following statistics of the issue of spectacles:

TABLE XVIII

Issues

	Pensioners	War office	R.A.F.	R.N.	Other Depts.	Totals
September 1, 1939 to March 31, 1940	102	30,622	2,173	266	1,092	34,255
April 1, 1940 to March 31, 1941 .	132	104,127	12,016	2,272	1,669	120,216
April 1, 1941 to March 31, 1942 .	213	57,351	35,080	6,759	1,646	101,049
April 1, 1942 to March 31, 1943 .	220	12,289	41,683	8,743	4,869	67,804
April 1, 1943 to March 31, 1944 .	337	2,907	34,098	16,513	5,467	59,322
April 1, 1944 to March 31, 1945 .	409	2,179	26,832	14,817	6,030	50,267
April 1, 1945 to March 31, 1946 .	552	3,384	12,640	8,448	11,226	36,250
April 1, 1946 to March 31, 1947 .	917	14,104	3,911	4,747	12,562	36,241
April 1, 1947 to March 31, 1948 .	1,155	21,556	3,866	3,416	10,971	40,964
						546,368

It will be seen that after March 1944, there was a steady decline, and this was largely due to the decline in demand for gas-mask spectacles owing to large numbers of troops being transferred oversea and the setting up by the War Office of optical units in the field.

In addition to the supply of spectacles, a large volume of repair work was carried out over the whole period, as will be seen from the following figures:

TABLE XIX

Repairs

	Pensioners	War Office	R.A.F.	R.N.	Other Depts.	Totals
September 1, 1939 to March 31, 1940	33	720	172	7	4	936
April 1, 1940 to March 31, 1941 .	46	5,597	670	75	19	6,407
April 1, 1941 to March 31, 1942 .	42	9,883	1,874	319	76	12,194
April 1, 1942 to March 31, 1943 .	48	6,610	4,073	688	237	11,656
April 1, 1943 to March 31, 1944 .	60	2,704	5,158	963	1,403	10,288
April 1, 1944 to March 31, 1945 .	67	1,051	4,060	1,081	408	6,667
April 1, 1945 to March 31, 1946 .	85	473	2,238	764	413	3,973
April 1, 1946 to March 31, 1947 .	125	1,001	400	239	327	2,092
April 1, 1947 to March 31, 1948 .	241	965	156	137	259	1,758
						55,971

Towards the end of 1944 it became apparent that for a variety of reasons the demand for artificial eyes could not be met by the existing methods of manufacture. It was therefore decided to investigate the possibility of using plastic materials, and a small plastic unit was set up, with the result that plastic eyes were manufactured on a mass production scale. The following table shows the change in the relative production of glass and plastic eyes:

TABLE XX

Artificial Eyes

Year	Ministry of Pensions			War Office			R.A.F.			R.N.			Ministry of Health			Other Departments			Totals		
	Glass	Plastic	Patients	Glass	Plastic	Patients	Glass	Plastic	Patients	Glass	Plastic	Patients	Glass	Plastic	Patients	Glass	Plastic	Patients	Glass	Plastic	Patients
1.9.39—31.3.40	1828			20												105					
1.4.40—31.3.41	2614		1321	381		378	68		42	49		37	30		30	108		67	1953		1004
1.4.41—31.3.42	2777		1419	1480		1453	160		139	58		57	574		457	82		51	3441		1875
1.4.42—31.3.43	2723		1411	2048		1985	229		213	76		60	387		298	159		120	5131		3576
1.4.43—31.3.44	2830		1481	2593		2483	402		270	129		119	411		309	267		225	5622		4066
1.4.44—31.3.45	3073		1677	2792		2704	448		283	155		153	615		478	439		383	6632		4887
1.4.45—31.3.46	4027	141	2329	3053	37	2920	381	13	261	161	5	153	777	11	578	522	4	457	8021	211	5678
1.4.46—31.3.47	3712	1289	2937	992	269	1176	173	61	163	71	14	83	527	155	468	274	95	324	5749	1883	6698
1.4.47—31.3.48	730	2471	2753	120	358	457	12	87	89	7	34	40	126	266	347	39	186	244	1034	3402	5151
																			45805	5496	3930
																					36,895

APPENDIX

NEW WAR DISABILITY CODE (1943)

CLASSIFICATION OF DISABILITIES FOR CODING PURPOSES

Diseases

Infective and Parasitic Diseases:

00	Tropical diseases (other than malaria 009)
009	Malaria
01	Intestinal infective diseases: and helminthiasis, not specified below
011	Typhoid fever
012	Paratyphoid fever
013	Dysentery: bacillary
014	Dysentery: amoebic, including amoebiasis
016	Dysentery: unspecified
0191	Cysticercosis
02	Pulmonary tuberculosis
021	With pleural effusion
027	With occupational disease of lung
028	Radiological diagnosis only
03	Tuberculosis, non-pulmonary
04	Syphilis (other than 043, 045, and 046, below)
043	Aneurysm and cardiovascular syphilis
045	Tabes dorsalis
046	General paralysis of the insane
05	Gonorrhoea and other V.D.
053	Gonococcal infections of joints
06	Other bacterial diseases: erysipelas; diphtheria; tetanus, etc. (except 062, 063, 066 below)
062	Cerebro-spinal fever
063	Septicaemia: pyaemia
066	Gas gangrene
07	Influenza: chicken-pox: herpes; small-pox
075	Acute poliomyelitis
076	Encephalitis lethargica
08	Other virus diseases (except 088 below)
088	Trachoma
09	Other infective and parasitic diseases (except 092 and 095 below)
092	Typhus fever: trench fever
095	Actinomycosis and other mycoses
10	Rheumatic fever, including chorea

Neoplasms:

11.	Malignant disease (except stomach 121)
121	Malignant disease of stomach
18.	Non-malignant tumours and cysts

General Diseases:

21	Allergic disorders. Asthma: hay fever, etc.
22	Diabetes: glycosuria

23	Diseases of thyroid
24	Diseases of other endocrine glands
25	Metabolic disorders: gout; osteomalacia; cystinuria; obesity; amyloidosis, etc.
26	Nutritional diseases; beriberi; pellagra, etc.

Diseases of the Blood; Spleen; and Lymphatic System:

27	Diseases of the blood: including anaemia; leukaemia, etc.
28	Diseases of spleen and lymphatic system, including Hodgkin's disease
29	Chronic poisoning and intoxication, including alcoholism

Diseases of the Nervous System and Mental Diseases:

30	Meningitis, encephalitis (other than 076): abscess of brain and spinal cord
31	Cerebral haemorrhage (except 310), thrombosis, embolism and sequelae
310	Sub-arachnoid haemorrhage
32	Diseases of intra-cranial and peripheral nerves
330	Mental deficiency
331	Constitutional inferiority and other abnormal character states
332	Anxiety of obsessional states: hysteria: reactive depression
333	Other psychoneuroses (except 3330)
3330	Effort syndrome: including "functional" heart disease
34	Psychoses
35	Other organic nervous diseases (except 351 and 358 below)
351	Disseminated sclerosis
358	Epilepsy

Diseases of Sense Organs:

36	Diseases of the eye (except 3655 and 368 below)
3655	Total blindness, due to disease
368	Diseases of retina and optic nerve
37	Diseases of the ear
371	Otitis media, without nerve deafness
3762	Nerve deafness with or without otitis media

Diseases of the Circulatory System:

38	Mitral stenosis
390	Pericarditis and adherent pericardium
392	Endocarditis (except sub-acute bacterial 393)
393	Sub-acute bacterial endocarditis including infective endocarditis
394	Myocarditis: acute or chronic
400	Valvular disease (other than mitral stenosis 38 or syphilitic 045)
403	Coronary disease
404	Myocardial degeneration
406	Arterial hypertension: Arteriosclerosis
41	Other organic heart disease (functional heart disease: 3330)
42	Diseases of arteries (other than 406, 043 or 427)
427	Circulatory diseases of the extremities
43	Diseases of veins

Diseases of the Respiratory System:

44	Diseases of upper respiratory passages (except 447)
447	Bronchitis
45	Pleurisy (not T.B.); empyema; lung abscess; bronchiectasis
450	Lobar pneumonia
451	Broncho-pneumonia
46	Other diseases of lung (except 467)
467	Silicosis and other pneumokonioses

Diseases of the Digestive System:

47	Diseases of mouth, teeth, tongue
48	Diseases of throat and oesophagus
49	Diseases of stomach and duodenum (except 490–492)
490	Gastritis
491	Gastric ulcer
492	Duodenal ulcer
50	Diseases of intestines, including appendix
52	Hernia
53	Diseases of rectum and peritoneum
54	Diseases of liver and gall bladder
55	Diseases of pancreas

Diseases of Genito-urinary System:

56	Nephritis
57	Pyelitis: cystitis: urinary calculi
58	Other diseases of G.U. tract
59	Diseases of male genital organs
60	Diseases of breast, ovary or parametrium
61	Diseases of uterus and other female genitals (except 614)
614	Disorders of menstruation

Pregnancy, Childbirth and Complications:

62x	Disorders of pregnancy
64	Abortion and complications
66x	Complications of childbirth and puerperium

Diseases of Skin and Cellular Tissue:

68	Boils; ulcers; dermatitis and other infective skin conditions
69	Other diseases of skin

Diseases of Joints: Bones and Locomotor System: Deformities:

70	Diseases of joints
706	Muscular rheumatism: myalgia: lumbago
71	Diseases of bone (except osteomyelitis 710)
710	Osteomyelitis
716	Internal derangement of knee joint
718	Bursitis: synovitis
72	Diseases of muscles and ligaments: deformities other than 725 and 727
725	Deformities of spine
727	Deformities of feet
73x	Congenital malformations

76 Ill-defined conditions and symptoms
(77) (Carriers)
(78) (Effects of prophylactic inoculation)

Trauma

Amputations:

790 Amputation: one upper extremity
7903 ,, hand, partial
791 ,, one lower extremity
7913 ,, foot, partial
792 ,, both upper extremities
793 ,, both lower extremities
794 ,, one lower, one upper extremity
795 ,, other multiple

Wounds or Injuries:

800 Wound or Injury: Head
801 ,, ,, ,, face and neck
802 ,, ,, ,, trunk, flesh
803 ,, ,, ,, upper extremity
804 ,, ,, ,, lower extremity
805 ,, ,, ,, thorax: penetrating
806 ,, ,, ,, abdomen or pelvis: penetrating
807 ,, ,, ,, flesh: multiple
808 ,, ,, ,, spine
(81) (Contusions : foreign bodies)
82 Injury peripheral nerves
(84) (Fractures : dislocations : sprains)

Total Blindness, Loss of Vision or Hearing (Traumatic):

851 Total blindness: due to wound or injury
8510 Total blindness: due to gas
852 Loss of vision: traumatic: one eye
853 Loss of vision: traumatic: both eyes
855 Loss of hearing: traumatic
86 Miscellaneous complications of trauma

Effects of Gas: except Total Blindness:

92 Effects of gas (other than eyes, 925, lungs 922 or total blindness, 8510)
925 Effects of gas: Eyes
922 Effects of gas: Lungs
93 Burns, other than Gas
94 External general traumas: heat, altitude etc. (other than 945: 942: 9490)
941 Drowning: immersion
942 Excessive cold: frost bite: trench feet
9490 General exposure
(95) (Therapeutic misadventures)
(96) (Late complications of treatment)

CHAPTER 7

INCIDENCE OF DISABILITIES

EARLY STAGES OF THE WAR

At the outbreak of the war there seemed every likelihood that the work of the Ministry would increase rapidly. Heavy air raids were expected on our cities, resulting in a very large number of civilian air-raid casualties, in addition to the casualties in the Armed Forces. For some time, however, these anticipations were not fulfilled, and until the summer of 1940, when hostilities flared up, the claims dealt with by the Ministry were almost all for diseases, or for accidental injury incurred in the course of military training or civil defence duties. Injuries occurring as a direct result of enemy action were rare.

This is shown by Table XXI below, in which it will be seen that claims in respect of wounds or injuries in the early days were a very small proportion of the total claims received. The figures for the month ending June 1945, are included as a contrast:

TABLE XXI

Disease and Trauma as percentage of all Claims

Quarter ended	Disease	Wounds and Injuries	Total cases
	Percentage	Percentage	
December 1939 / March 1940	93·4	6·6	18,435
June 1940	94·5	5·5	15,939
September 1940	92·6	7·4	14,232
December 1940	92·1	7·9	21,898
March 1941	93·0	7·0	38,306
June 1945	77·5	22·5	36,817

INCREASE IN BATTLE CASUALTIES

Up to March 1941, of approximately 110,000 Service disablement cases dealt with, some 25,000 suffered from neurological or mental diseases, 17,000 from gastro-intestinal, 14,000 from respiratory diseases and 5,600 from tuberculosis, these conditions alone accounting for nearly 60 per cent. of the total disablement claims from the Armed Forces. The flare-up of fighting in Europe increased the proportion of battle casualties, and the number of awards of pension for wounds and injuries increased rapidly, as is shown in the table below:

TABLE XXII

Services

Quarter ended	Awards for Wounds and injuries
December 1939 .	1
March 1940 . .	14
June 1940 . .	119
September 1940 .	291
December 1940 .	802
March 1941 . .	1,024
June 1941 . .	1,459
September 1941 .	1,738
December 1941 .	1,625
June 1945 . .	7,891

INCREASE IN CIVILIAN AWARDS

Soon after the fall of France in the summer of 1940 the enemy stepped up air attacks on this country and civilian air raid casualties greatly increased.

The influence of these air raids on the awarding figures is shown in the next table. It will be seen that civilian awards as a proportion of all awards gradually rose to a peak and then fell off. The awards to widows reached a peak in the quarter ended December 1940. That the peak of disablement awards was not reached until some months later was due to the practice of payment of injury allowances to civilian cases for at least 26 weeks before disability pensions were granted:

TABLE XXIII

First Awards for Disablement, Widows and Dependants

	Disablement		Widows		Dependants	
	Total awards	Civilian per cent.	Total awards	Civilian per cent.	Total awards	Civilian per cent.
To March 30, 1940	50	4	1,753	1·2	240	0
Quarter ended						
June 29, 1940 .	504	4	1,326	1·1	349	1·0
September 28, 1940	1,090	1	3,574	10·1	574	2·4
December 28, 1940	2,141	1·3	4,540	46·4	950	11·0
March 29, 41 .	2,950	4·4	4,947	43·0	1,075	19·3
June 28, 1941 .	5,781	9·5	6,646	44·9	1,231	18·5
September 27, 1941	13,725	20·6	5,725	14·3	1,638	14·0
January 3, 1942 .	13,629	26·4	4,243	7·0	1,523	8·0
March 28, 1942 .	8,961	18·5	3,794	3·3	1,170	3·7
To March 28, 1942	48,831	18·1	36,548	24·2	8,750	10·9

The great bulk of these awards to civilians were, of course, for the effects of trauma, and not for diseases; the figures for these trauma

awards are shown below. The time lag explained above before these increased casualties were reflected in the Ministry awarding figures is again apparent:

TABLE XXIV

Period	Disablement	
	First awards to civilians	
	Trauma	Disease
To December 1940 .	61	2
Quarter ended .		
March 1941 . .	132	1
June 1941 . .	538	9
September 1941 .	2,713	120
December 1941 .	3,457	150
March 1942 . .	1,524	133
June 1942 . .	871	85

It is of interest to note that the renewal of heavy air attacks in 1944 was also reflected in a similar way with a similar time lag.

TABLE XXV

Period Quarter ended	Disablement	
	First awards to civilians	
	Trauma	Disease
March 1944 . .	530	116
June 1944 . .	494	156
September 1944 .	754	171
December 1944 .	1,347	255
March 1945 . .	2,520	338
June 1945 . .	1,529	336

COMPARISON OF DISABLEMENT AWARDS IN THE SERVICES

The following table gives the total awards per quarter from July 1942, to December 1946, on account of invaliding for disablement from the Navy, Army and Air Force respectively:

Outstanding features in Table XXVI are:

(1) The considerable increase in the number of awards granted in the quarter ended January 1, 1944. This increase is particularly noticeable in diseases and was a direct result of the introduction of the White Paper in September 1943.

(2) The great increase in awards both for disease and wounds and injuries in the quarter ended December 29, 1945. By this date the war was over and demobilisation was well advanced. The considerable increase in awards for wounds and injuries

had commenced in the quarter ended March 31, 1945, and reached its climax in the quarter ended December 29, 1945, when, in addition to the expected demobilisation claims, the casualties from the fighting in Europe were more fully reflected in the awarding figures.

TABLE XXVI

Services—Total Disablement Invaliding Awards Quarterly

Quarter ended	Navy	Army	R.A.F.	All Services		
				Disease	Wounds and Injuries	Totals
September 26, 1942	912	6,549	1,025	6,964	1,522	8,486
December 26, 1942	991	6,046	1,086	6,377	1,746	8,123
March 23, 1943 .	915	5,425	1,096	5,719	1,717	7,436
June 26, 1943 .	1,038	5,354	1,180	5,845	1,727	7,572
October 2, 1943 .	1,643	8,301	2,139	9,832	2,251	12,083
January 1, 1944 .	2,028	14,721	2,977	15,772	3,954	19,726
April 1, 1944 .	1,903	12,967	2,547	13,327	4,090	17,417
July 1, 1944 .	1,781	12,282	2,623	12,381	4,305	16,686
September 30, 1944	1,798	12,127	2,588	12,268	3,845	16,513
December 30, 1944	1,847	13,198	2,434	12,405	5,074	17,479
March 31, 1945 .	2,527	16,834	2,979	15,422	6,918	22,340
June 30, 1945 .	2,257	17,511	3,052	14,929	7,891	22,820
September 29, 1945	3,945	17,312	2,669	17,106	6,820	23,926
December 29, 1945	4,976	28,299	3,080	26,292	10,063	36,355
March 31, 1946 .	3,386	19,025	2,379	18,080	6,710	24,790
June 29, 1946 .	2,377	8,616	1,775	9,592	3,176	12,768
September 28, 1946	2,139	6,956	1,687	8,303	2,479	10,782
December 28, 1946	1,948	6,044	1,346	7,454	1,884	9,338

ANALYSIS OF THE INCIDENCE OF DISABILITIES

In the following tables the awards are analysed by disability, by Service and by sex and by degree of disablement. It must be remembered, however, that these figures show the incidence of disabilities as found in pension awards only; and must therefore differ in some respects from the Services' figures for the occurrence of disabilities during the war period.

(1) *Disease and Trauma.*

It will be seen that, of the 342,175 Service invaliding disability pensions awarded up to December 1946, wounds and injuries accounted for approximately one-fifth of the total; awards for diseases in fact proved to be four times more common.

As might be expected, the highest proportion of awards for wounds and injuries was found to be in the Army (23·1 per cent).

In releases, the proportion of wounds and injuries was appreciably higher (33·0 per cent.) though it will be seen that these awards are in general in the lower assessment groups.

The great bulk of civilian awards on the other hand have been given for wounds and injuries (67·5 per cent.)

(2) *Invalidings*

Comparison between Services:

(*a*) *Wounds and Injuries.* In the combined total of awards it will be seen that wounds and injuries are first in the order of frequency, but, on comparing the individual Services, this occurs only for the Army. In the Navy awards for wounds and injuries rank equal third with neurological and mental diseases, tuberculosis being the most frequent with digestive diseases next in order of frequency.

(*b*) *Gastro-intestinal Diseases.* The great bulk of these awards were for peptic ulcers and in total it will be seen that such awards ranked second only to wounds and injuries in order of frequency. In the Navy these ranked second in frequency to those for tuberculosis and were appreciably more numerous than those for wounds and injuries. In the Air Force it will be seen that these awards were the most frequent of all (20·7 per cent.).

(*c*) *Neurological and Mental Diseases.* Awards for these conditions accounted for 13 per cent. of all Service invaliding awards, the highest individual incidence being that found in the Army (13·7 per cent.). In all three Services these diseases were found to provide a greater proportion of the awards in males than in females.

(*d*) *Tuberculosis.* Of awards for diseases, pulmonary tuberculosis will be seen to provide a proportion second only to peptic ulcers. The outstanding feature was the high proportion of the Naval awards which were given for this condition (25·7 per cent.). The high incidence of this disease in the awards to women was also remarkable (30·5 per cent.) and here again the figure for the Navy was the highest of the three Services (33·5 per cent.). Awards for tuberculosis ranked fourth in order of magnitude in the combined Services total of awards, and in the Navy this disease was the most frequent of all causes of pension award. In the Air Force it ranked second only to digestive diseases. Nearly one in three of all awards to females was for tuberculosis.

(3) *Releases*

In the release groups it will be seen that one in three pensions was awarded for the effects of wounds and injuries, a much higher proportion than that found in the invaliding figures. Next in order of magnitude were diseases of the locomotor system (14·3 per cent.).

Of the awards for diseases in all three Services, diseases of the ear ranked highest, followed by bronchitis. Peptic ulcers formed a relatively small group as did pulmonary tuberculosis, but it will be seen that the latter disease accounted for 11·2 per cent. of the awards to females, diseases of the ear accounting for 9·5 per cent.

(4) *Assessment Groups*

(*a*) *Diseases only*. By far the greatest bulk of the highest assessment group was comprised of pulmonary tuberculosis awards. In invalidings these awards made up 73·2 per cent. of all awards for disease assessed at 100 per cent. and in releases 77 per cent. This disease also provided a high proportion of such awards to civilians (38·9 per cent.) and to Mercantile Marine (68·7 per cent.).

Of the less than 20 per cent. awards, psychoneurosis provided the largest number in invalidings (26·7 per cent.) and diseases of the ear the greatest number among releases (18·1 per cent.).

(*b*) *All Awards*. In both invalidings and releases, tuberculosis provided the greatest number of 100 per cent. awards (51·8 per cent. in invalidings and 77·5 per cent. in releases). In invalidings the greatest number of less than 20 per cent. awards were for neurological and mental diseases (24·3 per cent.) while in releases, wounds and injuries provided the largest proportion of such awards (32 per cent.). In the Mercantile Marine, tuberculosis provided 51·3 per cent. of all awards assessed at 100 per cent. In civilians, wounds and injuries provided 61·8 per cent. of such awards.

TABLE XXVII

War 1939: Services: Invalidings: Officers and Other Ranks
First Awards Analysed into Male and Female for Certain Disabilities

Cumulative to December 28, 1946.

Disability	Navy			Army			Air Force			Total Services		
Description	Male	Female	Totals	Male	Female	Totals	Male	Female	Totals	Male	Female	Totals
Disease	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.
Gastric ulcer	1,303 3·7	17 1·3	1,320 3·6	6,544 3·7	71 1·6	6,615 3·6	1,349 3·9	54 1·6	1,403 3·7	9,196 3·7	142 1·5	9,338 3·6
Duodenal ulcer	4,567 12·8	37 2·7	4,604 12·4	25,339 14·4	204 4·5	25,543 14·1	6,481 18·8	128 3·7	6,609 17·5	36,387 14·7	369 4·0	36,756 14·3
Pulmonary tuberculosis	9,076 25·4	454 33·5	9,530 25·7	17,494 9·9	1,296 28·5	18,790 10·4	6,281 18·2	1,094 32·0	7,375 19·5	32,851 13·3	2,844 30·5	35,695 13·9
Psychoneuroses	3,239 9·1	105 7·8	3,344 9·0	25,724 14·6	275 6·0	25,999 14·3	2,288 6·6	243 7·1	2,531 6·7	31,251 12·7	623 6·7	31,874 12·4
Bronchitis	2,183 6·1	44 3·2	2,227 6·0	17,200 9·7	256 5·6	17,456 9·6	2,248 6·5	172 5·0	2,420 6·4	21,631 8·8	472 5·1	22,103 8·6
Diseases of joints	1,758 4·9	88 6·5	1,846 5·0	9,964 5·7	354 7·8	10,318 5·7	2,860 8·3	283 8·3	3,143 8·3	14,582 5·9	725 7·9	15,307 6·0
Diseases of ear	2,527 7·1	20 1·5	2,547 6·9	9,220 5·2	82 1·8	9,302 5·1	1,630 4·7	64 1·9	1,694 4·5	13,377 5·4	166 1·8	13,543 5·3
Skin diseases	883 2·5	28 2·1	911 2·5	6,109 3·5	162 3·6	6,271 3·5	817 2·4	74 2·2	891 2·4	7,809 3·2	264 2·8	8,073 3·1
Deformities of feet	613 1·7	35 2·6	648 1·7	4,311 2·4	113 2·5	4,424 2·4	686 2·0	72 2·1	758 2·0	5,610 2·3	220 2·3	5,830 2·3
Pleurisy	814 2·3	31 2·3	845 2·3	3,205 1·8	122 2·7	3,327 1·8	860 2·5	81 2·4	941 2·5	4,879 2·0	234 2·5	5,113 2·0
Non-pulmonary tuberculosis	538 1·5	51 3·8	589 1·6	2,583 1·5	234 5·1	2,817 1·6	758 2·2	191 5·6	949 2·5	3,879 1·6	476 5·1	4,355 1·7
Mitral stenosis	436 1·2	30 2·3	466 1·3	2,487 1·4	141 3·1	2,628 1·4	415 1·2	95 2·8	510 1·3	3,338 1·4	266 2·9	3,604 1·4
Psychoses	576 1·6	9 <1	585 1·6	2,674 1·5	30 <1	2,704 1·5	401 1·2	18 <1	419 1·1	3,651 1·5	57 <1	3,708 1·4
Rheumatism	239 <1	48 3·5	287 <1	2,391 1·4	148 3·3	2,539 1·4	371 1·1	77 2·3	448 1·2	3,001 1·2	273 2·9	3,274 1·3
Diseases of nerves	329 <1	17 1·3	346 <1	2,435 1·4	64 1·4	2,499 1·4	467 1·4	39 1·1	506 1·3	3,231 1·3	120 1·3	3,351 1·3
Allergic disorders	471 1·3	24 1·8	495 1·3	1,826 1·0	132 2·9	1,958 1·1	531 1·5	88 2·5	619 1·6	2,828 1·1	244 2·6	3,072 1·2
Nephritis	289 <1	11 <1	300 <1	1,907 1·1	48 1·1	1,955 1·1	363 1·1	39 1·1	402 1·1	2,559 1·0	98 1·1	2,657 1·0
Hernia	293 <1	3 <1	296 <1	1,982 1·1	6 <1	1,988 1·1	181 <1	3 <1	184 <1	2,456 1·0	12 <1	2,468 1·0
Diseases of veins	254 <1	23 1·8	277 <1	2,340 1·3	60 1·3	2,400 1·3	294 <1	29 <1	323 <1	2,888 1·2	112 1·3	3,000 1·2
Gastritis	266 <1	3 <1	269 <1	1,677 1·0	14 <1	1,691 <1	209 <1	10 <1	219 <1	2,152 <1	27 <1	2,179 <1
Valvular diseases of heart	184 <1	7 <1	191 <1	1,096 <1	27 <1	1,123 <1	228 <1	19 <1	247 <1	1,508 <1	53 <1	1,561 <1
Rheumatic fever	235 <1	34 2·6	269 <1	1,011 <1	124 2·7	1,135 <1	246 <1	95 2·8	341 <1	1,492 <1	253 2·7	1,745 <1
Arterial hypertension	440 1·2	11 <1	451 1·2	1,288 <1	21 <1	1,309 <1	135 <1	5 <1	140 <1	1,863 <1	37 <1	1,900 <1
Diseases of eye	358 1·0	11 <1	369 1·0	1,547 <1	23 <1	1,570 <1	252 <1	25 <1	277 <1	2,157 <1	59 <1	2,216 <1
Other diseases	3,820 10·7	215 15·9	4,035 10·9	24,332 13·8	543 11·9	24,875 13·7	4,090 11·9	423 12·4	4,513 11·9	32,242 13·0	1,181 12·6	33,423 13·0
Total Disease	35,691	1,356	37,047	176,686	4,550	181,236	34,441	3,421	37,862	246,818	9,327	256,145

TABLE XXVII—*contd.*

War 1939: Services: Invalidings: Officers and Other Ranks First Awards Analysed into Male and Female for Certain Disabilities

Cumulative to December 28, 1946.

Disability	Navy			Army			Air Force			Total Services		
Description	Male	Female	Totals	Male	Female	Totals	Male	Female	Totals	Male	Female	Totals
	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.
Trauma												
Wounds: lower limb	1,852 27·3	26 23·6	1,878 27·2	24,954 34·1	151 31·3	25,105 34·0	1,372 27·7	113 30·0	1,485 27·9	28,178 33·0	290 29·9	28,468 33·0
Wounds: upper limb	1,325 19·5	26 23·6	1,351 19·6	14,671 20·0	110 22·8	14,781 20·0	907 18·3	82 21·7	989 18·6	16,903 19·9	218 22·5	17,121 19·9
Wounds other than head and limbs	1,102 16·2	17 15·5	1,119 16·2	12,246 16·7	87 18·0	12,333 16·7	772 15·6	51 13·5	823 15·5	14,120 16·6	155 16·0	14,275 16·6
Amputations	864 12·7	7 6·4	871 12·6	9,933 13·6	20 4·1	9,953 13·5	597 12·1	38 10·1	635 11·9	11,394 13·4	65 6·7	11,459 13·3
Wounds: head	675 10·0	22 20·0	697 10·1	6,671 9·1	71 14·7	6,742 9·1	767 15·6	72 19·1	839 15·8	8,113 9·5	165 17·0	8,278 9·6
Loss of vision	399 5·9	3 2·7	402 5·8	2,034 2·8	14 2·9	2,048 2·8	136 2·8	4 1·1	140 2·6	2,569 3·2	21 2·2	2,590 3·1
Burns	157 2·3	5 4·5	162 2·4	975 1·3	13 2·7	988 1·3	149 3·0	9 2·4	158 3·0	1,281 1·5	27 2·8	1,308 1·5
Loss of hearing	245 3·6	1 1·0	246 3·6	638 <1	2 <1	640 <1	46 <1	1 <1	47 <1	929 1·1	4 <1	933 1·1
Other trauma	166 2·4	3 2·7	169 2·5	1,210 1·5	15 3·1	1,225 1·7	197 4·0	7 1·9	204 3·8	1,573 1·8	25 2·6	1,598 1·9
Total trauma	6,785	110	6,895	73,332	483	73,815	4,943	377	5,320	85,060	970	86,030
Disease and Trauma by Systems												
Wounds and injuries	4,954 11·7	91 6·2	5,045 11·5	58,542 23·4	419 8·3	58,961 23·1	3,818 9·7	318 8·4	4,136 9·6	67,314 20·3	828 8·0	68,142 19·9
Digestive diseases	6,905 16·2	79 5·4	6,984 15·9	37,972 15·2	345 6·9	38,317 15·0	8,711 22·1	244 6·4	8,955 20·7	53,588 16·1	668 6·5	54,256 15·9
Neurological and mental diseases	4,884 11·5	161 11·0	5,045 11·5	34,640 13·8	454 9·0	35,094 13·7	3,938 10·0	357 9·4	4,295 9·9	43,462 13·1	972 9·4	44,434 13·0
Tuberculosis	9,614 22·6	505 34·4	10,119 23·0	20,077 8·0	1,530 30·4	21,607 8·5	7,039 17·8	1,285 33·8	8,324 19·3	36,730 11·1	3,320 32·2	40,050 11·7
Locomotor	3,246 7·6	204 13·9	3,450 7·9	20,666 8·3	707 14·1	21,373 8·4	4,812 12·2	514 13·5	5,326 12·3	28,724 8·7	1,425 13·8	30,149 8·8
Respiratory diseases	3,265 7·7	92 6·3	3,357 7·6	21,760 8·7	427 8·5	22,187 8·7	3,359 8·5	289 7·6	3,648 8·4	28,384 8·6	808 7·9	29,192 8·5
Sense organs	2,885 6·8	31 2·1	2,916 6·6	10,767 4·3	105 2·1	10,872 4·3	1,882 4·8	89 2·3	1,971 4·6	15,534 4·7	225 2·2	15,759 4·6
Circulatory diseases	2,055 4·8	106 7·2	2,161 4·9	9,677 3·9	305 6·1	9,982 3·9	1,599 4·1	210 5·5	1,809 4·2	13,331 4·0	621 6·0	13,952 4·1
Amputations	864 2·0	7 <1	871 2·0	9,933 4·0	20 <1	9,953 3·9	597 1·6	38 1·0	635 1·5	11,394 3·4	65 <1	11,459 3·3
Skin diseases	883 2·1	28 1·9	911 2·1	6,109 2·4	162 3·2	6,271 2·5	817 2·1	74 2·0	891 2·1	7,809 2·3	264 2·6	8,073 2·4
Others	2,921 6·9	162 11·1	3,083 7·0	19,875 7·9	559 11·1	20,434 8·0	2,812 7·1	380 10·0	3,192 7·4	25,608 7·7	1,101 10·7	26,709 7·8
Grand totals: All cases	42,476	1,466	43,942	250,018	5,033	255,051	39,384	3,798	43,182	331,878	10,297	342,175

TABLE XXVIII

War 1939: Services: Releases: Officers and Other Ranks
First Awards Analysed into Male and Female for Certain Disabilities

Cumulative to December 28, 1946.

Disability	Navy						Army						Air Force						Total Services					
Description	Male		Female		Totals		Male		Female		Totals		Male		Female		Totals		Male		Female		Totals	
Disease	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Gastric ulcer	89	2·0	—		89	2·0	391	·74	3		394	·74	125	1·5	1		126	1·4	605	0·9	4	0·4	609	0·9
Duodenal ulcer	337	7·6	1	1·0	338	7·4	1,412	2·7	12	2·0	1,424	2·7	559	6·5	8	3·6	567	6·4	2,308	3·5	21	2·3	2,329	3·5
Pulmonary tuberculosis	232	5·2	16	16·3	248	5·4	1,035	2·0	62	10·1	1,097	2·1	239	2·8	26	11·6	265	3·0	1,506	2·3	104	11·2	1,610	2·4
Psychoneuroses	237	5·3	—		237	5·2	3,211	6·1	10	1·6	3,221	6·0	277	3·2	4	1·8	281	3·2	3,725	5·7	14	1·5	3,739	5·6
Bronchitis	372	8·3	1	1·0	373	8·2	6,788	12·9	41	6·7	6,829	12·8	835	9·7	12	5·8	847	9·6	7,995	12·1	54	5·8	8,049	12·1
Diseases of joints	262	5·9	16	16·3	278	6·1	3,805	7·2	49	8·0	3,854	7·2	728	8·5	16	7·1	744	8·4	4,795	7·3	81	8·7	4,876	7·3
Diseases of ear	856	19·2	7	7·1	863	19·0	7,078	13·4	56	9·2	7,134	13·3	1,366	15·9	26	11·6	1,392	15·8	9,300	14·1	89	9·5	9,389	14·1
Skin diseases	322	7·2	5	5·1	327	7·2	2,319	4·4	44	7·2	2,363	4·4	486	5·7	23	10·2	509	5·8	3,127	4·7	72	7·7	3,199	4·8
Deformities of feet	107	2·4	2	2·0	109	2·4	5,057	9·5	50	8·2	5,107	9·6	544	6·3	13	5·8	557	6·3	5,708	8·7	65	7·0	5,773	8·6
Pleurisy	48	1·1	1	1·0	49	1·1	406		8	1·3	414		87	1·0	4	1·8	91	1·0	541		13	1·4	554	
Non-pulmonary tuberculosis	13		1	1·0	14		86		7	1·1	93		29		3	1·3	32		128		11	1·2	139	
Mitral stenosis	14		—		14		161		9	1·5	170		18		1		19		193		10	1·1	203	
Psychoses	10		—		10		33		—		33		8		—		8		51		—		51	
Rheumatism	118	2·6	7	7·1	125	2·7	1,822	3·4	55	9·0	1,877	3·5	271	3·2	11	4·9	282	3·2	2,211	3·4	73	7·8	2,284	3·4
Diseases of nerves	72	1·6	1	1·0	73	1·6	892	1·7	16	2·6	908	1·7	142	1·7	6	2·7	148	1·7	1,106	1·7	23	2·5	1,129	1·7
Allergic disorders	47	1·1	2	2·0	49	1·1	470		16	2·6	486		124	1·4	4	1·8	128	1·5	641		22	2·4	663	1·0
Nephritis	22		—		22		140		1		141		22		1		23		184		2		186	
Hernia	266	6·0	2	2·0	268	5·9	2,121	4·0	5		2,126	4·0	319	3·7	2		321	3·6	2,706	4·1	9	1·0	2,715	4·1
Diseases of veins	138	3·1	5	5·1	143	3·1	2,410	4·6	26	4·3	2,436	4·6	294	3·4	4	1·8	298	3·4	2,842	4·3	35	3·8	2,877	4·3
Gastritis	49	1·1	—		49	1·1	493		3		496		65		3	1·3	68		607		6		613	
Valvular diseases of heart	7		—		7		61		2		63		11		—		11		79		2		81	
Rheumatic fever	12		1	1·0	13		135		5		140		25		2		27		172		8		180	
Arterial hypertension	29		2	2·0	31		126		2		128		16		1		17		171		5		176	
Diseases of eye	94	2·1	1	1·0	95	2·1	957	1·8	5		962	1·8	253	2·9	7	3·1	260	3·0	1,304	2·0	13	1·4	1,317	2·0
Other diseases	705	15·8	27	27·6	732	16·1	11,397	21·6	123	20·2	11,520	21·6	1,737	20·2	47	20·9	1,784	20·2	13,839	21·0	197	21·1	14,036	21·0
Total disease	4,458		98		4,556		52,806		610		53,416		8,580		225		8,805		65,844		933		66,777	

TABLE XXVIII—*contd.*

War 1939: Services: Releases: Officers and Other Ranks
First Awards Analysed into Male and Female for Certain Disabilities

Cumulative to December 28, 1946.

Disability	Navy			Army			Air Force			Total Services		
Description	Male	Female	Totals	Male	Female	Totals	Male	Female	Totals	Male	Female	Totals
	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.	No. Per cent.
Trauma												
Wounds: lower limb	877 23·7	23 25·0	900 23·8	13,834 33·1	115 33·6	13,949 33·1	1,552 29·1	49 23·6	1,601 29·0	16,263 32·0	187 29·1	16,450 32·0
Wounds: upper limb	978 26·5	23 25·0	1,001 26·4	9,208 22·0	97 28·4	9,305 22·1	1,237 23·2	59 28·3	1,296 23·4	11,423 22·5	179 27·9	11,602 22·5
Wounds other than head and limbs	500 13·5	10 10·9	510 13·5	7,624 18·2	39 11·4	7,663 18·2	641 12·0	21 10·1	662 12·0	8,765 17·3	70 10·9	8,835 17·2
Amputations	634 17·2	19 20·6	653 17·2	4,115 9·9	34 10·0	4,149 9·8	786 14·9	52 25·0	838 15·2	5,535 10·9	105 16·3	5,640 11·0
Wounds: head	147 4·0	5 5·4	152 4·1	1,688 4·0	14 4·1	1,702 4·0	271 5·1	7 3·4	278 5·0	2,106 4·1	26 4·1	2,132 4·1
Loss of vision	105 2·8	3 3·3	108 2·9	2,522 6·0	7 2·0	2,529 6·0	377 7·1	5 2·4	382 6·9	3,004 5·9	15 2·3	3,019 5·9
Burns	55 1·5	7 7·6	62 1·6	416 1·0	15 4·4	431 1·0	137 2·6	9 4·3	146 2·6	608 1·2	31 4·8	639 1·2
Loss of hearing	328 8·9	1 1·1	329 8·7	1,594 3·8	7 2·0	1,601 3·8	164 3·1	2 1·0	166 3·0	2,086 4·1	10 1·6	2,096 4·1
Other trauma	69 1·9	1 1·1	70 1·8	780 1·9	14 4·1	794 1·9	156 2·9	4 1·9	160 2·9	1,005 2·0	19 3·0	1,024 2·0
Total trauma	3,693	92	3,785	41,781	342	42,123	5,321	208	5,529	50,795	642	51,437
Disease and Trauma by Systems												
Wounds and injuries	2,502 30·7	61 32·1	2,563 30·7	32,354 34·2	265 27·8	32,619 34·2	3,701 26·6	136 31·4	3,837 26·8	38,557 33·1	462 29·3	39,019 33·0
Digestive diseases	826 10·1	3 1·6	829 10·0	5,315 5·6	36 3·8	5,351 5·6	1,261 9·1	16 3·7	1,277 8·9	7,402 6·4	55 3·5	7,457 6·3
Neurological and mental diseases	358 4·4	1 <1	359 4·3	4,548 4·8	29 3·0	4,577 4·8	505 3·6	11 2·5	516 3·6	5,411 4·6	41 2·6	5,452 4·6
Tuberculosis	245 3·0	17 8·9	262 3·1	1,121 1·2	69 7·2	1,190 1·2	268 1·9	29 6·7	297 2·1	1,634 1·4	115 7·3	1,749 1·5
Locomotor	669 8·2	32 16·8	701 8·4	13,903 14·7	199 21·0	14,102 14·8	2,008 14·4	66 15·3	2,074 14·5	16,580 14·2	297 18·8	16,877 14·3
Respiratory diseases	455 5·6	7 3·7	462 5·5	7,695 8·1	63 6·6	7,758 8·1	1,043 7·5	21 4·9	1,064 7·4	9,193 7·9	91 5·8	9,294 7·8
Sense organs	950 11·6	8 4·2	958 11·5	8,035 8·5	61 6·4	8,096 8·5	1,619 11·7	33 7·6	1,652 11·6	10,604 9·1	102 6·5	10,706 9·1
Circulatory diseases	215 2·6	7 3·7	222 2·7	2,950 3·1	44 4·6	2,994 3·1	371 2·7	8 1·8	379 2·6	3,536 3·0	59 3·7	3,595 3·0
Amputations	634 7·8	19 10·0	653 7·8	4,115 4·4	34 3·6	4,149 4·3	786 5·7	52 12·0	838 5·8	5,535 4·7	105 6·7	5,640 4·8
Skin diseases	322 4·0	5 2·6	327 3·9	2,319 2·5	44 4·6	2,363 2·5	486 3·5	23 5·3	509 3·5	3,127 2·7	72 4·6	3,199 2·7
Others	975 12·0	30 15·8	1,005 12·1	12,232 12·9	108 11·3	12,340 12·9	1,853 13·3	38 8·8	1,891 13·2	15,060 12·9	176 11·2	15,236 12·9
Grand totals: All cases	8,151	190	8,341	94,587	952	95,539	13,901	433	14,334	116,639	1,575	118,214

TABLE XXIX

War 1939: M. Marine (Officers and Other Ranks) and Civilians First Awards Analysed into Male and Female for Certain Disabilities

Cumulative to December 28, 1946

Disability Description	Mercantile Marine			Civilians					
	Male		Female	Totals	Male		Female		Totals	
Disease	No.	Per cent.	No.	No.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Gastric ulcer	71	1·3		71	40	1·3	—		40	<1
Duodenal ulcer	281	5·2		281	142	4·6	3	<1	145	3·5
Pulmonary tuberculosis	1,341	24·8		1,341	338	11·1	129	12·0	467	11·3
Psychoneuroses	937	17·4		937	447	14·6	325	30·1	772	18·7
Bronchitis	264	4·9		264	156	5·1	9	<1	165	4·0
Diseases of joints	85	1·6		85	210	6·9	43	4·0	253	6·1
Diseases of ear	218	4·0		218	120	3·9	51	4·7	171	4·1
Skin diseases	37	<1		37	105	3·4	37	3·4	142	3·4
Deformities of feet	13	<1		13	23	<1	4	<1	27	<1
Pleurisy	35	<1		35	49	1·6	9	<1	58	1·4
Non-pulmonary tuberculosis	19	<1		19	18	<1	11	1·0	29	<1
Mitral stenosis	17	<1		17	33	1·1	2	<1	35	<1
Psychoses	79	<1		79	43	1·4	47	4·4	90	2·2
Rheumatism	49	<1		49	129	4·2	15	1·4	144	3·5
Diseases of nerves	24	<1		24	75	2·5	16	1·6	91	2·2
Allergic disorders	53	1·0		53	8	<1	4	<1	12	<1
Nephritis	20	<1		20	12	<1	—		12	<1
Hernia	85	1·6		85	255	8·3	5	<1	260	6·3
Diseases of veins	26	<1		26	41	1·3	15	1·4	56	1·4
Gastritis	63	1·2		63	3	<1	1	<1	4	<1
Valvular diseases of heart	18	<1		18	10	<1	3	<1	13	<1
Rheumatic fever	4	<1		4	6	<1	3	<1	9	<1
Arterial hypertension	96	1·8		96	22	<1	9	<1	31	<1
Diseases of eye	74	1·4		74	110	3·6	60	5·6	170	4·1
Other diseases	1,488	27·6		1,488	666	21·8	277	25·7	943	22·8
Total disease	5,397			5,397	3,061		1,078		4,139	

TABLE XXIX—*contd.*

War 1939: M. Marine (Officers and Other Ranks) and Civilians First Awards Analysed into Male and Female for Certain Disabilities

Cumulative to December 28, 1946.

Disability — Description	Mercantile Marine						Civilians					
	Male		Female	Totals	Male		Female		Totals	
Trauma	No.	Per cent.	No.	No.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Wounds: lower limb	896	18·5		896	4,072	29·9	2,160	21·4	6,232	26·3
Wounds: upper limb	562	11·6		562	2,631	19·4	1,760	17·4	4,391	18·6
Wounds other than head and limbs	773	16·0		773	2,354	17·3	2,764	27·3	5,118	21·6
Amputations	138	2·9		138	904	6·7	409	4·0	1,313	5·5
Wounds: head	250	5·2		250	1,580	11·6	1,501	14·9	3,081	13·0
Loss of vision	74	1·5		74	1,302	9·6	955	9·4	2,257	9·5
Burns	195	4·0		195	188	1·4	160	1·6	348	1·5
Loss of hearing	125	2·5		125	252	1·9	161	1·6	413	1·7
Other trauma	1,829	37·7	1	1,830	296	2·2	231	2·3	527	2·2
Total trauma	4,842		1	4,843	13,579		10,101		23,680	
Diseases and Trauma by Systems										
Wounds and injuries	2,481	24·3		2,481	10,637	64·0	8,185		18,822	67·5
Digestive diseases	549	5·4		549	453	2·7	13		466	1·7
Neurological and mental diseases	1,781	17·4		1,781	732	4·4	497		1,229	4·4
Tuberculosis	1,360	13·3		1,360	356	2·1	140		496	1·8
Locomotor	162	1·6		162	473	2·8	80		553	2·0
Respiratory diseases	328	3·2		328	219	1·3	20		239	< 1
Sense organs	292	2·9		292	230	1·4	111		341	1·2
Circulatory diseases	282	2·8		282	198	1·2	38		236	< 1
Amputations	138	1·3		138	904	5·4	409		1,313	4·7
Skin diseases	37	< 1		37	105	< 1	37		142	< 1
Others	2,829	27·6	1	2,830	2,333	14·0	1,649		3,982	14·3
Totals: All cases	10,239		1	10,240	16,640		11,179		27,819	

TABLE XXX

War 1939: *Services: Invalidings and Releases: Officers and Other Ranks: Analysis of First Awards for Various Disabilities, by Degree of Disablement*

Cumulative to December 28, 1946.

Disability	Invalidings						Releases						
	Degree of Disablement					Totals	Degree of Disablement					Totals	Grand Totals
Description	100	90–60	50–40	30–20	<20		100	90–60	50–40	30–20	<20		
Disease	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Gastric and duodenal ulcers	139	252	5,079	40,369	255	46,094	16	10	312	2,380	220	2,938	49,032
Pulmonary tuberculosis	31,557	685	1,592	1,829	32	35,695	1,303	24	62	206	15	1,610	37,305
Psychoneurosis: specified	92	198	2,107	23,671	5,806	31,874	12	6	111	2,050	1,560	3,739	35,613
Bronchitis	163	693	5,860	14,738	649	22,103	6	16	382	6,335	1,310	8,049	30,152
Diseases of joints	801	727	3,405	9,573	801	15,307	27	24	174	2,833	1,818	4,876	20,183
Diseases of ear	94	669	2,252	7,480	3,048	13,543	2	95	367	3,629	5,296	9,389	22,932
Skin diseases	82	52	383	5,361	2,195	8,073	2	6	33	950	2,208	3,199	11,272
Deformities of feet	8	18	264	3,547	1,993	5,830	—	3	13	1,461	4,296	5,773	11,603
Pleurisy	967	292	1,549	2,198	107	5,113	12	3	42	383	114	554	5,667
Non-pulmonary tuberculosis	2,919	166	546	657	67	4,355	58	3	9	42	27	139	4,494
Mitral stenosis	301	673	1,653	972	5	3,604	4	8	79	111	1	203	3,807
Psychosis	1,002	170	781	1,614	141	3,708	31	2	5	12	1	51	3,759
Diseases of nerves	186	139	690	2,120	216	3,351	8	1	41	612	467	1,129	4,480
Rheumatism	42	56	413	2,247	516	3,274	2	2	21	840	1,419	2,284	5,558
Allergic disorders	80	74	554	2,137	227	3,072	1	1	17	463	181	663	3,735
Diseases of veins	77	76	424	1,791	632	3,000	1	—	34	1,124	1,718	2,877	5,877
Nephritis	404	284	899	1,043	27	2,657	4	2	39	116	25	186	2,843
Hernia	12	23	112	731	1,590	2,468	1	1	19	323	2,371	2,715	5,183
Gastritis	34	23	147	1,759	216	2,179	1	—	14	295	303	613	2,792
Diseases of eye	133	305	459	1,081	238	2,216	1	35	129	747	405	1,317	3,533
Arterial hypertension	146	264	644	817	29	1,900	8	9	35	111	13	176	2,076
Rheumatic fever	439	153	504	595	54	1,745	5	4	7	114	50	180	1,925
Valvular disease of heart	133	359	782	282	5	1,561	—	8	43	29	1	81	1,642
Other diseases	3,291	2,784	7,744	16,680	2,924	33,423	188	116	760	7,624	5,348	14,036	47,459
Grand totals: All diseases	43,102	9,135	38,843	143,292	21,773	256,145	1,693	379	2,748	32,790	29,167	66,777	322,922

TABLE XXX—*contd.*

War 1939: Services: Invalidings and Releases: Officers and Other Ranks: Analysis of First Awards for Various Disabilities, by Degree of Disablement

Cumulative to December 28, 1946.

Disability	Invalidings						Releases						Grand Totals
	Degree of Disablement					Totals	Degree of Disablement					Totals	
Description	100	90–60	50–40	30–20	<20		100	90–60	50–40	30–20	<20		
Trauma	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Wounds: lower limb	6,716	2,291	7,320	10,361	1,780	28,468	6	20	370	8,350	7,704	16,450	44,918
Wounds: upper limb	2,747	2,136	5,276	5,712	1,250	17,121	15	45	528	5,750	5,264	11,602	28,723
Wounds other than head	3,467	1,820	3,875	4,388	725	14,275	11	66	710	5,072	2,977	8,836	23,111
Amputations	7,227	1,345	1,196	999	692	11,459	21	214	207	1,094	4,104	5,640	17,099
Wounds: head	2,116	1,460	1,996	2,351	355	8,278	4	46	239	1,237	605	2,131	10,409
Loss of vision	439	615	1,022	481	33	2,590	2	128	1,481	1,233	175	3,019	5,609
Burns	296	177	341	420	74	1,308	1	9	37	336	256	639	1,947
Loss of hearing	47	117	239	379	151	933	2	34	136	945	979	2,096	3,029
Other trauma	342	131	364	600	161	1,598	2	3	33	509	477	1,024	2,622
Totals: All trauma	23,397	10,092	21,629	25,691	5,221	86,030	64	565	3,741	24,526	22,541	51,437	137,467
Disease and Trauma by Systems													
Wounds and injuries	15,046	7,707	18,467	22,812	4,110	68,142	36	177	1,847	20,409	16,550	39,019	107,161
Digestive diseases	387	405	5,929	45,345	2,051	54,117	34	16	385	3,582	3,410	7,427	61,544
Tuberculosis	34,476	851	2,138	2,486	99	40,050	1,361	27	71	248	42	1,749	41,799
Neurological and mental diseases	1,698	1,020	4,987	30,166	6,563	44,434	77	22	205	2,966	2,182	5,452	49,886
Respiratory diseases	1,355	1,077	7,774	18,039	947	29,192	28	26	452	7,063	1,715	9,284	38,476
Locomotor	1,297	1,007	5,142	18,887	3,816	30,149	50	38	296	7,276	9,217	16,877	47,026
Circulatory diseases	1,239	2,155	5,074	4,793	691	13,952	33	48	259	1,499	1,756	3,595	17,547
Sense organs	227	974	2,711	8,561	3,286	15,759	3	130	496	4,376	5,701	10,706	26,465
Amputations	7,227	1,345	1,196	999	692	11,459	21	214	207	1,094	4,104	5,640	17,099
Skin diseases	82	52	383	5,361	2,195	8,073	2	6	33	950	2,208	3,199	11,272
Others	3,465	2,634	6,671	11,534	2,544	26,848	112	240	2,238	7,853	4,823	15,266	42,114
Grand totals: All cases	66,499	19,227	60,472	168,983	26,994	342,175	1,757	944	6,489	57,316	51,708	118,214	460,389

TABLE XXXI

War 1939: M. Marine (Officers and Other Ranks) and Civilians: Analysis of First Awards for Various Disabilities, by Degree of Disablement

Cumulative to December 28, 1946.

Disability	M. Marine						Civilians					
	Degree of Disablement					Totals	Degree of Disablement					Totals
Description	100	90–60	50–40	30–20	<20		100	90–60	50–40	30–20	Lump sum	
Disease	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Gastric and duodenal ulcers	10	3	32	304	3	352	—	1	12	172	—	185
Pulmonary tuberculosis	1,261	33	32	13	2	1,341	428	11	15	13	—	467
Psychoneurosis: specified	98	66	200	500	73	937	92	60	170	447	3	772
Bronchitis	34	25	66	131	8	264	20	7	37	101	—	165
Diseases of joints	13	7	21	38	6	85	39	21	42	142	9	253
Diseases of ear	6	21	34	106	51	218	8	27	30	83	23	171
Skin diseases	1	1	4	19	12	37	16	2	13	106	5	142
Deformities of feet	—	—	2	8	3	13	—	—	19	8	—	27
Pleurisy	10	2	8	12	3	35	—	22	6	13	17	58
Non-pulmonary tuberculosis	14	1	1	3	—	19	17	2	4	6	—	29
Mitral stenosis	2	5	4	6	—	17	9	6	10	10	—	35
Psychosis	61	4	9	4	1	79	72	5	10	3	—	90
Diseases of nerves	2	—	3	13	6	24	13	8	19	45	6	91
Rheumatism	3	1	4	29	12	49	8	6	13	106	11	144
Allergic disorders	3	5	9	29	7	53	—	—	5	7	—	12
Diseases of veins	1	1	5	12	7	26	4	2	9	36	3	54
Nephritis	8	—	4	7	1	20	2	1	3	6	—	12
Hernia	9	2	9	26	39	85	4	3	7	83	163	260
Gastritis	2	3	11	40	7	63	—	—	—	4	—	4
Diseases of eye	6	4	15	36	13	74	23	15	29	96	7	170
Arterial hypertension	40	21	19	16	—	96	12	4	7	8	—	31
Rheumatic fever	—	—	1	2	1	4	6	2	1	—	—	9
Valvular disease of heart	4	7	5	2	—	18	2	4	6	1	—	13
Other diseases	247	109	227	778	127	488	326	83	153	371	12	945
Totals: All diseases	1,835	321	725	2,134	382	5,397	1,101	292	620	1,867	259	4,139

TABLE XXXI—*contd.*

War 1939: M. Marine (Officers and Other Ranks) and Civilians: Analysis of First Awards for Various Disabilities, by Degree of Disablement

Cumulative to December 28, 1946.

Disability	M. Marine						Civilians					
	Degree of Disablement					Totals	Degree of Disablement					Totals
Description	100	90–60	50–40	30–20	< 20		100	90–60	50–40	30–20	Lump sum	
Trauma	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Wounds: lower limb	78	56	163	325	274	896	1,667	604	1,149	2,598	214	6,232
Wounds: upper limb	34	48	87	191	202	562	616	403	991	2,118	263	4,391
Wounds other than head and limbs	70	62	130	306	205	773	1,027	499	1,093	2,243	256	5,118
Amputations	46	40	19	3	30	138	860	145	104	152	52	1,313
Wounds: head	32	37	56	67	58	250	987	420	682	936	56	3,081
Loss of vision	6	7	22	33	6	74	371	330	942	591	23	2,257
Burns	20	24	33	63	55	195	123	38	62	117	8	348
Loss of hearing	3	13	26	46	37	125	36	58	100	199	20	413
Other trauma	182	177	487	726	258	1,830	163	26	92	234	12	527
Totals: All trauma	471	464	1,023	1,760	1,125	4,843	5,850	2,523	5,215	9,188	904	23,680
Disease and Trauma by Systems												
Wounds and injuries	214	203	436	889	739	2,481	4,297	1,926	3,915	7,895	789	18,822
Digestive diseases	29	9	59	386	58	541	6	4	19	270	165	464
Tuberculosis	1,275	34	33	16	2	1,360	445	13	19	19	—	496
Neurological and mental diseases	248	112	303	1,006	112	1,781	263	109	253	595	9	1,229
Respiratory diseases	52	28	81	153	14	328	47	15	52	125	—	239
Locomotor	18	8	33	80	23	162	66	31	70	343	43	553
Circulatory diseases	107	54	57	55	9	282	69	36	56	72	3	236
Sense organs	12	25	49	142	64	292	31	42	59	179	30	341
Amputations	46	40	19	3	30	138	860	145	104	152	52	1,313
Skin diseases	1	1	4	19	12	37	16	2	13	106	5	142
Others	304	271	674	1,145	444	2,838	851	492	1,275	1,299	67	3,984
Grand totals: All cases	2,306	785	1,748	3,894	1,507	10,240	6,951	2,815	5,835	11,055	1,163	27,819

COMPARISON OF DISABLEMENT IN THE WARS OF 1914–18 AND 1939–45

Comparison between the disablement resulting from the Wars of 1914–18 and 1939–45 can only be made on broad lines and any deductions therefrom must be made only with considerable caution. Changes in the classification of diseases and injuries since the War of 1914–18, differences in the statistical methods of recording, changes of standard in the acceptance of entitlement, and the effect of advances in therapeutics and surgery in removing or shortening disablement are all factors which prevent a close comparison from the available records of pension awards. Further, it is to be remembered that the war figures of 1914–18 include pensions awarded over a period of nearly 30 years from the end of that war.

Subject, however, to these qualifications, the following tables give a broad comparison as at March 31, 1948, of disablement from the two wars in relation to main types of injury or disease and also degree of disablement.

TABLE XXXII

Disablement Pensions at the 20 per cent. Rate or Above granted up to March 31, 1948, summarised by Disability Groups

	War of 1914–18		War of 1939–45	
	No.	per cent.	No.	per cent.
Wounds and injuries of legs (including amputations)	196,119	14·6	47,497	10·9
Wounds and injuries of arms (including amputations)	163,108	12·1	29,952	6·9
Wounds and injuries to head	46,359	3·5	13,158	3·0
Other wounds and injuries (excluding eyes and ears)	98,051	7·3	22,917	5·2
Total wounds and injuries	503,637	37·5	113,524	26·0
Eyesight cases (disease and injury)	31,709	2·4	10,075	2·3
Deafness (disease and injury)	33,894	2·5	19,490	4·5
Respiratory diseases (including tuberculosis and bronchitis)	122,257	9·1	91,604	21·0
Rheumatism	84,852	6·3	6,197	1·4
Disease of heart and arteries	118,991	8·9	17,360	4·0
Epilepsy	8,435	0·6	1,543	0·4
Neurological and mental (excluding epilepsy)	84,677	6·3	46,059	10·5
Others	354,048	26·4	130,408	29·9
Grand totals	1,342,500	100·0	436,260	100·0

TABLE XXXIII

Disablement Pensions (including Temporary Allowances) in Payment on March 31, 1948, analysed by Degrees of Disablement

Degree of disablement	War of 1914–18 and former wars	War of 1939–45				Grand totals
		Armed forces	Mercantile marine, etc.	Civil defence and civilians	Totals	
100	20,641	28,787	1,091	1,799	31,677	52,318
90	2,846	784	12	84	800	3,726
80	11,966	7,715	192	697	8,604	20,570
70	17,346	9,783	185	761	10,729	28,075
60	26,622	13,363	194	1,164	14,721	41,343
50	42,128	19,900	362	1,638	21,900	64,028
40	42,165	34,876	454	2,593	37,923	80,088
30	67,578	78,264	915	3,913	83,092	150,670
20	101,920	130,957	1,384	5,290	137,631	239,551
Less than 20 and miscellaneous	11,077	64,826	592	—	65,418	76,495
Totals	344,289	389,255	5,381	17,939	412,575	756,864

CONCLUSION

This account of the work of the medical services of the Ministry of Pensions during the war is perforce but a summary of the main facts with brief comments on matters of particular interest. It shows, however, that the principles and methods developed after the War of 1914–18 proved sound and readily adaptable to the differing needs and problems of the 1939–45 conflict. The experience gained by the medical services of the Ministry of the short- and long-term effect of war casualties, both for the individual and for the community, were found to be invaluable. When the time came, after twenty years, for the medical services to remember their experience, and apply its teachings to new and wider problems, it achieved no less success than in the years when it was acquired.

I am indebted to my medical and lay colleagues for their assistance in the preparation of this account, and particularly to Dr. Langdale Kelham, O.B.E., on the history of the limb service, and to Dr. R. Powell for general aid.

PART III

Public Health in Scotland

Compiled in the Department of Health for Scotland

FOREWORD

by the

Chief Medical Officer of the Department of Health for Scotland

THE following Part, which is entitled 'Public Health in Scotland', describes the impact of the war upon the civilian health services, both personal and environmental. Inevitably, the war brought to these services many sudden and unpredictable changes; and one of the main lessons in these pages is that the organisation was sufficiently flexible to cope with the shocks and upsets. While the clouds were gathering, the local authorities were still in the process of developing their hospital and personal health services. They had shouldered considerable responsibilities during the previous decade, and to this burden was added demands of the Civil Defence casualty services.

The more sensitive indices of social conditions like infant mortality and tuberculosis gave rise to anxiety at the beginning of the war. That, perhaps, was not unexpected. But, while the trends of the usual health indices improved towards the end of the war, including infant mortality, tuberculosis was an exception. The effects of war conditions upon this disease were marked, and continued in Scotland long after the war was over. Perhaps the two most striking features of the period were the continued improvement in nutrition generally but especially among the young and growing population, and the rather unexpected recession of some of our most troublesome infections.

Attention might be drawn to one or two peculiarly Scottish developments, the Highlands and Islands Medical Service and the experiences of the Department of Health in social medicine—for example in rehabilitation and in the Clyde Basin experiment. Perhaps the most disappointing story is that of the failure of planned evacuation. Fortunately, its failure, as events turned out, did not have serious consequences, but the lesson is there for those to whom may fall the duty of planning a similar scheme in the future.

We are indebted to Dr. Bowman for the production of these chapters. He undertook the heavy task of assembling the data and also the task, even more difficult, of presenting them in an agreeable and readable form.

ANDREW DAVIDSON

Edinburgh, 1952.

CHAPTER 1
BACKGROUND TO THE WAR

DURING the twenty years which lay between the Armistice of 1919 and the outbreak of the war in 1939, the usually accepted indices of national well-being showed that a substantial, and indeed notable, improvement had taken place in the health of the Scottish people. The influenza pandemic of 1918–19 had engendered in the common mind a new conception of this particular disease and provoked a sense of foreboding for the future. Happily, however, although severe outbreaks of influenza occurred in the winters of 1932–3 and 1936–7 there was no recurrence in catastrophic pandemic form. The country as a whole enjoyed years of comparative freedom from attack by major epidemic diseases. The history of epidemiology in those intervening years is in fact remarkably negative, though passing mention may be made of a series of outbreaks of illness due to the enteric group of micro-organisms. These particularly affected the congested areas of the industrial West of Scotland, although on occasion—as in the local outbreak of 1938 in Hawick—other districts of the country were involved. It was recognised that in Scotland, among the infectious diseases, the most important were measles, whooping-cough and pneumonia. Between the two wars much attention was for this reason devoted to those diseases, formerly classed as trivial, yet only moderate success was achieved in treatment and relatively little in prevention, but health conditions were on the whole satisfactory and the outlook for the future was increasingly favourable. Despite some setbacks, the economic and sociological background of the people had improved and it could be expected that living conditions would also continue to improve. But it was clear that much remained to be done.

In spite of the increasing threat of war throughout the nineteen-thirties, there was, on the whole, remarkably little perception of what was to follow and surprisingly little disturbance in planning for the public health. During those years the application of the provisions of the Local Government Act of 1929, which made possible the co-ordination and unification of certain local health services, gave direction to a broader outlook in administration and served to emphasise the retarding effect of the restrictions imposed by too rigid and too parochial boundaries in such important matters as, for example, housing and water supply. Again in 1933, a committee on Scottish Health Services was appointed 'to review the existing health services of Scotland in the light of modern conditions and knowledge, and to make recommendations on any changes in policy and organisation

that may be considered necessary for the promotion of efficiency and economy'. In its report,[1] published in 1936, the committee concluded that the health services had been justified by their results, though the standard of health in Scotland was far below what could be attained. The committee accepted the 'promotion of fitness' among the people as the objective of health policy, and its report aimed at the creation of a flexible structure in health services so that at any time, and according to circumstances, effort could be directed where it might be expected to yield the best results. It recognised that fitness involves not only the promotion of healthy living and the prevention of disease, but also the promotion of fitness and the prevention of incapacity for work. That there was a real problem in relation to the latter question in the years immediately before the war is indicated by the fact that, in the year 1937–8, over 31,000 insured persons between the ages of 16 and 65 were wholly incapacitated from working throughout the entire twelve months' period.

In order that the broad outline of the position may be appreciated, a brief review of the fundamental aspects of the Scottish public health picture in the immediate pre-war years is given below.

VITAL STATISTICS

The index provided by ordinary vital statistics showed that appreciable improvement had occurred in the period between the wars. The general death rate had fallen from approximately 15 per 1,000 population to rather less than 13. Infant mortality had declined from about 100 per 1,000 births to below 70, the expectation of life at birth had increased by three years and at the age of 55 by two years, and maternal mortality had shown a moderate decrease since 1935. But, as the following table shows, in 1938 the vital statistics of Scotland still contrasted unfavourably with those of England and Wales and of certain other progressive countries:

Country	Birth rate	Death rate	Infant Mortality
South Africa*	25·1	9·4	52
Netherlands	20·5	8·5	36
Canada	20·4	9·5	63
Denmark†	18·1	10·4	66
New Zealand	17·9	9·7	36
Scotland	17·7	12·6	70
England and Wales	15·1	11·6	53
Sweden	14·9	11·5	41

* White population only. † 1937

The birth rates and death rates for the years 1939–45 inclusive, which call for no special comment, are as follows:

Year	Birth rate	Death rate
1939	17·4	12·9
1940	17·1	14·9
1941	17·5	14·7
1942	17·6	13·3
1943	18·4	14·0
1944	18·5	13·6
1945	16·9	13·2

The population of Scotland, estimated to be just over 5 million at the time of the outbreak of war, continued slowly to increase although the birth rate had fallen from 25·2 in 1921 to 17·7 in 1938. It was clear, however, that the population was an ageing one. The long-continued process of urbanisation had reached a stage at which four-fifths of the people lived in urban and only one-fifth in rural areas. The principal public health problems of Scotland, and the preponderance of disability, were therefore associated with the industrial belt stretching from the Clyde to the Tay, in which so many of the people dwelt. In this region were found the worst features of poverty, bad housing and overcrowding.

THE INCIDENCE OF POVERTY

In 1937, local authorities ceased to be responsible for assisting the able-bodied poor except for a small residue. Thereafter their work was concerned mainly with meeting the needs of the disabled poor, the sick, the aged and infirm, the widowed, orphans and the deserted. Before this administrative change, the local authorities were spending nearly £2,500,000 a year in outdoor relief to the able-bodied poor. In December 1938, 32 per cent. of the total number of the poor of Scotland were chargeable to the 31 county authorities and 68 per cent. to the 24 large burghs. Of the total poor, 40 per cent. were within the boundaries of the City of Glasgow itself. In the same year the number of poor persons in receipt of relief was 45 per 1,000 of the population in Scotland as a whole. In Glasgow the figure was as high as 82. In Hamilton it was 71; in Coatbridge 68; in Greenock and Port Glasgow 56; and in the County of Lanark 55.

	1939*	1940*	1941*	1942†	1943†	1944†	1945†
Ordinary poor .	118,396	113,801	64,338	59,092	55,797	52,940	55,429
Dependants .	93,307	78,819	52,993	46,087	42,589	38,147	44,130
Able-bodied poor	6,797	5,031	2,173	1,139	439	356	328
Dependants .	7,369	4,173	1,540	583	305	300	372
	225,869	201,824	121,044	106,901	99,130	91,743	100,259

* At May 15. † At January 15.

The total number of persons and their dependants receiving poor relief in Scotland throughout the years of war is shown above. The figures do not include persons receiving only outdoor medical relief, vagrants, lunatics and mental defectives.

Between July and August 1940, there was a decrease of 53,237 in the numbers receiving poor relief, due mainly to old age pensioners becoming entitled at that time to supplementary pensions under the Old Age and Widows Pensions Act, 1940. This fact apart, the diminishing figures suggest that war conditions reduced the need for relief, an assumption which receives some confirmation from the rising figure for 1945, when, for the first time, a slackening in the intensity of the war effort was beginning to manifest itself. It is a melancholy commentary upon the circumstances of our time and a matter of moment in social medicine that the conditions of peace should increase the need for poor relief. The most pressing problems are, of course, associated with the industrial belt, characterised as it is by some of the worst features of poverty, bad housing and overcrowding. With an ageing population, as evidenced by all available data, a reversal of the position becomes hard to contemplate.

NUTRITION

The climate of these islands, and the added disadvantage of congestion and smoke in the industrial areas, should have engendered an earlier consciousness of the need for adequate general nutrition. It was not, however, until after the War of 1914–18 that due recognition was given to the nutritional problem, the importance of which came to be more generally appreciated during the nineteen-thirties than at any earlier time. Though there was an improvement in nutrition during that decade, the position still left much to be desired. The Health Services Committee found that, although there was no evidence of widespread and gross malnutrition, there did exist an appreciable and indeed considerable degree of under-nourishment and faulty feeding. In short, nutritional practice in the houses of the people had failed to keep pace with the advance of modern knowledge and belief. In June 1935, the Minister of Health and the Secretary of State for Scotland requested the Advisory Committee on Nutrition 'to inquire into the facts, quantitative and qualitative, in relation to the diet of the people, and to report as to any changes therein which appeared desirable in the light of modern advances . . '. About this time, dietary surveys had been made in Scotland by Professor E. P. Cathcart of Glasgow and Sir John Boyd Orr of Aberdeen. The latter in his book, *Food, Health and Income*,[2] concluded that the diet of nearly half of the Scottish population, although sufficient to satisfy hunger, was deficient for the maintenance of health. This conclusion notwithstanding, he considered that conditions were much in advance of those which prevailed before

the War of 1914–18. A good deal had been done to improve nutrition through the agency of milk-in-schools schemes and other similar arrangements. In the City of Glasgow, for example, the school medical officers found in 1938 that 64·1 per cent. of the children examined at routine medical inspections were of 'good' nutrition; that 33·4 per cent. could be classified as 'fair' in this regard; and that in only 2·5 per cent. had the designation 'bad' or 'very bad' nutrition to be applied. These percentages were the most satisfactory since the institution of the system of recording in 1920. During the intervening period the average weight of five-year-old boys increased by 0·9 lb. and the average height by 0·9 in.; while the corresponding increases for thirteen-year-old boys were respectively 7·6 lb. and 2·0 in. It was therefore justifiable to conclude that the measures taken had been attended by a certain amount of success.

HEALTH PROBLEMS IN THE HIGHLANDS AND ISLANDS

The Highlands and Islands, by reason of sparseness of population and geographical remoteness, created problems of a peculiar and distinctive type which had no counterpart in the rest of Great Britain. These called for specialised liberal and resilient administrative action; and it became clear many years ago, that, in the interests of the common good as well as of the local population, a specific medical service must be evolved for operation in certain northern and western areas. A special scheme—the Highlands and Islands Medical Service—was therefore elaborated to meet the need in view. The plan which was devised received legal sanction in the year 1913, but its application was delayed because of the outbreak of war in 1914, and it was not until the early nineteen-twenties that it became properly established. Since that time, however, its development as an instrument of health practice and administration has called forth general appreciation. The service was based upon the activities of the family doctor in private practice; and upon this foundation a system of co-operative effort was built up by a flexible central administration embracing the Department of Health for Scotland, the local authorities, the general practitioners, the voluntary hospitals, the nursing associations and others, which was adequate to the needs of the area in times of peace.

The Highlands and Islands Medical Service has as its objective the provision at reasonable cost of hospital and domiciliary medical and nursing facilities for the crofter communities; and its development involved the subsidised employment of surgical specialists at Stornoway, Wick, Lerwick, Fort William, Kirkwall, Golspie and Oban. Conditions in the area may, indeed, be regarded as exemplifying an approach to the ideal relationship between the medical and nursing professions and a comprehensive medical service. In the pre-war years air ambulance facilities were provided as a further complementary factor in the

scheme. These air ambulances, operating from the airport at Renfrew, constituted a beneficent link between the remote Highlands and Islands areas and the general hospitals in Glasgow, to which urgent cases requiring treatment of a kind not locally available could be speedily transported with the minimum of delay and discomfort. In 1938, grants under the medical service arrangements of the Highlands and Islands Fund were made to 151 practices in the area and 209 nurses were employed in the work. The flexibility of the service permitted the making of special arrangements to meet emergencies as they arose. As an example, it was possible to arrange for special journeys by the mail boat to convey patients from out-lying islands to hospital. Shortly before the outbreak of the War of 1939–45, dental benefit at modified fees was introduced into the fabric of the service.

MATERNITY AND CHILDREN'S SERVICES

Maternal Mortality and Morbidity. Maternal mortality and morbidity had long been problems of particular gravity in Scotland. A departmental report on these subjects issued in 1935 found, that *inter alia*, 'there is no doubt that one of the most disquieting features of present-day obstetric practice is hurried and unnecessarily meddlesome midwifery'.[3] The Maternity Services (Scotland) Act of 1937, which followed the publication of this report, had as its general object the improvement of the standard of domiciliary midwifery. Under arrangements to be made by local authorities, it was provided that any woman to be confined in her own home should have the joint services, if she applied for them, throughout pregnancy, labour and puerperium of a medical practitioner and a certified midwife. Provision was also made for the assistance of a specialist obstetrician at the request of the practitioner in attendance. The Act thus offered a complete scheme of medical supervision in the home during the period of pregnancy, at the time of childbirth and throughout the lying-in period. By September 1939, when war broke out, the majority of health authorities had already submitted schemes for local application under the Act, and a number of these schemes were in effective operation.

The maternal mortality rate had been 6·2 per 1,000 births in 1934 and 6·3 in 1935. In 1936 it fell to 5·6 and 1937 to 4·8, the lowest recorded in Scotland since the beginning of the century. In 1938 the rate was 4·9. This fall was due mainly, though not exclusively, to a reduction in the number of deaths from puerperal sepsis, a reduction which was probably due in large measure to two factors, neither of which was directly a part of obstetric practice as such. In the first place it was due to an increasing recognition of the dangers of droplet infection and in the second place (and more influentially) to the widespread employment of the sulphonamide group of drugs.

Still Births and Child Health. An immediately pre-war development was the passage of the Registration of Still Births (Scotland) Act in 1938. Before that date still births were not registered in Scotland. The Act required the doctor or midwife who certified the still birth to make a statement as to the cause or probable cause 'if known'; and in this respect the Scottish Act differed from the corresponding legislation applied to England and Wales. The number of still births registered in Scotland in 1939 was 3,832, equivalent to a rate of 42 per 1,000 of all births (including still births). In 1,263 instances the cause was stated to be 'ill defined' or 'unknown'—sufficient evidence in itself of the need for investigation of the factors leading to still birth. Knowledge of the existence and presumptive importance of the Rh factor was still to come. In 863 of the cases in 1939 still birth was attributed to difficulties in labour; in 529 to foetal deformities; in 495 to ante-partum haemorrhages; and in 342 to toxaemias, including accident haemorrhage. In 1938 the infant mortality rate was 70 per 1,000 births as contrasted with an average figure of 92 for the period 1921–5. Infant mortality during the second six months of life was halved between 1921 and 1938, but the reduction in mortality during the first six months was insignificant. The outstanding factors contributing to infant mortality were congenital causes and pneumonia.

So far as children in the age group 1 to 5 are concerned, the death rate in 1938 was 6·6 per 1,000 of the estimated number of children in the group. This figure was the smallest ever recorded. The health of school children also showed considerable improvement, as did their cleanliness and general well-being; but in spite of a growing health consciousness on the part of the public and the steady amelioration of almost all other defective conditions found in school children, the incidence of dental defects showed little sign of improvement. More attention was being given to health education; nursery schools were being developed; and efforts were being made to bridge the gap previously existing between the health services applicable to children of school age and those regulating the entry of young persons to industry. But in spite of these developments a distressing prevalence of unhygienic conditions was to be disclosed by the events of the evacuation of 1939.

THE INFECTIOUS DISEASES

The immediate pre-war years were not characterised by any heavy, unusual or significant incidence of the infectious diseases in general. Those infectious illnesses commonly responsible for the heavier annual mortality were, in 1938, as usual, measles, diphtheria, tuberculosis and pneumonia. The death rate per 100,000 of the population from measles was 11, from diphtheria 9, from tuberculosis 69 (pulmonary 52 and non-pulmonary 17), and from pneumonia 80. Between the wars, all

these had diminished in importance as causes of death, although the decline was by no means so marked as it might have been.

Diphtheria. During the year 1938 there were 10,786 notified cases of diphtheria with 430 deaths, despite the fact that for some years previously immunisation had offered an effective means for the reduction of the incidence and mortality of this disease. From time to time the Department of Health, through the medium of its annual reports, drew attention to the desirability of immunisation against diphtheria, but there was no vigorous sustained drive to encourage local authorities to conduct active campaigns in favour of it. Such active immunisation as had been carried out was fitful and sporadic and was confined to a few centres.

Thus the proportion of the child population which was effectively immunised was so small that it was of no value in assessing the beneficial effects of the procedure.

Tuberculosis. The incidence of tuberculosis in the pre-war years is of outstanding interest in view of the peculiar susceptibility of this disease to the influence of war conditions. In 1937, 7,584 confirmed cases of tuberculosis were notified, 4,775 of them being pulmonary. Of the latter, 2,545 of the victims were males and 2,230 females. In females the incidence of the disease was especially marked in the age group 15 to 25. Eight hundred and eighty of the cases in females occurred between these ages. Males, on the other hand, had a broader spread of age incidence, roughly between the ages of 15 and 65. In the same year 4,492 patients suffering from tuberculosis received treatment in sanatoria or other institutions. At December 31, 1937, the total number of people resident in Scotland known to be suffering from tuberculosis was 29,627, of whom 17,639 were pulmonary cases. Tubercle bacilli had been found in the sputa of 8,259 of the patients with pulmonary involvement.

Death rates from all forms of tuberculosis fell more or less steadily from 1920 to 1938, although there was some retardation of the decline between the years 1934 and 1937. The rates for 1938—69 per 100,000 for all forms and 52 per 100,000 for the respiratory form—were the lowest ever recorded for Scotland. It was still true, unfortunately, that too many cases of the disease were being reported too late to permit the successful application of recent advances in treatment—often within a short time of the termination of the illness, and sometimes even after the death of the patient. New surgical techniques had been introduced involving the practice of artificial pneumothorax and thoracoplasty which not only affected the prospect of cure in pulmonary tuberculosis but also materially modified the infectivity of the subject.

Venereal Disease. Schemes for combating venereal disease date back to the War of 1914–18 when, in spite of opposing views as to the methods which should be adopted, much progress towards enlightened

practice was made. The annual number of new patients dealt with from 1930 onwards remained fairly steady, fluctuating around the 14,000 to 15,000 mark; but the proportion of patients discharged as cured rose considerably, and in 1937 had reached 57 per cent. The total number of new cases of congenital syphilis fell sharply between 1921 and 1938, the total in the latter year being less than half that in the former.

SUMMARY

In the main, the state of the health of the people just before the outbreak of war was undoubtedly better than it had been twenty years before; it was probably better than it had ever been previously. There was reasonable freedom from major epidemics, though still too much incidence of certain preventable zymotic diseases. The general medical services covered a large proportion of the working population, but still left a considerable element outside. Hospital resources were inadequate. There was considerable delay in securing treatment of the more chronic conditions. Laboratory services were not as generally available as they ought to have been. Expansion of social services and a rising standard of living were undoubtedly contributing to health improvement. For most there was, in reason, sufficiency

> '. . . of ale and brede, of wyne and wax,
> of gamyn and gle;'—

of the homely necessaries, if not the luxuries, and the happy leisure of prosperous, thriving folk. But there was still too much of the poverty that begets disease and too many people were still living under social and economic conditions that afforded little margin and were not likely to be conducive to the establishment of health reserves. There was a solid and increasing core of chronic incapacity which needed remedial measures, and though thoughts were being turned to this problem, little had been done to tackle it. The machinery of administration, though simplified by legislation of the ten pre-war years, still left areas of local health authorities too small for certain purposes, like hospitals and water supplies. There was not yet a real integration of the health services of the country as a whole; that could only come from effective co-operation between the several agencies controlling different aspects of the health services, different facets of what is essentially one major public health issue. It remained to be seen how the health of the people and machinery of health administration would respond to the shocks and strain of modern war.

CHAPTER 2

PORT SANITATION

GENERAL

THE routine procedure in connexion with the sanitary supervision of ships from oversea arriving at Scottish ports was in part simplified and in part much complicated by the advent of the war. Simplification resulted from the fact that the immediate emergence of submarine warfare led to the virtual closure for ordinary purposes of the majority of the seaboard areas concerned, and to the concentration of practically all the oversea shipping in the narrow waters of the Clyde Estuary. It was, of course, not only shipping ordinarily routed to Scotland which was concentrated there, for, between the years 1940 and 1945, the bulk of all shipping routed to Great Britain had, for reasons of security, to be diverted to the Clyde. Thus for the ports in general there was a relative freedom from the anxieties of sanitary supervision; but nevertheless there were certain features which complicated normal working. These were related principally to three factors:

The uncertainty, imposed by the imperative need for wireless silence, as to when arrivals might be expected;

the frequent transportation of civilians (survivors and others) by ships of H.M. Navy, in which the civil authorities had no statutory jurisdiction; and

the amendment of the Aliens Order, 1920, under which it was required that all aliens arriving in this country should be subjected to adequate medical examination.

Added to these, the insistent claims of the Security and Immigration authorities and of H.M. Customs increased the difficulties of those concerned with sanitary control, as did the fact that arrivals as a whole had a character far more cosmopolitan than anything which had been encountered on the same scale before. Further, it was not only the human element in the situation which had to be considered. The importation of food in enormous quantities had serious sanitary correlations; for food was, in the truest sense of the word, the fundamental munition of war.

The port sanitary supervision of the country is thus almost without a war-time history, except so far as the Clyde Anchorages are concerned, and the following brief description of the activities of the Anchorages may be said to represent the operation of the port sanitary services as a whole.

THE CLYDE ANCHORAGES

As mentioned in *The Emergency Medical Services*, Volume II, Part I, Chapter 4, the need of a comprehensive and co-ordinated scheme to deal with the increased shipping expected to use the Clyde Estuary, was realised. The Civil Defence arrangements are appropriately described in that volume; the special public health measures rendered necessary by war conditions are dealt with in this chapter.

As a result of inquiries which were undertaken by a committee under the chairmanship of Lord Patrick, it was decided that the limits of jurisdiction of the Port of Glasgow should be extended to cover an emergency establishment known as the Clyde Emergency Port; the limits of which, including the contained sea lochs, lay between two roughly parallel lines drawn (*a*) northwards from Port Glasgow, and (*b*) from Cloch Point to Dunoon—excluding the harbours and docks within the jurisdiction of the local authority of the Port of Greenock.

The local authorities which abutted upon the Clyde Emergency Port so constituted—referred to hereafter simply as the Clyde Anchorages—were the counties of Renfrew, Dunbarton and Argyll and the Burgh of Greenock, each with its own arrangements for medical and sanitary control. It was, however, clear that an extended port working under unified control for all other purposes could not be satisfactorily supervised by several medical authorities working independently. After a series of conferences in the autumn of 1940, therefore, it was agreed by all concerned that the problems presenting themselves could be dealt with only by the establishment of an Emergency Port Health Administration which would assume responsibility for the working of the area at large. The obligations thus represented were undertaken by the Port Health Authority of the Corporation of Glasgow, the existing organisation of which was the only one available which possessed the resources and the potential of expansion which were necessary. A tribute must be paid to the wholeheartedness with which the other riparian authorities co-operated in surrendering their own statutory rights in order, as a temporary measure, to give effective support to an important phase of the national war effort. As an exception to the general provisions which were formulated, it was agreed that the local authority of the Burgh of Greenock, represented by its Medical Officer of Health, should maintain its ordinary sanitary supervision of merchant shipping actually entering the docks or harbours of the burgh. This was a theoretical arrangement for, in the main, the practice of the Burgh of Greenock was completely integrated with that of the Anchorages at large. There is no doubt that the close liaison which was evolved was of material moment in the prosecution of the war at sea. The Department of Health acted as the agency through which the details of the scheme, operational and financial alike, were adjusted. The subject may be briefly considered under two main headings, namely:

Port Sanitation and Infectious Diseases in relation to the Anchorages; and The Welfare of Refugees and of Merchant Seamen.

PORT SANITATION

In theory, the augmented duties which were undertaken by the Glasgow Port Local Authority were rendered less onerous by the comprehensive arrangements which characterised the operation of the Port of Glasgow in peace-time. While the other riparian authorities all had their own statutory duties in respect of shipping lying in their waters, and while Greenock, in addition, was constituted as an 'approved port' for deratisation certification under the Port Sanitary Regulations, it fell to Glasgow boarding officers alone to board ships at the 'Tail of the Bank', off Greenock. All ships from foreign ports which were proceeding upstream to the harbour at Glasgow were thus examined before docking operations were carried out. The ordinary duties of the boarding medical officers covered the whole range of activity relating to sanitation and the infectious diseases, together with co-operation with the Immigration Officers so far as aliens were concerned.

From the time of the outbreak of war, certain changes had taken place in the boarding procedure on the Clyde at the behest of the Admiralty. The boarding station, for example, was moved a few miles downstream, and ships were no longer permitted to come to anchor at the Tail of the Bank. This necessitated an alteration in the boarding procedure. Again, the masters of ships did not know their ultimate destination until their arrival at the boarding point, and even after the latter was reached delays and uncertainty were apt to occur because of prevailing congestion in the upper river and of the varying and sometimes conflicting needs of the war situation. Thus a ship which had passed through the protective anti-submarine boom might be sent into Greenock docks, directed forward to Glasgow—or possibly, at a later time, to the new port of Faslane in the Gareloch, diverted to another port, detained in the Merchant Shipping Pool to await cargo, dispatched overseas in convoy, or ordered to discharge freight into lighters within the area of official jurisdiction of one or other of the riparian authorities. The number of vessels of different types and dimensions—and of different nationalities and ports of registry—lying in the Anchorages varied greatly, but concentrations of one hundred or more were common. The necessity was thus early made clear for the unification of medical and sanitary control, without which chaotic conditions would have speedily developed. In the early months of the struggle, delays inevitably occurred in the execution of the necessary sanitary work and in the granting of *pratique*, and these delays were highly inimical to the prosecution of a war effort which demanded the utmost possible use of every ton of cargo-carrying space. It was, in fact, impossible for the work to be carried out expeditiously, efficiently or economically by the

existing boarding medical staff of the Glasgow Port Local Authority; and that this should have been so is easily understood when it is realised that some 70 per cent. of incoming British cargoes were dealt with on the Clyde which, during certain periods of the war, merited the description of the most notable port in the world.

Reinforcements of various kinds had therefore to be provided. A Port Health Office was established at Greenock, in charge of the Port Boarding Medical Officer. The latter was assisted by at least two assistant medical officers, and at times by three or more; and the sanitary inspector and clerical staffs were appropriately augmented. Additional sea transport within the Anchorages had also to be provided, and in due course this was forthcoming—partly through Government agencies and partly through the generosity of the British Sailors' Society, which presented to the authorities an excellently equipped ambulance launch bearing the name of the donors. Further, it was the practice in ordinary times to disembark cases of infectious disease and other illness at the time of actual docking; but in the circumstances which rapidly developed in the Anchorages such a course was impossible, as many of the vessels involved did not proceed to harbour but continued to lie in open water. Patients had thus to be removed by sea, generally to Greenock or Gourock, but also to other officially designated landing points around the Anchorages.

The closest possible contact was maintained between the Port Health Office, the Admiralty and other Service agencies, the various Medical Officers of Health whose duties were delegated to the Port Boarding Medical Officer and the District Hospital Officers of the Department of Health, and a mechanism of remarkable smoothness was gradually elaborated by the co-operative effort of everyone concerned. Delays diminished in frequency and ultimately disappeared altogether, and the transport of patients to the shore, and their admission if necessary to hospital, became almost automatic processes.

A similar expedition and efficiency marked the operation of the sanitary, as distinct from the purely medical, working of the Anchorages. This was made possible by the general agreement that, for the duration of the war, it would be directly and substantially to the benefit of the national effort that a common authority—the extended Glasgow Port Local Authority—should assume responsibility for the complete sanitary supervision of all shipping in the River Clyde, with the exception of such vessels as actually went to berthage in any of the built-up harbours, such as that of Greenock. Ships in the latter category remained, for ordinary sanitary purposes—food inspection, deratisation and the like—the responsibility of the appropriate local authority. Thus the County of Dunbarton retained certain obligations in connexion with vessels coming to berthage at the new port of Faslane, and the American Naval authorities assisted with the supervision of their own

shipping entering the funnel port of Rosneath, through which an immense volume of military traffic passed. A second new port, at Cairnryan on Loch Ryan, came to assume significant proportions as a trans-ocean terminal. Cairnryan was remote from the Clyde Anchorages, and sanitary control was exercised by the Medical Officer of Health for the County of Wigtown. The duties undertaken were governed by statute and need not be elaborated here. It is sufficient to record that the experiment was an unqualified success.

Having in mind the fact that military and naval personnel—British, Dominion, Allied and United States—passed through the Anchorages in hundreds of thousands, it was not to be expected that problems of difficulty should be wholly absent. Specific questions arose, for example regarding the *locus standi* of the civil authorities on board naval vessels, and as to the disposal by the civil authorities of Service personnel found on arrival in the Anchorages to be suffering from infectious disease. It was not, indeed, until April 1943, that completely harmonious working was achieved in this regard. At this time the occurrence of smallpox in certain incoming ships had already given rise to serious anxiety; and this circumstance, together with the ever-present fear of the importation of typhus fever, plague and cholera, prompted the Port Medical Officer (who was also the Medical Officer of Health for the City of Glasgow) to insist that, so far as these Convention Diseases were concerned, no person suffering or suspected to be suffering from cholera, plague, yellow fever, smallpox or typhus fever should be removed from any vessel whatsoever except by order of the Port Medical Officer or his personal representative. This point having been conceded by everyone concerned, Service and civilian alike, the way was opened for the formulation of the following declarations of principle, which were unanimously agreed upon. When effect was given to these principles there resulted a greater degree of unification in the medical workings of the Anchorages than anything previously achieved. It was agreed that:

> The Port Boarding Medical Officer should be free to board any Red Ensign or Blue Ensign ship, and to examine Service patients on board who were suffering from—or suspected to be suffering from—infectious disease of any kind.
>
> The Port Boarding Medical Officer should not remove any Service patient suffering from infectious disease on board ship without consulting the appropriate Embarkation Medical Officer (Army or R.A.F.) or Naval Transport Officer as the case might be.
>
> An Embarkation Medical Officer or Naval Transport Officer should not remove to hospital any case of infectious disease without consulting the Port Boarding Medical Officer.
>
> The Port Boarding Medical Officer alone should deal with patients suffering from—or suspected to be suffering from—cholera, plague, yellow fever, smallpox or typhus fever.

Where cases of different types of infectious disease had to be removed, the ambulance launches of the Port Local Authority and of the Naval Authorities were to be employed in such a way that cases of one disease only should be conveyed in one launch, so that the risks of cross infection might be minimised. Similar precautions were to be taken in the transport of patients by ambulance.

It was left to the Port Boarding Medical Officer and the Service Medical Officers at the Anchorages to work out the operational details necessary to give effect to these principles. At the same time, it was found possible to dispose of certain outstanding questions relating to the management of members of the United States and Canadian forces suffering from infectious diseases. The American authorities maintained their own hospital accommodation for infectious as well as non-infectious diseases at Cowglen Hospital, Glasgow, and by mutual agreement the American authorities were given the care of their own personnel. A similar procedure was adopted in the case of Royal Canadian Navy personnel—and, indeed, of Canadian Service personnel in general—who were, for the most part, accommodated in the infectious diseases quarters of H.M.C.S. *Niobe*—the H.Q. shore establishment of the Canadian Navy located in Smithston Institution, Greenock—or, alternatively, in the conveniently situated Gateside Infectious Diseases Hospital at Greenock. In addition, and with the object of meeting any special emergency, a standing arrangement existed between the United States and the Canadian Authorities and the Port Boarding Medical Officer that in case of need the latter would assist in making any further arrangements which might be necessary. Thus close co-operation on an international plane was fostered at the Anchorages with benefit to all concerned.

No patients suffering from plague, yellow fever or cholera were actually received at the Anchorages; and, despite grave anxiety about the possible arrival of typhus fever from the East—and from Ireland in the case of the Wigtownshire ports—there was, in fact, a minimum of trouble from this source. Only four typhus incidents occurred in Scotland—the word 'incidents' being used advisedly, for, although four individual cases occurred, these were in no way associated and no secondary cases occurred. In view of the degree of infestation among the population, this was a fortunate circumstance. Cleansing and disinfestation arrangements were maintained at Greenock for members of the Merchant Navy, and these may not have been without their good influence.

The occurrence of smallpox on ships reaching the Clyde Anchorages was a problem of more serious moment. From 1941 onwards, a number of ships, either suspected or conveying actual patients, arrived. Certain questions of fundamental public health importance were raised by the Medical Officer of Health for the City of Glasgow, who, as Port Medical

Officer, had particular interest and responsibility in the matter. The most important of these questions related to the imposition of quarantine, which was imposed by him upon a troopship which arrived in the Clyde on November 24, 1943, with a case of confluent smallpox on board. The ship's crew numbered 348, and a full complement of passengers was on board, namely, 3,100 troops and some 400 marine survivors. At the time of the outbreak of the disease there was on board sufficient lymph for the vaccination of only about 100 of the immediate contacts. A delicate situation therefore confronted the Port Medical Officer who, with a previous incident in mind which had led to a somewhat widespread outbreak of the disease, detained the ship and personnel for observation. This was a drastic step which received the moral support of a number of medical officers of health who were consulted on the matter; but the official view was contrary. The latter pointed out that the mechanism laid down by the International Sanitary Convention—of which Great Britain was a signatory—was designed to prevent hindrance and obstruction to shipping (a consideration of added importance in war-time) as well as hardship to individuals, by, *inter alia*, eliminating so far as possible the employment of a procedure involving the quarantining of contacts. With this object in mind, the Convention indicated the maximum measures which might be taken at ports in connexion with ships affected by one or other of the five major epidemic diseases. In direct relation to contacts, it distinguished between 'observation'—by which term is implied isolation on board ship or at a sanitary station on shore—and 'surveillance', that is, the grant to the persons concerned of free *pratique*, subject to the authorities of their areas of destination being informed of the circumstances and so enabled to observe their state of health as might be necessary. The official view was that as the articles of the Convention were detailed in the case of each disease and did not provide for 'observation' alternatively to 'surveillance', in the case either of smallpox contacts or typhus contacts, the ship should not have been detained. There was, it is true, a footnote in the Convention that 'observation' may, 'as an exceptional measure', be substituted for 'surveillance' in the case of persons who 'do not offer adequate sanitary guarantees'; but, even apart from the implication of the term 'exceptional measure', failure to offer adequate sanitary guarantees could scarcely arise where there is the assurance of a close medical supervision such as is provided by the efficient public health administration of this country.[4]

THE WELFARE OF REFUGEES AND REPATRIATES AND OF MERCHANT SEAMEN

The arrangements made to deal with the large numbers of refugees and repatriates coming into the ports of the United Kingdom after the German invasion of the Low Countries have been dealt with elsewhere

in this History (see *The Civilian Health and Medical Services*, Volume I, Part I, Chapter 9).

As far as Scotland is concerned, most of the organised parties arrived in the Clyde Estuary and were later distributed throughout the country. The arrangements made for their reception and disposal have, as a matter of convenience, been fully described in *The Emergency Medical Services*, Volume II, Part I, Chapter 4, as they were for the most part dealt with by the same agencies as those concerned with the reception and distribution of marine and other casualties in the Estuary. The Welfare of Merchant Seamen has also been described fully in the same chapter and in Part II, Chapter 4, The Ministry of Transport, in *The Civilian Health and Medical Services*, Volume I.

AIR PORTS

Before the war, Scotland was affected scarcely at all by the development of international air traffic, and, while the ordinary public health mechanism was available for the medical and sanitary control of flying fields, it was exceptional indeed for any action to be required except at Leuchars, where certain services with Scandinavia were centred. With the outbreak of the war, however, the situation changed radically, and international air traffic in greater or lesser volume came to involve both existing and new airfields in new public health problems. The counties of Ayr and Fife were specially affected—particularly the former, for it was here that the immense international traffic converging upon Prestwick was built up. While principally concerned with the transatlantic route, Prestwick was nevertheless a point of reception for air transport from all quarters of the world. The statutory public health responsibility of the Medical Officer of Health was clear, but it was complicated by the fact that Prestwick, in common with all other aerodromes, had of necessity to be pressed into the service of the State. Thus the Royal Air Force came to be the presiding authority; and, after an initial period of uncertainty it was arranged at a series of meetings between the local authority, the Air Ministry and the Department of Health that, for the duration of the war, the medical and sanitary control of the airfields should be delegated to the Medical Branch of the Royal Air Force. In the interests alike of security and of economy in medical man-power, the arrangement was a right and proper one, and its operation was found to be satisfactory. Close contact was maintained between the Service and civil authorities and such occasional problems as were encountered were dealt with successfully.

CHAPTER 3

EVACUATION AND CARE OF THE HOMELESS

EVACUATION

The First Evacuation. Evacuation in Scotland fell into two distinct phases, the first associated with the Official Evacuation Scheme, and the second that which followed the intensive air raiding of the Clydeside areas in 1941. The first movement in mass may be described as the evacuation of election, and the second as the evacuation of necessity. In the first, the initial sending areas were Glasgow, Edinburgh and Rosyth, Dundee and Clydebank; and the following table indicates the numbers transferred to the reception areas—which covered the major part of the country south of the Caledonian Canal—between September 1 and 3, 1939:

Class of Evacuee	Sending areas					Totals
	Glasgow	Edinburgh	Rosyth	Dundee	Clydebank	
Unaccompanied children	42,280	11,311	361	6,288	1,819	62,059
Accompanied children	50,898	12,750	291	7,121	2,246	73,306
Total children	93,178	24,061	652	13,409	4,065	135,365
Mothers	16,517	4,470	123	2,377	782	24,269
Teachers and helpers	8,976	2,864	89	1,404	312	13,645
Special school children	813	347	—	101	65	1,326
Totals	119,484	31,742	864	17,291	5,224	174,605

On September 22, 1939, it was decided that the towns of Inverkeithing and North and South Queensferry should be added to the list of sending areas and from these a total of 207 persons were transferred.

For the Official Evacuation Scheme, the local authorities of the reception areas were requested early in 1939 to carry out a survey of accommodation to provide a basis upon which the operation could be planned. At the same time the Department of Health, in association with the Scottish Education Department, was occupied in making a detailed classification of the reception areas and in considering the selection of priority classes for the purposes of the scheme. As figures of vacant accommodation became available, they were correlated with

other relevant information and provisional plans were completed and in the hands of the local authorities at the end of April 1939. For the broad purposes of planning, three types of area had been designated, namely, the sending, the reception and the neutral. The approximate populations of these were 1,760,000, 1,210,000 and 1,880,000 respectively. The terms 'sending' and 'reception' are self-explanatory; and 'neutral' areas were defined as those which, while not themselves to be evacuated, were not regarded as being suitable for the purposes of reception. They included such populous districts as the City of Aberdeen, the Burgh of Dumbarton and the industrial belts of the Counties of Lanark and Renfrew. In the preliminary planning it was expected that the population of the reception areas might be augmented by upwards of half a million people from the sending areas. The housing of this incoming mass was, of course, a matter of serious concern, and it early became clear that the private dwelling house must remain the principal asset at the disposal of the Government. The standard of accommodation which was decided upon—and which was to be applicable alike to existing occupants and to those who were to be received—was one habitable room per adult person, each child under 14 years of age being reckoned as half an adult. On this basis it was concluded that, even if 500,000 people were transferred to the reception areas, accommodation could be provided, although some congestion was likely in certain areas. Children of school and pre-school age, the latter to be accompanied if need be by parents or guardians, formed the evacuation class of first priority. Other classes for whom it was considered necessary to make evacuation arrangements, which would become operative after the general child evacuation had been completed, included expectant mothers and the blind. The question of the crippled was also considered; cripples as such did not form part of the official evacuation in Scotland, but some crippled children were, of course, evacuated with others from institutions in Glasgow, Edinburgh and Dundee. Between April and September 1939, continuous guidance was given to local authorities on the operation of the plans, both by the issue of circulars and memoranda and by the holding of conferences; and steps were taken to familiarise all those specially concerned—particularly the Chief Evacuation Officers in the sending areas and the Chief Reception Officers in the reception districts—with the details of what they would be required to do. At the same time comprehensive transport arrangements were completed by the Department of Health in consultation with representatives of the two railway companies and the road transport authorities.

The Supplementary Evacuation. During the six months following the evacuation in mass, a scheme for supplementary evacuation was continuously in operation, but it yielded small results. It was designed particularly to minimise as far as possible certain of the unsatisfactory

features of the main movement, which are referred to below. Under the scheme, parents were required to register their children for evacuation in order that an adequate medical examination, with treatment if necessary, could be carried out before their transfer to the reception areas. The response was poor, due in part to the continued absence of enemy activity, and in part to certain unfavourable reports from the reception areas; and by March 3, 1940, no better showing could be found than that which is evidenced by the following figures:

Number of children registered	12,052
Numbers evacuated . .	5,953 children; 114 teachers and 9 helpers

The Drift Back. Not only did the supplementary scheme prove relatively abortive, but a progressive fall took place in the numbers of those evacuated. The drift back, indeed, began practically from the outset, and the anomalous situation was encountered in which, even as the later evacuees were reaching their destinations on September 3 and 4, 1939, certain of the earlier travellers were already making their own way home. Thus by the end of September the original total of 175,000 had shrunk to 140,000. In November only some 82,000 remained in the reception areas; and by January 1940 this number had further diminished to about 40,000. Throughout 1940 a more gradual but still progressive decline took place, and between January and March 1941 only some 18,000 Scottish evacuees remained in the reception areas; but to these must be added 11,708 people who came from evacuation areas in England. In theory, Scottish evacuees did not cross the Border; and in theory, likewise, English evacuees were not accepted under the Scottish scheme. Faced by heavy bombardment in their home areas during 1940, however, several thousands of people with English domiciles migrated to Scotland and took up private residence there. Many of these either already were or later became homeless through the destruction of English property; and accordingly, towards the end of 1940 some 12,000 of the English people who had secured Scottish accommodation through private arrangements, and whose homes were destroyed, were granted privileges under the Official Evacuation Scheme and placed in billets under Government auspices. Many of these English evacuees were among the last to return to their home areas.

The Revised Scheme. In February 1940, after a comprehensive review of the evacuation plans, the scheme was radically recast. The revised plans, which were designed to eliminate many of the difficulties which had arisen under the original scheme, provided for the evacuation of school children only, and their operation in any area was to be contingent upon the development of enemy air attacks upon that area. Provision was again made for the advance registration of children, and steps were taken to secure the fullest possible exchange of information between the sending and reception authorities and to improve, partly

by the establishment of cleansing stations in the sending areas, the arrangements for the medical inspection and treatment of registered children. The number of children allocated to each reception area was revised on the basis of the latest available information, and local authorities were encouraged to supplement the accommodation available in billets by the employment of hostels. In the summer of 1940, following the attacks upon Norway, Denmark and the Low Countries, a further review of the evacuation plans was carried out with the object of avoiding, as far as possible, the dispatch of children to east coast districts. During the year, five camps which had been provided through the agency of the Scottish Special Housing Association under the Camps Act, 1939, were completed and occupied by school children from the sending areas. Increases were also made in the rates of billeting allowances payable for school children, and the general payment of allowances in respect of persons in the priority classes who had secured accommodation through private arrangements was authorised. This matter had a medical bearing in so far as it affected the number of people entitled to participate in the medical and hospital arrangements made by the Department of Health.

The response of the public to the new scheme was almost as meagre as had been the case earlier, and it was not until after the massive attacks on Clydeside that any further evacuation movement of moment took place. In March 1941, however, it was decided to evacuate from Glasgow any children whose parents desired to avail themselves of the provisions of the scheme, and by the end of the second quarter of the year some 12,000 school children had been transferred in official parties. In addition, between March and June 1941, 90,000 people evacuated themselves voluntarily from Glasgow to accommodation secured by private arrangement, and a considerable proportion of those who remained in the reception areas for any length of time were sooner or later included among those for whom billeting allowances were paid. As on the former occasion, however, the fall in numbers was rapid, although the downward curve was less acute than was the case in relation to the first movement in mass. Such retardation of return as did occur was, of course, due to the destruction of homes and the

Date	No. of evacuees
June 30, 1941 .	142,000
July 31, 1941 .	120,000
December 31, 1941	76,000
June 30, 1942 .	54,000
December 31, 1942	40,000
June 30, 1943 .	33,200
December 31, 1943	25,800
June 30, 1944 .	2,000*

* Exclusive of some 5,000 evacuees from England.

consequent diminution of accommodation in the vulnerable areas. Nevertheless, the fall in numbers throughout 1941 was considerable and progressive, as the preceding figures show.

By the middle of 1942, 106 hostels, with accommodation for over 3,500 school children, had been brought into use. Provision had also been made for the establishment of sick-bays in the reception areas, and for setting up residential nurseries under the auspices of the Scottish Council of the 'Save the Children Fund'. During the period of their maximum activity, in 1943, seven such nurseries were in active routine operation. In 1941, two Welfare Officers were appointed by the Department of Health to stimulate welfare activities among evacuated and homeless people. They did useful work in inspecting hostels for children and in encouraging the establishment of clubs for evacuated mothers and for the blind, and play-centres for children.

MEDICAL ARRANGEMENTS

Special medical arrangements were necessary in both sending and reception areas to meet their respective problems. In the case of the latter, these arrangements were designed primarily with a view to treatment, and provision was accordingly made for domiciliary and institutional medical care and for the establishment of special clinics and of sick-bays in hostels and elsewhere in which cases of minor illness of a non-infectious nature could be cared for. In the sending areas the problem was of a different nature. It was essentially one of preventive medicine and was directed specially towards the control of infection and infestation in children registered for evacuation under the supplementary and revised schemes. Because of the precipitancy with which the original movement in mass had to be effected, it was not considered possible to subject the prospective evacuees to a preliminary medical inspection before their departure for the reception areas; but the seriousness and magnitude of the problem of infestation and skin infection had not been foreseen. The volume of infestation and infection—vermin, scabies, impetigo and the like—which suddenly erupted into the reception areas was such that it shocked the susceptibilities of the public health authorities and the voluntary workers who had been recruited to assist in the care of the evacuees, and aroused the conscience of the country. A repetition of this initial experience would have been intolerable, and the supplementary and revised schemes incorporated as cardinal principles the cleansing of children before they were removed from the sending areas.

Verminous Conditions. Arrangements were made for the cleansing and supervision of infested children in the interval which ordinarily occurred between the time of their registration and their actual transfer to the reception areas. It was, of course, well recognised that home conditions would often interfere with the maintenance of cleanliness

once the latter had been achieved, and the ideal was to transfer the children immediately after disinfestation. From certain figures compiled by the medical authorities in the City of Glasgow, the chief sending area, it appeared that some 69 per cent. of the children presented for evacuation were free from infestation or, at least, the gross manifestations of it, so it was assumed that the medically uncontrolled movement had carried into the reception areas children of whom at least 31 per cent. were infested.

Contagious Diseases. Scabies and severe impetigo were specially prevalent and to deal with them special centres for intensive treatment were established in the sending areas or in specific reception areas within easy reach. In other cases arrangements for treatment were made with the authorities in the reception areas where centres for the care of contagious diseases in children who had travelled with the movement in mass had already been opened.

Infectious Diseases. Provision for hospital care was made both in the sending and reception areas and the scheme devised for mutual assistance between all the health authorities operated satisfactorily from every point of view.

In the reception areas a system of medical control, which was at once more comprehensive and more complicated, was instituted. It comprised the following units or particulars:

Clinics. Out-patient facilities were provided for the treatment especially of infestation and skin infection. Much assistance was given to the medical officers of health by local district nursing associations and other agencies, such as the British Red Cross Society and the Women's Voluntary Services.

School Medical Services. The education authorities in the reception areas were instructed by the Scottish Education Department to adapt the school medical arrangements to meet the altered circumstances. In many cases this involved an increase in the number of sessions and an extension of working hours at existing minor-ailment clinics. New clinics had to be opened at certain schools and in the vicinity of others. Child patients referred either by teachers or by householders were examined in these clinics. In all schools where the number of children was considerable, it was regarded as imperative that special classroom inspections should be carried out with some frequency. This policy was adopted because of the ever-present risk of epidemics of infectious diseases. Preventive measures which were generally prescribed included the following:

> The scrupulous supervision of contacts of notified cases of infectious disease, and of cases of the non-notifiable infectious diseases of childhood. Immunisation, which was the immediate concern both of the public health and education authorities, necessitated close integration of the work of these two bodies.

Special regard for sanitation in schools and billets. In this connexion the conserving of water was a consideration which in some districts was of great importance notwithstanding the abundant Scottish rainfall.

Maintenance of systemic health. At the time of the outbreak of war the consumption of milk under the 'milk-in-schools scheme' was suddenly much reduced through the operation of the twin agencies of evacuation and the closure of schools in the sending areas. At the end of 1939, however, a joint memorandum was issued by the Department of Health for Scotland and the Scottish Education Department urging education authorities to resume the supply of milk and, in reception areas, to encourage evacuated children to take milk in schools. This step preceded the inauguration of the National Milk Scheme to which reference is made elsewhere (Environmental Services: Milk), and it was of at least presumptive value from the point of view of general child nutrition. The provision of communal meals was also a valuable factor, as was the encouragement of recreational activities from the point of view of general welfare.

The adoption by local authorities of pooling arrangements, which were of the utmost value in the maintenance of the school medical and dental services.

Domiciliary Care. In addition to the ordinary billeting allowances paid to householders caring for evacuated children, local authorities were authorised in June 1940 to make additional payments at the rate of 5s. per week in respect of each child to householders who undertook the direct nursing care of unaccompanied children suffering from minor ailments which could be appropriately treated in the home. In order to qualify for this additional grant, it had to be shown that the child's illness necessitated confinement to billet; and to this end an appropriate form of medical certificate was devised. The professional work of the domiciliary scheme was carried out by practitioners belonging to the National Health Insurance Scheme, who were remunerated in accordance with the financial provisions of the Scheme.

Hospital Care. In this connexion three categories of officially evacuated patients—apart from expectant mothers, who are dealt with under Maternity Services—had to be considered, namely: unaccompanied child evacuees suffering from ordinary illness requiring treatment in hospital; evacuees suffering from infectious diseases; and child long-term patients already in hospital in the sending areas and transferred to institutions in the receiving areas.

The services, medical and surgical, of all hospitals (in the reception areas only) belonging to the Emergency Hospital Scheme were freely at the disposal of all unaccompanied child evacuees under the official scheme who were suffering from ordinary illness or from accident. Evacuated adults and accompanied children, as well as all private evacuees, were subject to the ordinary routine of admission to the voluntary hospitals, or liable for their own expenses if otherwise treated,

although cases did arise in which, on humanitarian grounds, patients suffering from acute illness were freely admitted to whatever institution happened to be most convenient geographically.

The occurrence of infectious diseases in the evacuee, child or otherwise, was the concern of the local authorities. It was, however, recognised by the Government that it was clearly inequitable that individual authorities should be required to meet the heavy additional burden which the presence of the evacuated population tended to impose. A mechanism of financial recovery was accordingly set up whereby reimbursement to the reception area was required in certain specific instances—in connexion, for example, with the non-priority classes—from the funds of the sending areas in which the patients had their domicile; but under the ordinary practice appropriate adjustments were made through the National Exchequer.

The evacuation of children from 'vulnerable' hospitals to other institutions in the reception areas was a duty of the hospital officers of the Emergency Hospital Scheme. It may, nevertheless, be also mentioned under the present heading. Operations of this nature took place both at the beginning of the war and intermittently at later periods from Glasgow, Edinburgh and Dundee. The process naturally attained its maximum momentum in the days which coincided with movement in mass; but the procedure persisted in some measure during the whole period of the war—with this differentiating feature, that the operations, at first involving bulk transfers, came later to be sporadic in character, affecting individual children or small parties, and adopted on grounds of expediency rather than in the interests of the safety of the children. A characteristic movement of the former kind took place from Glasgow in the early days of the emergency, the details of which are as follows:

From	To	No. of children
Royal Hospital for Sick Children	Country Branch, Drumchapel	25
East Park Home	East Park Home, Largs.	65
Southern General Hospital	Culzean Castle, Ayrshire	7
Canniesburn Hospital	Kirkton Home, Millport	4
Mearnskirk Hospital	St. Andrew's Home, Millport	287
Victoria Infirmary	Brooksby Home, Largs.	2

All the initial transfers, and some of the subsequent ones, became charges against the Emergency Hospital Scheme and were classified as 'Transfers on the authority of the Hospital Officer'.

Questions regarding the maternity and children's services in relation to the evacuation are dealt with in the appropriate sections.

OVERSEA EVACUATION

In Scotland, 26,900 applications for the evacuation of children oversea were received under the Overseas Reception Scheme. Of these, 5,662 were approved; for England and Wales the comparable figure was 18,852. It was, however, possible to transfer under the official scheme only 462 Scottish children. These were evacuated to the Dominions during the months of June, July and August 1940—during the period, that is, when the fear of invasion was at its height. In October of the same year, however, the intensity of the U-boat campaign and the loss of many evacuees at sea, as well as the acute shortage of shipping, led to a suspension which was, in fact, a virtual abandonment of the scheme.

As regards the medical arrangements under the scheme, the Dominion Governments desired not only that a minimum medical standard should be applied in the examination of prospective evacuees, but that so far as possible a uniformity of standard should be attained. In order to achieve this, the Dominion representatives expressed a strong desire that medical reporting on all children presented for acceptance under the scheme, whether they attended grant-aided schools or schools of other types, should be carried out by the school medical officers of the areas in which they were situated. With the assistance of the Scottish Education Department and the co-operation of the local authorities, arrangements to this end were made.

REVIEW OF EVACUATION EXPERIENCE

Many controversial issues were raised during the actual course of the evacuation, and some of these are inevitably encountered when an endeavour is made to review the whole experience. At the outset many of them are found to be irrelevant when it is recalled that, except on grounds of security, the scheme was not advanced by any responsible authority as a desirable thing in itself. Many of the other issues, being purely social in character, are not considered here, but it may be mentioned that the disproportionate number of female adults who participated in the scheme was one of the influential factors which tended to disrupt it; and its disturbing effect was evident from the social and medical aspects alike—in the latter because of the tendency of the adult to interfere in the treatment of her children, and of the readiness with which, as indicated in the figures already given, she chose to terminate the experiment on the first experience of discomfort. In the face of these figures, it is difficult to avoid the conclusion that the scheme as a whole was a failure in Scotland; yet it had certain redeeming features of which by no means the least were the following: the light which it shed upon the prevalence of infection and infestation, and the inference which could be drawn from the latter as to the

disquieting public health conditions under which a considerable proportion of the people lived; and the fact that in such instances as made it possible to put the experiment to a proper test, a material improvement in physical health resulted.

The first point served a most useful immediate function by producing a painful impact upon the minds both of the public health authorities and of the public at large. The initial effect was one of surprise and anxiety—almost of disbelief; but it was speedily followed by dismay as the reports continued to pour in from the reception areas. There is no doubt that conditions were deplorable. The common conscience was aroused and for the time being there was a general awakening to the reality of what was conceded to be a national reproach. The more serious items in the indictment were:

Lack of Cleanliness. This term is inclusive of most of the disagreeable features which were associated with the evacuation and it may well be correlated with the findings of a privately instituted inquiry in respect of the clothing of the child evacuees. This survey,[5] which covered groups all over Scotland, indicated that the clothing of the latter was

Very good, Good, Adequate .	42 per cent.
Mixed Good and Bad . .	19 per cent.
Bad or Deplorable. . .	39 per cent.

The last figure corresponds well enough with the figures for infestation among children registered for evacuation in the City of Glasgow; and it would seem to be justifiable to suggest that not less than 30 per cent. of the evacuated were highly unsatisfactory from the point of view of cleanliness. Further, want of cleanliness seldom existed alone but tended, naturally, to be related to the greater or lesser evidences of superficial infection, infestation and, in many cases, malnutrition which accompanied it. By intensive effort it was possible to deal successfully with the ordinary infestation of those who remained sufficiently long in the reception areas; but impetigo and scabies, with or without secondary infection, proved more intractable and could only be eliminated by the co-operative endeavour of all available agencies—home treatment, the clinic, the cleansing station, the sick-bay and the hospital. A feature which was disheartening to the medical officer of health was the frequency with which children, after having been cleaned up, were re-infested or re-infected by the relatives who visited them. The effort of cleansing in the reception areas was more or less a wasted one, unless a simultaneous process of the same kind was operating in the sending areas.

Enuresis. Serious as was the problem of infestation it was at least subject to direct and successful attack. The problem of enuresis, however, with its implications in general medicine and psychology, was completely different in character. It is impossible to reach a reliable estimate of the frequency with which the condition was encountered,

for many housewives made the best of it and struggled with the problem for themselves rather than call for aid from the authorities. It would nevertheless be fair to assess the incidence at something between 5 and 10 per cent. of the child evacuees and to suggest that in 90 per cent. of the total cases the essential cause was to be found either in faulty training or actual neglect, or in the psychological reaction to enforced residence in strange and by no means always congenial conditions. It is not likely that more than 10 per cent. could be classified as sufferers from essential enuresis. This is an outside figure which includes those mental deficients who in the first rush of evacuation had evaded the reach of the agencies responsible for them and had been transferred with the movement in mass. Valuable work was done in hostels and sick-bay services in the treatment of evacuees suffering from this condition.

Dirty Habits. Little need be said under this heading, which implies unfamiliarity with or failure to employ the elementary methods of sanitation. The frequency with which contamination of property by bodily secretions was permitted to occur was a painful as well as disgusting feature of the evacuation and one which is wholly social. Infestation and infection were things which, up to a point, might be condoned. There were at least specific physical and environmental factors involved and those provided an explanation which if not satisfactory was nevertheless not wholly unacceptable. The psychological background of the enuresis picture likewise provided certain mitigating features; but the acceptance even by a few of sheer dirtiness of habit is in a different category and its presence may be interpreted as indicating an unstable element in the social fabric, requiring careful investigation and treatment.

To sum up, it may be said that apart from revealing an unsuspected prevalence of certain disagreeable conditions—on the whole minor in themselves but formidable in the mass—the evacuation presented few medical problems. As an index, however, of unsatisfactory and in some cases of deplorable social conditions the experience was a valuable one; but its lessons will be of no avail unless it leads to positive endeavour on the part of every national agency concerned. Although medicine, by methods using new discoveries, was able to accomplish a great deal in the treatment of these conditions during the war, their ultimate solution would seem to lie rather in the field of education and in housing.

CARE OF THE HOMELESS

The Emergency Relief Organisation. During the period of planning in the year which preceded the outbreak of war it was clear that comprehensive arrangements must be made for the housing and care of people rendered homeless through the effects of enemy action. With

this object in view the Emergency Relief Organisation was established and it had three main functions to fulfil, viz., the provision in Rest Centres of food and temporary shelter for homeless individuals; the supply of information and assistance for people, whether homeless or not, who were in difficulties by reason of enemy attack; and the provision of accommodation in billets or unoccupied buildings for people whose homes were so devastated that an early return to them was impossible. The organisation was set up under local authority auspices in various stages from July 1939 onwards and the Public Assistance Departments were in the main responsible for its operation.

Rest Centres. Throughout Scotland some 2,700 halls, schools and other buildings were selected and equipped as rest centres. The arrangements for the welfare and comfort of the occupants were progressively expanded. Special attention was paid to sanitary arrangements by adaptation and new construction, and medical control was provided for by the enrolment of local practitioners. Equipment was, in the main, the responsibility of the Department of Health for Scotland, but much of it was acquired by ordinary purchase by the authorities on the spot subject to appropriate grants from the Exchequer. In addition, generous gifts of blankets, clothing and the like were received from the public, from American sources and from various voluntary organisations. These gifts were distributed with the efficient and untiring help of the Women's Voluntary Services. Reserve stocks of equipment were held at strategic points throughout the country in order that sudden emergencies might speedily be met. The centres were staffed by teams of voluntary workers under the direction of the Emergency Relief Officers of the local authorities. In this connexion also, valuable assistance was given by the Women's Voluntary Services and the authorities were specially indebted to clergymen, church members and school teachers for their help. The faithful and generous service given in the unspectacular maintenance of the Emergency Relief Organisation was one of the most gratifying features in the whole record of civil defence.

From the point of view of medical interest, the rest centre was the most important single unit in the Emergency Relief Organisation, under the auspices of which many thousands of refugees from overseas found temporary shelter and succour—this function, of course, being fulfilled altogether apart from ordinary activities. The number of centres remained fairly steady at about the 2,700 mark as already mentioned. They were capable at one and the same time of caring for numbers estimated approximately at 300,000; and their staffs amounted to some 70,000 officers and helpers. As was inevitable, most of the buildings which had to be chosen for the purposes of the organisation were ill-equipped for domestic use. Accordingly, it became the duty of the medical officers of health to inspect the centres before they were

commissioned and to make recommendations in regard to their hygienic requirements: that is, sanitary conveniences, washing facilities, ventilation, sleeping and living accommodation, and cleansing. Since rest centres were designed for temporary occupation only, it was impossible to embark upon any extensive or elaborate schemes of adaptation; and equipment of a portable rather than a permanent and fixed variety was in most instances supplied.

Arrangements in respect of the formal medical supervision of those admitted to the rest centres included a daily visit, where necessary, of one of the local authority's medical staff or of a general practitioner acting on his behalf to each rest centre which was in operation; the constant availability of a medical officer for emergency calls; and provision for such nursing care as might be required.

Information Centres. These centres were set up by local authorities of all large burghs, while smaller units were established in small burghs and other populous areas in the county districts. Portions of available buildings such as libraries and schools were employed for the purpose and, where possible, various other local services as well as Government agencies specially concerned with relief were located in the same premises. In each information centre a central index was maintained and here records were kept of the homeless and of casualties. The tracing of these two classes was constantly facilitated. Those centres which actually operated, as in Clydebank, Greenock and Glasgow, fulfilled their function admirably and proved of much value in restoring the morale of the people. The contacts which were established with the emergency hospital organisation were of great assistance in bringing reassurance to the relatives of the injured. By the end of 1941, 220 information centres had been commissioned.

Mutual Aid Arrangements. The rest centres were designed to do no more than provide for the immediate needs of the homeless and local authorities were expected to have them cleared as soon as possible, preferably within 48 hours, in order that they might be maintained in a state of readiness to meet new calls for assistance. In order to relieve potential overloading, householders were requested to arrange in advance for friends to give them immediate shelter if they were rendered homeless. Local authorities made fresh surveys of accommodation in occupied and unoccupied premises to meet the needs of homeless people who had been unable to make satisfactory dispositions for themselves. A formal 'mutual-aid' scheme was conceived and put into operation in 1941 under which door-to-door canvasses were carried out with the object of encouraging householders to arrange in advance the reception, if need be, of bombed-out individuals or families. This scheme had an important medical bearing in that it was in part designed to lessen the risks to health which were incidental to the hazards of exposure and mental stress. It was participated in by 22 large burghs,

120 small burghs and nine counties in the industrial belt; and it was accepted with so much good feeling and understanding that in some areas as many as 75 per cent. of the householders were found to have made mutual-aid pacts. In consequence, while billeting of the occupants of rest centres was carried out as was required, it never had to be resorted to upon any extensive scale.

COMMENTARY

Unfortunately, the sudden and heavy attacks made on Clydebank in March and on Greenock in May 1941 caused the organisation much difficulty in functioning adequately. Some of the key personnel of the organisation were themselves homeless, consequently the operation of the rest centres was not conducted with that precision and efficiency that had been called for. Some of the rest centres in the adjacent receiving areas were at first overcrowded, which rendered supervision difficult and in consequence the initial vigorous control necessary in each centre was lacking. Co-operation was not firmly established between the Public Assistance Departments, the A.R.P. voluntary workers and the education authorities. For this reason the organisation was weak at the beginning. Many of the workers anxiously sought someone to whom they might refer for information and advice, but the essential administrative links had not been perfected by the time of the attacks and too often in the immediately following days no deciding authority could be found.

Despite these drawbacks the organisation afforded very material assistance and relief to the population in times of crisis.

In May 1945, after the termination of the war in Europe, local authorities were requested to close down and demobilise all rest centres and information centres in Scotland. Equipment was consequently disposed of while food stocks were transferred where possible to other services administered by the local authorities, any surplus being disposed of by the Ministry of Food.

CHAPTER 4

INFECTIOUS DISEASES

GENERAL

ONE of the major preoccupations of the central and local health authorities throughout the war was the possibility, never absent, of the occurrence of widespread epidemics of a serious nature; and it was an abiding cause for thankfulness that these grave expectations did not develop and that the country as a whole remained relatively free from outbreaks of infectious disease. A contrary situation might well enough have developed; and in order to appreciate how menacing in the aggregate were the potential factors, it is necessary only to mention the following: the frequent disruption of home life, the migrations of the people, the rapid and extensive development of war-time industry, food changes, and the discomforts of the blackout.

Only a passing reference need be made to the substantially commonplace incidence of the minor infections; and the war-time history even of influenza and the pneumonias was almost equally featureless, probably because of the therapeutic reinforcement which resulted from the use of the sulphonamides and of penicillin in infections of the lower respiratory tract. In the earlier war years there occurred some increase in the incidence of primary pneumonia which, however, even in the peak year of 1940, caused no particular anxiety. The increase is represented by the following figures:

1st Quarter	No. of notifications
1939	3,614
1940	6,355
1941	5,682
1942	4,304

Scabies, with its associated conditions, *impetigo* and *pediculosis*, was the first of the infections to obtrude itself on the consciousness—and, indeed, as recorded in Chapter 3, on the conscience of public health authorities and public in the early war years. The Scabies Order (Scotland) gave, in 1941, additional powers to medical officers of health for the treatment and control of scabies and other verminous conditions, and the establishment of special centres for treatment has already been dealt with in Chapter 3. In most areas of the country facilities (including in some cases the employment of gas-cleansing stations, which thus performed their most useful function) were provided for the cleansing of patients and the disinfestation of clothing. Within a few months a material improvement had occurred, and by the middle of 1942 it was

possible for several authorities to report that the prevalence of the condition was decreasing. The slackening of the incidence was progressive and the emergency measures which were taken, including their educative features, provided a useful demonstration of the effectiveness of intensive and co-ordinated public health effort.

The war-time insecticide discoveries, D.D.T., gammexane and the others, were not available for widespread public use in this country till the end of the war. There is no doubt that the use of benzyl benzoate changed and simplified the treatment of scabies and the use of lethane for head-louse infestation made treatment easy and effective. The cure of these 'dirt' diseases is now easy, so that their persistence is entirely attributable to failure to declare their presence, and thus to indifference and ignorance on the part of certain sections of the population.

Cerebro-spinal Fever. Shortly after the outbreak of war, the incidence of cerebro-spinal fever rose sharply. The increased frequency of the disease was presumably a direct consequence of war-time conditions. Apart, indeed, from tuberculosis and the venereal diseases, cerebro-spinal fever is probably the only representative of the major infections in Scotland about which this statement may properly be made. The figures relating to it are as follows:

Year	Notifications	Confirmed cases
1938	469	311
1939	491	304
1940	2,935	2,580
1941	2,511	1,868
1942	1,621	976
1943	1,295	641
1944	1,040	518

It is suggested that an influential factor in the increased incidence of the disease was the rapid enlistment and billeting, often under conditions which were not entirely satisfactory, of large numbers of young men and women. But although there were many cases in the Services, it was the civilian population that was mostly affected. The situation was in some ways a repetition of what occurred in the early stages of the War of 1914–18, but the results were very greatly modified by the use of the sulphonamides and, later, of penicillin. Also the basic principle of prevention—adequate space and ventilation—was understood and quickly applied, a factor which mitigated what might have been a really dangerous visitation.

Scarlet Fever. In 1938, the number of notifications of scarlet fever was 19,773. For the period 1935–9, the annual average of confirmed cases was 18,600, but a sharp drop then occurred. In 1940, the number of confirmed cases fell to 8,353, and a low level was maintained until 1942, when there were 14,209 notifications and 13,792 confirmed cases.

In 1943, the numbers were 15,108 and 14,722 respectively; but a diminution in the incidence again took place and in 1944 only 12,057 confirmed cases occurred, and 11,654 in 1945. From these figures it would appear that war-time conditions had no significant effect on the incidence of this disease.

Diphtheria. In the earlier war years diphtheria increased in prevalence. For more than thirty years before 1930, its incidence had risen (with temporary fluctuations) from about 3,000 annually to 10,000. In the succeeding ten years, the average was slightly less than 10,000. In 1939, the number of confirmed cases was 9,922—a figure which was, of course, too high, but which was nevertheless regarded as being within ordinary limits. In 1940, however, a sharp rise occurred, there being 15,711 notifications and 15,069 confirmed cases. In 1941, the figures were 13,586 and 12,395 respectively. The decline, illustrated by the figures 10,614 and 9,474, continued in 1942—the number of cases in this year being the smallest since 1933; and the decrease was maintained both as regards incidence and mortality. The following table is illustrative and significant:

Year	Confirmed Notifications	Deaths
1935–9 (average)	9,907	430
1940	15,069	675
1941	12,395	517
1942	9,474	290
1943	7,944	231
1944	6,835	183
1945	5,679	126

The increase both in incidence and in mortality during the initial period of the war led to an immediate reaction upon the part of the Department of Health and of the public health authorities alike; the circumstances which prevailed, which were likely to continue with augmented severity for an indefinite time to come, called for an active campaign for immunisation against the disease. Every agency, including the press, broadcasting, the public platform and advertisement, which could be called upon to serve the needs of the campaign was employed. Beginning at the end of 1940, the pressure of the public-health offensive was progressively increased throughout 1941. By the end of June in the latter year, approximately 440,000 children of school age and under—the equivalent of about 40 per cent. of the population in this age group—had been inoculated. At the end of the following year—that is, by June 30, 1942—some 792,000 children had been dealt with: 69 per cent. of the total age group, representing 73 per cent. of the school and 58 per cent. of the pre-school child population. At this time it could therefore be said that the campaign had met with considerable success. The relatively small proportion of inoculated children between

the ages of one and five was, however, disappointing; but by the middle of 1943, when the total number of children treated had increased to 80,000, little change had occurred in this connexion. Throughout the whole of the year 1943, less than 46,000 children in all were inoculated, and the relative apathy as regards the younger children remained a source of anxiety to the authorities. Thus of the 46,000 to which reference has just been made, the 30,000 who were under the age of five comprised only a third of the number of children who, each year, reached their first birthday. This state of things did not materially change, in spite of the fact that in the autumn of 1944 a new publicity campaign, in which the Department of Health, the Ministry of Information and the local authorities all participated, was vigorously initiated in an endeavour to persuade parents, especially those with young children, to have their offspring immunised without delay. The total number of children inoculated in 1944 was 62,877, as compared with 45,886 of 1943; but it was estimated that the increase which had occurred did little more than maintain the total number of inoculated children under 15 years of age at about the level previously reached. The above figures, however, show that the campaigns, and the practical work associated with them, accomplished a great deal. In addition to these figures, a statement made in Parliament on December 14, 1944, was strikingly significant. This statement related to the incidence of diphtheria in immunised and non-immunised children during the year 1943; and it explained that, on a revised basis of 700,000 inoculated and 540,000 non-inoculated children, the incidence was 1 in 430 for inoculated and 1 in 60 for non-inoculated children, case mortality rates being 1 in 163 and 1 in 18 respectively. Corresponding figures for the year 1944 were incidence rates of 1 in 435 for immunised children and 1 in 190 for non-immunised, with case mortality rates of 1 in 400 and 1 in 18 respectively.

Bacillary Dysentery. Complete data are not available in this connexion, but dysenteric conditions of fairly universal distribution appeared to be increased under war-time conditions. Confirmed cases in 1939 numbered 1,132. During 1940–3 they rose to 1,888, 2,429, 2,515 and 2,984 respectively. In 1944 there were 4,373 cases and there was an appreciable increase to 4,811 in 1945. There was reason to believe that part of the increased incidence of the infection, which affected adults and children alike but which was fortunately of a mild type, was to be accounted for by greater accuracy in diagnosis; but even so, there was no doubt that an absolute increase had occurred. The disease was a source of anxiety to the public health authorities, particularly in day nurseries, schools and institutions, but at no time did it assume the character of a disabling epidemic. Although statistics are not available giving detailed bacterial classification, there is no doubt that *Sonne* dysentery was the prevalent single type.

Fever Hospital Accommodation. The transfer of population and other considerations related to the prosecution of the war necessitated a review of the hospital accommodation available for the treatment of patients suffering from infectious diseases. In most areas, groups of neighbouring authorities arranged to pool their resources, and supplementary accommodation was provided where such was necessary or desirable. A harmonious and successful scheme of working was evolved, and co-operative effort proved itself to be effective.

Tuberculosis. The war had not progressed beyond its earliest phase before it became clear that tuberculosis was on the increase and while most of the indices of the health of the community actually displayed improvements under war-time conditions, tuberculosis, particularly in its pulmonary aspects, had shown itself to be a serious exception to the general rule. Mortality records in Scotland date from the middle of last century, and show that the death rate from tuberculosis rose to a peak about the year 1870 with 382 deaths per 100,000 of population. Subsequently there was a progressive decline and in 1938, the year immediately preceding the war, the death rate—69 per 100,000—was the lowest on record, no more, in fact, than 18 per cent. of the 1870 peak figure of 382.

The following review of notifications and deaths indicates the position in the years 1938 to 1945:

Year	Pulmonary		Non-pulmonary		Totals	
	Notifications	Deaths	Notifications	Deaths	Notifications	Deaths
1938	4,793	2,581	2,772	851	7,565	3,432
1939	4,657	2,717	2,440	809	7,097	3,526
1940	5,212	3,037	2,510	966	7,722	4,003
1941	5,739	3,117	2,555	1,058	8,294	4,175
1942	6,224	3,043	2,824	955	9,048	3,998
1943	7,215	2,976	2,873	983	10,088	3,959
1944	7,036	2,978	2,512	957	9,548	3,935
1945	7,316	2,932	2,342	871	9,658	3,803

The war thus brought about an increase in the number of cases of both pulmonary and non-pulmonary tuberculosis. The increase was immediate as regards pulmonary tuberculosis, which showed a steady rise throughout the war years until 1944, when there was a slight fall, but in the following year the numbers again rose to a figure higher than the 1943 level. Cases of non-pulmonary tuberculosis were slow in showing the war-time increase and reached a peak figure in 1943, followed by a decline to a level in 1945 below the pre-war figure. Deaths from tuberculosis during the war reached a peak in 1941, the trend being evident in both the pulmonary and non-pulmonary forms of the disease. After 1941 there was a decline in the mortality, although at the end of 1945 it had not yet reached pre-war level. Attention might

be drawn to one peculiarity in these figures which is not altogether easy to explain, namely, that the notifications of pulmonary tuberculosis in 1945, as compared with those in 1938, showed an increase of 53 per cent., while the increase in deaths only amounted to 14 per cent.

The central departments charged with responsibility for the direction of health services, the public health authorities and the Medical Research Council, were alike perturbed by the early indications of the increase in tuberculosis. There was initially special concern at the increase in the young adult female group; but a report published in 1942 by the Medical Research Council Committee on Tuberculosis in Wartime (M.R.C. Special Report Series, No. 246) indicated that not only women but all susceptible groups of the population were affected. Thus in contrast to the situation which prevailed during the War of 1914–18, young adult females, males throughout the wage-earning period, and children under five years of age all shared alike in the increased evidences of the disease.

The principal administrative events related to tuberculosis during the war may be summarised as follows:

In September 1939, in accordance with the Government's plans to provide the maximum number of beds for the reception of casualties, tuberculosis accommodation was evacuated on a large scale in order to make provision for the presumptive needs of the Emergency Hospital Scheme. The action taken was a proper one, but the course of the air warfare which followed showed it to have been unnecessary. With the rising incidence of tuberculosis, it was almost immediately recognised that, whatever the risks, it was not only desirable but necessary to restore certain sanatoria to peace-time functions. Throughout the year 1940, therefore, there was a progressive restoration of tuberculosis beds to their ordinary employment; and in 1941 there was an almost complete release of tuberculosis accommodation from the Emergency Hospital Scheme.

Despite the restoration of peace-time accommodation, the rising incidence of the disease led to a corresponding increase in the waiting lists of patients in need of admission to sanatoria. The urgency of the situation became such that at an early stage the Department of Health determined, as a factor in its general emergency policy, to withdraw certain blocks of beds from the Emergency Hospital Scheme and to commission them as supplementary tuberculosis units. These were situated at Law Junction, Bangour and Bridge of Earn Hospitals, and they continued to function as such after the war. By the beginning of 1944, 1,334 beds more than the pre-war numbers had been provided for tuberculosis purposes. Of these, 927 were located within these hospitals, the remainder being accounted for by the release from the Emergency Hospital Scheme of beds in existing local authority hospitals. A return, called for by the Department of Health in 1944, showed that

at that time some 6,500 beds were actively in commission throughout Scotland for the care of tuberculosis as compared with a pre-war figure of about 5,300. It has to be recorded, however, that 400 beds remained empty at this date because they could not be staffed.

The actual staffing of the new units occasioned much anxiety, which persisted into the post-war period.

A considerable number of nurses from the Civil Nursing Reserve volunteered for this work, and these volunteers also lent invaluable aid in reinforcing the resources of many of the local authority institutions. Great credit is due to these women for stepping into the breach in this way. Recognition of the general reluctance to serve in tuberculosis hospitals and sanatoria led to the institution of a special allowance which was added to the salary of nurses so employed. The Ministry of Labour and National Service became active in the quest for nurses for tuberculosis wards; and in this connexion the Department of Health provided detailed advice to all the authorities concerned on the supervision and maintenance of the health of tuberculosis nurses and of domestics whose duties brought them into contact with ward equipment likely to be infected. Arrangements for full medical examination before employment began, and periodically thereafter, were instituted, as was also comprehensive preliminary instruction in prophylactic procedures.

In spite of the measures which were thus taken, it is a melancholy fact that at the end of 1944 over 1,500 patients remained upon the waiting lists, including some 1,300 pulmonary cases; also, the numbers continued to rise. By the middle of June 1945, the total awaiting institutional treatment had increased to 1,898, of whom 1,710 were patients with pulmonary disease.

As a further relief to the civilian sanatoria, the Department set up at Bridge of Earn Hospital a pleurisy unit of 50 beds and associated with it convalescent facilities at the auxiliary hospitals, Dunira and Tough. This was a new departure in making special provision for cases of pleural effusion in an endeavour to obviate their future breakdown with pulmonary tuberculosis, which is a common sequel of this condition.

In addition to the formal sanatorium units which were established in certain of the emergency hospitals, the Department of Health set up, in association with the military authorities, 'clearing centres' at Hairmyres, Woodend and Bangour Hospitals for the handling of tuberculosis in Service personnel.

Throughout 1943 it became increasingly clear that certain patients had to be retained in tuberculosis hospitals for a disproportionate period because of the gross unsuitability of home conditions. Consideration was therefore given to the possibility of providing, in suitable cases, sleeping quarters which could be erected in gardens. As a result

a number of huts of an appropriate pattern were provided by local authorities throughout the following two years and a number of authorities which had not previously employed them were persuaded to participate in the scheme, at least in an experimental way.

Following certain recommendations made by the Medical Research Council Committee on Tuberculosis in War-time, provision was made in April 1943 for the payment of special financial allowances to enable sufferers from pulmonary tuberculosis to undergo treatment or observation free from anxiety about the position of their dependants. By the middle of the year 1945, some 4,853 people had become recipients under the scheme and, of those, a total of 1,078 had so far recovered as to have returned to work. The total amount expended by the Department of Health up till this time was £211,905.

A further recommendation of the same committee was that mass radiography should be introduced. In spite of the technical difficulties involved, in addition to the supply of equipment and personnel, it became possible for the first Scottish unit of the kind to begin work in Glasgow in June 1944. It was followed by a Lanarkshire unit in July of the same year; but staffing difficulties prevented the Edinburgh unit coming into operation until January 1945. The Glasgow unit, working on a full-scale basis from the outset, had surveyed 45,096 persons by the end of 1945. At the same time 3,532 people had been surveyed in Lanarkshire, the relatively small production of this unit being due to the part-time operation necessitated by shortage of personnel. Taking the Glasgow and Lanarkshire figures together, a total of 322 cases of active pulmonary tuberculosis were discovered—a rate of 7 per 1,000 of the 48,628 individuals surveyed. Only 22 of the patients were previously known to be victims of the disease. Of the total examined, 24,535 were males, of whom 116 had active tuberculosis—an incidence of 5 per 1,000; and 24,093 were females. Of the latter 206 were suffering from active tuberculosis, a rate of 8 per 1,000.

Broadly speaking, the increase in tuberculosis was in the predominantly human form of the disease, phthisis. No one factor can be singled out as having been peculiarly influential in determining the increase, but the responsibility may no doubt be ascribed jointly to the early and precipitate evacuation of tuberculosis hospitals and sanatoria, to the evacuation itself, to the blackout with its associated restriction of ventilation, to increased overcrowding and industrialisation of susceptible age groups, to longer hours of work and strain of travel, and to the curtailment of rest incidental to extraneous duties such as those of Civil Defence and Fire Guard. Nutrition, as such, would not appear to have been directly implicated, for the results of dietary surveys and the favourable changes in other health indices did not contain any suggestion that nutrition was at fault. As has been suggested elsewhere, nutrition may in fact have become less influential

in an aetiological sense because of the operation of the food-rationing scheme, which ensured the equitable distribution of essential foods over the whole population, and further, because of the differential shift to priority classes of certain foods such as milk.

Venereal Diseases. The incidence of venereal disease, as shown by the number of cases attending treatment centres, was not appreciably affected by conditions during the first year of the war. In 1941, however, there was a material increase in the number of new patients, which continued until the end of 1942. After this time a slight recession occurred, and the slackening of the tide became much more apparent in 1944. Details of new cases of syphilis and gonorrhoea treated at centres in Scotland during the years 1938 to 1944 are shown in the following table:

Year	Syphilis	Gonorrhoea	Totals
1938	2,990	5,133	8,123
1939	2,650	4,279	6,929
1940	2,727	4,491	7,218
1941	4,079	6,451	10,530
1942	5,340	5,957	11,297
1943	4,841	5,437	10,278
1944	3,542	4,270	7,812
1945	2,629	4,575	7,204

While the usual effect of war on the incidence of venereal disease was thus somewhat slow in manifesting itself, the potentialities were anxiously borne in mind. Thus from the earliest period of the emergency, local authorities had been enjoined to review the treatment facilities available in their areas; and in 1940 the need for further powers for the control of venereal diseases came under active consideration. By the end of another year public interest had been actively roused to the danger of the spread of these diseases. A national publicity campaign for the education of the public was therefore embarked upon and was conducted by means of posters, newspaper advertisements and motion pictures; and local authorities were requested to carry out appropriate propaganda in their areas. Defence Regulation 33B was formulated and brought into operation. Under its provisions the duty was laid upon medical officers of health to require the medical examination of any person named as a source of infection by two or more separate patients under treatment; and if, on examination, the individuals concerned were found to be infected with venereal disease, he or she was obliged to have treatment until certified to be free from the disease in a communicable form.

The results of the application of Regulation 33B are of interest. In 1943 notices were received by medical officers of health naming 827 persons as sources of infection, but of these only 43 were named by

more than one patient. Most of the 43 individuals attended voluntarily for examination and treatment, or did so after receiving notice requiring them to attend. In only one case was it necessary to resort to prosecution in order to compel the observance of the provisions of the regulation.

In 1944, 776 individuals were named as sources of infection but only 50 of these were so designated by two or more patients. Formal action under the regulation was necessary in four instances. So far as individuals named only once were concerned, although there were no powers, the mechanism provided was useful in bringing to light a significant number of potential sources of venereal infection; and in a number of areas attempts, which were often successful, were made to persuade men and women to attend for examination and treatment which was facilitated, in the case of gonorrhoea, by the employment of the sulphonamide drugs. Further, the existence of the regulation and the effectiveness of the sustained publicity campaign were instrumental in leading numerous individuals to seek advice and, if need be, treatment, on their own account. One indication of the public response is provided by the number of persons who attended treatment centres and were there found to be suffering from conditions other than the venereal diseases. This number, which was 4,081 in 1941, rose to 5,044 in 1942 and to 7,470 in 1943; in 1944 it remained at the satisfactorily high figure of 6,708, again rising to 7,674 in 1945.

The Convention Diseases. No instance of plague, cholera or yellow fever occurred in Scotland during the war. Typhus fever was found in four cases only, none of which produced any secondary spread. The dangers of this disease were, however, constantly borne in mind. Both hospitals and local authorities were constantly reminded of the potential menace and of the measures which should be instituted to combat its possible occurrence. In 1941, typhus teams were set up and made available as might be required; but even during the period of maximum risk which succeeded the cessation of hostilities in Europe the incidence of the disease remained negative.

Some mention of the position in respect of smallpox has already been made in Chapter 2 on the Clyde Anchorages, which were the ports of entry for such war-time cases of smallpox as occurred. The first appearance of the disease in Scotland since 1930 followed the introduction into Glasgow of a patient who arrived from the East at the end of May 1942. Ten other persons aboard this ship were affected and isolation and treatment were provided in Robroyston Hospital, Glasgow. During the following two months 25 cases occurred among the general public in Glasgow. The disease next made its appearance in the County of Fife in September—the first patient suffering from a type of illness not immediately recognised as smallpox—and continued into November. In the latter month an outbreak occurred in Edinburgh and dragged

on until the end of the year. Cases originating in Edinburgh also occurred in the Counties of Aberdeen and Inverness. The total number of patients and deaths in the whole epidemic is shown below:

Area	No. of cases	No. of deaths
Glasgow . .	36	8
Fife . . .	29	8
Edinburgh . .	36	8
Aberdeen County .	1	—
Inverness County .	1	1
	103	25

Vaccination on a large scale was carried out in almost all the infected districts and it was estimated that within the compass of a few months approximately 1,000,000 people were vaccinated in Scotland. In Glasgow itself this prophylactic procedure was adopted with special intensity and nearly three-quarters of the total vaccinations were effected there. This activity, together with the general energy of the public health authorities and their staffs in relation to other preventive measures, no doubt prevented a wider distribution of the disease.

Thus terminated an episode which was potentially menacing, productive of much anxiety and responsible for an associated outbreak of the disease in England as well as in Scotland. In November 1943, an infected patient was found aboard a ship arriving in the Clyde Anchorages, but special precautions (referred to in the Clyde Anchorages chapter) were taken and no spread of the disease occurred. There were no cases among the home population in 1944. In 1945, two separate importations occurred through the Clyde Anchorages, but once again there was no associated spread. In view of the ever-present danger, however, medical officers of health were requested to make their arrangements for the surveillance of contacts as complete as possible.

CHAPTER 5

ENVIRONMENTAL SERVICES

WATER SUPPLY

As a public service of supreme importance from the medical point of view, it was essential that measures should be taken for the maintenance and reinstatement of such water supplies as might be interrupted by enemy attack. With this end in view the industrial area of Scotland was divided into ten regions; and a mutual aid scheme was elaborated which provided for assistance among the water undertakings within each region, and for inter-regional aid where necessary. These arrangements operated through the agency of co-ordinating officers who, under supervision by the Department of Health, provided stores of material and controlled mobile repair squads, recruited partly from the regular staffs of the undertakings themselves and partly from volunteers in the employment of public works contractors and plumbers. The general organisation included the establishment of stocks of equipment for the repair of damaged water systems. These were strategically placed within the respective regions; and comprehensive arrangements were made for the emergency transport of men and material when required. On the personnel side, the co-ordinating officer of each region had under his direction local officials who were placed in charge of the squads of pipe-jointers, labourers and others available for transfer. When put to the test under actual conditions of air warfare, the mutual aid scheme worked satisfactorily in the districts principally affected—Clydeside and Aberdeen.

It was, of course, of equal importance that the water supplies should be maintained in a state of bacteriological safety. The installation by water undertakings of chlorination plants to protect water supplies in areas with appreciable populations was therefore required. The necessary work had been completed by the early months of 1942; and thereafter continuous chlorination was carried out.

Apart from measures necessitated by war conditions, the following steps were taken during 1941 and 1942:

> The attention of those concerned was drawn to the need for close co-operation between water authorities and the medical staff to ensure that the water supplied for domestic purposes, and for any other uses potentially related to human health, was of the highest quality obtainable.
>
> In consultation with the Department of Agriculture for Scotland, action was taken to ensure that the ploughing of land in gathering grounds for increased food production did not lead to contamination of the water supplies.

> Water undertakings were asked to carry out regular waste prevention inspections. This was a matter which, in war-time, assumed particular importance by reason of the possibility of a specific supply being required, under the co-ordination scheme, to meet heavy additional demands by the Services or by war industry. In the case of certain of the undertakings, waste-inspections were followed by subsequent repairs which resulted in a material reduction in consumption.

An engineering survey of Scottish water supplies was begun in 1943. It showed that many existing supplies were in need of improvement, and that more economical and effective use could be made of available resources. In particular, it revealed that the most pressing problem was to make piped water supplies available in the fullest possible measure to that part of the rural population (estimated at about one-third of the whole) at present without services of this kind.

The White Paper on *A National Water Policy* (Cmd. 6515) published in April 1944, intimated that, as part of the general post-war reconstruction policy, the Government proposed that a Scottish grant-in-aid amounting to £6,375,000 should be made available to assist local authorities to provide or improve water supplies and to make adequate provision for sewerage and sewage disposal in rural localities. It recommended legislation to ensure a planned and economical use of the water resources of the country. The main proposals upon which this legislation was to be based were that the information necessary for framing a wider policy should be systematically collected by the Secretary of State, upon whom would be placed the statutory duty of promoting the conservation of water resources and the provision of adequate water supplies; that amalgamation of water undertakings should be encouraged and, if necessary, enforced; that power should be vested in the Secretary of State to require, where necessary, the giving of bulk supplies of water by one undertaking to another; that industry and agriculture should have the right in certain circumstances to be supplied with water on reasonable terms and conditions; and that special steps should be taken to protect water resources against misuse, waste and pollution. It was made clear that the greater part of the grant-in-aid would be specifically allocated for distribution in connexion with the water supplies.

Effect was given to these proposals in the Rural Water Supplies and Sewerage Act of 1944, which received the Royal Assent in July of that year. Thereafter, local authorities were requested to submit applications for financial assistance, if possible by October 31, 1945. As the water survey, begun in 1943, was completed in each area, the local authorities concerned were offered advice and suggestions for the future development of their water-supply schemes. In connexion with the problem of water rating, a committee was appointed in 1944 to consider

the basis of valuation for the purpose of water rates and the methods of rating and charging for water supplied by statutory undertakings in Scotland, and to make recommendations.

GENERAL SANITATION

The conditions incidental to war made continuous demands upon the resources and ingenuity of those concerned with sanitary supervision. The quartering of large concentrations of troops throughout almost the whole country necessitated close and constant vigilance; and many problems were associated, for example, with the Evacuation Scheme, the erection of hostels of various kinds, the occupancy of shelter accommodation in the cities and the establishment of forestry camps. The co-operation of local authorities in securing satisfactory conditions was given wholeheartedly, and every endeavour was made to ensure that accommodation and conditions were maintained at the highest possible standard.

FOOD

Despite a substantial and irksome degree of food rationing, throughout the course of the war evidences of gross nutritional disorder were conspicuously absent. Viewed as a whole, the national well-being may be said to have been very satisfactory and a tribute is due to the framers of the food-rationing regulations which controlled the distribution of food in general throughout the war. Never before in the history of this country had so much equity existed in this respect; and, while the more prodigal among the population may have suffered through a limitation of their power to purchase, the deprivation was, in the physical sense, not a material one; in any case it represented a corresponding ability on the part of those who had been meagrely supplied before to purchase on the same basis and in the same quantity as their neighbours.

Bearing upon this general question, and in order to ascertain whether the dietaries available under the prevailing food-restrictive mechanism were sufficient for the maintenance of satisfactory health, the Scientific Advisory Committee (see Chapter 8) from 1941 onwards conducted a series of investigations into the feeding of certain limited groups of the population, particularly those who were employed in heavy industries. The families of the latter were included in the inquiries because of the possibility that the major portion of the family rations might have been consumed by the wage earners, to the physical detriment of those who were dependent upon them. The general conclusion to which those investigations led were significant. They strongly suggested that, as compared with pre-war diet, the food of such workers—as well as of their families—had improved, and that no serious reduction in the intake of essential foods had occurred. In general, it was found that the dietaries included a sufficiency of calories, protein, carbohydrate, fat,

phosphorus, iron and vitamin B; but that, on the other hand, the consumption of vitamins A and C was insufficient, while that of calcium was slightly less than was desirable. So far as the two deficient vitamins were concerned, the scarcity of fruit—an inevitable accompaniment of submarine warfare and shipping shortage—was an influential factor; and vigorous campaigns were embarked upon with the object of securing the inclusion of more fresh vegetables in the diet. By arrangement with the Ministry of Supply, the Department of Health undertook from 1942 onwards the organisation of the collection of rose-hips, from which was prepared the palatable rose-hip syrup of high vitamin C content. This work was assisted by the Women's Voluntary Services, the Scottish Women's Rural Institutes and school children, and was strikingly successful. In 1942, 40 tons of rose-hips were collected; in 1943, 70 tons; and in 1944, 77 tons.

Emergency Provisions. The operational control of the food regulations was, of course, a function of the Ministry of Food, the policy of which in some cases was, however, governed by the special requirements of the Department of Health. Continuous liaison was, for example, maintained in order to secure the adequate provisioning of the emergency hospitals, both as regards fluctuating current needs and also emergencies as they might occur. Planning in respect of hospitals also extended to the 'Shadow' and 'Crash' hospital schemes, although in the event no occasion arose to put the formulated plans into operation. Again, elaborate arrangements were necessary in connexion with the official evacuation scheme. These included the additional provisioning of the reception areas, and even provision for the feeding of evacuees at the reception railheads and reception halls. The food-in-schools scheme was extended, in certain rural areas and in certain circumstances, to include evacuees, both juvenile and adult. Plans for food supplies had to be made in relation to the Emergency Relief Organisation; and appropriate arrangements were also called for in the day nurseries, refugee camps and kindred establishments. The plans worked well and even on Clydeside immediately after the devastating enemy attacks, there was no delay in the operation of the food arrangements.

Standards of Purity. The supervision of the food supply under wartime conditions placed a heavy burden upon the resources of certain areas. Some modification of normal routine was necessary, but the examination of imported foodstuffs was consistently and thoroughly carried out, as were also the meat inspection and other important local services. In a few instances the Department of Health was consulted by the Ministry of Food in connexion with the suspension or modification during hostilities of the strict requirements of the regulations regarding imported food; and, when no potential danger to the public health was involved, minor relaxations as dictated by the supply position were agreed to.

In 1943, the inspection of slaughterhouses, which had been suspended during the earlier years of the war, was resumed, and was continued steadily thereafter. By the middle of 1944, 44 out of the 108 slaughterhouses then operating under the Meat Control Scheme had been inspected by officers of the Department of Health and in some, conditions were found to be not wholly satisfactory. Deficiencies were in the main due to structural deterioration, lack of sanitary facilities and the absence of suitable or adequate storage accommodation for condemned meat. Appropriate recommendations were made and action taken in order to secure improvements.

Throughout the war, the reports of the Public Analysts showed that the extent of sampling carried out by local authorities under the Food and Drug Acts was reasonably well maintained in comparison with pre-war years, and that there was no evidence of any appreciable increase in adulteration.

Food-borne Diseases. During the course of the war, outbreaks of illnesses directly attributable to foodstuffs were much less frequent than might have been expected. The food distributive trades lost many of their skilled and experienced employees to the Forces and the work had often to be carried on by inexperienced labour, so that the maintenance of the standards of hygiene and cleanliness expected in peacetime became more and more difficult as time went on. A few outbreaks of paratyphoid and dysentery did take place and even where the source was not definitely traced, the origin in most cases must have been in contamination of foodstuffs. The use of synthetic cream as substitute for real cream provided a ready medium for the transmission of infection, and throughout Great Britain several outbreaks were due to this cause. In Glasgow there was a large outbreak of paratyphoid in 1940 and there was also in 1942, a well-defined outbreak of typhoid fever which had its origin in a carrier employed in a butcher's shop where the standard of staff hygiene was very low. These examples indicate that, although the worst expectations arising out of the war-time conditions were not realised, there was some evidence that the distribution of infection by means of food did, in fact, occur. Whereas the standards of food handling generally did not improve during the war, the situation as regards milk was different, as the following paragraphs will show.

Milk. The peculiarly important place of milk as an article of food in the war-time dietary, particularly of children, expectant and nursing mothers, and invalids, was well appreciated, as was the fact that the maintenance of the highest possible standards of the purity of the public milk supply was, if anything, of increased importance under war conditions. The Milk and Dairies (Scotland) Act of 1914—the provisions of which did not come into active operation until 1925, because of the War of 1914–18 and the succeeding years of difficulty—was the first notable advance in the history of this subject; but little

was accomplished for another ten years, partly because of the relatively impoverished condition of the dairying industry. By the year 1938, however, the financial position of many dairymen had improved, and it was further advanced by the payment from State funds of a bonus of 2¼d. per gallon to those producers who held a licence for the sale of 'Tuberculin Tested' milk, and 1¼d. per gallon to those in possession of a Standard licence. This increased prosperity encouraged local authorities to press for the improvement both of the structure of dairy premises and of methods of milk production and handling; but again progress was interrupted by the outbreak of the War of 1939–45. This time, however, obstructing influences were not permitted to operate for long and rapid and substantial progress was made in spite of many difficulties.

Thus, compared with 1939, the consumption of milk in Scotland increased by over 45 per cent. This increase was due to the development of the Milk-in-Schools Scheme and the introduction of the National Milk Scheme. Towards the end of the war just over 500,000 children, or 68 per cent. of those on the registers of all schools administered by the education authorities, were participating in the Milk-in-Schools Scheme—the milk consumption amounting to about 450,000 gallons per month. The National Milk Scheme, although introduced only in 1941, was an immediate success. It is estimated that over 75 per cent. of those eligible to participate in it—namely, pregnant women, nursing mothers and children under five years of age—were taking advantage of the scheme. The operation of both these schemes was extended during the war years to meet the needs of evacuated women, mothers and children.

The recognition of the need for the preservation of the highest possible standards of cleanliness led to much continuous activity throughout the whole course of the war by the Department of Health. During each of the years in question upwards of 85 per cent. of the premises belonging to producers of designated milk were visited and reported on by members of the Department's Milk Inspectorate, and in many instances subsequent revisitation showed that recommendations made only a short time before had been acted upon. In 1942 the local authorities of the principal dairying counties appointed milk officers whose function it was to supervise the methods of milk production at the farms. At the same time, and in order to stimulate the growing interest in the maintenance of a clean milk supply, a film on the subject was produced in collaboration with the Ministry of Information for exhibition in farming localities. Again, taking the round figure of 9,000 to represent the total number of registered milk producers in the country, the following table of the numbers of those holding licences under the Milk (Special Designation) Order (Scotland) 1936–44 is of interest and significance:

1938	2,000
1941	3,900
1942	4,000
1943	4,100
1944	4,350
1945	4,700

It is therefore apparent that in the course of seven years the percentage of producers of the better qualities of milk (that is, 'Designated Milk') increased from 22·2 per cent. to over 50 per cent.—no mean achievement in itself.

The progress which was made during the years of war towards the provision of a safe milk supply followed two main courses, namely, an increase in the number of tuberculin tested herds and an increase in the efficiency of pasteurisation; and while it is difficult to express in actual terms the degree of improvement which has occurred, it is by no means unsatisfactory in itself to record that a movement of advance has in fact taken place. The following is a brief statement of the trend of this advance:

Before 1938, the increase in the number of tuberculin tested herds had been slow. The payment of a premium of 2¼d. per gallon to those producers who possessed tuberculin tested licences, and the introduction of the attested herds scheme, did much to increase the number of tubercle-free animals. In 1944, the premium was increased to 4d. per gallon, and this factor produced a further stimulus to the development of tuberculin tested herds. Progress may thus be shown:

Year	Herds
1937	769
1940	1,868
1943	2,420
1945	3,762

This apparently satisfactory progress was, however, marred by one disappointing feature, namely, the slow increase in the number of producer-retailers holding designated licences. In 1944, only 24 per cent. of the producer-retailers held licences for the sale of designated milk, compared with 62 per cent. of the producer-wholesalers. Few of the former held licences for the sale of tuberculin tested milk. The importance of this fact is that producer-retailers' milk, which is not subject to any form of heat treatment and which is not the product of tuberculin tested cows, is consequently the least suitable for direct sale to the public.

Coincident with the development of tuberculin tested herds and the increase in the number of licences for the sale of tuberculin tested milk, local authorities tightened up considerably their supervision of the conditions of production of designated milk. In 1945, for example, the local authority agencies obtained from producers of designated milk some 25,000 samples, an average of five samples of milk for each producer during the year. Eighty per cent. of these samples satisfied

the required standard of bacteriological cleanliness. Considering the demands on local authorities' staffs, and the increase in the number of designated licences, this record must be regarded as commendable.

To sum up this brief résumé of the milk position, it must be agreed that substantial advances have been made, not only in the mechanism of supply, but also in the development of the national consciousness of the importance of the problem—a factor without which no material steps could well be taken. It is, of course, admitted that much time must elapse before all, or even the majority, of the herds in the country can be included in the tuberculin tested category. It therefore follows that the most purposeful and continuous encouragement must be given to the efficient pasteurisation and heat treatment of milk. Pasteurisation, indeed, should be regarded not as antagonistic but as complementary to the production of tuberculin tested milk; and no effort must be spared in removing the confusion of thought which is still prevalent in this regard.

In endeavouring to effect improvements in the methods and volume of the pasteurisation of milk, many war-time difficulties were encountered. It was, for example, necessary, because of the absolute increase in the consumption of milk, for the distributors to handle greatly increased supplies during the war years. At the end of the war period, 87 per cent. of the milk produced was consumed as such—that is, as liquid milk—compared with 65 per cent. in 1939. Consequently, the pasteurising plants were obliged to operate, as it were, at an increased pressure, and they tended to deteriorate more quickly. Further, the difficulties encountered in the replacement of worn parts tended to reduce their efficiency; and again, since many skilled dairy workers had of necessity to be called to the service of the Armed Forces, labour difficulties were multiplied as the war progressed.

Partly to meet these difficulties, and also in order to assist both local authorities and distributors, two amendments were made to the Milk (Special Designations) Order (Scotland), 1936.[6] In 1941, the Order was amended to permit the employment of the high-temperature short-time method of pasteurisation[7] and this alteration was followed in 1944 by a second amendment which eliminated the need for a bacterial count of milk sold as pasteurised and replaced this requirement by a standard based upon the phosphatase and coliform tests.[8] The result of those two amendments was that, between 1941 and the end of the war, twenty new high-temperature short-time pasteurising plants were installed in Scotland, these acting as replacement units for plants which had fallen into a state of disrepair or serious inefficiency. The amendment related to the bacteriological standard had the effect of bringing to the notice of distributors unsuspected sources of contamination to their pasteurised milk; and thus necessitated the provision of new bottle-washing arrangements, bottle-filling machinery and other

apparatus. The milk inspectors of the Department of Health, in conjunction with the appropriate officers of the local authorities, effected a routine which made possible a closer supervision of the processes of pasteurisation, and were thus able to offer an increased volume of helpful advice to the distributors. Despite war-time embarrassments, there is no doubt that a notable improvement in the efficiency of pasteurisation was achieved and a safer milk supply was thereby made available to the public. But there still remained much to be done. Undesirable features associated with milk production and distribution still remained in plenty; but their existence was recognised and with the indications for continued effort, which had become clear, it was justifiable to assume that the progress which marked the passage of the years of war would be materially extended in the post-war period.

CHAPTER 6

GENERAL MEDICAL SERVICES

INTRODUCTORY

FOR several years before the war there had been a growing impression—not peculiar to Scotland—that the medical services of the country were in some way failing to produce as good results as they should. To quote the Report (1936) of the Committee on Scottish Health Services,[9] a document of much influence upon the whole range of medical planning which was to follow:

> 'Changes in the size and distribution of the population, in the habits and outlook of the people and in the actual cause of death and ill-health require a re-adjustment of health effort. Existing health services are not fully adapted to modern conditions and outlook and it is inherent in their more or less haphazard and sectional growth that they do not constitute a national health policy . . . Policy should be comprehensive in scope and should cover the whole field of morbidity.'

From many quarters, almost from all, the committee found evidences in favour of the extension of general medical services. It contemplated a system based upon the family doctor as health adviser, reinforced by ready access to specialist services, and an extension of general medical service to include the dependants of insured persons. It also looked forward to a material development of hospital resources. Already steps had been taken in the direction of widening the field of social insurance, and notable among these was the operation of the National Health Insurance (Juvenile Contributors and Young Persons) Act, 1937, and the Widows, Orphans and Old Age Contributory Pensions (Voluntary Contributors) Act, 1937. The first of these Acts provided National Health Insurance sick benefit for boys and girls who were employed between the school leaving age and the age of 16 years. The latter was formerly the lower limit, and the new provision introduced plans to facilitate the earlier recognition or prevention of conditions which, if not properly treated, might lead to impaired health or incapacity in later life. The second Act was meant to provide a portal of entry into pensions insurance for persons of limited means and under 40 years of age who had previously been outside the scope of the ordinary scheme of contributory pensions which is associated with the National Health Insurance Scheme. Some provision was made to meet the needs of older persons, and during the first year of operation the age limit was raised from 40 to 55. An agency was thus established through which a large number of middle-aged people—who had either passed out of the main scheme or who had not had an opportunity of availing

themselves of it—were enabled to participate in the State provisions. Concessions to all first year entrants included reduced rates of contribution, which remained applicable throughout the period of their insurance. During the first year of the operation of the new Act, some 60,000 applications from potential entrants were received by the Department of Health, and the great majority of these applications were allowed. The legislative action upon which this development was based foreshadowed events which were to come with National Insurance and a comprehensive Health Scheme.

One of the pre-war problems associated with this matter which occasioned much thought on the part of the authorities, was the question of incapacity for work among the insured population. The problem was of such importance as to demand special notice, and in the years immediately preceding the war special inquiries were made into the subject by the Department of Health. These threw an interesting light upon sickness in relation to capacity for work. It was found, for example, that year after year some 400,000 new cases of sickness arose involving incapacity for work, and the period of incapacity of an increasing number of so-called chronically ill patients was found to extend throughout the entire course of each year. In 1936–7, the number of such cases was 30,754, the equivalent of 17·2 per 1,000 insured persons. From a sample inquiry made in 1936–7 it emerged that 1·7 per cent. of the insured population were continuously incapacitated throughout the twelve months' period; that 23·5 per cent. were on one or more than one occasion unfit for work; and that 74·8 per cent. were free from incapacity through illness during the period covered by the investigation. For the incapacitated, the average days of incapacity per individual amounted, for both sexes, to 14·92 in 1936–7. Certain of the rural counties, notably Shetland, Aberdeen and Dumfries, showed surprisingly high incapacity figures; but in the main the heaviest incidence of sickness was found in the central industrial belt, particularly in the Counties of West Lothian, Lanark, Stirling and Renfrew. Some 42 per cent. of the total volume of sickness in 1936–7 could be described as 'chronic' in the sense that it continued throughout the statistical year. Of the 30,754 patients in this category, 14,080 had been added to the list during the three immediately preceding years—an average not far short of 5,000—and of these no less than 3,065 were still under 35 years of age. It is significant that 953 patients had actually been incapacitated continuously since the end of 1919. The detailed analysis to which these figures was subjected led to the inference that in order to secure such measure of working capacity as was compatible with any residual disability, treatment of the most energetic, enlightened and catholic nature was required. This was progressively more evident as it came to be realised that there were substantial grounds for the belief that an appreciable proportion of the sickness in certain

of the specified groups, for example, the respiratory, the alimentary and the rheumatic, might more properly have been classified as neurasthenic or, more specifically, psychoneurotic.

With such reflections as these in mind, just before the outbreak of war an investigation was made by the Regional Medical Officers of the Department of Health into a series of cases in which incapacity for work had continued for a period of three months. The specific aim of this inquiry was to collect information upon the factors responsible for the mass of incapacity and upon the measures, administrative and medical alike, which might be adopted to combat it. In all, 1,000 patients were investigated and, broadly, the conclusions were as follows:[10]

> Fifty-eight per cent. of the patients were males and over 45 per cent. were under 45 years of age. The vast majority (855) were found on investigation to be in fact unfit for work but in only a relatively small number (95) could it be said that there was no probability of ever returning to work again. In a further 115 the prognosis relative to work was doubtful. Some of the latter group were considered likely to be able to work only for limited hours, or intermittently. The general causes of disability in the 95 patients showing a presumptive negative capacity for work were mainly circulatory, cerebral, organic, nervous and respiratory, with the emphasis on the circulatory group. Of those patients whose prospects of return to work were regarded as doubtful, the general causes were slightly different although the circulatory group still held the first place. Psychoneurosis and arthritis appeared to be important in this group.

Among the principal points brought out by the survey were:

> The large numbers of cases which had not been fully investigated, either as out-patients or in-patients of hospitals; the inadequacy of communication of the results to the general practitioner as regards those cases who had been referred for specialist examination or hospital; and the almost complete lack of co-ordination in the work of the different hospitals concerned. Such conditions were obviously uneconomical from the standpoint of institutional effort and unprofitable from the point of view of the patient.

Even before the war, the importance of industrial health and industrial health services was becoming more widely recognised, as was the fact that, apart from specific industrial intoxications, many diseases had industrial correlations. Any approach to the problems, for example, generically termed rheumatism and respiratory disease must take cognisance of working conditions. In this connexion, the Registrar-General had pointed out that industry affects health not merely by the production of specific intoxications but by a wide range of factors, socio-economic in nature, which are apt to cast a shadow over the entire industrial community and which enlightened planning should do much to mitigate. The war provided an opportunity for the closer integration

of the many Government and social agencies concerned with industrial health, for the raising of additional superstructures upon the foundations laid by the Factory Act of 1937, and for using the various ways and means provided by the Ministry of Labour and National Service. Appreciation of the importance of the subject has been slow in coming. It is, for instance, many years since Sir William Osler wrote:

> 'We surround the babe unborn with premonitory protection, deal wisely and gently with infancy and childhood, and then hurl the product of a reasonably healthy youth into a maelstrom of blind changes, of dust, fumes and fatigues which wear down the stoutest body and cripple the most willing worker.'

But the need for further additions to a co-ordinated health structure is now well recognised and this recognition should materially hasten progress.

NATIONAL HEALTH INSURANCE AND REGIONAL MEDICAL SERVICE

The activities which followed the outbreak of war necessarily led to the immediate suspension of the Regional Medical Service; and those Regional medical officers who had not previously been seconded to the service of the Emergency Hospital Organisation were drafted into it for operational duties. The total suspension of the Regional Medical Service was, however, disadvantageous not only to the Approved Societies, but also to practitioners and to patients as well. Arrangements were accordingly completed as early as January 3, 1940, for the reconstitution of the Regional Medical Service on a modified basis. It was possible to operate the restricted service in Glasgow only, the offices in Edinburgh, Dundee and Aberdeen being fully occupied with the Hospital Scheme. All references, therefore, irrespective of the place of residence of the insured persons who were referred, were made to the Western District Office.

In some respects, and despite the fact that incentive to work in the national interest reduced the volume of unemployment and of lost time through illness, the duties of the Approved Societies assumed additional importance during war-time, for the exercise of particularly careful supervision of all claims for sickness benefit was demanded. In the ordinary course of events, much latitude was given to the societies in deciding which patients should be referred for examination by the Regional medical officers; but such liberty of action could no longer be permitted because of the limited number of investigations which could be made. Real doubt or difficulty thus became the criterion upon which references were based; and a specific statement as to the reason for making the reference was required before the Regional Medical Office could undertake to deal with it. The situation as a whole was further complicated by the fact that the departure for war

service of an appreciable proportion of the insurance practitioners and their assistants threw a heavier burden upon those who remained, a burden made still more onerous by reason of the many civil defence duties which had to be undertaken. Nevertheless, the obligations of the profession were discharged satisfactorily, although, as was to be expected, delays in dealing with individual patients occurred at times. These were, however, very few and complaints made which could be substantiated were insignificant. It was fortunate that winter sickness in the years 1939 and 1940 was, on the whole and unexpectedly, less than usual, and doctors were enabled to adjust themselves to the new situation more easily. The same consideration assisted the Approved Societies to reduce the number of essential references to the Regional medical officers. The longer hours of factory employment, as well as the quickened pace in the factories, made some adjustment of surgery hours necessary; but doctors did not usually hesitate to alter their professional routine and meet the needs of the patients.

The next development in the general arrangements of the Regional Medical Service took place in May 1943. By this time, war-time planning of the Department of Health was more or less complete, and its practical applications had become sufficiently established to permit the re-opening of the Regional Medical Service on a regional basis. A moderate extension of the facilities was, indeed, made possible by the fact that a portion of the Highland Area could now be served by the Hospital Office in Inverness, the existence of which was, of course, dependent upon the needs of the national emergency. It was still necessary, however, to impose limitations upon the number of patients dealt with. Approved Societies were accordingly reminded that they should refer only those cases which gave rise to real doubt or difficulty in respect of the existence of incapacity for work or of the member's state of health. On receipt of individual references, the medical officers of the Department of Health called for a report from the insured person's panel practitioner, and determined, in the light of the information provided by the reply, whether an examination was or was not necessary or desirable. Whether or not an actual clinical investigation was made, a report, indicating the result of the reference, was sent to the Approved Society. The skeleton service thus provided remained in operation until the early months of 1946, when working upon what was to all intents and purposes the pre-war plan was resumed.

A summary of certain conclusions relative to the incidence of sickness during the war years is of interest. Unfortunately, the many other demands on its resources compelled the Department of Health to discontinue the central recording of incapacitating illness. The war, moreover, resulted in such a variation in the number of people at risk from time to time that it became difficult to assess the incidence of sickness among the insured population as a whole. The indications

were, however, that sickness experience was of average frequency during 1939, while it increased in 1940 because of the high incidence of influenza at the beginning of that year. In 1941 the experience appeared to be more favourable and to have approximated to that of other years which were free from influenza.

The trend of sickness during 1942 indicated an increase in the prevalence of short-term illnesses, but a decrease in long-term incapacity. This observation assumes greater moment when certain remarks in the introductory section of this chapter are recalled, for it had become clear that under the stimulus of war or of the motives relating thereto, many of those who had previously been regarded as chronically and even permanently incapacitated had returned to remunerative work. The inference from the picture as a whole appears to be that, while the strain of war work tended to cause absence from work for short periods through illness, men and women alike were anxious to return to work as soon as possible, and individuals who might ordinarily have continued to be regarded, or to regard themselves, as chronic invalids were able to find suitable employment. It would seem that an important object lesson for the future may be contained in the conditions thus experienced.

During 1942, and in the subsequent war years, statistics of expenditure on sickness and disablement benefits indicated a considerable increase in claims. As has been suggested, the increase appeared to have been due in the main to claims for the short-term type of illness, and the occurrence was not unforeseen. Some increase in the number of claims was expected as a result of the absorption into the Armed Forces of the fittest members of the community and their replacement in insurable employment by married women and by people in the older age groups, whose expectation of sickness was higher. The full effect on benefit expenditure of the change in the composition of the insured population emerged, not in a sudden cascade, but gradually, for the process of substitution was gradual. In addition, new entrants into the National Insurance Scheme did not qualify for the reduced rate of sickness benefit for six months, or for the full rate of benefit for two

Year	Number of male insured persons	Percentage	Number of female insured persons	Percentage	Totals
1939	1,383,000	66·1	710,000	33·9	2,093,000
1940	1,305,000	65·2	696,000	34·8	2,001,000
1941	1,267,000	62·9	747,000	37·1	2,014,000
1942*	1,272,000	61·2	806,000	38·8	2,078,000
1943	1,212,000	59·7	818,000	40·3	2,030,000
1944	1,204,000	58·3	862,000	41·7	2,066,000

* The income limit for the insurability of non-manual workers was increased on January 5, 1942, from £250 a year to £420 a year.

years, after their entrance into the scheme. In order to illustrate the dimensions of the scheme, and the increase year by year in the proportion of females, the preceding table may be instructively employed.

To provide medical care for the insured population, there were in Scotland in 1938, 2,010 practitioners in active employment on the panel rolls. At the end of 1944 the number of doctors so engaged was 1,655, a doctor-patient ratio of 1 to 1,250. The difference was due almost entirely to the needs of the various national services.

SUPPLEMENTARY MEDICAL SERVICES

In January 1942, an important development in the national medical services took place in the form of the Clyde Basin Experiment, which in course of time progressed in influence and scope and became expanded to form the Scottish Supplementary Medical Service. It was recognised that long hours of work, changing shifts, rotation of duties, transport difficulties (particularly during the hours of darkness and the blackout), and interference with ordinary arrangements for meals constituted such hazards for many workers that they were apt to degenerate physically under the sustained stress of war work. The Clyde Basin Experiment was therefore inaugurated; the geographical scope of the experiment being the industrial portion of the Clyde Basin, comprising the City of Glasgow and the Counties of Lanark, Renfrew and Dunbarton, an area which contained over 40 per cent. of the insured population of Scotland.

The aim and purpose of the new service was the detection of the early signs of breakdown in health, and the restoration of fitness as soon as might be through the co-ordinated efforts of the general practitioner, the consultant and diagnostic services, and the hospital facilities which war-time requirements had made available to the Department. The most important single factor in the deliberations which led to the formulation of the scheme was the disquieting increase in the notifications of pulmonary tuberculosis, but it was not only with the potential gravity of the spread of this disease that the Clyde Basin Experiment was concerned. A catholicity of interest was intended, and thus the objective of the plan was defined as the protection of the general well-being of the worker, with particular emphasis upon those workers belonging to the age group 15 to 25. Accordingly, all insurance doctors in the area of the experiment were asked by the Secretary of State to maintain a vigilant attitude towards their patients, particularly the younger ones; to select those who appeared to manifest the signs of a possible breakdown in health, and to refer them specially to the Regional medical officer, whose function it became to arrange for an early and complete clinical investigation. Subsequent action depended upon the results of the examination. Detailed reports containing therapeutic suggestions were sent to the insurance practitioners about

their own patients, and arrangements were made, if necessary, for admission to one or other of the Department of Health emergency base hospitals for the purposes of observation and diagnosis, or, alternatively, to one of the auxiliary hospitals—designated for this purpose convalescent homes—for a short period of rest before resumption of work. In all parts of the district concerned, the response of the doctors to the scheme was one of interest. In some instances, indeed, it was enthusiastic and, although the first stages of the experiment were slow, before many months had passed there was general recognition and acceptance of the advantages of the medical reinforcement which was offered.

During the first six months of the experiment 584 patients were referred to the Regional medical officer, the month-by-month figures being as follows:

January 1942	23
February	49
March	48
April	152
May	176
June	136

It is thus seen that during the earliest stage of working, covering the period from January to March, only a limited response was made to the Secretary of State's request. From the situation as it then presented itself, some apathy on the part of the practitioners might have been inferred; but the hesitancy which was apparent was by no means due to reluctance to participate in the scheme but rather to want of full information as to its implications. That this was so became abundantly clear after a meeting held with representative practitioners in the month of April, when the number of patients dealt with increased threefold. Of the total of 584 people referred during the six months period, some 290 were admitted to institutions—three-quarters of them to base hospitals for full investigation and the remainder to convalescent homes for recuperative purposes. The majority were females. An impartial survey of the immediate results which were obtained indicated that in most of the patients an appreciable benefit rapidly ensued. Within the compass of a few weeks practically all of the hospital cases became fit to resume their own employment or to undertake work of an alternative character. It also became clear that an extension in the scope of the experiment was desirable, in relation to both the age groups and the geographical area covered. The institution of an adequate follow-up procedure for selected groups of patients, such as those suffering from anxiety states, simple pleural effusions and early peptic ulceration, was obviously indicated, but it had to be recognised that under the prevailing conditions it was unlikely that the necessary administrative machinery could be provided.

A consideration of these factors led to the conclusion that an extension of the scheme could indeed be justified, and new arrangements, which constituted the Supplementary Medical Service, came into operation on December 1, 1942. They extended the Clyde Basin arrangements to cover the whole of Scotland with the exception of the Highland counties of Argyll, Inverness, Ross and Cromarty, Sutherland and Caithness—which could not on the whole be designated 'industrial'—and at the same time they eliminated its restriction to the 15–25 age group. Henceforward the service became available to workers of all ages. Further, the interest of the Ministry of Labour and National Service was formally invoked, so that when, on medical grounds, it was found that a change of occupation would be of presumptive benefit in any individual instance, consultations could be arranged between a medical officer of the Department of Health and an official of the Ministry, and co-operative effort could be exercised on the patient's behalf.

Information is not available upon which to form a comprehensive assessment of the advantages of the scheme, for the administrative difficulties which invested the Clyde Basin Experiment applied with even greater force to the extended Supplementary Medical Service. It is of interest, however, to point out how predominantly the western district featured in the Scheme, and the following figures are significant in this respect. In these figures both the original Clyde Valley and the later Supplementary Medical Service Schemes are represented, and the dates are from the beginning of 1942 to the end of 1945:

District	No. of patients referred
Western	10,016
South-eastern	11,042
Eastern	912
North-eastern	200
Northern	4

The facilities offered were appreciated by patients and practitioners alike. The use which individual doctors made of the Service depended to some extent upon the availability of ordinary hospital resources in the areas in which they practised. Some expressed the opinion that the benefits of the scheme would be enhanced by the provision of a similar service (which it was not at that time possible even to contemplate) to patients unable to travel to an examining centre. It was expected in the early days that there might be difficulty in securing the co-operation of industry and in arranging for periods of absence from work in order that the necessary procedure should be carried out, but apprehensions upon this score proved to have been without foundation. Where difficulties were experienced in persuading the patient to take advantage of the facilities of the service, domestic factors were usually responsible.

Certain workers in employment were reluctant to give up remunerative work until forced to do so by the further development of their illnesses. Some had insuperable domestic difficulties, such as the care of ailing relatives; and in others the provision for the care of children while the mother was in hospital. Co-operative local effort, however, generally made it possible to overcome such obstacles. Unavoidably, a proportion of unsuitable cases—cases, for example, of established gross and chronic disease, where no prospect of the prevention of future ill-health remained—were referred, but the general conclusion was that the service as a whole had been both acceptable and beneficial.

Various additional duties were undertaken by medical officers of the Department of Health. For example, in June 1942, the services of the Regional Medical Officers were made available to the National Fire Service to advise on cases in which it was necessary to determine whether a man who was sick, or who had been injured, was permanently incapacitated or likely to become fit to give regular and efficient service, or whether sick-leave privileges were being abused.

At the time of the institution of the Fire Guard by the Minister of Home Security, the Department of Health further arranged with the Ministry of Labour and National Service that application for exemption on medical grounds from fire-guard duties should be submitted in the first place to the Hospital Officers for scrutiny and appropriate recommendation. No actual medical inspections were carried out by the Hospital Officers, who acted as a filtering medium only. In the course of the years 1942–4 inclusive, some 50,000 completed forms of application for exemption were reviewed.

Certain responsibilities were also assumed by the Department of Health under the Disabled Persons (Employment) Act, 1944. Under the terms of this Act, the Ministry of Labour and National Service was empowered, with the object of assisting disabled persons, to arrange:

> The organisation of courses of vocational training
> The provision of courses of industrial rehabilitation, and
> The institution of a Register of Disabled Persons, and the assistance of persons so registered by:
>> the imposition upon employers of an obligation to employ a quota of disabled men and women;
>> the appropriation of vacancies in certain types of employment for Disabled Persons and
>> the organisation of employment under special conditions.

The Act applied both to people who had served in H.M. Forces and to people who had not so served. In general, individual applications for admission to the Register were required, and evidence of disablement had to be produced—ordinarily in the form of a medical certificate. While in most cases the responsible Ministry was able to order admission to the Register on the authority of a simple medical document,

other cases arose in which a decision could not be reached so easily, and further investigation became necessary. It was therefore arranged that applicants of doubtful qualification should be referred by the Ministry of Labour to the Regional Medical Officers for clinical investigation and report. The adoption of this procedure was followed by acceptable results in all districts.

DENTAL SERVICE

Before the war, the Secretary of State established a Committee, which met under the chairmanship of an officer of the Department of Health for Scotland, to 'consider, prior to the actual occurrence of an emergency, all questions relating to the supply of dental personnel required to meet the needs of the Forces and the civilian population in the event of hostilities'. The committee, named the Scottish Dental Emergency Committee, prepared a register, in the form of individual cards, which included all relevant professional and personal details of every dentist in the country, and which effected a classification of the profession generally. The committee had the assistance of seven district committees.

The outbreak of war found the dental profession completely organised. The committee was reconstructed as the Scottish Dental War Committee which had the same chairman and membership as the parent committee except for the withdrawal of certain representatives who were called to service with the Forces. Volunteers for commissions in the three Fighting Services were at once offered in numbers sufficient for all immediate requirements. The committee also offered for service with the Emergency Medical Services sufficient dental surgeons experienced in the treatment of facial injuries to cover the whole of Scotland at strategic points and to staff maxillo-facial units as these were set up. With the coming into operation of the Armed Forces Act, the committee's function in respect of recruitment changed from the selection of suitable volunteers to arrangements for the call-up of dentists and to the formulation of advice on questions relating to the need for deferment of service in individual cases of dental mechanics and other dental personnel. Up to that time volunteers had been sufficient in number to meet all calls, but the new arrangements ensured a steady future supply of dental officers for the Services with due regard for the needs of the civil population in selecting the dentists for recruitment.

Throughout the war period 529 Scottish dental surgeons went on active service, of whom slightly more than half were newly qualified dentists. At one period there was hardly one dentist of military age and fitness who was not, or had not been, on service with the Armed Forces. Despite the embarrassments which sometimes resulted from a high rate of recruitment from a limited field, appeals against decisions

of district committees were few in number. Medically unfit dentists of military age were given the opportunity of electing employment approved by the Dental War Committee.

Dentists in the Emergency Medical Services. It was decided not to make whole-time appointments to the Emergency Medical Services except to the post of house surgeon in the special jaw injury units. Every hospital and auxiliary hospital in the Emergency Hospital Scheme had, however, a dentist attached to it to meet the urgent treatment requirements of in-patients. The service thus provided included the supply of necessary dentures. The method of appointment was by nomination, in the first instance, from the district committees. The method of payment was by sessional fee, while the National Health Insurance scale applied to the provision of dentures. The duties entailed special and emergency calls to hospital when such were necessary. The appointments were stable, and on the whole, continuous, the only changes which occurred being due to ill-health, death or recruitment to the Forces when the age-limit was raised.

Special Maxillo-facial Centres. The two principal centres were located at Bangour Hospital, West Lothian, and Ballochmyle Hospital, Ayrshire, while two subsidiary centres at Stracathro Hospital, Angus, and Raigmore Hospital, Inverness, were also established. All these were established early in the war and had an unbroken period of service. In conjunction with the military authorities, courses of instruction were instituted at Ballochmyle Hospital for Service dental officers and these proved to be widely acceptable and of the highest value. The instructional arrangements were in operation from June 1, 1942, to October 23, 1945. The ordinary or standard course occupied a period of fourteen days and was participated in by 224 Service dental officers, while 25 officers were given a special long course of instruction which ran for about two months. This teaching function was no doubt in part responsible for the fact that the centre at Ballochmyle became exceptionally strong on the dental side. The technique of immobilisation of fractured jaws was developed there to a degree which evoked warm commendation from the consultant adviser to the Army at Home and from Sir Harold Gillies, the E.M.S. consultant adviser in plastic and maxillo-facial surgery.

Dental Care of the Mercantile Marine. Arrangements were made early in the war whereby members of the Merchant Navy Pool received dental care, either from their own dentists or from other practitioners available under the National Health Insurance arrangements.

School Dental Service. War conditions and recruitment to H.M. Forces resulted in staffing difficulties in many local authority schemes; yet, it is gratifying to record, many local authorities succeeded in keeping their staffs up to pre-war strength or actually increased them with consequent improvement in the service generally available.

This was possible on account of the relatively large number of women students who qualify annually in dentistry in Scotland and to the fact that a number of younger male dentists, found to be medically unfit for service with H.M. Forces, elected to serve in the School Dental Service. At the outbreak of war the number of school dental officers was (in terms of whole-time service) approximately 70. At the end of the war it was 100, and the number of children per dental officer varied as between different authorities from 15,000 in one large city to between 2,300 and 2,600 in three of the smaller counties, and in several others just under 3,500. The average number over the whole country was 7,500. In all cases these figures include all secondary scholars and all schools of whatever classification if grant-aided. The average age of male dental officers was about 48 years. It should be noted that until the passing of the Education (Scotland) Act, 1945, education authorities had only permissive powers to provide treatment. In all the circumstances, those authorities (principally the smaller authorities) who improved their services to the children deserved to be congratulated. Nevertheless, the arrangements throughout the country generally required very considerable strengthening particularly in view of the bad state of the children's teeth.

A survey of the dental condition of school children was carried out by dental officers of the Department of Health in 1941–2 and 1942–3. This survey covered almost the whole of the Mainland and some of the Islands. It embraced somewhat more than one-sixth of the total five-year-old population of Scotland and a large sample of children above that age. Some of the more important findings are summarised. Only one five-year-old child in ten was found to have teeth in naturally sound condition. Of every eight back teeth five were decayed or had been extracted for caries. Cases were noted where children were entering on school life with no teeth, all twenty temporary teeth having been extracted. There were many cases in which only one, two or three sound teeth were present. On average, there were seven decayed teeth per child giving an estimated total of 400,000 for this section of the school population. It was estimated that about 100,000 of these teeth, principally molar teeth, were saveable by filling if sufficient staffs were available. The survey of the older children disclosed a rapid deterioration of the first permanent molar tooth (the first of the permanent set erupting normally at six years of age). At age 13 only 20 per cent. of these teeth were sound, 27 per cent. were carious but saveable, 20 per cent. carious and unsaveable, 25 per cent. lost and only 8 per cent. filled. Observations on the second molar teeth (erupting about 12 years of age) showed a somewhat similar grave state.

In order to test any change for better or worse which had taken place during war-time, re-examinations were made in some areas by revisiting the same schools. In all areas improvement was noted.

Examples :

Authority				*Sound*		*Sound*
A.	5-year-old children		1942	7 per cent.	1944	12 per cent.
B.	,,	,,	1942	12 per cent.	1944	17 per cent.
C.	,,	,,	1942	10 per cent.	1946	24 per cent.
D.	,,	,,	1941	8 per cent.	1946	15 per cent.
E.	,,	,,	1941	8 per cent.	1946	24 per cent.

There was little doubt that in some way war-time diet had resulted in a decrease in the amount of dental caries in children, a decrease which had been noted by many school dental officers, but there was no room for complacency. A much greater effort was required to provide treatment for all children and also to solve the complex problems of aetiology.

It had been noted in many quarters that children's gums were, by comparison with pre-war years, in a relatively healthy state. This was particularly so in the case of younger children, few of whom exhibited gingivitis other than a mild localised marginal type usually confined to an area where there were badly broken-down or irregular teeth. The general picture during war years, therefore, was that of an appalling but diminishing amount of dental caries, together with healthy or reasonably healthy gums.

National Health Insurance; Dental Benefit. The Regional Dental Service continued to function throughout the war, although the numbers dealt with were small in their relation to the pre-war volume of work. Much difficulty was naturally experienced in making arrangements for examination, due in part to the long hours of essential employment among the insured population and the restrictions of travel.

HIGHLANDS AND ISLANDS MEDICAL SERVICE

Many areas in the north and west were used for war purposes by the Army, the Royal Navy, the Royal Air Force and units of the United States Army. Nevertheless, in spite of prevailing difficulties, the medical and nursing services which had been established under the Highlands and Islands Medical Scheme were satisfactorily maintained and, indeed, extended with the aid of grants from the Highlands and Islands (Medical Service) Fund. Throughout the war, adequate surgical services based upon the hospitals at Wick, Thurso, Fort William, Lerwick, Kirkwall, Golspie and Stornoway were in operation; and these facilities were further reinforced through the appointment (in this case, however, under the auspices of the Emergency Medical Services) of a full-time surgeon at Oban. In this connexion, also, a gap which had previously existed in the County of Sutherland was closed. Grants were made towards the maintenance of specialised services in the Lewis Hospital and in the Royal Northern

Infirmary, Inverness. As was to be expected the volume of work at the larger hospitals increased materially as a result of war-time activities; and the consultant medical, obstetrical and gynaecological services based upon the Royal Northern Infirmary were of the utmost value in their own fields.

The air ambulance facilities were maintained and increased use was made of them for the rapid transport of patients in need of treatment in a mainland hospital. Arrangements were completed for the extension of the service to Shetland and Lewis; and at times, in the absence of sufficient ambulance planes, priority reservations were authorised for patients able to travel by ordinary passenger aircraft. It should be added that the nursing services in the Highland area were effectively carried on, and that financial aid was given to local authorities to meet part of the cost of propaganda work in connexion with the prevention and treatment of tuberculosis.

The object lesson provided by the Highlands and Islands Medical Services in civil life is not without its value. With certain reservations, indeed, it might be said to have embodied a small-scale illustration of what may be achieved in the future, and in the national field through the agency of a comprehensive health service.

REHABILITATION

The progress of the war was marked by ever-increasing demands for man-power, not only as regards the fighting Services but also in respect of the industrial field. Acceleration of recovery from wounds or illness, and the re-establishment of fitness and working capacity, were matters of urgent moment. In the planning of the Emergency Hospital Service the national needs in this connexion were at least partially foreseen. Thus the importance of rehabilitation was not forgotten, and special arrangements were accordingly made—particularly at those base hospitals in which orthopaedic units were established—for the ultimate functional and mental welfare of the patient. The facilities provided included the installation and equipment of physiotherapy departments and the agencies of occupational therapy; but it was recognised that the essential processes of rehabilitation have their origin in internal rather than external resources and welfare, educational and recreational activities within the hospitals were developed and encouraged. Valuable assistance in all these directions was given by the three fighting Services, by the British Red Cross Society and by voluntary workers; and, apart from the new institutions constructed by the Department of Health, existing general hospitals were encouraged to extend their outlook and resources in respect of rehabilitation. So far as the civilian side of this enterprise was concerned, details of the facilities available were made known to employers and to trade unions through the agency of the Ministry of Labour

and National Service; and, through the Hospital Officers, the maximum possible number of suitable patients was transferred, as occasion dictated, from hospitals lacking in rehabilitation facilities to other institutions which were more adequately equipped. The transfers were effected without compulsion, for the advantages of the scheme soon became apparent to medical officers and patients alike.

A noteworthy development in this field was the opening, early in 1943, of a Fitness Centre for miners in the Department of Health hospital at Gleneagles. The aim of this centre, which was set up at the joint request of the Ministry of Fuel and Power and the Miner's Welfare Commission, was to ensure that disabled miners, submitted to appropriate methods of treatment, were restored as speedily as possible to the highest degree of fitness compatible with their disability. To assist with non-medical questions relating to the welfare and re-employment of patients cared for at the centre, a consultative committee, consisting of representatives of the mining industry and of the Government departments interested was brought into being, and much valuable work was done. The centre, however, was not fully employed, for while accommodation was available for 200 miners, the average number in residence at any one time up till the end of 1945 was about 80. In 1944, therefore, it was decided that certain patients other than miners might in special circumstances be admitted, but the number of applications for such admission was small. At the end of the war it was still too early to assess the work of the centre but the indications were that it was gaining wide appreciation.

In 1944, the Medical Advisory Committee (Scotland) appointed a sub-committee under the Chairmanship of Professor E. P. Cathcart to define and report upon the problems of rehabilitation. The inquiry was carried on throughout the following eighteen months and evidence was taken upon the methods employed generally in medical rehabilitation —physiotherapy, heat, electro-therapy, remedial exercises, occupational therapy and the like—upon rehabilitation as at present practised, upon the conditions in which rehabilitation is of value and upon rehabilitation in relation to industry. The Report of the Sub-Committee[11] published early in 1946, dealt finally with the nature and extent of further facilities required, and contained an appendix by the Medical Officer-in-Charge of the Gleneagles Fitness Centre. Broadly speaking, and in brief, the Report concluded that, so far as possible, there must be continuity of patient supervision during the whole process of primary treatment and rehabilitation; that a planned programme of increasing activity should continue through convalescence to the point at which the patient is considered fit either to resume his ordinary employment or to undertake alternative work, and that care should be taken to prevent the benefit gained through reconditioning from being lost through injudicious delay in the resumption of occupation.

CHAPTER 7

MATERNITY AND CHILD WELFARE

MATERNAL AND INFANT MORTALITY

THE general war-time trend of events in relation to the maternal and infant mortality is indicated in the following table:

Year	Births per 1,000 of population	Still births per 1000 live and still births	Maternal mortality per 1,000 live births	Infant mortality per 1,000 live births	Illegitimate births (percentage of total births)
1938	17·7	*	4·9	70	6·1
1939	17·4	42	4·4	68·5	6·0
1940	17·1	42	4·2	78	5·9
1941	17·5	40	4·7	82·7	6·6
1942	17·6	38	4·0	69·3	7·1
1943	18·4	36	3·7	65·2	7·6
1944	18·5	32·5	2·9	65	7·9
1945	16·9	33	2·8	56	8·6

* Still births were not then registrable.

The fall in the birth rate which had been observed before the war continued throughout 1940—that is, until the common effects of war in retarding or reversing such a fall had become apparent. Thereafter, there was a material if not substantial increase till 1944, after which a decline again occurred. The number of still births progressively decreased throughout the war years except for the slightly less satisfactory figures in 1945, and a combination of circumstances was no doubt responsible for this happier situation. Among those must probably be included a more enlightened practice of obstetrics, a greater emphasis upon ante-natal care and (possibly most influential of all), the nomination of expectant mothers as a priority group for certain foods such as milk and eggs. The 'queue priority' for expectant mothers which was instituted by the Government in 1945 did not become widely operative, partly because of the reluctance of those concerned to claim their rightful privilege. It cannot, therefore, be regarded as of any importance in this connexion.

The percentage of illegitimacy—a factor, as has already been pointed out, of some value as an index of social stability—followed the course which was to be expected in the prevailing circumstances; but, unlike the birth rate, it did not attain its maximum in 1944, but in the following year, when the birth rate as a whole declined. This increase in illegitimacy reflected a slackening of restraint which was manifest throughout the social structure.

The maternal mortality figures indicated steady progress. In 1941 a rise in the maternal death rate almost to the 1938 level did occur, but this could in large measure be ascribed to the conditions associated with the period of maximum aerial activity by the enemy. The decline in the figures was largely attributable to the coming into use of the sulphonamides and penicillin.

The infant mortality rate for 1939 was the lowest which had ever been recorded in Scotland; and though still relatively unfavourable, it was at least tending in the right direction. In 1940, however, the rate increased considerably, which could be explained by the occurrence of large numbers of deaths due to the exceedingly severe weather during the first quarter of the year. Similar conditions prevailed throughout the early months of 1941, when the infant mortality rate was still higher. Subsequently, a happier trend prevailed, so that in 1942 the rate fell to a new low record, and further progressive falls occurred in the following three years.

The disquieting figures for 1940 and 1941 led to the appointment, in June 1942, of a Sub-committee of the Scientific Advisory Committee to examine and report upon the problem of infant mortality in Scotland. The Report of this Sub-committee[12] appeared in 1943. It evoked widespread interest not only among those directly concerned with the problems involved, but among the population at large. It recorded the opinion that one of the main causes of the high Scottish infant mortality was the fact that a large proportion of the people, both in urban and rural areas, lived under housing conditions which were seriously defective. It further advanced the opinion that no measure taken to safeguard the health and well-being of infants was likely to be satisfactorily operative unless at the same time a radical improvement in housing occurred. The recommendations which were made included the arrangements for adequate food of the right kind to be provided; the provision of extended and improved child-welfare services; and an increase in the number of maternity hospitals staffed by specially trained personnel.

In a sub-section of the report, attention was drawn to the high neo-natal death rate associated with infections both in the home and in hospital; and the Scientific Advisory Committee (see Chapter 8) nominated another sub-committee to undertake an examination of this special problem.[13]

The report was exhaustively discussed by the Department of Health in association with representatives of the local authorities, and the latter were asked to consider plans for carrying out, when times were more favourable, recommendations which could not be dealt with immediately, and suggestions for achieving, even in existing circumstances, progress and improvements in some aspects of the problem. It is satisfactory to record the interest with which local authorities explored the possibilities and formulated their plans.

MATERNITY SERVICES

Maternity Services (Scotland) Act, 1937. The outbreak of war found the maternity services of Scotland in a state of transition and uncertainty. In 1937, the Maternity Services (Scotland) Act had been placed upon the Statute Book, but the operation of its provisions was retarded because of the pre-occupation of the local authorities with the problems of national safety. By September 1939, however, the Act had begun to influence practice in the majority of local authority areas and was finding increasing favour in the eyes of public and profession alike. Notwithstanding opposition upon the part of the medical profession in certain districts, and despite war-time difficulties in general, the practice fostered by the Act was progressively widened throughout the years of struggle. Thus, by the middle of June 1941, 45 schemes covering the areas of 47 local authorities, out of a total of 55 in Scotland, had been approved by the Department of Health, and of these no less than 38 were actually in operation. A year later, 39 schemes were functioning. Even so, the medical practitioners in some few districts were still disinclined to accept service under the Act; and the Scottish Committee of the British Medical Association accordingly increased its efforts to secure universal co-operation. As a result, in part, of these activities, 47 schemes covering 49 local authority areas were given official approval by the middle of 1943, at which time 41 schemes were in operation. During the next 12 months three additional schemes began to function; and by the end of June 1945, out of the 55 local authority areas, schemes had been approved for 52, and 50 schemes were in active operation. To all intents and purposes, the country as a whole was covered, but Glasgow and Dundee were exceptions. By the same time, Section 6 of the Act, which prohibits unqualified women from acting as maternity nurses for gain, had been applied to 42 local authority areas. The consequent elimination of the 'handywoman' was an important step in the raising of the standard of midwifery practice.

It may be recalled that the main purpose of the Act was to make available to pregnant women, who propose to be confined in their own homes and who apply for the service, the joint care throughout pregnancy, parturition and the lying-in period of a medical practitioner and a certified midwife, with the additional assistance of an obstetrician or anaesthetist, or both, should the practitioner so desire. The prescribed medical supervision included not less than three examinations at different periods of pregnancy, care of the patient during labour and the puerperium, and at least one examination four weeks after delivery. An inclusive charge was authorised, which varied with the patient's capacity to pay and which could be remitted entirely in the case of those in necessitous circumstances.

THE EVACUATION SCHEME: MATERNITY ARRANGEMENTS

The Evacuation Scheme included provision for the transport from time to time of parties of expectant mothers from the sending to the reception areas. In consultations between the Department of Health and the local authorities it was agreed that the best interests of individuals and authorities alike would be served by arranging, so far as possible, to billet expectant mothers as near as was convenient to the maternity homes or hospitals in which they would probably be confined. Consequently, under the broad plan, the location of these homes and hospitals, and the number of beds available in them, was the determining factor in deciding which reception areas should be asked to billet expectant mothers, and also the number of individuals to be allocated to the respective districts. By the end of September 1939, some 800 beds had been made available for emergency maternity purposes; but because of the unexpectedly small number of expectant mothers who were actually evacuated as a class (the actual total was 403) and of those others (also few in number) who accompanied their evacuated children, only a limited use was made of the available maternity accommodation. It was therefore decided, in November 1939, to release a number of the maternity homes of which little use was likely to be made, and most of them were added to the list of Auxiliary Hospitals which formed part of the Emergency Hospital Scheme. At the end of 1939, therefore, only some 400 beds remained available in the 16 emergency maternity homes or hospitals which continued to function or were held in reserve. Up till this time, 250 confinements among evacuated pregnant women were dealt with in the emergency institutions.

The ordinary maternity services in the reception areas, and particularly those of the local authorities concerned, were available for the routine care of maternity patients; and, in view of the relative remoteness of certain of the areas from centres of population ordinarily provided with specialised services, the assistance of obstetric specialists resident in Perth, Inverness and Dumfries was placed at the disposal of the reception authorities. This step was important in itself and was also perhaps an indication of the trend of practice in the future. By strengthening the resources of the medical officers of health, it gave increased confidence to patients and their relatives, for it ensured the adequate care of special cases.

There was doubt at first as to the adequacy of the supply of midwives, and in order to meet possible shortages, a list of volunteer midwives was prepared and circulated to local authorities. Medical officers of health were authorised to make appointments from the list, and arrangements were made between the Central Midwives Board and the Department of Health for the distribution of amended lists

from time to time. Because of the small number of pregnant women who presented themselves for evacuation, however, no difficulties arose. Only one local authority found it necessary to invoke the powers provided by Regulation 33 of the Defence Regulations, 1939, which permitted the resumption of practice by women who had voluntarily surrendered their certificates under Section 4 (1) of the Maternity Services (Scotland) Act, 1937. Even in this isolated instance, only one midwife was affected.

Maternity Hospital Accommodation. The growth of popularity of the new domiciliary service had repercussions which had not been fully appreciated in advance. It had been expected that it would relieve the pressure on maternity hospital clinics and beds; but it had precisely the opposite effect. More widespread, thorough and regular ante-natal supervision brought to light an increased number of abnormal conditions; as a result, the provision of ante-natal beds in maternity institutions was found to be far short of requirements. It was assumed that when the leeway could be made up, the situation would adjust itself satisfactorily; and even as things were, there was evidence for the belief that the operation of the Act was having a benign effect upon the maternal mortality figures. Thus in 1943, in approximately 18,000 cases dealt with under the Act, there was maternal mortality of 1·9 per 1,000 live births as compared with a rate of 2·8 in some 10,000 cases treated privately under ordinary domiciliary conditions.

Apart from the use which was made of the domiciliary services provided under the Maternity Services Act, there was a progressively increasing demand for maternity beds. This demand was met so far as was possible; and despite the other pre-occupations of the war, and after excluding the emergency arrangements which were made, the number of ordinarily established maternity beds in Scotland rose from 1,430 in 1938 to 1,620 in 1941. The rise continued to a maximum in 1944, as follows:

1942 . . .	1,670
1943 . . .	1,845
1944 . . .	2,178

This provision permitted of the management of some 55,000 to 60,000 confinements in institutions each year. In the Orr Report,[14] it was stated that as a minimum the country should provide 45 beds for every 1,000 confinements. On this basis, Scotland would require some 4,300 beds, that is, about 2,000 more than existed at that time. In respect of lying-in beds, therefore, the situation in Scotland was still far from satisfactory. Nevertheless, the general position was materially improved throughout the latter part of the war years by the opening in 1943 of the Ayrshire Central Hospital at Irvine and the provision from E.M.S. sources of upwards of 100 beds at Lennox Castle Hospital. The City of Edinburgh adapted wards in existing institutions for

maternity purposes and certain other local authorities whose building schemes had been held up because of the war, received permission to proceed. Local authorities in general gave urgent consideration to the question of increasing their maternity bed resources, and various schemes were submitted for consideration by the Department of Health.

A special note is desirable upon one aspect of the emergency maternity services. During the years 1939–41, some 11 emergency maternity homes were opened in the reception areas, primarily for the benefit of evacuated expectant mothers. As has been indicated above, not all of these were actually required for the end in view. Four were for the most part held in reserve, while the others served—and continued to serve—general local authority needs simultaneously with their function under the Evacuation Scheme. These others contained a total of about 200 beds—a number which fluctuated slightly in accordance with immediate needs—while 108 additional beds were potentially available in the reserve homes. Although equipped to emergency standards only, the record of work accomplished by the maternity homes may be described as remarkable, and this despite the background against which their work must be viewed. The figures tabulated below, which cover the working of seven of the maternity homes over the years 1940 to 1944 inclusive are significant:

Home	Admissions	Live births	Still births	Neo-natal deaths	Maternal deaths	Local patients	Evacuee women	Abnormal labour
Airthrey Castle	2,210	2,021	32	26	2	394	1,816	169
Arthurlie, Bute	378	369	9	9	0	11	367	6
Fordbank .	1,499	1,426	26	11	0	732	767	132
Haddo .	1,308	1,221	35	11	1	534	774	79
Kingsmeadows	1,157	1,113	18	4	1	709	448	140
Meiklour .	1,203	1,095	11	17	0	710	493	121
Lucy Sanderson	48	45	2	0	0	0	48	5
Totals .	7,803	7,290	133	78	4	3,090	4,713	652

Of the total admissions 60 per cent. of the patients were evacuated women—in the sense that they were transferred from centres of population to the country for confinement—while the remaining 40 per cent. were admitted to hospital from local domiciles. Multiple births numbered 103. Only two cases of puerperal sepsis occurred and in no instance was infection found in the nursery quarters. The still birth rate was 17·9 per 1,000 live and still births, as compared with the Scottish average over the years in question of 37·6 per 1,000 live and still births. The neo-natal death rate was 10·7 per 1,000 live births—a figure which compares very favourably with the average Scottish neo-natal death rate (covering the first two weeks of life) of 25 per

1,000 live births. Again, the maternal mortality rate was only 0·54 per 1,000 live and still births compared with the Scottish average of 4 per 1,000 live births.

This record is, at first glance, an outstanding one, and it provides food for thought. In the absence, however, of certain data—details, for example, of the degree of selection which was exercised in the admission of patients—the only comments which may appropriately be made here are as follows:

Particular emphasis was laid upon the maintenance of friendly and home-like relations between all the inmates, patients and staff alike, of the maternity homes; and the benign influences of 'atmosphere' were fostered and called into active therapeutic service. A rational system of dietetics was progressively built up, a matter of importance from the point of view not only of the immediate needs of the patients, but of stimulating their interest in the possibilities of the domestic kitchen. Professional practice was maintained in the simplest form which was compatible with established principles. Abnormal cases, numbered 652, or some 9 per cent. of the whole. Specialist services were available when they were required; and the obstetricians appointed under the emergency arrangements at Perth, Inverness and Dumfries rendered valuable services not only to the institutions situated within their respective territories, but in the ordinary course of events throughout the surrounding regions.

CHILDREN'S SERVICES

NURSERIES

In 1939 when the evacuation of mothers and children from danger areas took place, it was suggested to local authorities that nurseries for pre-school children might be set up in reception areas. The type of children who, it was believed, would benefit from this provision were those of expectant mothers who, during the period of confinement would be unable to care for their families. Since, however, the great majority of women and pre-school children returned home after a very short stay, no nurseries were set up for this purpose.

Later it became apparent that some residential nursery provision was advisable in 'safe areas' for pre-school children whose parents had to remain in vulnerable areas. The 'Save the Children Fund', with money from America and equipment and some financial assistance from the British Government, set up seven nurseries for such children between the ages of two and five years. The first was opened at Cockenzie House in May 1941, with accommodation for 30 children. By 1943 there was accommodation for 203 children in these nurseries.

To all intents and purposes the residential nursery scheme came to an end in 1945. It served a useful purpose in showing the degree to which physical and mental improvement might take place in children

unfamiliar with any environment other than that of the city streets, and in so doing it provided a practical and valuable object lesson for the future.

With the demand for married women to take up employment to aid the war effort, war-time nurseries became essential in industrial areas. While their main objective was to make it easier for married women to take up employment in factories, these nurseries were by no means dissociated from two of the great objectives of all schemes of public health, namely, the well-being and happiness of children and the amelioration of the lot of the harassed mother.

In 1941, local authorities were asked to consider the needs of their areas, contingent upon the steady flow of married women into industrial employment, in respect of nursery accommodation. It was intimated that approved expenditure on war-time nurseries would, after deduction of any contributions received from parents, be borne by the National Exchequer. The siting of such nurseries was governed mainly by the necessity of having premises near the children's homes so that no mother or child had a long journey to make. This restriction entailed the acceptance of buildings and land which did not reach the ideal, but made it possible for the two public health objectives referred to above to be in a great measure realised. The table below indicates the progress of war-time nursery activity:

Date	Number in operation	Accommodation
January 30, 1942	29	1,180 children
January 30, 1943	99	4,353 ,,
January 30, 1944	139	6,338 ,,
December 31, 1944	146	6,596 ,,
June 30, 1945	143	6,410 ,,
December 31, 1945	138	6,215 ,,

The Scottish Education Department collaborated whole-heartedly with the Department of Health in the organisation of war-time nurseries, but serious deficiencies in the availability of nursery school teachers for work with children over two years of age hindered the play activities and social and mental development of these children. In addition to the war-time nurseries set out above, there were in operation at the end of June 1945 twenty-two war-time nursery classes for children aged two to five years, set up mainly in school premises by education authorities. These war-time nursery classes were controlled by the local authorities' education committees and not by the public health committees. The Department of Health for Scotland maintained continuous contact with the Ministry of Labour and National Service, so that early information might be available in respect of those areas in which nursery needs could be foreseen.

Efforts could thus be made to ensure that prospective demands would be met as soon as they actually arose.

It may be said that the nurseries were on the whole a success and exercised a marked effect on the war effort. Most of them could have been filled several times over had accommodation and service been available. The public health aspect of the nursery activities included the encouragement of habits of personal cleanliness, the institution of sound dietetic arrangements and a proper regard for rest and sleep as well as for work and play. In fact the chief aim of nursery workers was to make the nursery an ideal extension of the best type of home.

Following the cessation of hostilities and the lessening of the drive for married women to enter into employment, a few nurseries in the less industrial areas where attendance did not maintain a high level were closed. But by far the greater number of closures was due to the owners requiring the return of their property, e.g., church halls, and private dwellings. The demand for accommodation in nurseries continued and three years after the end of the war was greater than could be met by the existing arrangements. Eighty-two of the war-time nurseries were still functioning with places for 3,483 children, while 30 or more were still used for children either as nursery schools, convalescent or children's homes.

SCHOOL HEALTH ADMINISTRATION

The School Health Services, already affected before the outbreak of war by the calls made upon the medical staffs by the developing civil defence scheme, were further interrupted by the operation of the evacuation scheme from September 1939 onwards. In 1940, the additional duty of conducting medical inspections on behalf of the Children's Overseas Reception Board had to be undertaken; and during the same year further burdens fell upon the school medical staffs by reason of the diphtheria immunisation campaign initiated by the Department of Health. Nevertheless, even during this difficult period the services were maintained in a satisfactory manner.

Of the special demands made upon the school health authorities by the evacuation scheme something has already been said in the chapter dealing with the latter, and no amplification is necessary here except in one particular connexion. An important evacuation responsibility of the school health services was that of dentistry. As in the case of the ordinary medical services, the School Dental Service was available to the evacuated children in common with those actually belonging to the reception areas. It was understood in advance, and demonstrated by the event, that in certain localities a virtual suspension of school dental activities would be necessary for a time after the evacuation, and that this would be especially true in relation to conservative

treatment. The importance of the resumption of a full service at the earliest possible time was, however, stressed; and in point of fact such a resumption was found to be possible in most districts within a few months. In view, nevertheless, of the unavoidable temporary restrictions, instruction in dental hygiene was adopted as a normal part of the school routine. By reason, further, of the increased demands upon the time and resources of the official dental staffs, which were reinforced in certain areas by the temporary employment of private dental practitioners, it was agreed that the methods of ordinary treatment applied to temporary dentitions should be modified and simplified, but that there should be no relaxation in the effort to conserve permanent teeth. Arrangements were also made for the simplification of record keeping; and in this connexion the sending authorities were asked to pass on to the reception areas any information which might be helpful to dental officers in the execution of their work—for example, the names of children who were bleeders or who had been supplied with orthodontic appliances.

Throughout the years up to and including 1943, the prevalence of scabies and of vermin was a disturbing feature of school life at large. It was an indication of the neglect of hygiene in the home and a disquieting problem from the standpoints of public health and national morale alike. The continuous campaign against these conditions, which showed no definite recession until after 1943, threw much additional work upon the depleted school health staffs. Much assistance was given, however, by the co-operation of the teaching staffs, who undertook the duty of imparting instruction in hygiene, and of the personnel of certain first-aid posts, the cleansing facilities of which were employed as occasion required. It is, indeed, the fact that the extensive gas-cleansing facilities which were established under the first-aid post organisation found their only real field of usefulness in the treatment of scabies and skin infestation.

Apart from the fairly general increase in skin affections, there was no evidence whatever throughout the course of the war that the health and nutrition of school children had fallen below the pre-war standard. On the contrary, the indications presented from the year 1943 onwards suggested that the physical condition of the children, including their nutritional state, was not only being maintained, but that in some areas an actual increase, as compared with pre-war figures, in the heights and weights of children entering and leaving school was being observed. The operation of the milk-in-schools schemes and of the arrangements for the feeding of school children—which were fortified by the provisions of the Education (Scotland) Act of 1942—undoubtedly contributed to this improvement.

The Education (Scotland) Act of 1945, which received the Royal Assent in June of that year, extended the powers and duties of education

authorities in respect of medical inspection, supervision and treatment, and of the cleanliness of pupils.

PROVISION OF ARTIFICIAL LIMBS

Child guidance clinics, special-school activities and the school orthopaedic services, where these were already in existence, operated during the war with as much efficiency as was possible. In relation to the last, an interesting development took place in the last months of 1942. Local authorities were then informed that special arrangements had been made by the Government in connexion with the provision of artificial limbs for children. These arrangements were designed to ensure that a child who, for any reason, had to be subjected to amputation of a limb would, when necessary, be provided with an artificial limb with a minimum of delay and under the best possible auspices. Under this scheme, the services of the limb fitting surgeons of the Ministry of Pensions, the facilities of the Ministry's hospital and limb fitting centres, and the resources provided by the Committee of Queen Mary's (Roehampton) Hospital became available to the authorities. (See Part II, Chapter 5 of this Volume.)

CHAPTER 8

THE MENTAL HEALTH SERVICES IN SCOTLAND, 1939-1945

THE MENTAL HEALTH SERVICES BEFORE 1939

ORGANISATION

In Scotland before the outbreak of the War of 1939–45 there was accommodation for approximately 20,000 patients in mental hospitals and 4,500 patients in mental deficiency institutions. In addition, there was accommodation for approximately 1,000 patients in the lunatic wards of poorhouses and for 400 patients in the four observation wards (three in Glasgow and one in Dundee) attached to general hospitals.

The total number of patients resident in mental hospitals and in lunatic wards of poorhouses, certified and voluntary, during the period 1927–38 is shown in Table 1 (A). This table shows an increase during the period in both the certified and voluntary patients, moderate in regard to the former, but marked in regard to the latter.

The mental hospitals were 32 in number, 7 of these were Royal mental hospitals, 23 were under the control of Local Authorities and 2 were private mental hospitals, one of these last being administered by a religious body. The largest mental hospital provided accommodation for approximately 1,500 patients. Several mental hospitals had accommodation for over 1,000 patients, but, in general, the size of the average mental hospital in Scotland was considerably smaller than its counterpart in England, many having approximately 400 to 500 patients.

In association with one of the Royal mental hospitals, a special unit had been established for the diagnosis and in-patient treatment of patients suffering from neurosis; and there were nursing homes attached to certain of the Royal mental hospitals admitting patients suffering from early and mild forms of psychiatric illness without the provisions of the Lunacy Acts.

In connexion with many of the mental hospitals there were out-patient psychiatric clinics and extra-mural mental health services varying considerably in the range of service they provided and in their degree of development.

There were 13 institutions for mental defectives; of these one was a Royal institution, two were administered by independent bodies, two by religious bodies and the remainder by local authorities.

The standards of accommodation and treatment varied considerably in the different mental hospitals and mental deficiency institutions, and in some of the local authority hospitals situated in the more remote

and rural counties the material accommodation at least was often below desirable standards.

In addition to institutional accommodation, extensive use was made of the boarding-out system both for mental and mentally defective patients. This system had been employed in Scotland for 90 years; it had developed progressively during this period and in 1938 there were 1,032 mental and 1,587 mentally defective patients boarded-out in the community under either related or un-related guardianship.

There was one University Chair in Psychiatry (the first in the United Kingdom) situated in Edinburgh, where both undergraduate and post-graduate instruction in psychiatry was provided and a University diploma in psychiatry granted.

The central authority responsible for the administration of the Mental Health Services was the General Board of Control for Scotland situated in Edinburgh.

ADMISSION TO MENTAL HOSPITALS

Patients could be admitted to mental hospitals either as certified or as voluntary patients, provision for the latter class of patient having been introduced in Scotland in 1866. In the case of mental deficiency institutions certification was necessary before admission.

During the period 1927–38 the annual admission rate to the mental hospitals and to the lunatic wards of poorhouses had varied from 3,871 in 1927 to 3,600 in 1938. The admissions of each class, i.e. certified and voluntary, for each year during the period are shown in Table 2 (A).

The range of variation in the total admission rate showed little of significance, the average annual rate being 3,710. There was, however, a marked variation in the method whereby admission was obtained. The total number of patients admitted on a certified basis had fallen fairly steadily from 3,168 in 1927 to 2,491 in 1938; but the number of voluntary admissions had risen in the same period from 703 to 1,109. The highest percentage of voluntary admissions was to the Royal mental hospitals; but, on the other hand, no voluntary patients had been admitted to certain of the large local authority mental hospitals.

DEATHS IN MENTAL HOSPITALS

The death rate per thousand patients resident during the period 1927–38 is shown in Table 3 (A). The death rate varied between 91·4 per thousand in 1929, the highest, and 69·4 per thousand in 1934, the lowest. The mean death rate was 76·1 per thousand.

The death rate from pulmonary tuberculosis is shown in Table 4 (A). It showed a gradual fall from 10·8 per thousand in 1927, the highest figure, to 6·2 per thousand in 1938; the lowest figure was 5·9 per thousand in 1933 and the mean death rate for the period 7·7 per thousand.

THE SURRENDER OF ACCOMMODATION TO THE E.M.S. AND COMBATANT SERVICES

The outbreak of war in 1939 presented two problems of particular importance to the Mental Health Services. In the first place, heavy casualties were expected among the civilian population in the industrial and urban areas of central Scotland as a result of air raids, and in association with these casualties there was also the possibility of a large number of cases of neurosis, or even of the grosser forms of mental disorder, occurring. In the second place, it became evident that, if the experience in the War of 1914–18 could be taken as a guide, the number of psychiatric casualties occurring in the three combatant services would also be considerable.

In both events it would be necessary for accommodation to be provided for the possibly large and, particularly in the former case, unpredictable number of patients. In addition, in Glasgow and other cities, many hospitals were situated in the danger zone and might themselves be subject to air attack and require evacuation.

In the event, in Scotland, as elsewhere, it was found that air attack was less intensive than had been expected and that where severe air raids did occur (as in the Clydeside area in 1941) they did not produce any appreciable increase in psychiatric casualties among the civilian population. During the war period there tended, in fact, to be a decrease rather than an increase in the incidence of psychiatric illness, or at least of patients presenting themselves for treatment, possibly due to such factors as increased employment.

In order to meet the possible additional demand for beds, both for civilian and service neurosis patients and for general medical and surgical cases, certain mental hospitals were either wholly or in part evacuated of their mental patients and their accommodation transferred to the administration, either of the E.M.S. or, later, of one or other of the Services. The patients in these evacuated mental hospitals were transferred to mental hospitals in other parts of Scotland.

The mental hospitals evacuated in the first instance included the City of Glasgow Mental Hospital at Gartloch, the Stirling District Mental Hospital at Larbert and City of Edinburgh District Mental Hospital at Bangour in West Lothian. In addition, the Institution at Carstairs in Lanarkshire, which had just been completed (but not occupied), for the detention and treatment of criminal lunatics, was handed over as an emergency hospital by the Scottish Home Department.

The City of Glasgow Institution for the care of mental defectives at Lennox Castle was also included in the emergency scheme, but, in this case, the patients were not all evacuated, certain of them being transferred to a hutted annexe which was provided by the Department of Health within the grounds of the Institution; many of the permanent

buildings thus became available for casualty purposes. The City of Aberdeen Mental Hospital at Kingseat was taken over by the Admiralty.

As a result of the transfers of patients from these hospitals to other hospitals the principle of 'crowding-up' in the receiving mental hospitals had to be adopted.

Further accommodation was surrendered as the war progressed. In 1941 the Smithson Institution (for mental patients) in Greenock was taken over by the Royal Canadian Navy for headquarters purposes. Further provision for service patients was made at the Crichton Royal Hospital, Dumfries, in which a psychiatric hospital for officers with 60 beds was opened at the beginning of 1941; and at Gleneagles Hospital (formerly an hotel) where accommodation was provided for neurotic cases arising in the Royal Air Force.

A neurosis unit was established at Gartloch Hospital in 1940. With the opening of this unit, the neurosis unit at Bangour Hospital which had been opened in 1939 ceased to function. The number of beds available at Gartloch neurosis unit was approximately 200 and, for the most part, the patients were civilians or members of the Merchant Navy or patients for whom the Ministry of Pensions were responsible. In 1945 this unit was transferred to Law Junction Hospital where 80 beds were available and later in the year, owing to staffing difficulties at Law, the unit was transferred to a villa at Lennox Castle where 50 beds were available, all for male patients. Female patients at this time were admitted to ordinary medical wards, if beds were available, for psychiatric observation and treatment. In 1946 the neurosis unit for male patients was finally moved from the villa at Lennox Castle to Killearn Hospital.

Thirty beds were provided for neurosis patients at Old Mill Hospital, Aberdeen. In 1944, when it was expected that the beds thus employed would be required for battle casualties from the North European front, the unit was transferred to Ballogie Auxiliary Hospital.

Between 1940 and 1942 Carstairs Hospital acted as the main Services neurosis unit in Scotland. In 1942 it was transferred from the E.M.S. and became a military psychiatric hospital for psychosis patients under the control of the War Department. The War Department also operated a section of the Larbert Base Hospital in two phases. The first phase began in June 1940, when a small military staff was installed and military neurosis patients were admitted and treated with the help of the hospital medical officers; later in the year a full military staff took over a block of 300 beds which was thereafter known as Bellsdyke Military Psychiatric Hospital and continued in operation until early in 1946.

The total number of patients involved in the evacuation of these hospitals and institutions, or in the transfer to other hospitals, was 4,200 (4,040 mental patients and 160 mental defectives). In addition to the overcrowding in the receiving hospitals already mentioned,

patients who might otherwise have been transferred to mental hospitals had necessarily to be retained in the observation wards of general hospitals. In addition, many mental patients were retained in the ordinary wards of poorhouses.

THE EFFECT OF THE WAR UPON THE MENTAL HOSPITALS

ADMISSION RATE

The total number of patients resident during the period 1939–45 both on a certified and on a voluntary basis is shown in Table 1 (B).

Table 2 (B) shows the admission rate during the period 1939–45. This rate showed a slight decrease in 1940, but the average figure remained much the same as during the pre-war years, the average admission rate being 3,617 as against 3,710 during the 1927–38 period. The percentage of voluntary admissions continued to rise, however, and in 1945 it was almost three times as high as in 1927 and almost twice as high as in 1938.

DEATH RATE

As will be seen from Table 3 (B), despite the overcrowding, the lack of ventilation, particularly in dormitories, the rationing of food and difficulties in providing numerically adequate medical and nursing staff, there was very little change in the death rate during the war period, the average figure—74 per thousand as against 76·1 per thousand during the 1927–38 period—being in fact less than during the pre-war period.

The death rate from tuberculosis during the period 1939–44 is shown in Table 4 (B). This table showed that there was a high rate in 1942 which began to fall in 1943, but the average 7·9 per thousand was not appreciably greater than the average during the preceding period, 7·7 per thousand. Figures for the death rate from tuberculosis for 1945 are not available.

There were no major epidemics of a serious nature in the mental hospitals or mental deficiency institutions during the war. In two institutions there were outbreaks of dysentery, but, apart from this, there was little variation from the pre-war period. It may be noted that serious outbreaks of dysentery and allied diseases have always been unusual in mental hospitals and mental deficiency institutions in Scotland.

MEDICAL AND NURSING STAFF

As in England many difficulties were experienced in obtaining and retaining adequate medical and nursing staffs in the mental hospitals and mental deficiency institutions. The problems in regard to the recruitment of medical officers from mental hospitals and mental deficiency institutions to the Armed Forces and in regard to the

reservation and direction of nursing staff did not differ essentially from similar problems arising elsewhere in the United Kingdom and do not call for special mention or discussion here.

THE MENTAL DEFICIENCY SERVICES

Throughout the 1939–45 period considerable and increasing difficulty was found in obtaining beds for mentally defective patients, particularly those suffering from the lower grades of mental deficiency. A section of Gogarburn Institution was evacuated to make room for general medical and surgical cases and a section of Lennox Castle Institution was similarly evacuated.

AIR RAID DAMAGE TO MENTAL INSTITUTIONS

Seven mental hospitals were affected by air raids, but only two received much material damage. A complete ward and sections of other wards of the Aberdeen Royal Mental Hospital were destroyed, one patient and three members of the staff being killed; and considerable damage was inflicted at the Montrose Royal Mental Hospital where two members of the staff were injured, one seriously. At the latter hospital one of the mental hospital nurses was awarded the George Medal for gallantry.

THE EFFECT OF THE WAR ON THE MENTAL HEALTH SERVICES

One of the most important changes occurring during the 1939–45 period was the increasing integration of the medical services as a whole, including the Mental Health Services. Closer co-operation became possible between the general hospital and the mental hospital. During this period also, although not as a result of the war, increasing use was made of the new physical methods of treatment in psychiatry such as electro-therapy, insulin-therapy and leucotomy. Occupational therapy was increasingly developed in various hospitals and help and assistance in this and other fields was provided by the Department of Health and by the British Red Cross Society. The latter established in Glasgow in 1944 an out-patient occupational centre and also provided an occupational therapist for the neurosis unit at Lennox Castle.

In 1944 the After-care Organisation for the treatment and after-care of ex-Service psychiatric casualties was set up by the General Board of Control for Scotland.

POST-WAR DEVELOPMENTS IN THE MENTAL HEALTH SERVICE

Important developments have occurred since the close of the war.

The most important of these has been the introduction of the National Health Service (Scotland) Act, 1947, as a result of which all the mental hospitals (with the exception of two private mental hospitals) and all the mental deficiency institutions (with the exception of four

administered by religious bodies) became the responsibility of the Secretary of State for Scotland.

In 1938 a committee was set up to report upon the Scottish Lunacy and Mental Deficiency Laws under the chairmanship of Lord Russell. This committee made its report in 1946, the report containing numerous suggestions for amending and modernising the statutes governing legal procedure.

Since the war the process of bringing the Mental Health Services into the field of the general medical services has continued. New chairs of psychiatry have been established; new psychiatric clinics have been opened for out-patients in the teaching hospitals and elsewhere. Some of the functions of the Board of Control relating to mental health are now transferred to the Department of Health.

Other trends showing improvement in the services are the abolition of lunatic wards in poorhouses and the rapid increase in the proportion of voluntary patients.

Problems still remaining are the recruitment of sufficient nursing staff for the mental and mental deficiency hospitals and the deficiency in the number of beds. There is still a scarcity of psychiatric specialists—particularly in the field of child psychiatry—and the recruitment of psychiatric social workers is still below the requirements for an adequate service.

In conclusion it might be said with truth that out of the emergency conditions of war new trends and developments which had long been in contemplation received an impetus and under the urge of necessity the foundations of many improvements in the Mental Health Services were laid. Their full implementation, however, depends upon the post-war economy and on the availability of national resources in material and man-power in competition with demands from other quarters.

Numbers of Patients Resident in Mental Hospitals and Lunatic Wards of Poorhouses

TABLE I (A)

THE PRE-WAR YEARS

Year	Certified	Voluntary	Totals
1927	16,922	815	17,737
1928	17,294	909	18,203
1929	17,405	950	18,355
1930	17,650	972	17,650
1931	17,935	1,038	18,973
1932	17,915	1,056	18,971
1933	18,069	1,088	19,157
1934	18,251	1,190	19,441
1935	18,353	1,213	19,566
1936	18,304	1,327	19,631
1937	18,422	1,405	19,827
1938	18,463	1,480	19,943

TABLE 1 (B)
THE WAR YEARS

1939	18,292	1,531	19,823
1940	18,061	1,558	19,619
1941	17,884	1,570	19,454
1942	17,635	1,642	19,277
1943	17,452	1,779	19,231
1944	17,284	1,912	19,196
1945	17,169	2,081	19,250

Admissions to Mental Hospitals and Lunatic Wards of Poorhouses

TABLE 2 (A)
THE PRE-WAR YEARS

Year	Certified	Voluntary	Totals
1927	3,168	703	3,871
1928	3,309	775	4,084
1929	3,173	800	3,973
1930	3,056	734	3,790
1931	2,968	771	3,679
1932	2,781	803	3,584
1933	2,862	801	3,663
1934	2,670	843	3,513
1935	2,694	855	3,549
1936	2,564	900	3,464
1937	2,735	1,013	3,748
1938	2,491	1,109	3,600

TABLE 2 (B)
THE WAR YEARS

1939	2,303	1,138	3,441
1940	2,187	1,102	3,289
1941	2,387	1,088	3,475
1942	2,148	1,227	3,375
1943	2,240	1,444	3,684
1944	2,125	1,800	3,925
1945	2,187	1,945	4,132

Deaths per 1,000 *Patients Resident (Certified Cases) in Mental Hospitals and Lunatic Wards of Poorhouses*

TABLE 3 (A)
THE PRE-WAR YEARS

Year	Number of deaths	Deaths per 1,000 resident
1927	1,429	84·4
1928	1,425	82·4
1929	1,591	91·4
1930	1,368	77·5
1931	1,383	77·1
1932	1,387	77·4
1933	1,348	74·6
1934	1,267	69·4
1935	1,334	72·7
1936	1,382	75·5
1937	1,449	78·7
1938	1,303	70·6

TABLE 3 (B)
THE WAR YEARS

1939	1,361	74·4
1940	1,462	80.9
1941	1,389	77·7
1942	1,406	79·7
1943	1,156	66·2
1944	1,179	68·2
1945	1,224	71·3

Deaths per 1,000 *Patients Resident (Certified Cases) from Pulmonary Tuberculosis in Mental Hospitals and Lunatic Wards of Poorhouses*

TABLE 4 (A)
THE PRE-WAR YEARS

Year	Deaths per 1,000 resident
1927	10·8
1928	9·7
1929	9·1
1930	8·6
1931	7·1
1932	6·5
1933	5·9
1934	7·9
1935	6·9
1936	7·2
1937	6·8
1938	6·2

TABLE 4 (B)

THE WAR YEARS

1939	6·5
1940	7·0
1941	7·7
1942	10·2
1943	8·7
1944	7·3

CHAPTER 9

VARIOUS PUBLIC HEALTH ACTIVITIES

MEDICAL ADVISORY COMMITTEE

In February 1943 the Secretary of State for Scotland established a Medical Advisory Committee composed of fourteen physicians and surgeons of standing in various branches of the profession. The committee was not set up in substitution for any of the Department's established arrangements for consulting medical and other interests in special fields, nor was it a negotiating body. Its function was a purely advisory one which provided a ready means of securing the broad opinion of the medical profession on any matter of wide medical interest. In other words, the responsibility of the committee was to obtain and evaluate information, and to provide collective advice upon the medical aspects of current problems. The ordinary routine of the committee's work was to deal with problems referred to it by the Department of Health, but it nevertheless remained free to initiate the consideration of any matter within its functions.

Soon after its formation, the committee undertook an investigation into the urgent questions of the incidence of tuberculosis and venereal disease; and simultaneously it embarked upon a series of inquiries bearing upon the health organisation of the country in the post-war years. In addition, a special sub-committee was appointed to confer with the Scottish Housing Advisory Committee in connexion with improved standards of housing.

Before the formation of the Medical Advisory Committee, an important memorandum was prepared and published by an earlier committee on the 'Hospital Treatment of Burns'[15]—a subject of the greatest moment in relation alike to peace-time and war-time medicine. The first major publication of the Medical Advisory Committee itself appeared in May 1944, and it had as its subject the venereal diseases in general. This document,[16] which was circulated to all local authorities and to others concerned, surveyed the whole of the field with which it was associated, including the problems of syphilis, gonorrhoea, congenital syphilis, ophthalmia neonatorum, soft chancre and non-specific conditions; and it included a number of recommendations designed in part for immediate adoption and in part for later action. Among the most important of its articles were the following:

> A plea for the extension of the powers of medical officers of health under Regulation 33B;
> a recommendation in favour of legislative action requiring the notification of every established case of venereal disease; and

suggestions for the extension of the powers of the health authorities in respect of treatment, with provisions for the maintenance of strict anonymity for the patient so long as he co-operated and respected his obligations towards his family, his community and himself.

Questions dealing with the methods of rehabilitation (already referred to) and with the work of the laboratory services were also dealt with exhaustively by the committee; and during the years 1944 and 1945 an extensive inquiry was carried on into the general aspects of rheumatism. A report[17] on the latter subject defines the problems at issue and usefully indicates certain directions in which effort may be pursued. The setting-up at the end of 1945 of a special hospital unit for the investigation of the rheumatic complex in its many aspects was an earnest of the practical measures which were taken in this connexion. The unit was situated at Killearn Hospital and operated in close association with the Western Infirmary of Glasgow.

The following reports by the committee were published:

May 1944: Report on the Venereal Diseases.[16]
Sept. 1945: Chronic Rheumatic Diseases.[17]
April 1946: Rehabilitation.[18]

SCIENTIFIC ADVISORY COMMITTEE

This Committee, also established in an advisory capacity, functioned under the following terms of reference:

'To advise the Secretary of State for Scotland on the application of the results of scientific research to public health administration and to promote medical investigations designed to assist the Secretary of State in the discharge of his responsibilities for the health services in Scotland.'

Reports of inquiries carried out by the committee were published between the years 1943 and 1945 as follows:

1943: Infantile Mortality (Scotland).[12]
1944: Sulphonamides in the Treatment of Meningococcal Meningitis.[19]
1945: The Freezing Point (Hortvet) Test of Milk .[20]

The particular attention of local authorities was drawn to the Report on the Hortvet Test which, except in rare instances, is capable of furnishing conclusive evidence of the presence or absence of added water in milk. The test was likely to be widely accepted as evidence in cases of suspected adulteration brought before the courts, and consequently possessed a high significance in public health administration.

After preliminary consideration by a specially appointed sub-committee, field trials were arranged to assess the efficiency against midges of repellents developed during the war for use against flies and insects, and practical advances of much interest and presumptive usefulness followed. Inquiries were continued on the problem of the death of

infants under one year of age due to infections, and on certain aspects of nutrition, including dietary surveys in maternity hospitals and among other selected groups of the population. A special study was also undertaken of the relation between nutrition and the dental state of school children. In the domain of the infectious diseases, work was pursued on a survey of diphtheria in the inoculated and the uninoculated, on the comparative values of the sera used prophylactically in measles, and on the evaluation of penicillin as a therapeutic agent in the treatment of lobar pneumonia, acute infections of the central nervous system and certain other grave infective states.

MEDICAL TRAINING AND HEALTH EDUCATION

At the beginning of the war, arrangements were made for the specialised training of medical officers in such essential subjects as anaesthesia, post-graduate surgery, bacteriology and the clinical aspects of gas injuries. Nurses also attended the gas courses and were intensively trained in their own branches of operating-theatre work. From time to time thereafter various interests were served by the organisation of courses or individual tuition on such specialised services as physiotherapy, radiology and clinical pathology. The arrangements met with an enthusiastic response. In 1944 and 1945 the Department of Health, in consultation with the Universities, the Royal Medical Corporations and the other organisations concerned, assisted in planning for the provision of post-graduate training facilities, including refresher courses and residential hospital appointments for doctors returning to civilian life after release from the Forces. The specialist services of the country were also closely reviewed.

The Inter-Departmental Committee on Medical Schools, appointed jointly by the Minister of Health and the Secretary of State for Scotland in March 1942 'to inquire into the organisation of the medical schools, particularly in regard to facilities for clinical teaching and research . . .', visited Scotland on two occasions during the years 1942–3. On the occasion of these visits, instructive meetings were held with representatives of the Scottish Medical Schools, the Local Authority associations, the Department of Health and other interests. The Report of the committee was published in July 1944. At the beginning of 1945, the Government announced its acceptance of the principle of increased grants for medical education, such grants to be distributed by the University Grants Committee through the Universities. The authorities in charge of the medical schools were invited to consider the committee's recommendations for revision of the medical curriculum, a matter in which the General Medical Council took the initiative.

Throughout the year 1942, discussions were held with local authority associations and others connected with health propaganda as to the desirability of the absorption of the functions of the Scottish Committee

of the British Social Hygiene Council by a new body to be designated the Scottish Council for Health Education. With the agreement of all concerned, the Council was formally constituted on July 5, 1943. It had as its general object the promotion and encouragement of education in the science and art of healthy living, and in the principles of hygiene. In serving this end, it was agreed that the council would assist statutory bodies in Scotland in undertaking publicity or educational propaganda relating to health. The Department of Health recommended the council to the sympathetic interest of the Scottish local authorities, who undertook to provide a substantial measure of financial support. To assist in its activities, the council was given the promise of a grant of £1,000 per annum from the Department of Health itself.

Among its other activities, the council prepared and distributed to all local authorities a portfolio of leaflets and booklets on a wide variety of subjects. Early in 1945, the services of a medical lecturer were secured, and a six-months' tour of rural and highland areas was planned. In this propaganda journey a cine-motor unit was also employed. The council further organised, during August of the same year, a Summer School at St. Andrews, and this was satisfactorily attended.

Cognate to this subject of public education was the war-time legislation affecting the publication of advertisements relating to medicinal preparations. Under the Pharmacy and Medicines Act, 1941, which came into force on August 7, 1941, it became an offence to publish without authority from the Minister of Health or the Secretary of State for Scotland advertisements referring to any article in terms which might lead to the use of that article for the purpose of the treatment of certain diseases. The authority granted by either the Minister or the Secretary of State conferred the right of publication throughout the United Kingdom, and the necessary arrangements for collaboration between the Ministry of Health and the Department of Health for Scotland were accordingly made.

CANCER ACT, 1939

Under the terms of the Cancer Act of 1939, local authorities were required to submit to the Department of Health, for approval, projected arrangements for the diagnosis and treatment of malignant disease. The occurrence of the war inevitably interfered with much of the specific planning which would otherwise have been accomplished, and the period prescribed for the submission of schemes had to be extended from year to year throughout the whole war-time period. Local authorities were requested to make such interim arrangements as might be possible, due regard being paid to the impossibility of authorising the erection of new buildings or extensive alteration to existing properties. Despite the prevailing difficulties, discussions were held with representatives of district local authorities in Glasgow, Edinburgh, Aberdeen and

Inverness, as a preliminary to the preparation or acceptance of interim schemes. In 1944, the Cancer Advisory Committee, the work of which was suspended at the outbreak of war, was revived.

PLANNING FOR THE FUTURE

When, in 1941, it was announced in the House of Commons that it was the intention of the Government to ensure the provision of a comprehensive peace-time hospital service, an indication was given that a preliminary survey of hospital resources would be undertaken. Thus, in Scotland, the hospital surveys which had been carried out during the preceding three years were completed in 1945, and the Report of the Surveyors (*Scottish Hospitals Survey*), published early in 1946,[21] aroused wide interest not only among local authorities and hospital authorities, but among the public at large. The survey, which was carried out in each of the five Districts by specially appointed panels, was comprehensive in scope; and the terms of reference of the surveying officers were 'to review the hospitals (other than mental hospitals and mental deficiency institutions) . . . and within a policy aimed at the post-war development of a comprehensive and co-ordinated hospital service, to advise the Secretary of State what modifications or extensions of the existing hospital facilities are necessary or desirable'. The task of the surveyors was, in brief, to study the facilities offered by each hospital and advise upon the most desirable means of fitting them into a regional scheme, and upon such extensions or other changes as might be required.

Simultaneously with the general hospital survey, an examination was made by psychiatrists appointed for the purpose of surveying the facilities available in Scotland for the diagnosis and treatment of mental conditions, among which the complex termed psychoneurosis was borne prominently in mind. A report on this particular subject was made to the Department of Health in 1943. It contained observations based upon the study of the facilities then available, and recommendations on the technical principles which should be observed in planning for a more comprehensive service for the future.

Preoccupations with the almost all-absorbing affairs connected directly with the war did not inhibit thought upon the problems likely to be encountered after the advent of peace. The importance of planning well ahead of an event, the actual emergence of which could not be foreseen, was appreciated. Apart from the schemes which were laid as foundations for the post-war housing programme, the most important early occurrence in this connexion was the Report [22] by Sir William Beveridge in November 1942 on Social Insurance and Allied Subjects. In this report it was pointed out that the proposals must rest, *inter alia*, on the assumption (Assumption B of the Report) that a comprehensive health service would be brought into being, which would:

> 'ensure that for every citizen there is available whatever medical treatment he requires in whatever form he requires it, domiciliary or institutional, general, specialist or consultant, and will ensure also the provision of dental, ophthalmic, and surgical appliances, nursing and midwifery, and rehabilitation after accidents.'

The Government welcomed the Beveridge proposals for a comprehensive health service, and the Secretary of State for Scotland was jointly charged with the Minister of Health with the obligation of initiating consultations with representatives of all the interests which were intimately concerned—namely, the medical profession, the major local authorities and the voluntary hospitals. The talks which followed, and which were discussions rather than negotiations, were begun early in 1943, in the course of which year the Hetherington Committee also submitted its report upon the problems of post-war policy. Over all, the ground covered was sufficiently productive to enable the Government to proceed with the preparation of a White Paper which would at once provide the necessary data and material for the initiation of parliamentary debates, and would indicate to the people at large the main outlines of the policy which was being pursued.

The White Paper on *A National Health Service*[23] appeared on February 18, 1944. It defined itself as a vehicle whereby it might be shown 'what is meant by a comprehensive service, and how it fits with what has been done in the past, or is being done in the present, and so to help people to look at the matter for themselves'. The proposals which it contained were based upon five general principles which were to be implicit in the organisation of the scheme, and these principles may be stated thus:

> Freedom to use or not to use the facilities of the service in accordance with the will of the individual.
>
> Freedom of choice of medical advisers.
>
> Freedom for the doctor to pursue his professional methods in his own individual way, and free from subjection to outside interference in the clinical sphere.
>
> The traditional doctor-patient relationship to be maintained; the whole service to be founded upon the conception of the 'family doctor'.
>
> Integration of services by an appropriate degree of public organisation which would ensure the provision of proper services, the adequate distribution of resources and the employment of new methods such as group practice in Health Centres.

It was recognised that one of the main functions of the White Paper was to serve as a precipitant which would lead to the crystallisation of ideas which were still fluid. It would in fact stimulate criticism and permit the unveiling of various lines of opposition. The discussions

which it was hoped could be initiated between the interested bodies soon after its publication had to be postponed because of certain factors, such as the restriction on travel and the attacks on the South of England by the V-weapons, and consequently no effective progress was possible until the early months of 1945. The break-up of the Coalition Government in May 1945, imposed a further serious check upon the progress of discussions; but on the election of the new Government, these activities were resumed, as a result of which a Bill, applicable to England and Wales, providing for the establishment of a comprehensive health service was presented to Parliament in March 1946, and at the same time the drafting of a corresponding Bill for Scotland was begun.

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PART IV

Public Health in Northern Ireland

Contributed by the Ministry of Health and Local Government

FOREWORD

by the

Chief Medical Officer, Ministry of Health and Local Government

NORTHERN IRELAND was extremely fortunate that the impact of war did not seriously dislocate or unduly strain its public health services. As the text of this Part will show, these health services could not be said to be of the best modern standard at the beginning of the war, and tribute must be paid to the doctors, nurses, sanitary and other health staffs who carried on so magnificently in the face of extreme difficulties.

Although Northern Ireland had its share of heavy air attacks and all the discomforts and privations inseparable from war-time conditions, it is pleasing to record that there were no major epidemics of serious disease.

It is significant, however, that in the period of war the Health Services of Northern Ireland were completely reviewed, and with the advent of happier times it was found to be possible to re-organise those services without delay and to shape the foundations of a new and comprehensive Health Service for our people on the lines already planned for the remainder of the United Kingdom.

JAMES BOYD

CHAPTER 1

PUBLIC HEALTH ORGANISATION PRIOR TO THE OUTBREAK OF WAR

UNDER the Government of Ireland Act, 1920, Northern Ireland, as a separate area of Government, came into existence.

In 1922, the various services which previously had been administered by the Imperial Government from London or Dublin, were transferred to the Northern Ireland Government, with the exception of a few services which remained to be administered by the Imperial Government.

The services taken over by the various Ministries, under the new régime, were grouped for administrative purposes according to their relationship to one another rather than on the analogy of previous administration.

Thus the functions of the Local Government Board were transferred to the Ministry of Home Affairs. For public health matters generally, and for the Dispensary Poor Law Medical Service, the Ministry of Home Affairs became the central authority, local administration being carried out by Urban and Rural District Councils for public health matters, and by Boards of Guardians in the case of the Dispensary Medical Service.

Practically all public health work was based on the Public Health (Ireland) Acts, 1878–1919. To these Acts were allied the Infectious Disease (Notification) Act, 1889; the Infectious Disease (Prevention) Act, 1890; the Sale of Food and Drugs Acts; portions of the Acts relating to the diseases of animals; the Acts relating to tuberculosis; and the Acts relating to registration of medical practitioners, dentists, nurses and midwives.

There was no scheme of systematic education of the public in health matters, but a considerable amount of voluntary educative work was done, and some instruction in hygiene was given in public elementary schools. Public instruction, moreover, was given in connexion with schemes for the prevention of tuberculosis.

POOR LAW MEDICAL SERVICE

Dispensary, Domiciliary and Hospital Treatment. The Dispensary system under Boards of Guardians was established by the Medical Charities Act, 1851. There were 27 'Unions' divided into 180 dispensary districts, with 168 medical officers, the medical officer being, in some instances, in charge of more than one district. A person desiring medical treatment, whether at the dispensary or his own home, applied to the

relieving officer, warden of the district, or a member of the Board of Guardians. If he was considered eligible, a ticket was issued entitling him to free treatment. If a dispensary medical officer considered an applicant ineligible for free treatment, the medical officer could apply to the Board of Guardians for cancellation of the ticket. Probably at least one-eighth of the total population availed themselves of this medical service.

The Poor Law provided for in-patient treatment in Union Infirmaries. These institutions were originally intended for workhouse inmates only, but owing to the shortage of other hospital accommodation, it became necessary to admit patients who did not belong to the 'destitute' class. Such patients were required, if possible, to defray the cost of their maintenance.

The Local Government (Ireland) Act, 1898, empowered Boards of Guardians to convert Union Infirmaries into District Hospitals under the control of Governors, of whom not less than two-thirds were required to be Guardians, but these powers were not utilised until after the end of the War of 1914–18. Thenceforward up-to-date District Hospitals gradually replaced the old Union Infirmaries, and by 1939 there were twelve such hospitals in existence, of which the greater number were at least sufficiently well equipped to deal with almost any type of general surgery. They were all provided with both public and private wards, and no patient resident in the area was refused admission.

OTHER HOSPITALS

County Infirmaries. By the County Infirmaries (Ireland) Act, 1765, a hospital was established in every county, so that Northern Ireland had six of these, namely, in Lisburn, Downpatrick, Armagh, Londonderry, Omagh and Enniskillen. These hospitals were supported by voluntary subscriptions and county council grants, and some benefited considerably by donations and bequests. Management was in the hands of a Joint Committee of subscribers and members of the County Council. As in the case of District Hospitals, public and private ward accommodation was available.

Voluntary Hospitals. In Belfast there were 10 voluntary hospitals—two of which were general and eight special. All 10 hospitals were included for teaching purposes in the Belfast Medical School. Londonderry had an Eye, Ear and Throat Hospital, and there was a Maternity Hospital in Coleraine.

There were nine Cottage Hospitals in the Province, and although the medical service rendered in these was mainly of a general practitioner type, most of them were provided with facilities for major surgery.

MATERNITY AND CHILD WELFARE

The Joint Nursing and Midwives' Council established in 1922 controls the training of midwives, and registration with this Council was required before a midwife was allowed to practise in Northern Ireland.

The only public midwifery service was that controlled by the Boards of Guardians and carried out by dispensary medical officers and midwives—both part-time officials, who, in addition, had private practices.

Ante-natal supervision schemes could be provided by the Boards of Guardians, but many other schemes existed; for example, in Belfast, the Maternity and Child Welfare Committee of the Corporation provided ante-natal clinics. In addition, certain voluntary hospitals in Belfast and some district hospitals in the Province had ante-natal clinics.

Maternity and Child Welfare Services were administered by the Urban and Rural District Councils, and these included some measure of ante-natal supervision.

The position of Midwifery Services was summed up by a specially appointed Maternity Services Committee in a report presented to the Minister of Home Affairs in June 1939, as follows:

> 'Public midwifery services in Northern Ireland, being an integral part, both legislatively and administratively, of the Poor Law system, provide only for the destitute poor. Personnel and equipment of the maternity service provided by the Boards of Guardians may be utilised by other sections of the population, always subject to the prior claims of the destitute poor. Generally speaking, for the whole of the population above the status of pauper, midwifery provision in its broader sense is a private matter.'

This committee referred to the inadequate provision for antenatal and post-natal care, and to the need for 'effective co-ordination throughout the three stages of each maternity case, namely, pregnancy, delivery and puerperium'.

At the end of 1938 schemes for safeguarding the health of expectant or nursing mothers and of children under 5 years were operated by 15 local authorities. In addition, 34 authorities contributed to the funds of nursing societies undertaking such work; and in 11 cases nursing societies carried out the work alone.

Government grants to these schemes were on the basis of 50 per cent. of approved expenditure.

THE SCHOOL MEDICAL SERVICE

In accordance with the Education Act (N.I.), 1923, arrangements were in force generally for the medical and dental inspection of children attending public elementary schools. These services were carried out by 18 Regional Education Authorities in accordance with regulations made by the Ministry of Home Affairs and approved by the Ministry of Education.

Many of these authorities made provision for treatment of defective vision and for surgical treatment of tonsils and adenoids. Comprehensive schemes for the supply of school meals to necessitous children were in operation in Belfast and County Down, and, although a beginning had also been made by one or two other authorities, there was much scope for development in this direction.

Wide powers were given under the Act for attention to the health and physical condition not only of the healthy but also of afflicted children, e.g. blind, deaf and dumb, crippled, epileptic and mentally defective. These powers before the war had not been used to proper advantage, especially in dealing with crippled and mentally defective children. Moreover, an education authority had power to make arrangements, with the approval of the Ministry of Education, for attending to the health, nourishment and general welfare, not only of children of school age, but of children attending nursery schools. This power gave ample scope for co-operation in the establishment and proper use of orthopaedic clinics and hospital schools.

INFECTIOUS DISEASES

The most noteworthy features were as follows:

Only one case of smallpox was notified between 1922 and 1939. The patient developed the disease on the journey from Canada to Belfast in 1924, and was subsequently treated in hospital in Belfast.

A few cases of typhus occurred each year from 1923 to 1930, the number varying between 2 (in 1925) and 18 (in 1929), the total for this eight-year period being 62. Since then, only one case (in 1935) had been notified.

It is interesting to record that Professor W. J. Wilson, Queen's University Department of Hygiene, discovered that the blood serum of a typhus patient developed, after a few days of the illness, the power to agglutinate certain intestinal bacilli. The Weil-Felix reaction is a particular application of the Wilson phenomenon to the particular organism *B. proteus* X19. Felix and Weil have the credit of developing the Wilson typhus reaction, expanding it and getting it more widely used during the War of 1914–18 (*vide, The Colon Group and Similar Bacteria*, by W. J. Wilson and W. Bulloch, *A System of Bacteriology*, Medical Research Council, Vol. IV, *Enteric Group*, 319–322, H.M.S.O. London; *The Weil-Felix-Wilson Reaction*, by Dr. E. H. M. Milligan (1947), ii, 670).

Encephalitis lethargica, which first appeared in 1918, reached serious proportions in the year 1924 when 223 cases were reported in Belfast, with 35 deaths. It is not possible to give reliable figures of the incidence of the disease in the rest of the Province, but it can be stated that there were 45 deaths. Many patients developed chronic encephalitis.

Enteric fever, including typhoid and paratyphoid fevers, showed a declining incidence. Up to 1932, the annual notifications varied between 127 (in 1924) and 361 (in 1929). In 1937 and 1938 the numbers were 98 and 95 respectively.

Scarlet fever and diphtheria both showed a declining case-mortality rate. Regulations were made in 1936 whereby local authorities were authorised to provide facilities for the protection of the public against diphtheria. Although the value of active immunisation against this disease had been amply demonstrated, this measure even in 1939 had not been adopted to such an extent as to render it an effective public health measure.

TUBERCULOSIS

Figures for the years preceding the Second World War showed a progressive decrease in the mortality rate from 164·1 per 100,000 of the estimated population in the year 1922 to 91·6 in the year 1938. Such progress was due to improved social and sanitary conditions, to better education of the public in the laws of good health, and to more effective methods of treatment.

The following table shows the position in Northern Ireland as contrasted with England and Wales, Scotland and the Irish Free State (Eire):

Death Rate from Tuberculosis per 100,000 *of the Estimated Population*

	1922	1938	Percentage reduction in sixteen years
Northern Ireland .	164	92	43·9
England and Wales .	112	64	42·9
Scotland . . .	119	69	42·0
Irish Free State (Eire)	146	109	25·3

Although the rate of decline in the death rate in Northern Ireland compared favourably with that in the other countries, the position in Northern Ireland was unsatisfactory in comparison with that in Great Britain. In fact, the figure for Northern Ireland in 1938 slightly exceeds that for England and Wales in 1930.

In accordance with powers given by the Tuberculosis Prevention (Ireland) Act, 1908, all county and county borough councils in Northern Ireland had schemes for prevention and treatment. For out-patients there were fifty dispensaries. For in-patient treatment of pulmonary cases, the position was far from satisfactory. Belfast had its sanatorium at Whiteabbey with 265 beds, and 70 beds were available in the Union Infirmary, making a total of 335 beds. County Antrim had no sanatorium, but the Larne and Ballycastle District Hospitals had each 20

beds. County Armagh had a small sanatorium with 33 beds, but no X-ray apparatus. County Tyrone had a small sanatorium with 32 beds and X-ray apparatus. The remaining three counties—Down, Londonderry, Fermanagh—and the Londonderry County Borough had no public sanatoria. A few beds were available in the Londonderry Union Infirmary.

There were two voluntary institutions, namely, the Forster Green Hospital (200 beds) and the Rostrevor Sanatorium (60 beds) which admitted patients from any part of the Province if there was accommodation, at the expense of the patient or of the local authority.

Thus the maximum number of beds available was approximately 440 in public institutions and 260 in voluntary institutions, making a total of about 700; this was quite inadequate for the needs of the Province.

VENEREAL DISEASES

Schemes for the diagnosis and treatment of venereal diseases were in operation in all counties (with the exception of County Londonderry) and county boroughs. The treatment was given at dispensaries and in hospitals irrespective of the place of residence or means of the patients, and all details were confidential. The Government reimbursed 75 per cent. of the net approved expenditure.

NATIONAL HEALTH INSURANCE

National Health Insurance, established by the National Insurance Act, 1911, came into general operation in July 1912. The Act applied to the whole of the United Kingdom, and established bodies of Insurance Commissioners in each of the four national areas—England, Wales, Scotland and Ireland—for the purpose of the general administration of the scheme. Medical benefit was, from the outset, provided in Great Britain, but not in Ireland. The direct administration of sickness and disablement benefits and the other benefits of the Act, apart from medical benefit, was vested in Approved Societies.

In Ireland, after the War of 1914–18, the union of the Insurance Commission and the Local Government Board was recommended by the Public Health Council, but no action was taken pending the establishment of the two Irish Governments under the Government of Ireland Act. In the meantime, however, the situation was entirely changed by the extension of unemployment insurance in November 1920, to cover almost the same field as health insurance. The Government of Northern Ireland decided that one department only should be responsible for the administration of the schemes for cash payments to insured persons who were unemployed either through ill health or lack of work. The Ministry responsible for these services was designated the Ministry of Labour, and it was charged in addition with the administration of the Factories Acts.

The question of including medical benefit as a statutory benefit had been considered from time to time, notably by a Departmental Committee in 1913 and the Irish Public Health Council in 1920. Both these bodies concluded that, having regard to the existence and scope of the Poor Law Dispensary system in Ireland, a general medical service for insured persons should await a comprehensive reform of the Poor Law and a reorganisation of the Public Health Services. As time went on, however, it became increasingly apparent that the Health Insurance Scheme could not be properly administered without the provision of medical benefit. Accordingly, the Government introduced the necessary legislative measures, and medical benefit for insured persons became available as a statutory benefit as from October 1930.

In Great Britain, medical benefit was administered through Insurance Committees subject to supervision by the Ministry of Health, the Department of Health for Scotland, or the Welsh Board of Health, as appropriate. It was decided, however, that in Northern Ireland this benefit should be administered by the Ministry of Labour.

As in Great Britain, medical benefit provided, broadly speaking, medical attendance and treatment by a general practitioner, proper and sufficient medicines, and certain medical and surgical appliances. All insured persons were entitled to medical benefit except those voluntary contributors whose income exceeded a certain sum (£250 a year in 1939). Title to this benefit began with the first insurable employment after leaving school, and continued throughout life if the insured person was entitled to it on reaching 65 years of age (or 60 in the case of women).

With the co-operation of the Queen's University and the teaching hospitals, post-graduate courses were instituted for insurance practitioners. The first course was held in 1933, and thereafter courses were held annually until the outbreak of the war. During the six years, 196 practitioners attended; and fees, travelling expenses, subsistence allowances and the cost of a locum tenens were met from Health Insurance moneys.

At the end of 1939 there were 544 practitioners on the medical list and 472 pharmaceutical chemists were under contract to provide medicines under the Scheme. The number of insured persons was approximately 420,000, i.e. about one-third of the total population.

INDUSTRIAL MEDICINE

The main body of factory legislation was contained in the amending and consolidating Factories Act (N.I.), 1938, which came into operation on July 1, 1939. This Act was based on that passed in Great Britain in 1937, and there was, accordingly, a close similarity in the main provisions of factory legislation throughout the United Kingdom.

The Ministry had power to appoint duly qualified medical practitioners to be 'Examining Surgeons'. Northern Ireland was divided into a number of districts of suitable size in each of which a resident doctor was appointed as Examining Surgeon. The duties of this post were varied and include the examining of young persons under 16 entering factory employment. Further, the Examining Surgeon had facilities for obtaining the confidential information in the possession of Education Authorities as to the medical history of a young person. The Ministry had also, under certain conditions, power to require medical supervision of workers. A few of the more progressive employers, no doubt realising the benefit it would be both to the workers and to industry, had already voluntarily obtained the services of works medical officers whose duties included advising the management on all matters affecting the health of the workers.

MENTAL TREATMENT

Mental hospitals were provided and maintained, as in England, by County Councils and County Borough Councils, each of which, in accordance with Section 9 of the Local Government (Ireland) Act, 1898, appointed a Committee of Management. This committee was in control of the mental hospital generally, central control being exercised by the Ministry of Home Affairs, chiefly through Medical Inspectors.

Until 1932 legislation in Northern Ireland had advanced little since the passing of the Lunatic Asylums (Ireland) Act, 1875. To remedy this state of affairs, the Mental Treatment (N.I.) Act, was passed and came into operation in 1932. This Act was based partly on the English Lunacy Act, 1890, and, in the provisions for voluntary and temporary patients, on the English Mental Treatment Act, 1930. It is noteworthy that this Act vested the power to discharge certified patients in Resident Medical Superintendents, and not, as in England, in Committees of Management. With regard to voluntary and temporary patients, if the medical inspector forwarded a report to the Ministry of Home Affairs pointing out that the patient was unsuitable to remain in his present grade, the Ministry, having considered such a report, was empowered to order a regrading of the patient, or in default his discharge.

VITAL STATISTICS

1. *Death Rate.* During the eight years 1931–8 the highest and lowest death rates were respectively 15·1 (in 1937) and 13·7 (in 1938). The corresponding figures for England and Wales were 12·4 (in 1937) and 11·6 (in 1938), and for Scotland 13·9 (in 1937) and 12·6 (in 1938).

2. *Infant Mortality Rate,* calculated per 1,000 live births. During the same period (1931–8) the infant mortality rate varied between 86

(in 1935) and 70 (in 1934). These figures compare favourably with those for Scotland, but are less satisfactory than those for England and Wales which show rates decreasing almost year by year from 66 in the year 1931 to 53 in the year 1938.

3. *Maternal Mortality Rate*, calculated per 1,000 live births, and in England and Wales per 1,000 total births. The figures for the period 1931–8 varied between 6·27 (in 1934) and 5 (in 1937). In Scotland the extremes were 6·30 (in 1935) and 4·83 (in 1937). In England and Wales, however, the figures were much more satisfactory and showed a downward trend from approximately 4 in the years 1931 and 1932 to 2·97 in the year 1938.

4. *Tuberculosis Mortality Rates*. Reference has already been made to these figures.

GENERAL

Before the outbreak of war in September 1939, it had been amply demonstrated that improvements could be effected in public health by generally improved nutrition, better housing, increased facilities for healthy recreation, the education of the public in health matters by lecture, film and radio, and instruction in theoretical and practical hygiene in schools; the improvement of welfare, health and safety measures in factories, etc.

Moreover, there was an increasing recognition of the value of active immunisation against diphtheria, school medical services, child welfare clinics, efficient maternity services, including adequate ante-natal and post-natal care. Added to this was the realisation of the need for the early diagnosis and treatment of disease and the availability of hospitals, which should be properly constructed, suitably equipped and well-staffed, were becoming more and more widely appreciated.

So far, however, no measure had been introduced corresponding to the English Midwives Act (1936) or the Scottish Maternity Services Act (1937). Hospital accommodation for tuberculous patients was inadequate. Laboratory services were almost confined to Belfast and Londonderry. The Dispensary Medical Service was still associated with the Poor Law, and those outside the Poor Law and National Health Insurance—i.e. about half the population—had to make private arrangements for general practitioner medical services. Specialist medical services, except in the case of dispensary patients, were obtainable only in hospitals or by private arrangement.

CHAPTER 2

PUBLIC HEALTH DURING THE WAR

CENTRAL ADMINISTRATION

SELECT COMMITTEE ON THE HEALTH SERVICES

As already explained, at the beginning of the war the Ministry of Home Affairs was the central authority for Local Government, for Public Health and for the Dispensary Poor Law Medical Service, while the Ministry of Labour was the central authority for industrial conditions including industrial health conditions. Co-ordination in medicine and public health matters was secured in 1942 by the appointment of the same Chief Medical Officer for both Ministries. During the war the House of Commons of Northern Ireland on December 22, 1942, passed a resolution that a Select Committee be appointed to investigate and consider the Health Services of Northern Ireland and report to the House. The Committee made certain special interim and final reports. These were embodied in a Report[1] which was laid on the Table and ordered by the House of Commons to be printed on January 18, 1944. The main recommendations of this Committee were as follows:

1. That a Ministry of Health, should be set up at once, to act as the central controlling authority for all health services in Northern Ireland.

2. That the County Council be the administrative health authority for the county, and act in all matters of health through a county health committee. This committee to be elected on a representative basis and include an adequate number of medical practitioners as co-opted members of the committee. That local authorities representing a population of 10,000 and over should have the privilege of opting out of the county scheme. That there should be a county medical officer of health for each county, this officer to be responsible for the oversight of all medical health services in his area. This officer should be appointed by the Minister of Health.

3. That an honorary advisory health council for Northern Ireland be appointed, whose functions would be to advise the Ministry on the various aspects of health services.

4. That all health services should be transferred to the Ministry of Health.

5. That the notification of all infectious diseases should be uniform throughout Northern Ireland.

6. That the Ministry of Health must have all the powers necessary to ensure the carrying out of any schemes which it thought necessary and desirable, and while the detailed administration of health services

would be the function of the local authority, the Ministry of Health would be the sole authority, subject to the over-riding power of Parliament, to formulate the general policy of health services throughout Northern Ireland.

The Report went on to deal with particular health problems in detail and made recommendations covering mental deficiency, blindness, child welfare, tuberculosis, midwifery, sanitary inspection; veterinary medical services as far as they related to food for human consumption; national health insurance, dispensary medical service, hospital (including fever hospital) services, with a special note on the services in the county boroughs of Belfast and Londonderry.

ESTABLISHMENT OF THE MINISTRY OF HEALTH

The Ministry of Health and Local Government, with the Rt. Hon. William Grant, M.P., as its first Minister, was established in June 1944, and was in due course to become responsible for all the Health and Local Government matters formerly administered by no fewer than six Ministries. J. Boyd, M.D., F.R.C.P.I., D.P.H., Chief Medical Officer of the Ministries of Labour and Home Affairs was appointed as its first Chief Medical Officer.

The various Ministries responsible for the more important Health Services up to that date and from that date to the end of the war are listed hereunder. It will be noted that Medical Referee Services and Industrial Medicine were not transferred to the new Ministry immediately. They were transferred over a year later:

Emergency Medical Service	
Ministry of Home Affairs	1939–June 1940
Ministry of Public Security	June 1940–May 1941.
Ministry of Home Affairs	May 1941–June 1944.
Ministry of Health and Local Government	June 1944–August 1945.
Public Health and Hospitals (Local Authority)	
Ministry of Home Affairs	1939–June 1944.
Ministry of Health and Local Government	June 1944–August 1945.
Medical Referee Services and Industrial Medicine	
Ministry of Labour	September 1939–August 1945.
Casualty Services	
Ministry of Home Affairs	September 1939–June 1940.
Ministry of Public Security	June 1940–June 1944.
Ministry of Home Affairs	June 1944–August 1945.

HEALTH ADVISORY COUNCIL

A Health Advisory Council was set up in November of the same year which subsequently made many recommendations on questions referred to it by the new Ministry, 'proving', as the Ministry's Report

for 1938–46 states, 'beyond all doubt the wisdom of seeking the co-operation of public-spirited men and women in matters where technical and professional advice is of paramount importance'.

The council submitted its First Annual Report for the year ended December 31, 1945, consisting of a summary of the recommendations made by its committees. These were: Children's Health Services, Hospitals, Maternity and Infant Welfare, Tuberculosis, Nursing Services, Dental and Public Health. The report was published in June 1946, under the title 'First Annual Report of the Health Advisory Council'.[2] It contained also a summary of action taken or in course of being taken on the many recommendations. Priority was given to the Children's Health Services, the Maternity and Infant Welfare Services and the Tuberculosis Service. The Nurses Act (Northern Ireland), 1946, was passed in July to impose restrictions on the use of the titles 'Nurse' and 'Assistant Nurse' and lay down regulations for the conduct of nurse-supplying agencies. Meanwhile a special committee had been working on a review of the Mental Health Services and its report was published in November 1946, under the title *Mental Deficiency in Northern Ireland.*[3]

Another report of the Health Advisory Council was the Report on the Treatment of Cancer in Northern Ireland, published early in 1946, which stressed the steady increase in the toll of human lives which cancer had levied upon the community. This disease had now become 'one of the most important causes of mortality, especially in the later age groups' and every effort must be made to find a radical cure and at the same time to use all available means to restrict its deadly activities. While several causes might account for the reported increase in the incidence of cancer in recent years—the survival of a greater number of aged people who are more prone to cancer, better diagnosis resulting in its earlier recognition, and more accurate certification of the causes of death—the fact remained that cancer was second only to heart diseases among the main causes of death in the United Kingdom. The report went on to quote examples of how the problem was being dealt with in England and to make recommendations for more effective treatment in Northern Ireland. The report is entitled *Treatment of Cancer in Northern Ireland.*[4]

These and other recommendations of the Health Advisory Council built up a firm structure of expert opinion over a wide field of health subjects, which the Ministry found invaluable as it set itself to the task of framing its proposals for a Comprehensive Health Service for Northern Ireland.

LOCAL ADMINISTRATION

The Public Health and Local Government (Administrative Provisions) Act (N.I.), 1946. This Act, which received Royal Assent on August 29,

1946, provided for the establishment of Health and Welfare Authorities in each County and County Borough. In general, it simplified and strengthened Local Government administration by reducing the total number of local authorities responsible for health and welfare to eight.

It was a far-reaching Act in that it also cleared the ground for the smooth introduction of a comprehensive Health Service. In this way much time and trouble was avoided when local authorities were asked to play their part in the administration of the full personal Health Service which the Minister of Health introduced on July 5, 1948.

There was no further election of Boards of Guardians, but individual Guardians in office retained their seats until the Boards were abolished.

Gradually there were entrusted to the Health Authority a number of services formerly run by the following different bodies:

County Councils:	Food and Drugs Acts Rats and Mice Act Venereal Diseases Scheme Supervision of Midwives Supervision of Nursing Homes
Boards of Guardians:	Domiciliary Midwifery Service Vaccination
Urban and Rural Councils:	Maternity and Child Welfare Immunisation against Diphtheria Control of Infectious Diseases

While the County Council or County Borough Council would, as Health Authority, control the policy and be responsible for finance, the day-to-day business of the Authority would be looked after by the Health Committee.

County Borough and County Health Committees consisted of not less than fifteen and not more then twenty-one members appointed by the Health Authority. Such members were appointed from members of the Authority and other outside persons, and in the case of County Health Committees must include one person appointed by each borough and urban district within their area. The majority of the members of any Health Committee must be members of the Health Authority.

Broadly, the intention of the Act was to concentrate the personal Health Services in the six County and the two County Borough Health Authorities. It did not remove from the Borough, Urban and Rural Councils the responsibility for the important environmental

health services, such as the abatement of nuisances, the control of parks and playgrounds, the collection of refuse, and the provision of cemeteries.

In order to secure a flexible system in accord with local wishes, a County Health Committee may make an arrangement with a Borough, Urban or Rural Council in the County to have certain services provided locally, and there is a similar provision whereby a smaller authority may make an agreement with the County Committee to have certain services performed by that committee which would otherwise be the responsibility of the smaller authority.

HEALTH EDUCATION

On the matter of health education, arrangements were made with the Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1, for the Council to extend its activities on health education to Northern Ireland, and in co-operation with the local authorities to introduce a scheme for health education throughout Northern Ireland. An area representative was appointed and a local office opened at Howard Street, Belfast, for this purpose.

GENERAL

The circumstances attending the war years gave cause for active concern for the general health of the public, and the difficulties encountered during those years added considerably to the strain and responsibility of the local authorities in the discharge of their duties in the prevention and control of epidemic and infectious disease under the Public Health and related Acts.

It is to the credit of all concerned that, notwithstanding the large increase in population during the war years and the conditions of overcrowding prevailing in most areas, there was no serious outbreak of disease.

Indeed, the Government of Northern Ireland, in spite of the many claims on its attention caused by a state of war, found time to remodel and extend its public health services, to set up a special Ministry of Health and Local Government, and to take active steps to improve the health and social welfare of the people.

VITAL STATISTICS

Population. The Registrar-General's statistics in regard to the population of Northern Ireland during the war years gives the following information:

Northern Ireland—Estimated Mean Population in thousands by Age and Sex in each year 1939 *to* 1944 (*excluding non-civilian males after September* 3, 1939, and *non-civilian females after June* 30, 1941).

Sex and age	1939	1940	1941	1942	1943	1944	1945
Males							
0—15	175	174	174	174	177	180	182
15—65	400	390	388	391	391	395	393
65 and over	55	54	53	54	54	54	54
All ages	630	618	615	619	622	629	629
Females							
0—15	168	168	167	168	171	173	175
15—65	433	431	442	445	445	449	448
65 and over	64	64	64	64	64	65	65
All ages	665	663	673	677	680	687	688
Persons							
0—15	343	342	341	342	348	353	357
15—65	833	821	830	836	836	844	841
65 and over	119	118	117	118	118	119	119
All ages	1,295	1,281	1,288	1,296	1,302	1,316	1,317

Births and deaths. The following table gives the principal figures in regard to births and deaths in Northern Ireland during the war years as reported by the Registrar-General:

Northern Ireland—Births, Deaths, Population, Infant Mortality, 1921 *to* 1944

	Birth rate per 1,000 living (mean annual rates 1921–44)	Number of births registered (annual averages 1921–44)	Estimated population (annual averages 1921–44)	Number of deaths registered (annual averages 1921–44)	Death rate per 1,000 living (mean annual rates 1921–44)	Infant mortality rate, i.e. deaths of children under 1 year of age per 1,000 live births
1921–30	22·2	27,761	1,255,000	18,999	15·2	80
1931–35	20·0	25,098	1,258,000	18,026	14·3	78
1936	20·3	25,909	1,276,000	18,429	14·4	77
1937	19·8	25,412	1,281,000	19,282	15·1	77
1938	20·0	25,742	1,286,000	17,649	13·7	75
1939	19·5	25,240	1,295,000	17,542	13·5	70
1940	19·6	25,363	1,281,000	18,941	14·6	86
1941	20·9	26,887	1,288,000	19,640	15·2	77
1942	22·9	29,645	1,296,000	17,256	13·3	76
1943	24.2	31,521	1,302,000	17,437	13·4	78
1944	23·5	30,900	1,316,000	16,791	12·8	67
1945	22·0	29,007	1,317,000	16,264	12·3	68

The number of births during the year 1945 was 29,007 representing a birth rate of 22·0 per 1,000 population. The infant mortality rate for the same period per 1,000 live births was 68. The average death rate per 1,000 births over the previous eight years was 76.

As disclosed in the Registrar-General's returns, the percentages of the total death rates due to the principal epidemic diseases for each year of the period 1938–46 were as follows:

*Percentage of Total Death Rates due to the Principal Epidemic Diseases**

	1938	1939	1940	1941	1942	1943	1944	1945	1946
Percentages of total death rates	5·9	5·0	8·2	5·3	4·1	5·8	4·3	3·7	4·1

* Typhoid and paratyphoid fevers, scarlet fever, whooping cough, diphtheria, dysentery, influenza, smallpox, measles, typhus, and diarrhoeal diseases of children under 2 years of age.

During the year 1946, the percentage of deaths was 4·1 compared with an average of 4·6 for the previous five years.

The high death rate in 1940 was principally due to measles, whooping cough and diphtheria, and, to a lesser extent, to typhoid fever, influenza, and diarrhoeal diseases of children under two years of age.

The number of deaths from the principal causes and the death rates per 100,000 of the estimated population are given in the table in Appendix I.

CHAPTER 3

INFECTIOUS DISEASES

It is noteworthy that at no time during the war period was there any threat of infectious disease assuming more than ordinary peace-time proportions, although the area was largely used for field training of military personnel of the Western Allies; there were large numbers from the Air Force, and the harbour facilities of Belfast, Londonderry, and Larne ensured a constant flow of shipping to these ports. Thus, apart from the problems arising from the disorganisation of the normal civilian population, there was constant risk of infection through the medium of a frequently changing Service population. The freedom from epidemics may have been fortuitous, but is none the less noteworthy.

NOTIFICATIONS AND DEATHS

The numbers of notifications from the principal infectious diseases during the nine years ended December 31, 1946, will be found in the three tables in Appendices II, III and IV. The decrease in the number of cases of scarlet fever, diphtheria and measles is noteworthy. During the war years of 1940 to 1943 there was an exceptionally high incidence of cerebro-spinal fever, but this had substantially declined in 1946.

No serious general epidemic occurred, but local outbreaks of typhoid fever account for the high figures shown in Appendix II for the years 1941, 1944 and 1946. The sources of infection were found, and prompt action brought the outbreaks under early control.

In 1942, one case of typhus and one case of smallpox were notified. These were the first notifications of typhus since 1933, and of smallpox since 1924.

With these two exceptions Northern Ireland remained free from the pestilential conditions dealt with by International Sanitary Conventions. There were no cases of yellow fever, plague or cholera. The number of deaths and the death rates per 1,000 of the estimated population from the principal infectious diseases during the years 1938–46 are given in the table in Appendix I.

The population of the County Borough of Belfast of some 440,000 usually provides 60–75 per cent. of the acute infectious diseases of the Province with a total population of 1,280,000. Notifications of infectious diseases during the completed years 1939 to 1945 for the whole country ranged from 5,853 in 1941 to 12,564 in 1940, with an average of 9,084. The peak figures of 1940 were mainly due to measles, coinciding with the largest diphtheria notifications of the six-year period.

Smallpox. Information was received from the Ministry of Health, England, in 1942, that the case of smallpox referred to above was on board a coastal ship coming from Scotland. The ship was boarded before reaching port in Northern Ireland and the patient removed to hospital. The immediate precautions taken were effective and no further cases were reported. The population at risk is well controlled by the application of the Vaccination Acts.

Typhus. The case notified as typhus, in 1942, occurred in the Newry district and the patient died. This was an isolated case, and examination of the contacts gave no confirmation of the diagnosis, which remained doubtful. Strict precautions were taken and no further cases of typhus were notified.

Enteric Fever. A total notification of 581 cases, including paratyphoid fever, comprised the usual incidence of cases of sporadic type with several small outbreaks quickly detected and rapidly brought under control. An appreciable number of civilians availed themselves of T.A.B. inoculation following air raid damage, and no abnormal number of cases followed enemy air raids. The type of disease met was of average severity, and mortality was within normal limits.

Dysentery. There was no unusual incidence of bacillary dysentery in civil practice during the war, but it was recognised that amoebic dysentery might eventually present some problems with the return to civil life of individuals infected on foreign service.

Poliomyelitis. No abnormal number of cases of this most dreaded of the common infectious diseases occurred during the period. The cases met with were of the text-book variety with the dangerous ascending type commoner in adults; in these cases experience showed that little help was derived from artificial respiration.

Cerebro-spinal Fever. The wave of increased incidence of this disease began in 1940, was maximal in 1941 and, although declining after 1943, had not returned to peace-time figures at the conclusion of the war. The vast majority of cases were of the acute meningeal type and responded well to modern chemotherapy. The acute fulminating septicaemic type was familiar and accounted for most of the deaths from the disease. In the treatment of this type serotherapy combined with sulphonamides and penicillin was regarded as giving the most favourable results. A tragic and inexplicable mortality from the septicaemic type in young females was reported. Comparatively few cases of chronic meningococcal infection were recognised.

Scarlet Fever. The incidence of scarlet fever or scarlatina remained well below the figure for 1939. In fact in 1941 more cases of diphtheria were notified than of scarlet fever. The type remained mild, perhaps too mild, leading to missed or neglected cases which might later reveal themselves in the guise of acute or chronic nephritis. The mortality was low and comparative freedom from complications, perhaps as the

result of modern therapy, made hospital admission of cases of scarlet fever infrequent.

Diphtheria. There was a marked fall in the notifications of diphtheria in the Belfast County Borough from 1,168 in 1940 to 225 in 1944. This fall was not reflected in the total notifications of the entire area and may reasonably be attributed to the stimulation of immunisation within the Belfast District. There was an alarming increase in the severity of the disease during the closing months of 1939 persisting into 1941. The mortality in hospital cases in 1940 in Belfast reached 7·6 per cent. but later returned to under 4 per cent. The bacteriological type was mainly *mitis*, with occasional *intermedius*, and only rare *gravis* outbreaks. The incidence and mortality were almost entirely confined to the unprotected among the population, giving encouragement to the belief that wholesale immunisation might eventually stamp out the disease. With a view to stimulating greater interest in this matter, local authorities were asked by the Ministry of Health and Local Government in September 1945, to examine afresh the measures taken to combat diphtheria in their respective areas. It was stated that the aim of the Ministry was to assist local authorities everywhere to ensure that at least 80 per cent. of children were immunised. This figure was subsequently attained or exceeded in certain areas, but by the end of 1946 there was still room for much improvement, especially as regards immunising infants before they enter their second year. The cost of prophylactic purchased by local authorities for this purpose had been recouped to them since the year 1941.

Measles and Whooping Cough. The incidence and severity of these conditions were within normal limits. Both were still potent killers and maimers of young life, but there was a welcome tendency, especially in the populous area, to admit both measles and whooping cough to isolation hospitals. The experience in hospital was that the mortality could be lowered and the morbidity from sequelae reduced by competent nursing.

Gastro-enteritis. Infantile diarrhoea and vomiting had been found in recent years in seasons, and in a climate, that scarcely justified the title of summer diarrhoea. The mortality from this condition was always high and unfortunately appeared to be little reduced by hospital treatment.

Pneumonia. Probably the notification figures failed to give a true indication of the incidence of pneumonia; the general impression was that there was no departure from peace-time numbers. Chemotherapy proved efficacious in lowering the mortality and morbidity of the disease.

Influenza. Although the title covered a host of indefinable conditions there was nothing to suggest even remotely a prevalence comparable with that of the year 1919, or even 1929.

CONCLUSION

The general impression remained that the worst fears of abnormal incidence of infectious diseases likely to arise under war-time conditions were unfulfilled. The general response to treatment of the infectious sick in hospital was at least as good as in pre-war days and the natural resistance of the individual did not appear to deteriorate under war nutrition.

TUBERCULOSIS

Northern Ireland, like other parts of the British Isles, showed an increase in tuberculosis mortality which, having reached a peak in 1941, declined slightly each year from 1942 to 1944. The figures for deaths from tuberculosis from 1938 to 1945 are as follows:

Years	Pulmonary		Non-pulmonary		Total deaths (all forms of the disease)
	Males	Females	Males	Females	
1938	437	432	158	151	1,178
1939	413	439	116	122	1,090
1940	490	477	168	131	1,266
1941	541	471	153	174	1,339
1942	471	468	175	145	1,259
1943	439	424	166	161	1,190
1944	434	428	133	169	1,164
1945	391	408	131	128	1,058

It appears that the percentage increase in Belfast was slightly less than that for the whole of Northern Ireland; thus, there was an increase of 20·2 per cent. in tuberculosis deaths in Belfast between 1939 and 1941, while the corresponding percentage increase in Northern Ireland was 22·8.

The most striking increase (in tuberculosis deaths) was that recorded for tuberculosis of the central nervous system. The number of deaths in Northern Ireland from this form of tuberculosis rose from 92 in 1939 to 145 in 1941, a percentage increase of 57·6. Deaths from tuberculosis of the central nervous system in children under five years doubled in number between 1939 and 1941. A similar increase in deaths from tuberculous meningitis in children during the war years was observed in England and Wales and Scotland.

A comparison of death rates in Northern Ireland and Eire shows that the war increase was more marked in Eire than in Northern Ireland. As has already been stated, in the years preceding 1939 the decline in tuberculosis mortality in Northern Ireland was more rapid than the decline in Eire.

The numbers of notified cases of acute infectious tuberculosis during the years 1938–46 are given in the table in Appendix IV.

It is probable that the causes for the increase of tuberculosis in Northern Ireland in war-time have been the same as those which have operated in other parts of the United Kingdom. The serious increase in tuberculosis of the central nervous system suggests that overcrowding and increased infection from 'open' cases were factors of special importance.

In the war years Northern Ireland was very short of tuberculosis beds, particularly for the isolation of advanced cases of pulmonary disease.

Apart from the war-time increase in tuberculosis, other factors (such as a wider appreciation of the value of early treatment in an institution) contributed to augment the demand for beds. To meet the growing demand the Government of Northern Ireland provided 80 additional beds for tuberculosis at Whiteabbey Sanatorium, Belfast, in the period 1941–2 together with emergency accommodation for the necessary additional nursing and domestic staff. It was soon apparent that further beds were required, and in 1945 it was found possible to set aside 350 beds for the treatment of tuberculosis in a section of a large hutted hospital which had been transferred by the War Office to the Emergency Hospital Service operated by the Ministry of Health and Local Government for Northern Ireland. In the same year hutments, with accommodation for about 40 patients, which had been erected for Emergency Hospital purposes at Dungannon, Co. Tyrone, were brought into use for the treatment of civilians suffering from pulmonary tuberculosis. These additions to the pre-war accommodation inevitably put a strain on the nursing profession; and although the difficulties in Northern Ireland were less than those experienced by hospitals and sanatoria in Great Britain, there was, especially towards the end of the war, a shortage of nurses for tuberculosis. To assist in remedying this shortage the Ministry of Health and Local Government arranged special training courses for Nursing Auxiliaries enrolled in the Civil Nursing Reserve, who had volunteered for duty in the tuberculosis section of the Ministry's principal Emergency Hospital.

Other war-time measures to combat tuberculosis were the inauguration of mass radiography in Belfast and the adoption of treatment allowances throughout Northern Ireland. There is no doubt that the war-time increase in tuberculosis stimulated public interest in the prevention and treatment of the disease. Comprehensive measures were planned to provide adequate hospital accommodation for infectious cases and it was expected that the implementing of these plans would greatly help to reduce the incidence and mortality of the disease.

Treatment Allowances Scheme. In 1944, the Treatment Allowances Scheme, which had a short time previously been introduced in Great Britain, was inaugurated in Northern Ireland. Under this scheme

weekly allowances were paid to persons suffering from pulmonary tuberculosis, who gave up work in order to undergo treatment and whose source of income necessarily ceased when treatment was undertaken. The object of the scheme was, of course, to encourage persons suffering from the pulmonary form of the disease to cease work while there was still hope of complete recovery, knowing that during the probably lengthy period of treatment their dependants would be provided for financially. The amount of the weekly allowance varied according to circumstances, and continued after discharge from a sanatorium for a period up to eighteen months subsequent to that date, provided that the tuberculosis officer certified that further remedial treatment was advisable. Thereafter, payment could be continued for a further period subject to the approval of the Ministry of Health and Local Government. In the year ended March 31, 1946, the amount recouped to tuberculosis committees by the Ministry in respect of such payments, which were subject to 100 per cent. grant, was £44,182 12s. 11d. The amount of grant paid in the previous financial year—the first year in which the scheme came into operation —was £9,925 16s. 8d.

Changes in Administration of Tuberculosis. During the war years tuberculosis services in Northern Ireland continued to be administered by committees of the County and County Borough Councils, but by virtue of the provisions of the Public Health (Tuberculosis) Act (Northern Ireland), 1946, a central authority, known as the Northern Ireland Tuberculosis Authority, was set up to take over all the functions of the local authorities in this connexion. Thus, after September 1, 1947, the responsibilities for the prevention and treatment of tuberculosis were transferred from County and County Borough Councils to the Northern Ireland Tuberculosis Authority. Members of this Authority included representatives from each of the County and County Borough Councils. The aim of the new Authority was to make better provision for the prevention and treatment of tuberculosis, pulmonary diseases generally and orthopaedic conditions.

Accommodation. The need for additional sanatorium accommodation was still urgent at the end of the war although an improvement in the position was effected by the opening in April 1945, of the Ministry's Emergency Hospital, Musgrave Park, Belfast, which, by the end of 1946 had beds for approximately 250 pulmonary tuberculosis patients. The new Authority took active steps to reduce as far as possible the waiting list of persons requiring treatment, but the operation of the Mass Radiography Unit installed by the Belfast Corporation Tuberculosis Committee, which began to function in June 1945, tended to lengthen the waiting list by revealing cases of tuberculosis in the early stages of the disease, which might otherwise have remained undetected for some time.

VENEREAL DISEASES

The number of persons examined for venereal disease, the number of persons treated for syphilis and gonorrhoea (grouped together), and the number of persons found free from disease during the war years, 1939–45, are given in the following table:

Venereal Diseases—Return of Persons examined and treated during the years 1939–45

Year	No. of persons examined	No. of persons treated for disease	No. of persons found free from disease
1939	5,953	2,796	3,157
1940	5,340	2,440	2,900
1941	4,967	2,150	2,817
1942	5,102	2,237	2,865
1943	5,527	2,554	2,973
1944	5,554	2,500	3,054
1945	6,115	2,615	3,500
Totals	38,558	17,292	21,266

It will be observed that the figures of venereal disease diagnosed and treated at clinics did not increase during the war; if anything they slightly diminished. The number of persons diagnosed and treated in 1939 was 2,796; in 1945 the comparable figure was 2,615, and the figures for the intervening years in each year are lower than this.

The number of persons examined and found to be free from disease showed some increase, 3,500 in 1945 as compared with 3,157 in 1939. This testifies to increased appreciation of the value of the treatment centres to persons who had been exposed or considered they had been exposed to the risk of infection.

The return in this table does not distinguish between cases of syphilis and gonorrhoea, but from the table in Appendix V showing the number of persons examined and treated for venereal diseases during 1946, including persons treated in a previous year whose treatment was continued in the year ended December 31, 1946, some indication of the numbers of persons treated for syphilis and for gonorrhoea in an average year can be obtained. Thus, in 1946, 1,397 males and 890 females received treatment for syphilis, being a total of 2,287 persons; 1,150 males and 187 females were treated for gonorrhoea giving a total of 1,337 persons. It is probable that the incidence of gonorrhoea was much higher, as many persons suffering from this disease prefer to be treated by their private doctors, especially since the advent of the efficacious sulphonamide preparations.

Throughout the war, as might be expected, the two chief centres of population, Belfast and Londonderry County Boroughs, continued to provide the highest proportion of cases of venereal disease.

In spite of the favouring influences of war, the influx of workers, movements of population and the presence of military forces from oversea and elsewhere, it is gratifying to report that, according to the figures available, venereal disease did not increase among the population of Northern Ireland.

Administrative Arrangements during the War. With the inauguration in 1943 of a scheme for the treatment of venereal diseases in County Londonderry, all Counties and County Boroughs in Northern Ireland had treatment schemes. During the war additional powers were obtained with the object of taking more effective steps to prevent the spread of venereal diseases.

The terms of Regulation 33B of the Defence (General) Regulations, 1939, provided that where a patient suffering from a venereal disease furnished information as to the person from whom he suspected the disease was contracted, the special practitioner who received such information was required to notify the Medical Officer of Health for the County or County Borough in which the suspected infector was believed to reside. If a person were suspected of having infected two or more other persons, she or he was required to attend for examination and, if necessary, for treatment, until certified as being free of the disease. The fact that this Regulation existed proved useful in tracing foci of infection and securing treatment of infected persons. It was seldom necessary to exert the compulsory powers which this Regulation provided.

A grant of 75 per cent. on the total expenditure involved in venereal diseases schemes was paid by the Ministry of Health and Local Government to the local authorities. In the last years of the war the use of penicillin in place of other forms of treatment formerly used tended to increase the cost per patient. On the other hand, penicillin considerably shortened the period of effective treatment.

CHAPTER 4

MATERNITY AND CHILD WELFARE

In general, the administrative arrangements for maternity and child welfare remained in being during the greater part of the war, as described in Chapter 1.

The arrangements for evacuation of expectant mothers and young children necessitated some additional welfare provision in rural areas of the country, the provision of day nurseries, hostels, etc.

The problem, however, was of much less magnitude than in England and Wales or Scotland, so that additional provision on an extensive scale was not required.

MATERNAL MORTALITY

	1939	1940	1941	1942	1943	1944	1945
Number of live births in Belfast . .	8,966	8,704	8,383	9,659	10,713	10,456	9,853
N. Ireland . .	25,240	25,363	26,887	29,645	31,521	30,900	29,007
Maternal mortality rate (per 1,000 live births) Belfast .	3·2	3·4	2·98	3·2	2·9	2·3	1·83
N. Ireland . .	3·8	4·22	4·17	2·96	3·17	3·08	2·69

The maternal mortality rate per 1,000 live births for Northern Ireland in 1938 was 5·37. It will, therefore, be seen from the above table that this rate for the war years showed a gratifying decline. This maintained decrease can be explained partly by the increased use of chemotherapy in the treatment of puerperal pyrexia and puerperal fever, and also by the increased care given under maternity schemes to pregnant women and women in childbirth.

Probably the Ministry of Food's rationing scheme operated to the advantage of most mothers and children in Northern Ireland. Many of them, for the first time, received a guaranteed, balanced, and adequate diet.

From April 1941, the Belfast Civil Defence Authority undertook to provide meals for expectant mothers through the British Restaurants. Belfast Corporation, as part of its normal health services, arranged for the supply of free meals to necessitous expectant mothers, but so few mothers applied under this scheme that it was assumed that the amount of employment available as a result of the war had greatly reduced the number of needy cases.

The other services were used to a greater extent, particularly the Home Helps Scheme which was in great request.

In post-war years these services were retained and developed. Legislation imposed the duty on local authorities throughout Northern Ireland of providing such services in their area. The falling infant and maternal rates provided an index of the results which were being achieved.

INFANT MORTALITY

The infant mortality rate per 1,000 live births declined in 1946 to 54. The average rate over the previous eight years was 74. The highest infant mortality rates during the war years were recorded in the County Boroughs of Belfast and Londonderry.

The following table gives the infant mortality rates and the neo-natal rates per 1,000 live births in Belfast and Northern Ireland for the years 1939–45:

	1939	1940	1941	1942	1943	1944	1945
Infant death rate (per 1,000 live births)—							
Belfast	85	122	91	92	111	89	84
Northern Ireland	70	86	77	76	78	67	68
Neo-natal death rate (per 1,000 live births)—							
Belfast	33	40	36	40	58	48	40
Northern Ireland	32	35	33	35	39	36	32

Main Causes of Infant Deaths—1939–45.

1. Premature birth and injury at birth.
2. Congenital debility.
3. Congenital malformations.
4. Pneumonia and broncho-pneumonia.
5. Diarrhoea and enteritis.

These were by far the major causes of infant death in Northern Ireland during the years under review. Reports on the health of the City of Belfast during the period emphasise the predominance of prematurity, diarrhoea and enteritis, and pneumonia and broncho-pneumonia; in 1941, of 759 infant deaths, 434 or more than half, were ascribed to one or other of these three causes.

Efforts in Belfast to reduce the Mortality. In Northern Ireland as a whole and in Belfast in particular the mortality rates among mothers and infants had for long compared unfavourably with those in Great Britain. Examination of the vital statistics for the war years, however, shows that, despite adverse circumstances, an effort was made to deal with the problem. Figures for the post-war years were even better and suggested that at last the effect of improved services was making itself felt.

During the war measures were introduced in Belfast, which had been in force for years in many of the cities of Great Britain, and which represented a considerable improvement in the services of Northern Ireland, and a radical departure from the old *laissez faire* attitude of local authorities. A report on the City's general health published in 1941 stated that ante-natal and post-natal facilities and arrangements for child welfare were inadequate. These services further deteriorated during the war. Concurrently with their use for maternity and child welfare purposes, the buildings were used as A.R.P. centres, first-aid posts, etc. thus adversely affecting efficient service. Air raids aggravated the position as buildings were destroyed or damaged and the housing shortage, always an enemy of public health, became more pronounced.

The three main causes of infant death in the City mentioned above could easily have become much more grave in their effects. They were largely due to malnutrition, lack of care and bad social conditions, and the conditions created by major air raids. Fortunately, the interruption of the water, gas, and electricity services was not prolonged, but makeshift window coverings often made homes draughty and uncomfortable and this could increase the incidence of pneumonia. As Belfast was not subjected to sustained attacks from the air, the City was able to get back to something like normal, and the results to the health of the people were not so grave as they might have been.

To improve the existing maternity services certain new features were added:

1. The provision of free meals for necessitous expectant mothers for a period of three months before confinement.
2. Supply of home helps.
3. Formation of an obstetrical flying squad to afford immediate and highly skilled treatment at their homes to women suffering from ante-partum or post-partum haemorrhage or obstetrical shock.
4. Organisation of the city's maternity services as an administrative unit.
5. Arrangement whereby the Society for the Nursing of the Sick Poor (a society affiliated to the Queen's Institute of District Nursing) was to provide home nursing facilities for children up to two years of age suffering from acute bronchitis, broncho-pneumonia or gastro-enteritis.

In addition, the numbers of health visitors, ante-natal clinics and child welfare clinics grew and the City increased its contributions to maternity institutions.

EVACUATION

In Northern Ireland the direct effects of the war were felt mainly in the City of Belfast and its immediate surroundings. Other districts were affected in smaller measure but in general it may be said that disruption of normal life was confined to Belfast.

At the outbreak of war Belfast and also the City of Londonderry were designated evacuation areas and a scheme was prepared for the large-scale evacuation of women and children to scheduled reception areas throughout Northern Ireland. At first public response was poor owing to the general feeling that Northern Ireland was sufficiently remote to be immune from air attack. An attempt to carry the evacuation scheme into effect in July 1940, was not highly successful, but public apathy was dispelled by several sharp air attacks on Belfast in April and May of 1941 and large numbers of people were then evacuated. From that time until the end of the war, however, enemy activity over Northern Ireland was negligible and a number of evacuees gradually drifted back into the City.

In July 1944, about 7,000 Gibraltarian evacuees, who had been living in London until the commencement of the flying-bomb attacks, were received into Northern Ireland; these were dispersed to camps which had been constructed in county areas for the reception of evacuees from Belfast, but which were not, as events turned out, required for that purpose.

In general, it may be said that evacuation was not widespread and had little disruptive effect in Northern Ireland.

NURSERY CENTRES IN WAR-TIME

Nursery Centres were provided as a purely emergency measure by two official agencies: the Evacuation Branch of the Ministry of Home Affairs which was transferred to the newly created Ministry of Health and Local Government on June 1, 1944 and the Ministry of Education.

Nursery Centres set up by Evacuation Branch. In April 1941, after the first air raid on Belfast, large numbers of persons were evacuated from the City to reception areas throughout Northern Ireland. As part of the arrangements, there were established, through the agency of the Nursery Centres Committee (a Northern Ireland Committee of the Nursery Schools Association), some 14 day nursery centres, two residential nurseries and one nursery unit. These were established in reception areas primarily for evacuee children from two to six years of age, but local children, particularly those whose mothers were on work of national importance, were also admitted. Indeed, the centres proved to be more popular with local residents, and by the beginning of 1944 the number of local children in attendance exceeded the number of evacuated children.

The two residential nurseries and the nursery unit provided billets for children between the ages of two and six who, because of their extreme youth, could not be billeted in the normal manner, and whose mothers were unable, by reason of employment on war work or because of special family circumstances, to accompany the children to the reception area. One of the residential nurseries served as a home for

'difficult' children. The nursery unit was so called because a number of children with nurses was placed in the home of a local lady.

In July 1944, the Gibraltarian evacuees already referred to were received into Northern Ireland and were dispersed to sixteen emergency camps in the reception areas. Each camp had its nursery centre.

Towards the end of 1944 it was decided to close the day centres but, in fact, only three were closed, the remainder being taken over by the Ministry of Education with a view to the establishment of permanent centres in the districts concerned.

Nursery Centres set up by the Ministry of Education. As a purely war-time measure the Ministry of Education ran twenty-one nursery centres (ten in Belfast and the remainder in the larger towns). These were for children from two to five years of age. Attached to some of these nursery centres were 'Baby Units' for children under two years. There were, in addition, two resident nurseries for the children of mothers on war work who were on night shifts or away from home for long periods.

GENERAL WAR-TIME POLICY

Apart from the centres managed by the Ministry of Education, it was deemed unwise to sponsor the establishment of crèches or nursery centres in the evacuation areas, although strong pressure was brought to bear on the Government by interested bodies. After discussion and careful examination, it was decided that the problem of attracting married female labour into essential industry was not so important as in Great Britain and that expenditure on war-time nurseries would not be justified. In this connexion it is of interest to quote Dr. Thomson, Medical Superintendent Officer of Health for the City of Belfast, in a report dated September 15, 1942. 'I canvassed the Health Visitors very carefully on the question of "women at work" and as to whether, in consequence, day nurseries or crèches are necessary. I am somewhat surprised to find that the staff states that at the present time day nurseries are not necessary at all'.

WELFARE FOODS

Expectant and nursing mothers and young children in Northern Ireland enjoyed the same advantages in regard to special foods as did their counterparts in Great Britain. They were more fortunate in that it was never found necessary to ration milk in Northern Ireland; the National Milk Scheme was nevertheless adopted in 1940 to provide milk of an attested quality either free or at a reduced cost for expectant and nursing mothers and children under five years of age.

While no precise figures of the acceptance of cod liver oil, orange juice, blackcurrant purée, etc., are available, it is probable that the use of these commodities was not so wide as could have been hoped.

There is no doubt that they proved an immense boon to those mothers who fully availed themselves of the service during the difficult war years. One of the few good things to emerge from the war was the inauguration and subsequent continuance of the Welfare Foods Scheme.

The Ministry of Health and Local Government took over from the Ministry of Food as from July 21, 1946, responsibility throughout Northern Ireland for the cost of the supply and distribution of Welfare Foods, comprising orange juice, cod liver oil, vitamin A and D tablets and orange juice jelly to expectant and nursing mothers and young children.

The Ministry of Food had operated the scheme after its introduction during the war, and the cost of the scheme had been met out of the Vote of that Ministry. Under arrangements made later, the Ministry of Food continued to operate the scheme, but the costs were recouped by the Ministry of Health and Local Government. For the portion of the financial year 1946–7 involved, the estimated cost of the scheme was £80,000.

In addition to the distribution of such foods from local food offices, arrangements were also made for their distribution from some of the Maternity and Child Welfare centres.

DEVELOPMENT OF EXISTING SERVICES

Following the Reports of the Select Committee of the House of Commons and of the Health Advisory Council concerning maternity and child welfare services throughout Northern Ireland, the Ministry of Health and Local Government wrote in August 1945, to all Maternity and Child Welfare Authorities drawing their attention to the recommendations made; and urging them to review their arrangements and to consider the development of existing services; and where none was then available, to consider the introduction of such services. The response to this circular was on the whole satisfactory and resulted in many improvements.

After the war, Maternity and Child Welfare Services were affected by the Public Health and Local Government (Administrative Provisions) Act (Northern Ireland), 1946, under the provisions of which the administration of Maternity and Child Welfare Schemes passed from urban and rural district councils to the respective county health authorities.

Under arrangements existing at the end of 1946, urban and rural district councils administered their schemes, employing medical practitioners, generally on a part-time basis, and health visitors for the purpose. Child Welfare clinics also operated in many areas. In other districts, the work was carried out on behalf of the local authority by local district nursing societies, and towards the expenses of such

services the local authorities contributed annual sums to the societies. The Ministry paid to the local authority a grant equal to 50 per cent. of the net approved expenditure involved.

POST-WAR POLICY

Post-war policy was guided by the reports of several committees of experts set up to advise on the reorganisation of Northern Ireland's maternity services:

(i) Report of the Maternity Services Committee on Maternal Mortality and Morbidity in Northern Ireland. Published 1943 (Cmd. 219).
(ii) Report by the Select Committee on Health Services. Published 1944 (M.C. 601).
(iii) Report of the Health Advisory Council, 1945 (Cmd. 238).

These reports agree on most points and the main recommendations were as follows:

(1) Organisation of the maternity services on a county and county borough basis.
(2) Setting up of an organised midwifery service.
(3) Setting up of an organised blood transfusion service.
(4) Compulsory immunisation against diphtheria.
(5) Establishment of obstetric flying squads and mobile infant welfare clinics.
(6) Establishment of a home help service.
(7) Provision and supervision of ante-natal and post-natal clinics by local authorities. It was stated that in Northern Ireland these services were much below the standard in the remainder of the United Kingdom.
(8) Instruction in mothercraft in girls' schools and intensification of the work of child welfare clinics. This was judged necessary as the infant mortality rate in Northern Ireland had for long compared unfavourably with that in England and Wales. Many of the infant deaths could be ascribed to ignorance or carelessness on the part of the mothers.

These recommendations were in the main implemented by legislation, viz: the Public Health and Local Government (Administrative Provisions) Act (Northern Ireland), 1946, and the Health Services Act (Northern Ireland), 1948. Immunisation against diphtheria was not, however, made compulsory. Adequate nursing, medical and hospital facilities became the right of every mother and child regardless of income or social status and it was the duty of the several statutory bodies set up under the terms of the Acts quoted to provide these services. Northern Ireland hopes to provide a maternity service second to that of no other country; the future only can tell whether it will be achieved.

MEDICAL INSPECTION AND TREATMENT OF SCHOOL CHILDREN

The School Medical Service was maintained and developed during the years of the war.

All local education authorities now employ school medical officers, dental officers, and school nurses, either in a full-time or part-time capacity for the medical inspection of school children.

While treatment can be recommended for defects found in school children in the course of inspections, it is to be noted that the necessary treatment can only be given after the consent of the parents has been obtained. The attention of parents was drawn to the defects found and they were urged to see that the required treatment was procured.

The annual reports of the medical officers showed in some cases that the number of children actually treated for certain defects fell far short of the number recommended for such treatment.

Mentally sub-normal children were not properly catered for, and there was room for improvement in dealing with children suffering from defective sight or speech.

In some areas, particularly in more remote rural districts, the condition of school buildings was the subject of very adverse criticism by school medical officers. This may be ascribed, in part at least, to war conditions, which of course interfered to a considerable extent with routine maintenance work. Generally speaking, however, the health of school children tended to improve during the war years, even in spite of certain food restrictions which prevailed.

CHAPTER 5

MENTAL HEALTH SERVICES

BEFORE the outbreak of the war the mental health services in Northern Ireland were chiefly made up of institutional accommodation for the treatment of persons suffering from mental illness. Except for an extern psychiatric clinic at one of the teaching general hospitals in Belfast and conducted by one of the medical staff of the Belfast Mental Hospital, though the clinic was not provided by the latter hospital, no services outside the institutions were in existence. During the war years, however, especially during 1944, extern clinics were either set up at local general hospitals by the mental hospital authorities or plans were prepared to have such clinics established. This work was encouraged by the central authority, so that proper facilities would be available for ex-Service patients to obtain advice and treatment where institutional care was not required.

The pre-war institutional accommodation comprised six public mental hospitals and one private mental hospital. The public mental hospitals were provided by the county or county borough authorities either singly or jointly. This accommodation remained substantially the same during the war years except for certain transfers of patients, to be mentioned later, arising from the taking over of Mental Hospital premises for war purposes. The private mental hospital which had a bed complement of 52 (14 males and 38 females) and had 30 patients (11 males and 19 females) in residence on December 31, 1938, is not included in the statistical tables which follow:

TABLE I

Mental Hospital	Area served	Population served	Beds (standard)			Patients in residence December 31, 1938			Percentage over-crowding
			Male	Female	Totals	Male	Female	Totals	
Purdysburn Villa colony	City of Belfast	438,086	691	733	1,424	926	815	1,741	18·0
Derry (Joint Board)	City of Londonderry County of Londonderry	47,813 94,923	350	226	576	351	239	590	2·4
Armagh	County Armagh	108,815	340	277	617	318	277	595	None
Antrim	County Antrim	197,266	330	300	630	375	307	682	8·0
Omagh (Joint board)	County Tyrone County Fermanagh	127,586 54,687	491	380	871	487	389	876	0·57
Down	County Down	210,687	424	380	804	448	462	910	13·1
Totals		1,279,863	2,626	2,296	4,922	2,905	2,489	5,394	9·5

Table I sets out the different public mental hospitals, the area and population each serves, the standard bed complement and the patient population in them on December 31, 1938, the last complete peace year before the outbreak of hostilities. Overcrowding existed to the extent of 9·5 per cent. of normal standard accommodation. This overcrowding was greatest in Belfast Mental Hospital with 18 per cent. overcrowding and Down Mental Hospital with 13·1 per cent. overcrowding. The proportion of beds per 1,000 of total population served was 3·83. The proportion of patients in mental hospitals to the total population on December 31, 1938, was 4·2 per 1,000. It will be noted that the male population in the mental hospitals was greater than the female. This preponderance of male to female mental patients is a characteristic of Northern Ireland and also of Ireland as a whole. In England and Wales female patients outnumber male patients.

In 1940, the War Office requisitioned the recently constructed reception block of the Belfast Mental Hospital containing 120 beds (60 males and 60 females) for use as a military mental hospital. This accentuated the 18 per cent. overcrowding already present in the mental hospital. In 1941, further buildings of the same hospital were taken over for the purposes of an emergency hospital. Accommodation had to be found for the displaced mental patients in the remaining mental hospitals in Northern Ireland. Derry Mental Hospital was not considered for this purpose as it was situated in a vulnerable area. In order to accommodate the patients displaced from Belfast and at the same time to create a reserve of bed space in the hospitals in the less vulnerable areas to accommodate further transfers from Belfast or cases from Derry Mental Hospital should an emergency arise there, eight Nissen hospital huts were erected at two of the mental hospitals. This gave extra accommodation for 360 patients (180 males and 180 females). Huts for nursing staff were also provided. In the same mental hospitals additional kitchen and laundry equipment was supplied to meet the extra load. Altogether, 481 patients (280 males and 201 females) were transferred from Belfast Mental Hospital in 1941 to the different county mental hospitals. The Nissen huts were occupied by mental patients for over two years and were found very satisfactory as temporary accommodation, provided the patients were suitably selected. The main alteration made to the huts was to change the position of the heating stoves from the centre of the wards to the corners and to protect them with wire fire guards.

NUMBERS OF PATIENTS UNDER TREATMENT

Since 1922 there had been a gradual rise in the number of patients under treatment and care in mental hospitals, and this continued during the five years before the outbreak of war. During the war years, however, there was a noticeable falling-off in the number of patients

under treatment, similar to that observed during the years of the War of 1914–18. The following chart shows the variation in the number of patients under treatment in the peace years compared with the war years. Table II also shows the daily average number of patients resident in the mental hospitals for each year from 1913 to 1944.

CHART

Showing daily average number of patients resident in Northern Ireland Mental Hospitals for period 1913–44

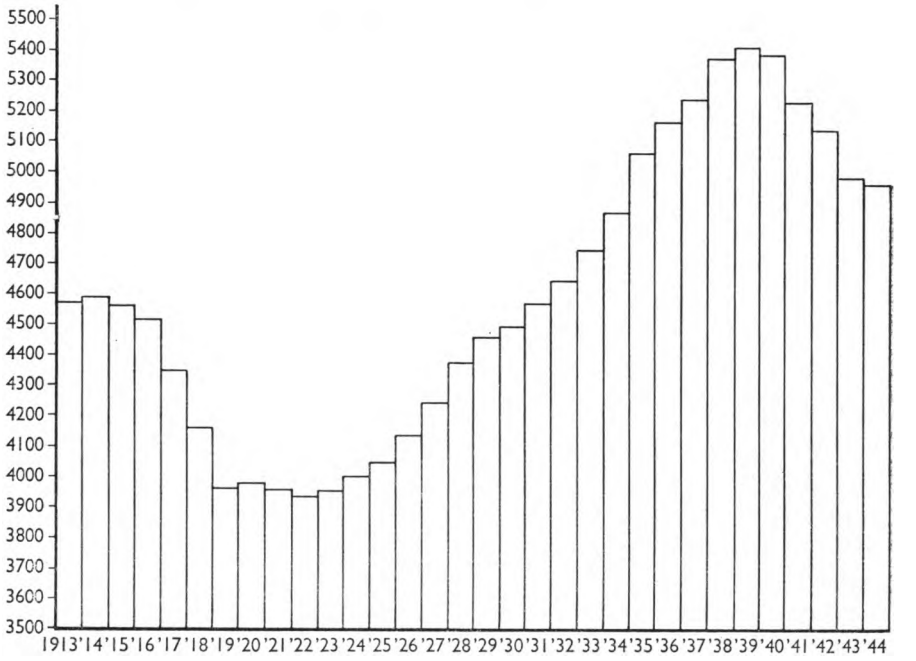

TABLE II

Year	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
Daily average number of patients resident	4,575	4,586	4,562	4,524	4,363	4,178	3,963	3,977	3,973	3,954	3,968	4,015	4,069	4,156	4,261	4,393
Year	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
Daily average number of patients resident	4,461	4,501	4,571	4,655	4,755	4,894	5,077	5,181	5,255	5,386	5,410	5,393	5,259	5,171	4,995	4,992

The variation in the numbers of patients under treatment as depicted in the Chart accords with that experienced in Great Britain and other countries.

In Table III is given the number of patients resident in the public mental hospitals on December 31 of each year for five years before the outbreak of war and also for the war years 1939–44. There was a steady rise in the mental hospital population in the pre-war years. During the first four years of war the reverse took place, there being 311 patients less at the end of 1943 than at the end of 1939. The year 1944, however, showed a rise in population of 158. Table III once more brings out the predominance of male patients to female patients:

TABLE III

Year	Number of patients resident on December 31		
	Male	Female	Totals
1934	2,675	2,293	4,968
1935	2,788	2,337	5,125
1936	2,865	2,370	5,235
1937	2,895	2,400	5,295
1938	2,914	2,480	5,394
1939	2,945	2,485	5,430
1940	2,904	2,438	5,342
1941	2,828	2,382	5,210
1942	2,738	2,363	5,101
1943	2,634	2,195	4,829
1944	2,702	2,285	4,987

ADMISSIONS

The number of admissions into Northern Ireland public mental hospitals in the immediate pre-war quinquennium and in the war years classified according to the nature of their admission is given in Table IV. It may be mentioned at this stage that the principal statutory enactment in Northern Ireland governing the reception into institutions, for treatment, of persons suffering from mental or kindred illness was the Mental Treatment Act (Northern Ireland), 1932. Under the provisions of this Act persons could be received into institutions (1) as Voluntary patients, that is at the person's own request; (2) as Temporary

TABLE IV

Admissions to Public Mental Hospitals

Year	Voluntary			Temporary			Certified			Totals		
	Male	Female	Totals	Male	Female	Totals	Male	Female	Totals	Male	Female	Totals
1934	60	57	117	20	36	56	520	533	1,053	600	626	1,226
1935	100	69	169	24	48	72	530	510	1,040	654	627	1,281
1936	121	71	192	46	47	93	517	479	996	684	597	1,281
1937	106	76	182	50	58	108	481	457	938	637	591	1,228
1938	107	101	208	51	91	142	455	490	945	613	682	1,295
1939	132	94	226	53	73	126	367	433	800	552	600	1,152
1940	126	95	221	77	90	167	362	374	736	565	559	1,124
1941	107	120	227	62	86	148	365	348	713	534	554	1,088
1942	108	123	231	48	84	132	267	284	551	423	491	914
1943	121	125	246	60	101	161	325	318	643	506	544	1,050
1944	138	158	196	70	88	158	315	376	691	523	622	1,145

patients, that is for a limited period not exceeding twelve months in all on the recommendations of two medical practitioners but without any judicial order; (3) as Certified patients, that is, where a medical certificate and a reception order given by a Justice of the Peace or Resident Magistrate is required. Each of the years 1939 to 1942 shows a slight drop in the total number of admissions but in 1943 and 1944 an increase in the admissions appeared. There has been a steady rise in the number of patients admitted on a voluntary basis both in the peace years and during the war, with a fall in the certified admissions except in the last two years of the war.

The only statistical information available as to the number of persons seeking advice on mental health matters outside the public mental hospitals is the number of those who attended the extern psychiatric clinic held at the Royal Victoria Hospital, Belfast. From Table V it can be seen that there was some increase in the number of new cases seen during the war years compared with peace-time. This was no doubt due partly to war strain and partly to an increased readiness on the part of persons to seek advice on psychological problems.

TABLE V

New Cases seen at Extern Psychiatric Clinic, Royal Victoria Hospital, Belfast

Year	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
No. of new cases seen	98	99	104	80	95	86	119	88	119	155	156

HEALTH IN THE MENTAL HOSPITALS

The general health of the patients in the mental hospitals gave little cause for added anxiety during the war years, in spite of the greatly increased degree of overcrowding necessitated by reduction in accommodation and reception of patients transferred from other mental hospitals. Overcrowding was eased to some extent by the drop in the number of patients in residence.

The chief factor which contributed to the good state of health was the maintenance of the dietary scale at a satisfactory level, thanks largely to the rationing system which ensured equitable distribution. This was assisted by the good supplies of potatoes which were usually available in Northern Ireland and which helped to augment and supplement any deficiencies in the diet. Potatoes have always been popular with the rural section of the population from which a large number of the patients in the mental hospitals come. Ample supplies of vegetables were well maintained; indeed, among the patients transferred to the county mental hospitals an increase in weight generally was obtained.

Except for a sharp rise in the death rate from all causes in 1940 and 1941, the death rate in mental hospitals in the war years compared very favourably with peace-time rates as is shown in Table VI:

TABLE VI

Deaths from Tuberculosis and all Causes (Ratio per 1,000 daily average number patients in residence)

Year	Tuberculosis			All causes
	Pulmonary	Non-pulmonary	All forms	
1934	9·4	0·8	10·2	90
1935	8·1	2·1	10·2	91
1936	5·8	1·1	6·9	92
1937	9·1	0·7	9·8	92
1938	9·1	0·9	10·0	85
1939	7·6	0·9	8·5	84
1940	10·4	1·3	11·7	93
1941	15·8	1·3	17·1	110
1942	14·9	1·5	16·4	84
1943	9·2	1·2	10·4	83
1944	8·8	1·2	10·0	83

The tuberculosis death rate showed a sharp rise in the war years 1940–2, reaching 17·1 in 1941 compared with the average for the quinquennium 1934–8 of 9·4. It however dropped to 10·4 in 1943 and 10 in 1944.

War-time conditions could not be said to have materially affected the death rate among mental hospital patients. Blackout conditions with increased overcrowding and the adjustment to a somewhat modified diet may have contributed to the increased tuberculosis death rate, but judging by the decline in the rate in the latter years of the war, satisfactory adjustment to these circumstances would appear to have been reached.

Among the infectious diseases which occurred (see Table VII) in mental hospitals only diphtheria and typhoid fever showed an appreciable increase in incidence during the war years. Typhoid fever had been endemic in several of the mental hospitals in the pre-war years and with the introduction of susceptible patients from other mental hospitals to these places, added to the increased overcrowding, new cases appeared. Diphtheria flared up in a number of the mental hospitals; infection appeared to be conveyed to the patients in the hospitals by the nursing staff from outside contacts. The mortality rate was fortunately low in these cases.

Dysentery of both Flexner and Sonne variety had also been endemic in two mental hospitals both before and during the war. Cases previously reported as colitis have within recent years been diagnosed as dysentery, thanks to improved bacteriological methods of isolation

of the causative organisms. Wilson and Blair's tellurite-iron-rosolic acid selective medium has been the means of detecting cases of Flexner dysentery which would otherwise have remained undiagnosed.

TABLE VII

Chief Infectious Diseases

Disease	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
Influenza	64	—	83	670	77	36	149	226	1	118	—
Scarlet fever	2	6	4	—	3	6	1	5	—	2	1
Colitis	—	—	—	35	15	8	3	33	7	4	6
Dysentery	—	—	8	5	15	1	1	2	6	21	20
Typhoid fever	13	29	12	12	8	10	6	6	32	22	29
Paratyphoid fever	5	1	1	—	15	1	3	—	1	—	—
Diphtheria	1	2	2	1	46	12	29	26	36	15	18
Cerebro-spinal fever	—	—	—	—	—	—	—	—	1	2	—

The first cases of cerebro-spinal fever to occur among patients in Northern Ireland mental hospitals appeared in 1942 and 1943. There were three in all and they were in the same mental hospital. The three patients recovered from the infection after sulphonamide treatment.

SPECIAL MEASURES

Special Methods of Treatment. During the war electric convulsive therapy was introduced in all the mental hospitals for the treatment of persons suffering from particular types of mental illness.

Child Guidance Council. A Child Guidance Council was set up in Northern Ireland in 1942 to establish clinics for the diagnosis, treatment and study of behaviour disorders in children and to educate the community, particularly parents and teachers in the nature and value of child guidance. Owing to the extreme difficulty in obtaining trained personnel to conduct clinics in war-time, only one clinic was established and this was in Belfast, towards the end of the war period.

Special After-care Provision for ex-Service Personnel. Arrangements were made in Northern Ireland for the provision of after-care for members of H.M. Forces invalided from Service Psychiatric Hospitals and from Neurosis Centres, similar to those which were made in Great Britain. A psychiatric social worker was appointed by the Ministry of Health and Local Government to assist in this work.

Medical Staff. From each of three mental hospitals an assistant medical officer was released to join the Services for the duration of the war. It was necessary to employ substitutes as the normal ratio of medical officers to patients was low in Northern Ireland.

Nursing Staff. A number of the members of the nursing staffs of the mental hospitals were released for service in the Forces. The scale of salaries provisionally recommended by the Scottish Nurses' Salaries Committee for mental nurses was adopted by all the mental hospital authorities in Northern Ireland.

CHAPTER 6

GENERAL HOSPITAL SERVICES

THE full story of the work of Northern Ireland Hospitals in war-time will be found in Part II, Volume II of the Emergency Medical Services History. Here only a brief account is given of the more important developments in the period from 1939 to 1945.

REVIEW OF AVAILABLE HOSPITAL SERVICES

The approach of war caused the Government in 1939 to review the existing hospital services in order to ascertain how far they could cope with the demands for treatment which were to be expected in a period of modern warfare with the likelihood of air attacks on the civil population. This survey showed that the following hospital beds were available:

	Approximate Number of Beds
Voluntary Hospitals—	
(General and Special, excluding Tuberculosis)	1,800
County Hospitals	500
District Hospitals and Fever Hospitals ..	1,200
Union Infirmaries and Fever Hospitals ..	2,650
Tuberculosis Hospitals and Sanatoria	600
Special Fever Hospitals	350
Mental Hospitals	5,300
Total	12,400

THE EMERGENCY MEDICAL SERVICE

It was clear that in time of war the aid of all the leading general hospitals would be required to treat casualties and that many additional beds would probably be needed.

Civil Defence legislation was drafted to provide for the organisation of necessary services in war-time, including measures to deal with casualties and disease. Before the Civil Defence Act (Northern Ireland), 1939, came into operation much work had been done in anticipation of the sanction of Parliament.

The approved scheme provided for the following action:

1. The appointment of a Hospital Officer.
2. The setting up of an Emergency Medical Service.
3. The inclusion of hospitals in the Emergency Hospitals Scheme.
4. The provision of additional beds at hospitals and the erection of hutted annexes to hospitals.

5. The provision of additional medical and surgical equipment.
6. The protection of hospitals against damage by air attack.
7. The provision of improved and new services at hospitals.

The Hospital Officer was the link between the Ministry and hospital authorities, and it was his task to plan the necessary arrangements for the reception of casualties and to advise both the Ministry and the hospital authorities as to the action needed to prepare for the strains which an attack on the civil population would impose on the hospital system.

The Emergency Medical Service included practically all the medical and surgical specialists in Northern Ireland and a large number of other doctors, who enrolled in the Service and agreed to serve wherever their help might be required for the treatment of casualties.

All the general hospitals were included in the Emergency Hospitals Scheme and prepared to receive casualties, sick evacuated persons or patients transferred from larger hospitals to provide beds in those hospitals for the reception of casualties.

Increase in Hospital Accommodation. At the beginning of the war there were 4,700 general hospital beds in Northern Ireland. This number was substantially increased by making the maximum use of all available accommodation and setting up beds, approximately 1,000, provided by the Ministry. Alterations and extensions at certain hospitals were a necessary part of these arrangements and, in particular, building works were undertaken at Londonderry, Ballymena, Omagh, Limavady and Magherafelt.

It was soon obvious that other efforts to provide additional hospital accommodation would be necessary, and it was decided to erect prefabricated hutments as annexes to many of the hospitals in Northern Ireland. The majority of the hutments were provided at general hospitals but others were erected to supplement the accommodation available for the treatment of persons suffering from fevers or tuberculosis.

The steps taken to increase hospital accommodation in Northern Ireland, as described briefly in the preceding paragraphs, added about 2,500 beds to the number available at the beginning of the war.

In November 1941, further accommodation for the treatment of casualties was provided by the setting up of an emergency hospital in a section of the Belfast Mental Hospital at Purdysburn. This step was made possible by the helpful co-operation of the mental hospital authorities and the transfer of several hundreds of mental patients from Purdysburn to other mental hospitals in Northern Ireland. This emergency hospital, known as the Belfast Emergency Hospital, had accommodation for 400 patients.

Equipment of all kinds was provided by the Government and issued on loan to hospitals in the Emergency Scheme. The articles supplied varied from beds and bedding to X-ray apparatus and operating theatre

equipment. Even well-equipped hospitals, by 1939 standards, required additional equipment to enable them to be prepared for meeting war-time needs. In other cases it was necessary not only to supply equipment, but also to upgrade hospitals by establishing operating theatres where there had been none.

In the early period of the war it seemed likely that the greater part of Northern Ireland would be outside the range of enemy attack by air, but with the fall of France and the development of the long-range bombing aeroplane, it became clear that no part of the country could be regarded as safe from attack. It was, therefore, necessary to extend to all areas the scheme of protective works which had at first applied only to hospitals in the Belfast area. That scheme provided for the bricking-up of windows, the protection of operating theatres against damage by blast and bomb fragments, the development of anti-gas measures, including facilities for the cleansing and treatment of casualties which would result from the use of poison gas by the enemy, and the provision of air-raid shelters for patients and staffs. The greater part of the cost of all these measures, in many cases the total cost, was borne by the Government.

The organisation required in war-time was steadily, although at times slowly, developed. Exercises were held to test the efficiency of the arrangements, and constantly the whole scheme was under review and subject to alterations which experience elsewhere showed to be desirable.

Northern Ireland escaped prolonged or sustained air attack by the enemy. The few raids which occurred were confined to a period of about four weeks beginning early in April 1941. Belfast was the main target upon which the enemy concentrated, although some casualties occurred in Londonderry and in the Bangor-Newtownards area. (See Emergency Medical Services, Volume II, Part II, Chapter 2 and Part III, Chapter 14.)

USE OF THE HOSPITALS IN WAR-TIME

The Emergency Hospital Scheme was primarily designed for civilian casualties, but it was decided at an early stage in the war that the services of the hospitals should be available to sick and wounded members of His Majesty's Forces and the Forces of the Allies. The Forces, including the American Forces, established several hospitals in Northern Ireland, but it would have been difficult for them to meet their needs without the aid of the Emergency Hospital Service. Throughout the war co-operation between the Forces and the civilian units was excellent, aided by the work of the Ministry of Health's Hospital Officer, who acted in a liaison capacity.

As the war continued the demand for hospital treatment of civilian sick continued to grow and, inasmuch as new building work was in abeyance apart from special work directly related to the war effort,

the waiting lists in the voluntary hospitals of Belfast became longer than ever before. After the spring of 1941, when air attacks ceased, part of the accommodation in the Belfast Emergency Hospital was made available for the treatment of civilian sick. This arrangement reduced the pressure on other Belfast hospitals, particularly the Royal Victoria Hospital.

Professor W. W. D. Thomson, M.D., F.R.C.P., Professor of Medicine, and Professor P. T. Crymble, F.R.C.S., Professor of Surgery, Queen's University, Belfast, have contributed valuable commentaries on the effect of the conditions arising out of the war on medicine and surgery in Northern Ireland in general, but with particular reference to the functioning of the Belfast Medical School and the Royal Victoria Hospital, Belfast. These will be found in Appendices VI and VII.

In Appendix VIII will be found an interesting account of the arrangements made for safeguarding the health of the considerable number of United States troops stationed in Northern Ireland from time to time. This account is supplied by Colonel J. H. McNinch, U.S. Medical Corps Historian, through the agency of the Commonwealth and United States Medical Historians Liaison Committee. The account pays tribute to the invaluable assistance furnished by the British authorities, both military and civil and to the close liaison which existed between them and the U.S. Medical Corps.

Maintenance of Medical Personnel. There was no conscription in Northern Ireland, but the teaching hospitals were affected by the absence on active service with H.M. Forces of many of the younger medical and surgical specialists. This threw an extra strain on senior members of the hospital staffs, both in teaching and other duties, but the work of the Belfast Medical School was well maintained. The medical course was reduced from five and a half years to five years and the great majority of students passed into H.M. Forces after a period of six months' hospital service following graduation. Nearly 700 graduates of the medical school joined the medical branches of the Forces, and over eighty of them received decorations or were mentioned in despatches. The Northern Ireland Medical War Committee, on which the Ministry of Health and Local Government was represented, considered applications from doctors wishing to join the Forces, and endeavoured with success to maintain a balance between the demands of the Forces for more and more medical officers, and the need for an adequate number of doctors to prevent services at home from breaking down. The committee's work was an important contribution to the country's war effort.

THE BLOOD TRANSFUSION SERVICE

A small blood transfusion service, providing for the calling of blood donors when needed, had been organised in Belfast, shortly after the

War of 1914–18, under the leadership of Sir Thomas Houston, and it continued to operate until 1939. Experience in that period and the lessons learned during the civil war in Spain made it obvious that in time of war a well-developed blood transfusion service would be an essential part of hospital arrangements.

The Government agreed to accept financial responsibility for an Emergency Blood Transfusion Service, and under the direction of Professor J. H. Biggart and Dr. J. A. L. Johnston (for the North-west area) the new service made rapid progress. Before the end of 1941 more than 10,000 voluntary blood donors had been recruited and arrangements were made to supply blood and plasma to all hospitals in Northern Ireland.

War-time experience not only proved the value of a well-organised blood transfusion service, but also led to many developments in technique. There was, therefore, no doubt that the benefits obtained by the emergency arrangements would be required in time of peace also, and towards the end of 1945 consideration was given to the question of making provision for a permanent blood transfusion service. This subject received the attention of the Ministry's expert advisers and was also considered by other bodies representing Northern Ireland hospital authorities. The result was that the Ministry of Health and Local Government was convinced that, pending the reorganisation of health services as a whole, it should accept responsibility for providing a blood transfusion service.

Following the decision referred to above, the Ministry took steps to reorganise the transfusion service and appointed a whole-time Blood Transfusion Officer, technical assistants and a team of donor attendants. The new Service began its work at the end of November 1946, and superseded the emergency war-time arrangements which had been so valuable in those dark and dangerous days.

A full account of this service will be found in E.M.S., Volume II, Part II, Chapter 6.

THE NORTHERN IRELAND COUNCIL FOR ORTHOPAEDIC DEVELOPMENT

The development of orthopaedic services for the treatment of crippled persons and persons suffering from injuries and diseases of bones or joints, is one of the most interesting advances of surgery in the twentieth century and has already a history of fine achievement to its credit.

Northern Ireland was late in taking its full part in the development of orthopaedic services, and it was not until 1940 that an organised effort was made to apply to this country the lessons which had been learnt in other parts of the United Kingdom and in many countries throughout the world. In that year, Sir David Lindsay Keir,

Vice-Chancellor of the Queen's University of Belfast, called a meeting of representatives of hospitals and other bodies and it was decided to establish the Northern Ireland Council for Orthopaedic Development. Financial assistance was obtained from the Trustees of the Lord Nuffield Fund for Cripples, and the Council took the first step in its wide programme by establishing a number of clinics throughout the country at which specialist orthopaedic teams attend at regular intervals to advise and treat patients. Arrangements also were made to try to assist patients requiring hospital treatment to obtain admission to a suitable institution.

The Council co-operated closely with the Ministry of Health and Local Government hospital authorities, and with local authorities, and did valuable work during the war.

The lack of a long-stay open-air hospital was a handicap but, by arrangement with the Ministry, upwards of 100 beds for persons with orthopaedic conditions were made available in the Emergency Hospital, Musgrave Park; these beds were in the charge of visiting surgeons who also acted as surgeons under the Council's clinics scheme. While the ultimate aim was to provide at least one specially-equipped open-air orthopaedic hospital for Northern Ireland, the Council recorded its appreciation of the valuable help given by the Ministry in making the temporary arrangements at Musgrave Park.

DISTRIBUTION OF PENICILLIN TO HOSPITALS

The application of Sir Alexander Fleming's discovery of penicillin was one of the greatest, if not the greatest, advance in medical science during the war and although in the early stages of production supplies were reserved solely for the treatment of casualties in the Fighting Forces, it became possible before the end of the war to release small quantities of penicillin for the treatment of civilian sick and injured persons. Until production reached the stage at which restriction of supplies was no longer essential, it was necessary to devise special means to ensure that the available small quantities of penicillin would be used to the best advantage. It was, accordingly, arranged that supplies for Northern Ireland should be made available to the Ministry, and the Ministry asked the Queen's University, through a special committee of the Faculty of Medicine, to undertake the distribution of these supplies to Northern Ireland hospitals. The committee did valuable work in this matter and, while preventing the unwise use of penicillin in cases where it was not required or was not essential, was able to provide adequate supplies for the treatment of patients whose condition showed that penicillin therapy was essential.

An important part of the scheme was the provision of transport to enable supplies to be taken to hospitals without delay. In this matter, as in the distribution of blood and plasma under the Blood Transfusion

Scheme, the National Fire Service gave very valuable assistance and, despite adverse conditions on many occasions, never failed to effect delivery in good time.

A full account of these arrangements will be found in E.M.S. Volume II, Part II, Chapter 6.

DEVELOPMENT OF HOSPITAL POLICY DURING AND AFTER THE WAR

Traditionally, an institution for the care of the sick, known as the 'House of Sorrow' was established in Ulster in the year 300 B.C. Throughout the long years that lie between this early foundation and the nineteenth century there was always some attempt to meet the needs of the sick and injured. The nineteenth century witnessed a revolution in the attack on disease and suffering and the establishment of the Royal Victoria Hospital, Belfast, and other hospitals. In Northern Ireland, the leadership in this revolution has been taken by these hospitals and the medical schools, and they remain the great centres of medical and surgical endeavour.

There were in Northern Ireland as in Great Britain two groups of hospitals—the voluntary hospitals and the hospitals maintained out of public funds. The two groups were not co-ordinated, and good as their work was, there had, thoughout some forty years, been an increasing demand for a re-assessment of needs, a definition of hospital policy, and a studied and enlightened planning of hospital services.

These questions were touched upon by the Vice-Regal Commission on Poor Law Reform in Ireland (1906)[5] by the Majority Report (on Ireland) of the Royal Commission on the Poor Law (1909)[6]; and at greater length by the Departmental Commission, appointed by the Minister of Home Affairs in 1925,[7] to inquire into and report on Local Government Administration in Northern Ireland. This Commission reported in 1927, but owing to the economic crisis of 1931, little was done to implement its recommendations.

War is, however, a stimulus to health reform and the activities of England and Wales and Scotland in taking steps to survey and replan their hospital services for the future, even at a time when the national existence was at stake, had their repercussions in Northern Ireland. As already mentioned, the Select Committee on Health Services in Northern Ireland was set up in December 1942, and its Final Report was presented to the House of Commons on January 18, 1944.[1]

The Committee found that the hospital services were inadequate and that the existing system whereby hospitals were administered under two separate and distinct schemes—viz. voluntary and rate-aided—was unsatisfactory. They recommended that Northern Ireland should be constituted one region for the purpose of hospital administration; that the Ministry should work through a Regional Council

acting in an advisory capacity, and that this Council, which should be composed of an equal number of representatives from the voluntary and rate-aided hospitals, should include adequate medical representation and should be the authority to settle hospital policy for the region; and that all hospital services in Northern Ireland should be fused into one unit under the regional scheme, thus ensuring co-operation between the various hospitals and a co-ordinated use of all hospital facilities. The implications of these recommendations were dealt with in some detail and certain principles were laid down by the committee as a guide to the reorganisation of the hospital services.

In the meantime the Nuffield Provincial Hospitals Trust, established at the instance of Lord Nuffield to survey hospital services in Great Britain to determine the needs of the several areas, and to suggest how they should be met, had extended its activities to Northern Ireland. Under its auspices, in October 1942, the Northern Ireland Regional Hospitals Council was formed.

This Council included representatives of every hospital authority in Northern Ireland, and members representing respectively the Faculty of Medicine of the Queen's University, certain Government Departments (including, at a later date, the Ministry of Health and Local Government), the British Hospitals' Association, the Association of Rate-aided Hospitals and the British Medical Association. Never before had such a widely representative body of expert opinion been assembled to review the planning of hospital services in Northern Ireland.

The Council appointed three physicians, Dr. Stanley Barnes, Lieut. General Sir William MacArthur and Dr. Duncan G. Leys, to make a comprehensive survey of the hospital services. On receiving the Surveyors' Report, the Northern Ireland Regional Hospitals Council appointed a co-ordination committee and fifteen sub-committees. Each of the sub-committees studied the implications of the Surveyors' Report. Their detailed recommendations dealt with tuberculosis, bone and joint tuberculosis and orthopaedics, maternity and infant welfare, ancillary services (radiology, laboratory services, blood transfusion and dispensing), auxiliary services (catering, heating, lighting, laundry, etc.), psychiatric services, personnel and hospital staffing, casualty services, special services (ophthalmology, ear, nose and throat surgery, and dermatology), almoners with after-care and hospital records, nursing and domestic staff, dental services, anaesthetics, general practitioners, and dietetics.

The co-ordination committee received the sub-committees' considered views, integrated them and presented a complete report to the Regional Hospitals Council in June 1946. It was endorsed by the Council, and was published in August 1946, under the title of *The Red Book*. This comprised a detailed study of the manner in which the general principles outlined by the Surveyors could most suitably be

applied to Northern Ireland; and it supplemented, and in some respects modified the detailed and particular recommendations of the Surveyors on the many aspects of hospital services. The work of the Regional Hospitals Council has supplied a valuable body of information for administrative action.

In 1944, the Ministry of Health and Local Government had been established and assumed responsibility for the general supervision of the health services including the hospitals. Its Health Advisory Council set up a Hospitals Committee. This committee first recommended the closing of several small fever hospitals, as suggested by the Select Committee. The Ministry, with the concurrence and co-operation of the Hospital Authorities, by orders under the relevant Statutes, directed the closing of these hospitals and the transfer of their responsibilities to larger fever hospitals in adjoining areas. The committee also dealt with the wider aspects of fever policy, made a report to the Minister of Health on arrangements for the treatment of cancer, and reviewed the hospital services in the Londonderry area. They advised the establishment of a new general hospital to serve the City of Londonderry and the surrounding district, covering in all a population of about 100,000 people, and steps were taken in 1946 by the Ministry to purchase a site for the erection of this hospital.

In the meantime, as recorded elsewhere in this History, legislation had been passed in Northern Ireland to provide for the unification and expansion of tuberculosis services, with the transfer of tuberculosis hospitals and sanatoria to the new Northern Ireland Tuberculosis Authority. Shortly afterwards, the Public Health and Local Government (Administrative Provisions) Act (Northern Ireland), 1946, was passed. This Act made provision for the setting up of County and County Borough Health and Welfare Authorities and for the abolition of Boards of Guardians. So far as hospital services were concerned this step necessarily involved a change in administrative arrangements when the Act came into full operation, and it was stated that this aspect of the subject would be covered by the promised Bill to provide a comprehensive health service.

Thus amid the stress and peril of war, Northern Ireland took active steps to survey and advance the efficiency of its hospital services. It was clearly revealed by the work of Government Committees, by the Nuffield Surveyors' Report and by *The Red Book*, that even after a suitable administrative structure for Northern Ireland's hospital system had been created, years of unremitting effort would be required to provide an adequate hospital service with a full complement of highly skilled staffs for all departments and modern buildings in all parts of the country. But a notable beginning had been made towards this desirable end.

CHAPTER 7

OTHER MEDICAL SERVICES

NATIONAL HEALTH INSURANCE

THE fact that in Northern Ireland the administration of National Health Insurance came within the province of the Ministry of Labour which, unlike the Ministry of Health in England, had not, on the outbreak of war, to devote its attention to such matters as evacuation, emergency hospital services, casualty and first-aid services, proved of advantage to Approved Societies, in that it was not necessary in Northern Ireland to close down altogether the Medical Referee Service and the Dental Referee Service. While medical staff was set free for urgent duties with other Departments, it was possible to continue to offer Approved Societies a Medical Referee Service for those cases in which a second medical opinion was, for any special reason, considered necessary, and to permit references to the Dental Referee where independent professional advice was considered essential. When the limited Medical Referee Service had been in operation for some time it was clear that it would not be possible to meet in full the demands made upon it by the Societies, and it became necessary thereafter to fix a quota for references in the case of each Approved Society based, among other factors, on a percentage of its pre-war references.

Northern Ireland was fortunate in that it had in operation before the war a unified scheme of sick visiting available to all Approved Societies operating in the area, and while, on account of travelling difficulties, it became necessary to restrict the service in country districts, Societies continued to have at their disposal a ready means of ensuring that, however scattered their membership, claims to benefit were dealt with by them in the light of a full knowledge of the circumstances of their members.

During the years 1940 and 1941 the overall expenditure on sickness and disablement benefit for insured persons was little different from that obtaining in pre-war years. Among men, claims to disablement benefit showed a tendency to fall and claims to sickness benefit a tendency to rise. The disablement benefit position among women was not so favourable, and there was an increase in women's sickness claims corresponding to that which took place in the case of men's claims. During the year 1942 the position of men showed little change but the position of women showed a marked deterioration. There was a sharp increase in sickness benefit claims from both married and unmarried women, and a marked increase in the disablement benefit claims of married women. It was evident that the strain of war conditions affected

women to a greater degree than it did men. No doubt the amount of work required to be done in their homes by the majority of women, superimposed on the concentrated and prolonged effort demanded by war industry and their undertaking, in many cases, heavy work to which they had not been accustomed in peace-time, had a bearing on their general state of health.

The changes in National Health Insurance legislation, such as increases in the rates of sickness and disablement benefit and the extension of compulsory insurance to non-manual workers earning between £250 and £420 a year, took effect in Northern Ireland from the same date as in Great Britain, and in other respects National Health Insurance legislation in both areas remained on a uniform basis. As was the case in Great Britain, steps were taken, where certain drugs became scarce, to authorise the substitution of alternatives of similar therapeutic value, and the National War Formulary issued by the Ministry of Health in England was brought into use throughout the area.

Local conditions in Northern Ireland brought about certain changes, which had no counterpart in Great Britain, in the Medical Benefit Regulations in so far as they affected insurance doctors, and for that reason an account of the position might not be out of place. It will be borne in mind that, in the absence of conscription in Northern Ireland, recruitment of medical personnel for His Majesty's Forces was on a voluntary basis.

At the outbreak of the war there were approximately 500 doctors on the Medical List of the Ministry of Labour as principals engaged in Health Insurance practice. During the last four months of the year 1939, 16 of these voluntarily entered His Majesty's Forces and these were followed by 13 in 1940, 5 in 1941 and 6 in 1942. In making arrangements for safeguarding the interests of those insurance doctors who joined the Forces and the treatment of their insurance patients during their absence on active service, the Ministry of Labour had regard to the provisions of the voluntary Protection of Practices Scheme sponsored by the British Medical Association whereby doctors who joined His Majesty's Forces left both their private and their Health Insurance practices to be carried on by other doctors in the scheme. The scheme provided for part of the accruing fees to be drawn by the absentee doctor and the remainder by the scheme doctor or doctors who attended the patients. Obviously, the success of such a scheme, from the point of view of the absentee doctor, depended on the extent to which it was supported by the medical profession in general. This was a matter in which the Ministry of Labour could not exercise any degree of compulsion, and the most the Ministry could do at the outset was to give statutory effect to the scheme, in so far as Health Insurance practice was concerned, in the cases of those particular doctors who

signified their acceptance of the scheme. The regulations accordingly provided that insured persons on the panel of a doctor who joined the Forces should remain on his permanent list so long as they were attended by other doctors in the scheme, and that the absentee doctor should receive part-payment of the panel fees, the remainder of the fees being distributed among the scheme doctors who attended the insured persons. The right of an insured person to free choice of doctor remained, and it was naturally open to insured persons, whose insurance doctor had joined the Forces, to secure acceptance by practitioners who had not joined the Protection of Practices Scheme. In such a case the Ministry had no alternative to removing the insured person's name from the permanent list of the absentee doctor who thereupon ceased to receive any fees in respect of him. The regulations provided, however, that, on the return of a doctor from active service, the insured persons who had been on his panel before he went away should be re-transferred to him, unless in any case a definite election to the contrary was made. In addition, the regulations provided that all acceptances by doctors of insured persons during war-time should be on a temporary basis, and that persons who during war-time made a choice of doctor should, on the termination of hostilities, be given the opportunity of transferring to any other insurance practitioner of their choice. In the case of those doctors who, on joining the Forces, left their Health Insurance panels to be attended by doctors participating in the Protection of Practices Scheme, the Ministry undertook the responsibility of apportioning Health Insurance fees between the absentee doctor and the doctors who attended his patients, a small levy being made from participating practitioners towards the administrative costs involved. The extent to which Health Insurance practitioners participated in the Protection of Practices Scheme remained a matter of individual choice, and as time went on it became clear that a considerable number of doctors had remained outside the scheme. Instances occurred where, on a practitioner's absence on war service, numbers of his patients found their way on to the lists of non-participating doctors, and representations were made to the Department by the British Medical Association that further steps should be taken to protect the practices of absentee doctors. It appeared that certain young doctors had set up in Health Insurance practice in districts where doctors were absent on war service and had attracted to themselves considerable numbers of their Health Insurance patients. This was not only unfair to the doctors, who had left their practices to take up war service, but, in the nature of things, could not fail to have an adverse effect on the further voluntary recruitment for the Forces. The matter was accordingly discussed at meetings of the Medical Personnel (Priority) Committee on which the Department had representation. After these discussions and subsequent consultation with the Central Insurance Practitioners'

Committee, the Department obtained the concurrence of the National Health Insurance Joint Committee and the Ministry of Finance to the making of Emergency Regulations under the National Health Insurance, Contributory Pensions and Workman's Compensation Act, 1941, suspending for the duration of the war the general right of entry into National Health Insurance practice conferred by Section 213 of the National Health Insurance Act, 1936, on all medical practitioners resident in Northern Ireland.

While these regulations gave the Ministry power to decline to put any fresh names on the Health Insurance Medical List, they did not affect the existing rights of any doctor who was on that list, and it was still open to doctors to change their area of practice and, for those already on the Ministry's medical list as assistants, to set up in Health Insurance practice as principals. In both cases, if the doctor setting up a new practice in an area had not subscribed to the voluntary Protection of Practices Scheme, there was a possibility that the practices of absentee doctors in that area might suffer. This did, in fact, happen and further representations were made to the Ministry by the British Medical Association. The position was again discussed and the British Medical Association was informed that if a substantial majority of insurance doctors could be persuaded to give their support to the existing Protection of Practices Scheme, the Ministry would be prepared to put before the Central Insurance Practitioners' Committee proposals to ensure that all doctors on the Ministry's medical list should observe two of the main principles of the scheme, namely, that, on accepting the patients of a doctor absent on war service, they should receive only a proportion of the panel fee, the remainder of the fee being set aside for the absentee practitioner, and that, where a practitioner returned from war service, there should be an automatic reinstatement on his panel of the insured persons who were on it when he went away, subject to their being still in that doctor's area of practice. It was also suggested that, if the Protection of Practices Scheme were adopted by the majority of the profession, steps might be taken to regulate the undertaking by existing insurance doctors of insurance practices in new districts. The British Medical Association recorded its appreciation of the assistance which the Department was prepared to offer, and took certain steps in the matter; but, in the absence of any assurance on behalf of the medical profession as a whole that the required support for the scheme would be forthcoming, the Department was unable to proceed further with these proposals.

INDUSTRIAL MEDICAL AND ALLIED SERVICES

There were at the end of the year 1943, 6,500 factories subject to the provisions of the Factories Act (Northern Ireland), 1938, and approximately 180,000 persons were employed in these factories.

Medical duties under Factories Act. The duties of Examining Surgeon were carried out by 141 medical men of whom 91 were dispensary doctors acting *ex officio* within the dispensary area. As an indication of the work done by examining surgeons it may be stated that during the year 1942 they examined 9,296 young persons under 16. Of these 213 were rejected, 123 certified conditionally as fit for employment and the remainder certified as fit for employment. The principal causes of rejection were:

Skin diseases . . .	60
Pediculosis . . .	42
Defective bodily development	25
Disease of the eye . .	23
Disease of the circulatory system	17

Premises in which outwork was done continued to be effectively supervised by local authorities. For instance during 1942 medical officers of health and sanitary inspectors of District Councils visited 4,470 outworkers' premises; in 152 of these it was found that the outwork was being done in unwholesome premises and the necessary steps were taken to prohibit the use of such premises.

Industrial Health Services. Before the outbreak of war, there were in Northern Ireland comparatively few undertakings employing works doctors, nurses and welfare supervisors, but, as war industries expanded, it became increasingly necessary to ensure that industrial health and efficiency should not be impaired by the added strain brought about by war conditions of employment. Among employers there was increased recognition of the importance of medical and welfare facilities and the voluntary provision of those services continued to be encouraged and fostered by the Ministry of Labour. In order that the Department might, if necessary, be in a position to insist on proper steps being taken in any particular case, an Order was made on December 2, 1942, under the Defence Regulations entitled the Factories (Medical and Welfare Services) (Northern Ireland) Order, 1942, empowering the Chief Inspector of Factories, in any factory engaged on war work on behalf of the Crown, to direct the occupier of the factory to provide the following services:

(*a*) Medical supervision of persons employed in the factory.
(*b*) Nursing and first-aid services.
(*c*) Supervision of the welfare of employees.

Having regard to the difficulties experienced in recruiting the necessary personnel, the voluntary provision of these services continued on a satisfactory basis and it was known that on December 1, 1943, the following numbers were in posts under the various headings:

(*a*) 14 medical men (one whole-time, the remainder part-time) employed by 11 firms and covering 46 factories; the total number employed in such factories was approximately 80,000.
(*b*) 33 nurses.
(*c*) 29 personnel managers or welfare supervisors.

Canteens. The Factories (Canteens) (Northern Ireland) Order, 1941, made on May 19, 1941, under the Defence Regulations enabled the Chief Inspector of Factories to direct the provision of a suitable factory canteen serving hot meals in any factory engaged on munitions or Crown work in which more than 250 persons were employed. One such direction was given under the Order, but the Department preferred that the desired results should be achieved by enlisting the co-operation and good-will of employers. In fact, the provision of canteens in factories developed to a very considerable extent during the war years and on December 1, 1943, there were known to be 91 factory canteens of which 49 were in factories employing more than 250 persons.

Development of Industrial Welfare Services. In pursuance of its policy of fostering and encouraging the development in factories of the services contemplated in the Canteens and Medical and Welfare Services Orders, a woman Factory Inspector with specialised knowledge of such services was appointed by the Ministry of Labour during the course of the year 1943. A further step towards this end was the holding, during October 1943, in co-operation with the Industrial Welfare Society, of a three day lecture course and conference at which papers on various aspects of industrial welfare were read. The conference was well attended and among the papers were 'The Works Doctor' by Dr. R. Lane, F.R.C.P., and 'Rehabilitation of the Injured' by Mr. H. E. Griffiths, F.R.C.S. Arrangements were made with Queen's University, Belfast, for an instructional course in industrial welfare during the spring of 1944. The course comprised 30 lectures which included 4 by medical men on various aspects of industrial medicine and hygiene.

REHABILITATION AND RESETTLEMENT OF DISABLED PERSONS

The Interim Scheme for the Training and Resettlement of Disabled Persons became operative in Northern Ireland in October 1942. Under the Government of Ireland Act responsibility for men and women whose disablement was due to war service or war causes was vested in the Imperial Government and, so far as war disabled persons were concerned, the Ministry of Labour in Northern Ireland acted as agents of the Imperial Ministry of Labour and National Service. Other disablement cases were the direct responsibility of the Ministry of Labour for Northern Ireland.

The object of the scheme was to secure that disabled persons should be re-absorbed into civil employment, either immediately on discharge from hospital, or after a suitable course of training. As in Great Britain, at the outset of the scheme it was a condition for training that the need for it arose from disablement and that there should be a reasonable expectation that a course of training would enable the disabled person to secure employment and retain it under normal working conditions.

The general arrangements provided for officers of Employment Exchanges to make contacts with patients while still in hospital to discuss the question of future employment or training with the patient and the doctor or surgeon in charge of the case, and to take the necessary steps to assist the patient on discharge to secure employment or enable him to take up training.

In the case of persons requiring a course of training, those whose disability did not preclude them from training with able-bodied trainees could avail themselves of the ordinary training facilities provided by the Department for courses in war engineering trades. For the more severely disabled, arrangements were made whereby they could be admitted to special courses in Great Britain, either at Government Training Centres or other Institutions with special facilities for the training of disabled persons for industrial employment.

Apart from the Interim Scheme, arrangements were made by the Assistance Board for Northern Ireland with a Committee of the Cripples Institute, Belfast, under which courses were provided locally in surgical and ordinary bootmaking and repairing, manufacture of surgical splints and appliances, and in horticulture.

Following the issue of the Final Report of the Tomlinson Committee (Cmd. 6415) on January 15, 1943, an Inter-departmental Committee was set up in Great Britain to co-ordinate the work of the various Departments in making preparation for the introduction, on the termination of hostilities, of the more comprehensive scheme outlined in the Report. On this committee the Northern Ireland Departments were represented by an officer of the Ministry of Labour.

An Act to make further and better provision for enabling persons handicapped by disablement to secure employment, or work on their own account, on similar lines to that passed by the Parliament of the United Kingdom in 1944 was passed in the same year by the Parliament of Northern Ireland.

POOR LAW MEDICAL SERVICES

Administration during and after the War. Since the first Poor Relief Act came into force in Ireland in 1838, poor relief had been administered by Boards of Guardians of which there were 27 in Northern Ireland. In addition to being responsible for the help of the destitute poor under the Poor Relief Acts, Boards of Guardians administered

the Medical Charities Act, 1851, which provided free medical attention and medicines for all poor persons who were unable to pay ordinary medical fees. They also administered the Vaccination Acts which made the vaccination of children under three months of age compulsory.

The passing of the Public Health and Local Government (Administrative Provisions) Act (Northern Ireland), 1946, made an important change in poor law administration. It established County and County Borough Councils as the Welfare and Health Authorities for their areas and provided for the transfer to them of health and welfare functions of Boards of Guardians as well as of Borough, Urban, and Rural Councils. The Welfare Authorities are responsible for the local administration of welfare services and the Health Authorities for that of health services. These services are not confined, as under the poor law system, to the poor but are for all. The Act provided that the means of persons in need of care or help may be disregarded and that fees may be charged for services provided by the welfare or health authorities, e.g. services of midwives or nurses and any maintenance or treatment whether domiciliary or institutional. The stigma of pauperism which was one of the chief objections to the Poor Law system has thus been removed, better health and welfare services provided, and the administration of these services made uniform throughout the Province. The Poor Law Service was discontinued on July 5, 1948.

PORT SANITARY SERVICES

There are three port sanitary authorities in Northern Ireland—Belfast, Londonderry and Newry.

The medical inspection of ships entering these ports continued throughout the years 1938 to 1946.

In 1946, 2,389 ships, 268 foreign and 2,121 coastwise, were medically inspected, and the following table gives details of the numbers of ships medically inspected during the preceding years:

Year	1938	1939	1940	1941	1942	1943	1944	1945
No. of ships medically inspected . .	1,911	1,852	1,844	1,865	1,933	1,990	1,892	1,981

Belfast is an authorised port under the Port Sanitary Regulations for the granting of deratisation certificates and deratisation exemption certificates.

THERAPEUTIC SUBSTANCES REGULATIONS

The Therapeutic Substances Act, 1925, provides means of controlling the manufacture and import of therapeutic substances, i.e. substances whose purity or potency cannot be adequately tested by chemical

means. In consequence, no such substance can be manufactured or imported without a licence (issued in Northern Ireland by the Minister of Health and Local Government).

The Act so far as it relates to Northern Ireland was formerly administered by the Ministry of Home Affairs, but by means of the Ministries of Northern Ireland (Transfer of Functions) Order, 1945, all functions under the Act were transferred to the Ministry of Health and Local Government with effect from November 12, 1945.

A Joint Committee consisting of the Minister of Health (England and Wales), the Secretary of State for Scotland, and the Ministry of Health and Local Government for Northern Ireland has power to make Regulations under the Act, and the Therapeutic Substances Regulations, 1931 (the Principal Regulations) made by this Committee include provisions regarding standards of purity, etc. and methods of testing.

The following amending Regulations were made during the period 1938–46 by the Joint Committee:

1. The Therapeutic Substances Amendment Regulations, 1939, which (*a*) provide for the use of separate laboratories, utensils, and apparatus for the culture or manipulation of pathogenic spore-bearing micro-organisms; (*b*) add to the Therapeutic Substances Regulations, 1931, provisions relating to the control of tetanus toxoid, and gas-gangrene antitoxin (histolyticus).
2. The Therapeutic Substances Amendment Regulations, 1944, which substitute fresh provisions relating to the control of vaccine lymph for those included in the Principal Regulations.
3. Therapeutic Substances Amendment (No. 2) Regulations, 1944, which added to the Principal Regulations provisions for the control of penicillin.
4. The Therapeutic Substances Amendment Regulations, 1946, which revoke the Regulations at (3) above and substitute fresh provisions.

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Chapter 2.

[1] Government of Northern Ireland. Special Interim and Final Reports of the Select Committee on Health Services in Northern Ireland, together with Proceedings of the Committee and Appendix, 1944. (H.C. 601), H.M.S.O., Belfast.

[2] First Annual Report of the Health Advisory Council for Northern Ireland (Cmd. 238 (N.I.)).

[3] Mental Deficiency in Northern Ireland (published by H.M. Stationery Office, Belfast).

[4] Treatment of Cancer in Northern Ireland.

Chapter 6.

[5] Vice-Regal Commission on Poor Law Reform in Ireland (1906).

[6] Majority Report (on Ireland) of the Royal Commission on the Poor Law (1909).

[7] Departmental Commission appointed by the Minister of Home Affairs in 1925.

APPENDICES

APPENDIX I

Table showing the number of Deaths in Northern Ireland from the Principal Causes and the Death Rates per 100,000 of the estimated Population

Causes of death	Number of deaths									Rate per 100,000 population								
	1938	1939	1940	1941	1942	1943	1944	1945	1946	1938	1939	1940	1941	1942	1943	1944	1945	1946
Typhoid and paratyphoid fevers	7	6	10	8	7	12	19	6	9	0·5	0·5	0·8	0·6	0·5	0·9	1·4	0·5	0·7
Cerebro-spinal fever	12	17	58	105	70	44	25	28	26	0·9	1·3	4·5	8·2	5·4	3·4	1·9	2·1	2·0
Scarlet fever	49	39	27	12	2	11	5	8	5	3·8	3·0	2·1	0·9	0·2	0·8	0·4	0·6	0·4
Whooping cough	110	68	141	98	64	113	95	76	65	8·6	5·3	10·9	7·6	5·0	8·7	7·2	5·8	4·9
Diphtheria	76	70	127	133	91	72	64	35	18	5·9	5·4	9·8	10·3	7·0	5·5	4·9	2·7	1·4
Tuberculosis of respiratory system	869	852	967	1012	939	863	862	799	849	67·6	65·8	74·6	78·6	72·5	66·2	65·6	60·5	63·7
Other forms of tuberculosis	309	238	299	327	320	327	302	259	262	24·0	18·4	23·1	25·4	24·7	25·1	23·0	19·6	19·6
Syphilitic disease	59	62	64	76	68	73	75	38	59	4·6	4·8	4·9	5·9	5·2	5·6	5·7	2·9	4·4
Influenza	258	401	665	443	194	339	213	139	381	20·1	31·0	51·3	34·4	15·0	26·0	16·2	10·5	28·6
Measles	308	16	193	18	68	34	8	24	8	23·9	1·2	14·9	1·4	5·2	2·6	0·6	1·8	0·6
Acute poliomyelitis and polioencephalitis	2	3	4	12	9	6	2	14	7	0·2	0·2	0·3	0·9	0·7	0·5	0·2	1·1	0·5
Acute infectious encephalitis	39	25	32	33	26	28	18	25	17	3·0	1·9	2·5	2·6	2·0	2·1	1·4	1·9	1·3
Cancer and other malignant tumours	1,700	1,721	1,764	1,763	1,837	1,892	1,852	1,898	1,889	132·2	132·9	136·1	136·9	141·7	145·1	140·9	143·8	141·7
Diabetes	166	167	158	141	117	93	108	109	88	12·9	12·9	12·2	10·9	9·0	7·1	8·2	8·3	6·6
Intra-cranial vascular lesions	1,357	1,363	1,544	1,659	1,393	1,458	1,603	1,537	1,531	105·5	105·3	119·1	128·8	107·5	111·8	122·0	116·4	114·8
Heart disease	3,618	3,757	3,950	4,076	3,616	3,826	3,860	4,025	4,353	281·3	290·0	304·8	316·5	279·0	293·4	293·8	304·8	326·5
Other diseases of the circulatory system	636	708	337	341	390	350	356	322	385	49·5	54·7	26·0	26·5	30·1	26·8	27·1	24·4	28·9
Bronchitis	650	720	942	908	737	578	574	572	673	50·5	55·6	72·7	70·5	56·9	44·3	43·7	43·3	50·5
Pneumonia	1,026	798	873	913	859	988	786	765	806	79·8	61·6	67·4	70·9	66·3	75·8	59·8	58·0	60·5
Other respiratory diseases	224	237	296	281	250	261	239	244	280	17·4	18·3	22·8	21·8	19·3	20·0	18·2	18·5	21·0
Ulceration of the stomach or duodenum	144	151	164	159	140	115	132	107	130	11·2	11·7	12·7	12·3	10·8	8·8	10·0	8·1	9·8
Diarrhoea (under 2 years of age)	226	277	387	327	282	425	310	309	191	17·6	21·4	29·9	25·4	21·8	32·6	23·6	23·4	14·3
Appendicitis	85	81	72	67	54	67	70	55	67	6·6	6·3	5·6	5·2	4·2	5·1	5·3	4·2	5·0
Other digestive diseases	483	481	427	432	382	389	370	332	322	37·5	37·1	32·9	33·5	29·5	29·8	28·2	25·2	24·2
Nephritis	410	405	473	419	397	362	360	316	351	31·9	31·3	36·5	32·5	30·6	27·8	27·4	23·9	26·3
Puerperal and post-abortive sepsis	42†	24†	34	19	20	22	21	19	11	3·3	1·9	2·6	1·5	1·7	1·6	1·4	0·8	
Other maternal causes	95†	72†	73	93	68	78	74	59	59	7·4	5·6	5·6	7·2	5·2	6·0	5·6	4·5	4·4
Premature birth	399	376	442	425	467	512	485	391	372	31·0	29·0	34·1	33·0	36·0	39·3	36·9	29·6	27·9
Congenital malformations, birth injury, infantile disease	594	549	609	648	755	687	642	641	509	46·2	42·4	47·0	50·3	58·3	52·8	48·9	48·6	38·2
Suicide	54	67	60	55	44	52	48	28	47	4·2	5·2	4·6	4·3	3·4	4·0	3·7	2·1	3·5
Road traffic accidents	122	165	170	224	210	146	146	113	93	9·5	12·7	13·1	17·4	16·2	11·2	11·1	8·6	7·0
Other violent causes*	354	360	461	1330‡	399	367	344	327	338	27·5	27·8	35·5	103·3	30·8	28·1	26·2	24·8	25·4
All other causes	3,166	3,266	3,118	3,083	2,981	2,847	2,723	2,644	2,465	246·2	252·1	240·6	239·4	230·0	218·3	207·2	200·3	184·9
All causes	17,649	17,542	18,941	19,640	17,256	17,437	16,791	16,264	16,666	1,372·3	1,354·6	1,461·5	1,524·8	1,331·5	1,337·2	1,277·9	1,232·1	1,250·3

* *Including miscellaneous accidents.*

† *The deaths and rates for these causes for 1938 and 1939 have been regrouped in this Table in accordance with the International List used from 1940.*

‡ *Including deaths of civilians due to war operations*

(Figures taken from the Registrar-General's Annual Reports and Returns)

APPENDIX II

The following Table gives a summary of infectious diseases cases notified in Northern Ireland under Section 6 of the Infectious Disease (Notification) Act, 1889, during the nine years ended December 31, 1946

	Typhoid fever	*Para-typhoid B. fever	Typhus	Smallpox	Scarlet fever	Diphtheria and membranous croup	Erysipelas	Puerperal fever	Cholera	Relapsing fever	Continued fever	Totals
1938—Urban districts	23	—	—	—	2,774	1,066	169	21	—	—	—	4,053
Rural districts	72	—	—	—	1,423	530	83	10	—	—	—	2,118
Totals	95	—	—	—	4,197	1,596	252	31	—	—	—	6,171
1939—Urban districts	36	—	—	—	2,519	953	171	16	—	—	—	3,695
Rural districts	49	—	—	—	1,551	280	80	6	—	1	—	1,967
Totals	85	—	—	—	4,070	1,233	251	22	—	1	—	5,662
1940—Urban districts	29	—	—	—	1,794	1,392	157	19	—	1	—	3,392
Rural districts	40	—	—	—	1,082	277	67	3	—	1	1	1,471
Totals	69	—	—	—	2,876	1,669	224	22	—	2	1	4,863
1941—Urban districts	68	—	—	—	777	1,090	110	7	—	—	—	2,052
Rural districts	44	—	—	—	628	512	51	9	—	—	—	1,244
Totals	112	—	—	—	1,405	1,602	161	16	—	—	—	3,296
1942—Urban districts	20	2	—	1	1,082	800	109	18	—	—	1	2,033
Rural districts	65	—	1	—	591	396	28	4	—	—	—	1,085
Totals	85	2	1	1	1,673	1,196	137	22	—	—	1	3,118
1943—Urban districts	36	9	—	—	2,506	1,075	75	4	—	—	—	3,705
Rural districts	55	3	—	—	771	495	35	1	—	2	—	1,362
Totals	91	12	—	—	3,277	1,570	110	5	—	2	—	5,067
1944—Urban districts	36	1	—	—	2,586	814	99	7	—	—	—	3,543
Rural districts	87	1	—	—	939	580	40	2	—	—	—	1,649
Totals	123	2	—	—	3,525	1,394	139	9	—	—	—	5,192
1945—Urban districts	25	8	—	—	1,447	515	103	3	—	—	—	2,101
Rural districts	33	6	—	—	582	344	34	3	—	—	—	1,002
Totals	58	14	—	—	2,029	859	137	6	—	—	—	3,103
1946—Urban Districts	69	13	—	—	1,101	473	121	2	—	—	—	1,779
Rural districts	44	7	—	—	452	213	30	2	—	—	—	748
Totals	113	20	—	—	1,553	686	151	4	—	—	—	2,527

* *Note: Prior to October 23, 1942, Paratyphoid B. Fever was notified under "Typhoid Fever."*

APPENDIX III

The following Table gives particulars of diseases which have been notifiable in Northern Ireland by certain Local Authorities in pursuance of Section 7 of the Infectious Disease (Notification) Act, 1889, during the nine years ended December 31, 1946

	(a) Cerebro-spinal fever	(b) Encephalitis lethargica	(c) Chicken-pox	(d) Measles*	(e) Poliomyelitis	(f) Whooping cough*	(g) Diphtheritic laryngitis	Totals
1938—Urban districts	39	1	69	6,127	5	676	—	6,917
Rural districts	4	1	2	33	6	2	—	48
Totals	43	2	71	6,160	11	678	—	6,965
1939—Urban districts	27	—	78	659	5	836	—	1,605
Rural districts	4	—	—	1	7	301	—	313
Totals	31	—	78	660	12	1,137	—	1,918
1940—Urban districts	225	—	43	5,167	2	701	—	6,138
Rural districts	30	3	1	282	2	126	—	444
Totals	255	3	44	5,449	4	827	—	6,582
1941—Urban districts	349	—	71	248	11	501	—	1,180
Rural districts	115	—	8	110	9	144	—	386
Totals	464	—	79	358	20	645	—	1,566
1942—Urban districts	179	—	23	4,333	9	399	—	4,943
Rural districts	109	—	1	58	12	288	—	468
Totals	288	—	24	4,391	21	687	—	5,411
1943—Urban districts	109	2	92	1,502	7	1,274	—	2,986
Rural districts	63	—	9	39	6	13	—	130
Totals	172	2	101	1,541	13	1,287	—	3,116
1944—Urban districts	69	—	21	3,104	10	757	—	3,961
Rural districts	29	—	1	—	3	—	—	33
Totals	98	—	22	3,104	13	757	—	3,994
1945—Urban districts	57	—	120	1,940	22	603	—	2,742
Rural districts	29	—	—	—	14	—	—	43
Totals	86	—	120	1,940	36	603	—	2,785
1946—Urban districts	50	1	52	1,512	11	1,137	—	2,763
Rural districts	16	—	2	32	11	—	—	61
Totals	66	1	54	1,544	22	1,137	—	2,824

Note: Out of a total of 67 sanitary districts, (a) is notifiable in 64, (b) is notifiable in 45, (c) is notifiable in 14, (d) is notifiable in 7, (e) is notifiable in 67, (f) is notifiable in 4, (g) is notifiable in 39.

** In Belfast these diseases are compulsorily notifiable by Order of the Ministry dated November 9, 1932. In the case of measles the second or any subsequent case in a household within 2 months of the first notification is not notifiable.*

In the case of whooping cough the second or any subsequent case within 3 months of the first notification is not notifiable.

APPENDIX IV

The following Table gives particulars of diseases notified in Northern Ireland during the nine years ended December 31, 1946, *under Regulations made by the Local Government Board for Ireland on March* 7, 1919, *or by the Ministry of Home Affairs for Northern Ireland in pursuance of Sections* 148 *and* 149 *of the Public Health (Ireland) Act*, 1878, *and Section* 33 *of the Local Government Act (Northern Ireland)*, 1934

	Pneumonia	Malaria	Trench fever	Dysentery	Acute infectious tuberculosis	Ophthalmia neonatorum	Puerperal pyrexia	Totals
1938—Urban districts	617	—	—	16	493	20	108	1,254
Rural districts	100	—	—	6	41	—	3	150
Totals	717	—	—	22	534	20	111	1,404
1939—Urban districts	614	—	—	8	506	25	68	1,221
Rural districts	101	—	—	1	25	—	5	132
Totals	715	—	—	9	531	25	73	1,353
1940—Urban districts	333	1	1	8	576	21	40	980
Rural districts	111	—	—	—	24	—	6	141
Totals	444	1	1	8	600	21	46	1,121
1941—Urban districts	223	—	—	2	538	20	99	882
Rural districts	68	—	—	—	38	—	2	108
Totals	291	—	—	2	576	20	101	990
1942—Urban districts	249	1	—	7	588	16	102	963
Rural districts	99	—	—	2	34	—	6	141
Totals	348	1		9	622	16	108	1,104
1943—Urban districts	221	—	—	6	669	21	85	1,002
Rural districts	85	—	—	14	30	1	2	132
Totals	306	—	—	20	699	22	87	1,134
1944—Urban districts	172	2	—	8	732	12	78	1,004
Rural districts	85	—	—	14	64	1	1	165
Totals	257	2	—	22	796	13	79	1,169
1945—Urban districts	172	—	—	7	704	7	30	920
Rural districts	45	—	—	14	41	1	4	105
Totals	217	—	—	21	745	8	34	1,025
1946—Urban districts	182	10	—	6	1,031	5	26	1,260
Rural districts	62	1	—	7	31	—	2	103
Totals	244	11	—	13	1,062	5	28	1,363

APPENDIX V

Table showing the number of persons examined and treated for Venereal Disease in Northern Ireland during the year 1946

Local authorities Column (*a*): Figures applicable to year ended Dec. 31, 1946. Column (*b*): Persons treated in a previous year whose treatment continued in year ended December 31, 1946.		Total number of persons examined		Total number found free of disease		Number of persons treated															
						In-patients								Out-patients							
						Syphilis		Gonorrhoea		Other V.D.		Totals		Syphilis		Gonorrhoea		Other V.D.		Totals	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Antrim . . .	(*a*)	58	36	23	16	8	3	14	5	—	—	22	8	11	13	7	—	—	—	18	13
	(*b*)					1	2	1	—	—	—	2	2	2	10	—	—	—	—	2	10
Armagh . . .	(*a*)	126	92	95	75	3	4	5	3	—	—	8	7	9	9	14	1	—	—	23	10
	(*b*)					—	—	—	—	—	—	—	—	10	9	—	—	—	—	10	9
Down . . .	(*a*)	515	430	372	367	13	13	7	3	—	—	20	16	53	37	70	10	—	—	123	47
	(*b*)					—	1	—	—	—	—	—	1	57	37	8	4	—	—	65	41
Fermanagh . .	(*a*)	21	6	9	3	—	1	3	—	—	—	3	1	9	2	—	—	—	—	9	2
	(*b*)					—	—	—	—	—	—	—	—	1	2	—	—	—	—	1	2
Londonderry . .	(*a*)	47	15	6	—	2	3	—	—	—	—	2	3	17	8	22	4	—	—	39	12
	(*b*)					—	—	1	—	—	—	1	—	11	7	—	1	—	—	11	8
Tyrone . . .	(*a*)	34	40	1	4	10	23	12	10	—	—	22	33	12	8	—	1	—	—	12	9
	(*b*)					1	2	—	—	—	—	1	2	8	1	—	—	—	—	8	1
Belfast County Borough	(*a*)	3,710	1,371	2,566	1,050	104	83	53	3	—	—	157	86	361	157	626	78	—	—	987	235
	(*b*)					—	—	—	2	—	—	—	2	605	413	251	57	—	—	856	470
Londonderry County Borough . .	(*a*)	154	52	31	9	1	—	—	—	—	—	1	—	73	38	49	5	—	—	122	43
	(*b*)					—	—	—	—	—	—	—	—	15	4	7	—	—	—	22	4
Totals . . .	(*a*)	4,665	2,042	3,103	1,524	141	130	94	24	Nil	Nil	235	154	545	272	788	99	Nil	Nil	1,333	371
	(*b*)	Nil	Nil	Nil	Nil	2	5	2	2	Nil	Nil	4	7	709	483	266	62	Nil	Nil	975	545
Grand totals . . .		4,665	2,042	3,103	1,524	143	135	96	26	Nil	Nil	239	161	1,254	755	1,054	161	Nil	Nil	2,308	916

APPENDIX VI

ON MEDICINE IN THE WAR YEARS IN NORTHERN IRELAND

By PROFESSOR W. W. D. THOMSON
M.D., F.R.C.P.
Late Professor of Medicine, Queen's University, Belfast

ONE sunny morning in the memorable summer of 1945, my house physician and I were in the long main corridor of the Royal Victoria Hospital, Belfast. The sun was streaming through the windows, just freed from the long gloom of the 'blackout'. My young colleague said, 'I never realised before what a bright and cheery place "the Royal" really is'. His remark made me realise that this lad, and some hundreds of his contemporaries, had spent their whole period of medical training at the Belfast Medical School under war conditions with the consequential distractions from sustained study and restrictions of facilities for work. But indeed, we were fortunate in Belfast. The University, the Royal Victoria Hospital, the City Hospital, the Belfast Hospital for Sick Children and the Ophthalmic Hospital were unharmed by raids; the Mater Infirmorum Hospital and the Benn Eye, Ear and Throat Hospital received damage by blast and fire, but carried on without grave interruption of their work; unfortunately, the Ulster Hospital for Children and Women was hit by a high explosive bomb and later entirely gutted by fire, but there were no serious casualties among the patients or staff.

The Military Service Act did not apply to Northern Ireland and all entrants to H.M. Forces were volunteers. The medical profession endeavoured, however, to regulate recruitment so as to maintain a proper balance between the requirements of the Services and the needs of the civilian population. A medical war committee was set up and it was arranged that the Forces would accept only those persons who were certified by the War Committee to be available for service. As a corollary to this a voluntary scheme of 'reservation' of medical students was arranged. The voluntary response of the medical graduates of Queen's University to the call of the colours should be a source of pride to Northern Ireland. The names of 660 serving medical men and women are known and no doubt many others have been overlooked. More than forty (including four nursing sisters) were killed in action, died on service or were posted as missing and are still missing up to the time of writing: over eighty have been awarded decorations or have been mentioned in despatches. Many medical students at Queen's University viewed their reservation with impatience and some of these, anxious for active and thrilling war service, insisted on joining the Forces; but the majority adapted themselves with equanimity to the changed conditions, and volunteered in large numbers for Civil Defence duties; their services in several capacities and, particularly, as fire-watchers in the various hospitals during the air raid period were invaluable.

At the request of the General Medical Council the clinical period of study was reduced by six months. This resulted in an overcrowded curriculum and

difficulties arose in fitting the various courses into the shorter period. In addition, the absence on war service of many of the active members of the staffs of the University and of the Teaching Hospitals rendered pre-clinical and clinical teaching a very arduous task for those who remained behind. Notwithstanding these difficulties, the proportion of successful candidates at the Final M.B. examination was maintained, without a lowering of the standard of knowledge demanded.

The newly-qualified graduate, instead of the usual year as house-man in hospital (an A post), was only allowed six months in a resident appointment before joining the Forces. This rule was strictly enforced throughout the hospitals in Northern Ireland, very few house-men being retained to fill the so-called B posts (higher residents), with the result that Queen's University has the proud distinction of sending as high a proportion of her young medical graduates to the Services as any university in the kingdom. On the other hand, work in many hospitals suffered by the reduction of the resident staff, and senior unqualified students often deputised as house physicians and house surgeons and did their work surprisingly well.

Ulster medicine benefited in many ways by the influx of numerous and distinguished medical officers from the Services, including many colleagues from the United States. They took an active interest in the clinical meetings of the Ulster Medical Society and in those of the local branch of the British Medical Association and they contributed many valuable papers. New view-points and fresh ideas from other medical schools in Britain and America acted as a stimulus and an incentive to consultants and general practitioners alike. The Campbell orations delivered by Colonel Leonard Colebrook, on his researches on the Sulphonamides, by Dr. V. P. Sydenstricker, on the vitamin B complex, and by Sir Alexander Fleming, on Penicillin, were notable examples.

The Faculty of Medicine, realising the importance of a fuller knowledge of Tropical Disease for our senior students, were fortunate enough to secure the services in consecutive years of Colonel J. D. Sandes (one time Professor of Medicine in the University of Calcutta), Lieut. Colonel F. Murgatroyd and Lieut. Commander J. W. Crofton, to give short courses of lectures on this subject. Brig. E. C. Beddows on several occasions lectured on the work and organisation of the medical services in war. Other clinical lectures to students were given by Lieut. Colonel L. B. Cole, on Tetanus, Lieut. Commander J. W. Osborne, on Chest Diseases, and Major J. H. Kellgren, on the diagnosis of the cause of pain. Our medical students had in this way the advantage of direct contact with men who had made an intensive study of these subjects. The University owes a further debt to Colonel J. D. Sandes and Lieut. Colonel J. W. Osborne for acting as extern clinical examiners at the final examinations. Under the auspices of the British Council, four post-graduate courses were given to American and Canadian Medical officers and nurses and these courses afforded many of our colleagues from oversea an opportunity of visiting the University, the various teaching hospitals of Belfast and the public health services of the city.

On the whole, the general health of the population did not suffer greatly under war conditions. The food shortage in Northern Ireland was never so acute as in other parts of the United Kingdom. Northern Ireland is largely

an agricultural community and there was no rationing of milk; poultry could often be obtained to supplement the meat ration and many families had their own supply of eggs. Loss of weight was, however, not infrequent, partly due to the fat shortage, but probably more so to the strain, stress and anxiety caused by war conditions. The curtailment of fats and vitamin C, overcrowding and poor ventilation, entailed by the 'blackout', increased the incidence of pulmonary tuberculosis. Among physicians the impression was prevalent that a greater number of cases of thyrotoxicosis was seen, but reliable figures could not be obtained to prove this point, as fear of air raids militated against the entry to hospital of patients suffering from this condition.

The increase observed in gastric and duodenal ulcer, and in perforations resulting therefrom, was investigated by Dr. Muriel Frazer from the admissions into the Royal Victoria Hospital. The number of cases of gastric ulcer, of perforated gastric ulcer, of duodenal ulcer and perforated duodenal ulcer in the years 1938–42 are given in the following table:

	1938	1939	1940	1941	1942
Gastric Ulcer . . .	19	38	45	45	43
Gastric Ulcer (perforated) .	15	21	28	40	21
Duodenal Ulcer . . .	77	73	58	60	66
Duodenal Ulcer (perforated)	39	58	58	92	61

The marked rise in 1941—the year of the air raids—in the number of perforated gastric and duodenal ulcers is striking.

During the air raids several cases of shock anuria were observed. Three cases were carefully studied by Dr. J. Edgar Morison and reported in the Journal of Pathology and Bacteriology, 1941, Vol. LIII, No. 3, p. 403. In this paper, the main points are as follows: The first case was a man of 41 years who lived for six days, the second a man of 26 years who survived for eight days, the third a woman of 38 years who died on the ninth day. All had been buried under debris for periods of 4–8 hours. A striking feature in all three was the absence of really serious shock. Repeated attempts to demonstrate muscle haemoglobin in either the urine or the blood serum failed. The terminal blood urea readings were 420, 594, and 351 mg. per cent. respectively.

Post-mortem findings: Oedema was marked over a fairly wide area around the site of crushing, but was never completely generalised. The sub-cutaneous adipose tissue of the crushed limbs was very oedematous, but showed no pigmentation or extravasation of blood. On section of the muscle sheaths, the muscles bulged through and exuded fluid. Muscle changes were present in all cases and the appearance described as 'fish flesh' was very marked in two cases. The kidneys were enlarged, swollen and congested. Microscopically the damaged muscles showed complete disintegration of muscle cells. In the kidneys the changes were most marked in the collecting tubules of the medulla. In these were seen compact brownish casts which behaved like haemoglobin or allied material with the benzidine test. Almost all the tubules were blocked at some level in their course. Attempts to demonstrate the spectrum of myohaemoglobin were unsuccessful. This obstructing material (which is some type of haemoglobin derivative) is cleared from the blood by the glomeruli of the kidney almost as quickly as the circulation removes it

from the damaged muscles. It is then concentrated in the tubules of the kidney and precipitated there into masses which become impacted as casts in the collecting tubules. The lesions of crush anuria might thus be explained upon a purely obstructive basis.

During the war a great increase in the demand for hospital treatment was observed. Instead of being nursed at home, the sick were anxious to go to hospital. The waiting-list of the Royal Victoria Hospital reached a figure of 1,700, while it was almost impossible to secure a bed in a nursing home for an acute case. An ambitious scheme for a great extension of the Royal Victoria Hospital and its colony of associated institutions is being planned; a new and larger Ulster Hospital for Children and Women, in a more suitable setting with a wider sphere of usefulness, is contemplated; the survey of the hospital services of Northern Ireland by the Nuffield Provincial Hospitals Trust has been carefully scrutinised and amplified by committees of medical experts; great expectations have been aroused by the establishment of the Health Advisory Council, which was appointed by the Minister of Health and Local Government in accordance with a recommendation of the select committee on Health Services in Northern Ireland, presided over by the late Mr. Howard Stevenson, F.R.C.S., M.P., whose report was published in January 1944. The generous response by the Government of Northern Ireland to the recommendations of the University Grants Committee will make possible the long-needed expansion of the Belfast Medical School. In the Vice-Chancellor's words, 'with more spacious buildings, modernised equipment, a reinforced teaching staff, improved rates of salary and wages, ampler provision for scholarships and studentships, better amenities and ampler facilities for research, the promise of the future is most encouraging and an even more distinguished position in the University world is within our reach.' The large sum of money set aside by the Ministry of Health and Local Government for the rehabilitation of demobilised medical officers allowed many young medical men to resume their hospital appointments cut short by war service. Others were encouraged to resume training for various specialities by the establishment of well paid registrarships. For six years the training of our future consultants was in abeyance, thus the vital importance of this liberal action by the Ministry of Health and Local Government in assisting suitable demobilised medical officers to specialise can be readily appreciated.

APPENDIX VII

ON SURGERY IN THE WAR YEARS IN NORTHERN IRELAND

By Professor P. T. Crymble
F.R.C.S.
Professor of Surgery, Queen's University, Belfast

Surgery during 1939–45 was influenced by many factors, but most of the factors operated in all parts of the United Kingdom and the changes noted

in Northern Ireland were, no doubt, similar to those experienced in Great Britain. The following brief outline of war-time experiences in civilian hospitals may, however, indicate some changes which were peculiar to Northern Ireland.

THE MEDICAL SCHOOL

During the war the Belfast Medical School functioned on the usual lines and the pre-war standard was maintained, despite the fact that the course was shortened from 6 to 5½ years. A large number of graduates entered the Services after a post-graduate period of six months' residence in a hospital. When the Service authorities were in a position to release them, it was expected that a number of these young officers would wish to take up civilian surgery and every effort would be made to find hospital appointments for them as 'surgeons in training'.

Leave courses in the Medical School for American and Canadian Medical Officers were arranged. Each of these courses, lasting one week, was attended by thirty officers and provided an opportunity for Northern Ireland medical personnel to meet their oversea colleagues. In the early years of the war, close contact was maintained with the R.A.M.C. by means of a committee which held a number of meetings and surveyed the whole field of war surgery. Social bonds were also cemented.

In Belfast during the air raids of April 15 and May 4, 1941, incendiaries caused damage to several small hospitals and almost complete destruction of the Ulster Hospital for Children and Women.

During the years of war a number of hospitals were established by the British and American forces in buildings or in huts and many civilian hospitals had additional accommodation for patients as a result of the provision of hutments under the Emergency Hospital Scheme.

Patients were evacuated from a portion of the Belfast Mental Hospital at Purdysburn, in order to provide premises for the establishment of an emergency general hospital. This hospital became the main hospital of the Emergency Hospital Service, and was transferred to larger premises at Musgrave Park, Balmoral, Belfast. The provision of this emergency general hospital and of special hospitals for the British and American Forces relieved the staffs of the other Belfast Hospitals of war surgery and enabled them to deal with the increased work resulting from accidents and illnesses in expanded war industries such as ship-building and the manufacture of aircraft and munitions.

The Royal Victoria Hospital, Belfast, the principal hospital of the Medical School, had to bear the main burden of the substantial increase in civilian hospital admissions which was recorded in Northern Ireland during the war years. The 1944 report of this hospital showed a record number of intern patients—9,656. The total for 1940 was 8,328. There was, unfortunately, a large waiting list at the end of 1944 (1,256 names). The admissions included increasing numbers of patients with acute abdominal trouble, head injuries, fractured legs, enlarged prostates and cancers. Increases in accident cases were in fact so large as to indicate that there was a danger that the Royal Victoria would be converted into a casualty hospital, which would be injurious from the point of view of the Medical School. The establishment of a large

convalescent hospital to which certain cases could be evacuated as soon as they had been dealt with satisfactorily, appeared to be the solution to this problem. Cases such as patients awaiting operation for enlarged prostate, one week after operation for chronic appendix, and with a fractured leg (when fracture has been reduced and fixed) could be dealt with satisfactorily in a smaller hospital and District Hospitals outside Belfast could help to relieve the strain on the Royal Victoria Hospital by receiving and treating larger numbers of such patients.

NURSING HOMES AND PAY BEDS

A feature of the war was the difficulty of obtaining a private bed in Belfast for a surgical emergency. There might be a waiting period of three weeks before a patient was admitted to the Musgrave Clinic, Belfast (the pay-bed section of the Royal Victoria Hospital) and a delay of about ten days in obtaining a bed in a nursing home. Many acute surgical cases, therefore, had to be treated in the Royal Victoria Hospital and transferred to a private bed at a later date. Outside Belfast there was no delay as there were usually vacant beds available in the private wards of the District Hospitals.

INFLUENCE OF THE WAR ON SURGICAL CONDITIONS

Apart from surgical casualties produced by air raids and battle wounds, many surgical conditions were caused or influenced by the war. Some of these could be attributed to grief, under-nourishment, overwork, financial strain, and separation from relatives. An increase was observed in the following diseases :

Osteomyelitis. During the war years a marked increase in the number of acute inflammatory conditions of bone was observed in the Belfast hospitals, but it was not known whether this was due to an actual increase in the disease in Northern Ireland or merely to a centralisation of the cases. Acute osteomyelitis, which is largely a disease of the poor, is seldom found in a paying patient. Under-nourishment, dirt, septic skin spots, and minor injuries are aetiological factors. It is hoped that the use of penicillin will diminish the mortality and shorten the duration of this disease.

Duodenal Ulcer. Duodenal ulcer, and duodenal perforation which are prevalent among male workers and especially common in transport drivers, possibly on account of prolonged driving strain, irregular meals and cigarettes, were common and there was little improvement in the mortality rate.

Goitre. An increase was noted in the number of simple and toxic goitres admitted to the Royal Victoria Hospital, Belfast, for surgical treatment. It is not clear whether this was due to an increase in the disease or to greater confidence in the benefits of surgery. A large number of cases were reported in the Dungannon, Omagh and Londonderry areas. Thiouracil, a new drug under trial, proved of value in the preparation of the patient for operation, and in maintaining freedom from toxic signs.

APPENDIX VIII

UNITED STATES TROOPS IN NORTHERN IRELAND

THE following account concerning the health of and public health arrangements for United States troops in Northern Ireland is mainly based upon notes kindly supplied by Colonel J. H. McNinch, U.S. Medical Corps Historian.

ARRIVAL OF TROOPS AND LIAISON WITH BRITISH AUTHORITIES

The United States Army, North Ireland Forces, was based on the 34th Infantry Division and the First Armoured Division. On January 24, 1942, the first contingent of United States troops arrived in Ulster, Northern Ireland.

From the beginning of American activity in Northern Ireland, invaluable assistance was furnished by the British authorities, both military and civilian, and in particular by Brigadier E. C. Beddows, the Deputy Director of Medical Services of the British Troops in Northern Ireland. Liaison was established with British military commanders and their Royal Army Medical Corps representatives; with local health officers and Emergency Medical Service representatives; with leading local health authorities and surgical practitioners through the Ulster Medical Society and the Northern Ireland Branch of the British Medical Association; and with the heads of local British relief and hospital aid associations.

ARRANGEMENTS MADE BY THE CIVIL AUTHORITY FOR THE PUBLIC HEALTH AND MEDICAL NEEDS OF THE UNITED STATES FORCES STATIONED IN NORTHERN IRELAND

After the arrival of United States Forces in Northern Ireland, the Ministry of Home Affairs issued a Circular (No. M. 63 of date February 13, 1942), to all hospitals in the Emergency Hospital Scheme, mental hospitals, sanatoria and infectious diseases hospitals, which extended to members of the United States Forces stationed in Northern Ireland the same facilities for treatment as were available to members of His Majesty's Forces. Officers and men of the United States Forces, including members of the nursing staffs, were accommodated as Service Cases in E.M.S. and other hospitals and paid for accordingly by the Ministry.

In regard to scavenging of camps, water supplies, etc., the assistance of the Ministry of Home Affairs does not appear to have been sought at any time by the United States Military Authorities. These authorities approached the local authorities directly on these matters and obtained from them such assistance as was possible. Concerning water supplies, in many instances the facilities—while sufficient for a small rural community—were quite inadequate for the needs of large camps, and, as a result, the American military authorities had to make their own provision. The engineering work entailed was done on behalf of the American Forces by the Royal Engineers.

Camp Accommodation. American troops, upon arrival in Northern Ireland early in 1942, were quartered in various districts. Nissen huts accommodated most of the troops although other types of shelter were utilised in some instances. Arrangements for the occupancy of camps and installations were made through the British Army Authorities. Their Barracks Engineer Officer was charged with the responsibility for the care and issue of movable equipment such as furniture, light-bulbs, coal and straw, and for conservancy service.

In order that the various activities incident to the operation of so many camps might be co-ordinated, each camp commander appointed a utility officer, who worked in close liaison with the local British Garrison Officer. In effect, the utility officer was the American agent; it was his duty to see that rules and regulations on camp maintenance were carried out, and that needed fuel, camp equipment and waste disposal services were available.

Hygiene. The subject of hygienic precautions received early and careful consideration by the surgeon, United States Army, North Ireland Forces. Following a survey of the situation as it presented itself in Northern Ireland, detailed and comprehensive sanitary regulations were published. These related to water supply, food, milk, disposal of waste, garbage and rubbish, personal hygiene, venereal diseases, and control of rats and other vermin. Commanding officers of all grades were responsible for initiating and enforcing sanitary measures within their organisations and the boundaries of areas occupied by them. In all cases where questions of jurisdiction arose, the appropriate British medical officer or local health officer was consulted.

All existing water supplies were non-potable according to U.S. standards, and therefore all cooking and drinking water in Northern Ireland had to be chlorinated. This was accomplished by installation of chlorinators, batch chlorination or Lister bags. Some camps utilised a town supply which was chlorinated by the community. In these instances the water was tested and if found potable further chlorination was not practised.

Sewage disposal in the camps presented no problem. Bucket latrines were used and were emptied daily by civilian contractors.

Rat control was important. Units were directed to carry out a rat destruction campaign and were instructed as to the availability of poisons and traps. Arrangements were made for a special course of instructions in rat control to be given to representatives of each large camp by a special instructor from the Rodent Control Division of the Ministry of Food.

BLOOD TRANSFUSION

Before the Northern Ireland Base Command was set up, the necessity or advisability of organising a blood bank had not arisen, as the small quantities of blood needed for United States troops were readily supplied by the British Army Transfusion Service. When the base section was established, the troop load increased rapidly and it was anticipated that calls for blood would be more frequent. Arrangements were made with the British authorities who had an efficient mobile blood bank functioning. Soon afterwards, the British authorities were notified by the War Office that their Field Transfusion Units were to be ready for overseas service and that a replacement was not available. It became necessary for the United States Forces to take over the facilities

and functions of these units. Irish nurses, who had been assisting the British team, continued the work of assisting the United States Army Transfusion Service in maintaining an adequate up-to-date donor panel. The arrangements were made possible by the full co-operation of Major Oliver, R.A.M.C., Deputy Assistant Director of Pathology, Northern Ireland. Major Oliver was very active in stimulating the civilian workers and donors, and making them into an efficient organisation. It was agreed that blood would be supplied to British Military Hospitals in Northern Ireland in the event of an emergency; and that the Transfusion Service would be maintained, so that it would again be available to British Forces at such time as the United States Army ceased to have need for it. Blood was obtained from panels of British donors. The mobile team visited one or two civilian centres each week, drawing from 30 to 80 pints of blood at a time. All excess blood not used within a week was sent to Professor Biggart's Laboratory at the Royal Victoria Hospital, Belfast, for conversion into liquid plasma, which was distributed to the British Armed Forces in Northern Ireland. As the panels were altered or depleted, it became necessary to organise a campaign for new donors. Consequently, in order further to inform the civilian population of the need for blood, arrangements were made with the local W.V.S. organisers to give talks and demonstrations, followed by typing and registering of prospective donors.

HEALTH OF THE COMMAND

The maintenance of the health of the Command was supervised by the Preventive Medicine Section, Office of the Surgeon, North Ireland Base Section. This section supervised preventive medicine and sanitation in SOS units and maintained liaison with the Army Ground Forces and with the British military and civilian medical authorities. Information as to the prevalence of communicable diseases in the United States personnel was obtained from hospital daily admission and disposition reports, and by telephone from hospitals and dispensaries. Information was also exchanged with the Surgeon, XV Corps, and Unit surgeons on the prevalence of communicable diseases in units under their control. The Assistant Director of Hygiene of the Royal Army Medical Corps gave advice through personal visits and by telephone on problems that might affect Allied military personnel. The civilian authorities who furnished useful information on disease that might affect United States Army personnel, were the Chief Medical Officer, Ministry of Home Affairs, Northern Ireland and the Medical Officer of Health, Belfast. With the report of the initial case of infection the unit was visited and the medical officer in charge was informed of the preventive measures to be initiated according to established practice.

Venereal diseases. On February 22, 1944, an officer was assigned to North Ireland Base Section as Venereal Disease Control Officer. This officer was in touch with the Chief Medical Officer, Ministry of Home Affairs, Northern Ireland, and the Medical Officer of Health, Belfast. The venereal disease clinics of the City of Belfast were visited, and every attempt was made to work in close co-operation with the V.D. officers and clinics. Conferences were held with surgeons of the Ground Forces, Air Forces, and the United States Navy; and, also, with the Assistant Director of Health and the Venereal Disease Control Officer of the British Army. On April 11, two nurses were

attached to this headquarters as investigators of venereal disease contacts. The approval and co-operation of the Northern Ireland health officials was obtained before they were sent out to interview these contacts. Health and the V.D. rate for U.S. Army troops in Northern Ireland compared very favourably with other sections of the British Isles, while the number of cases of respiratory diseases was slightly less than in England.

Completion of United States Army operations in Northern Ireland was marked in August 1945, when Langford Lodge, the last major military installation in Ulster, was handed over to the Royal Air Force at a ceremony in the American Red Cross Club, Belfast.

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