CHAPTER 15

CEREBRO-SPINAL MENINGITIS

MEMORIES of the epidemic violence of cerebro-spinal meningitis during the 1914-1918 war and of its high mortality rate at that time were still fresh in 1939, and were not altogether dispersed by the knowledge that powerful specific drugs were now at hand. From August 1914 up to the end of June 1916 no less than 256 recruits had died of the disease out of 604 affected, and the incidence in young soldiers was then five times that among the civilian population. General R. M. Downes and Dr J. H. L. Cumpston, fully aware of their responsibilities to the army and the civilian population, knew the potential risks in 1939. For twenty years there had been a very low incidence of cerebro-spinal meningitis in Australia. Thus a non-immune population of young adults had grown up, and study of the disease showed that it was affecting a higher age group than before. Young recruits in the armed Services would soon acquire immunity by nature's methods, but the attendant perils were not negligible.

The first case in a military camp appeared on 6th December 1939, at a time when the concentration of recruits in camps was beginning to attain some density. It was recognised that the ever-smouldering disease would certainly increase its activities in the civil population also, owing to the alterations in life and domicile and other social changes brought about by the war.

As was expected, similar conditions produced a wave of meningitis in Britain, and the Australian Medical Liaison Officer in London sent particulars of the precautions adopted there with regard to breathing space per man in sleeping huts and tents. In Britain in 1939-1940 it was the group I type of meningococcus which showed epidemic activity, while the group II was more usually found in carriers. However, in Australia as elsewhere there was no intention of attempting to identify carriers as was done with such thorough intensity during the 1914-1918 war. In England and France in 1939 observations of a large series showed that wholesale swabbing of contacts served no useful purpose. Since meningococci in the naso-pharynx of carriers disappeared after five days' treatment with one gramme of sulphanilamide given three times a day, the problem was simplified even if localised outbreaks should occur. It was further realised that even the information that certain "contacts" carried meningococci in their throats and noses helped little in forecasting possible outbreaks of clinical disease.

INCIDENCE IN AUSTRALIA

In 1940 emphasis was laid on early recognition of cases of meningitis, both from the therapeutic and the prophylactic points of view, and all medical services were insistent on the need for adequate air space in sleeping quarters. Respiratory epidemics would also certainly appear in the camps, particularly in the colder months of the year; these were a

warning of the possible appearance of cerebro-spinal meningitis, and their presence would mask the early mild coryzal manifestations of meningoccal invasion. Occasional fulminating infections of meningeal and septicaemic type were likely to occur too, and as the death rate of these is always high, constant surveillance of the position was necessary. Contrary to popular belief the concern of the health authorities was more felt for civilians than servicemen, for the proportion of severe infections and of deaths is lower in military establishments than in civil epidemics, by reason of the higher degree of vigilance and discipline in the armed Services and their more favourable age groups.

Seasonal distribution of cerebro-spinal meningitis had not been very noticeable in the civil population of Australia during the ten years before the war; it was slightly more prevalent in winter and spring. During 1940, however, under wartime conditions a rise during the winter was expected. By the end of September twenty cases had been notified in army camps. These were distributed in ones and twos over the various camps in all commands, with the exception of eight from one camp, Northam, in Western Australia. Most of them occurred in the late winter and spring. Even with these very small numbers some interesting features had been noted. One hundred and one cases had occurred in the civil community from January to September 1940, double the average yearly incidence of previous years, and a definite rise was perceptible in the 3rd Military District (Victoria) during September. Colonel M. J. Holmes, Army Director of Hygiene, correctly predicted that a rise in military camps in Victoria would follow the increase in civilian cases. A proportionately small incidence was observed in air force camps also, but this too was now tending to rise. In no instance did more than one case appear in the same unit. These observations are of interest, and illustrate how even a small series of figures, dealing with a disease usually of sporadic habit, can be most informative, even when scattered over so large an area as Australia. The relative activity of the disease among civilians was taken as a warning that there was a possibility that epidemic spread might occur in the camps, where conditions were more favourable to such a development. At the same time Colonel Holmes pointed out that provided all care was taken to secure good hygienic conditions and to detect clinical outbreaks immediately, the massing together of young susceptible persons in almost closed communities would assist the natural process of immunisation.

At the end of 1940 an alarm occurred at Darwin. Early in December a naval rating died of an illness diagnosed as cerebro-spinal meningitis and following this other suspicious cases occurred. The Commonwealth Medical Officer quarantined the barracks and took measures to limit close contact of numbers of people, as in hotels and cinemas. The army and air force medical services supplied additional medical officers and nurses, and a pathologist was sent to investigate. Considerable difficulty was experienced in avoiding contamination of cultures owing to the prevalence of dust and the humid heat. In the ensuing two months over 140 patients

were observed who had an illness characterised by rapid onset, pains in the head and back, some stiffness of the neck and a morbilliform rash. There is no doubt that this illness was due to dengue fever and that it was at first mistaken for meningitis. Stiffness of the neck muscles and severe aching in the back of the head and neck have in some epidemics of dengue fever given reasonable cause for suspecting meningeal infection. This false alarm did good in emphasising the need for prompt investigation.

By the end of 1941 the disease had passed through a phase of increased activity, but was then beginning to wane. It never reached alarming proportions, but it was expected to show recrudescence again during the winter and spring of 1942, though on a lower level. In the first two years of war numbers of cases reported in Australia were as follows:

Army	215
R.A.A.F. . . .	45
R.A.N. . . .	9
Civilians . . .	1,125
Total . . .	1,394

The distribution between States was proportional to population, except in Western Australia, in which 481 civil and 104 service cases occurred. Dr J. H. L. Cumpston, Commonwealth Director-General of Health, had the subject discussed at a meeting of the National Health and Medical Research Council in November 1940, and at this and at a later meeting in 1941, Colonel Holmes presented a complete analysis of the position. An instructive point was noted with reference to age incidence. During 1931-1939 age distribution had been noted only in New South Wales, and here 23 per cent of cases occurred over the age of 15 years; in 1940 this percentage rose to 45, and in 1941 to 56. In the other States this figure varied from 49 to 91, with an average of 60.

The experience of two years showed that the epidemic did not begin in military camps and spread to civil population, since the civil occurrence of the disease preceded its appearance in camps. Further, during the summer months the disease tended to die away in camps, but remained active among civilians. Decline in the military camps was found to anticipate and forecast a later drop in the civil community. In most of the camps only isolated cases were still occurring. At first the preponderance of infection was in the metropolitan areas, but during the second year a wider spread occurred in rural areas. This too was an evidence of the widened spread of the infective agent, and therefore of the process of immunisation, which it was confidently expected would terminate the epidemic. The mortality in the defence forces was low: up to September 1941 it was 2.8 per cent in the authenticated cases. Incomplete figures for the various States at this stage showed a civilian death rate ranging from 20 to 24 per cent.

During this 1940-1941 period the recognised factors affecting the incidence of meningitis in camps were given careful attention. A higher standard of hygiene in the camps was achieved than in 1915-1916, though all that was desired could not be obtained, as it was difficult to have precautions enforced. The lag of accommodation behind the numbers of recruits, perhaps inevitable in a country unprepared for war, was at times a cause of definite and even serious anxiety. The lack of sufficient space both in rural and semi-rural camps and near metropolitan areas forced the use of areas such as showgrounds, many of the buildings used being intrinsically unsuitable for sleeping quarters. Though over-optimism and perhaps some lack of realism even in military circles were an occasional cause of overcrowding and other defects of accommodation, the pressure of medical opinion helped to raise and maintain camp hygiene. Even in a country like Australia, on the whole favoured climatically, extremes of heat and cold are encountered, and the "toughening" process of training requires some discretion at first when local conditions are not favourable.

Anxiety had been felt by the D.G.M.S. and his staff since the beginning of 1940 about the living and sleeping accommodation in camps, and in August 1940 a special instruction forbidding overcrowding was issued by the Military Board and strictly enforced. Steps were taken too to modify training so as to avoid undue exposure and fatigue. This was specially necessary in view of the large numbers of universal service trainees who were entering camps for short periods of training, as their physical standards were lower than those of A.I.F. volunteers. Not more than six men were allowed in a tent 12 feet by 14 feet, and not less than 45 square feet space per man in huts, nor less than 5 feet between the centres of beds. These figures were arrived at by compromise, for the accepted standard floor space is 60 square feet, and bed distance 6 feet. Care was taken to air huts and bedding, and no overcrowding was permitted in canteens, recreation huts and cinemas. Medical officers were instructed to institute immediate isolation of men suspected to have meningitis and to ensure prompt energetic treatment, and to keep immediate contacts under surveillance. Isolation of immediate contacts was carried out only at the discretion of the medical officer. (See appendix.) Fulminating cases were still occasionally seen at the close of 1941, but their number was dwindling, an indication either of rising immunity or decreasing virulence. At the end of 1941 there were still evidences of activity in the disease. Even in the summer months the incidence was much higher than the average over the preceding ten years, but with the exception of the temporary and moderate rise in Western Australia infection had remained sporadic in distribution.

IN THE MIDDLE EAST

Meanwhile in the A.I.F. in the Middle East the problem had also arisen. An occasional case occurred among troops in transit by sea, and it was to be expected that the infective agent, if not already present in the force, would be brought from Australia. However, the conditions were

favourable in the training camps, both with regard to climate and camp accommodation. A small outbreak occurred in Palestine in the last few months of 1940. The first three cases occurred in a survey company of a railway construction unit at Nablus. Precautions were taken to avoid overcrowding in all ways, and no further cases occurred. Others were reported from separate battalion areas: as is usual in this disease, no common cause was evident. Care was taken to secure adequate dispersal in tents and billets, messes and amenity huts. No outbreaks of importance occurred. The total incidence in the A.I.F. in the Middle East was as follows:

1940	16 cases with 1 death
1941	66 cases with 2 deaths
1942	3 cases with no deaths

The actual incidence of proven meningococcal infections may have been lower, as all the above were not bacteriologically proved. Lymphocytic benign meningitis is not included. In addition there were 15 cases in the A.I.F. in the United Kingdom with no deaths. The incidence rate in the A.I.F. overseas did not exceed 1.2 per 1,000 per year in 1940 and 1941.

In 1943, when all troops had returned to Australia from the Middle East, cerebro-spinal meningitis still required to be carefully watched. During 1942 the great expansion of military camps throughout Australia and the increase of all the Australian and Allied armed forces in Australia enhanced the risk of outbreaks. The figures were now large enough to allow a more accurate idea of the mortality rate to be formed, and an investigation was carried out at army medical headquarters to ascertain the corrected rate, and to determine, if possible, the importance of sequels.

The figures obtained from 2nd Echelon for the army showed that up to 31st December 1942 646 cases of cerebro-spinal meningitis had been recorded in all areas with 57 deaths. Analysis of the case histories of the men who died showed that 14 deaths out of the 57 were not due to cerebro-spinal meningitis, that is, due to the meningococcus, but to other forms of meningitis, such as tuberculous, streptococcal or post-traumatic. This was purely an error in classification. The corrected figure of 632 cases with 43 deaths gave a mortality rate of 6.7 per cent. It is of interest that in Sydney, where all military patients from the metropolitan area were treated for meningitis at one civilian hospital, the Prince Henry Hospital, the death rate excluding a few moribund patients was 5 per cent, whereas the civilian death rate in New South Wales was then about 12 per cent. It was obvious from the study of the case histories of this military series that the diagnosis was frequently not simply made, particularly when the symptoms were aberrant or mild, or at the other extreme, rapid and severe.

Though the official instructions stressed the need for the invariable administration of a sulphonamide drug in high dosage at once when suspicious symptoms were noted, even before lumbar puncture was performed, the importance of these measures had not always been realised. Half the fatalities occurred in men stricken down quickly, and one-third

of the deaths took place within twenty-four hours of the onset. More difficult to estimate was the degree of morbidity following the illness. Of the 587 men who recovered 352 were still classified "A", 70 as "B", and 104 as unfit for service: 48 had not been reclassified, and 13 were not recorded. Of the 104 unfit, examination of the records showed that 14 were classed "D" by reason of a disability not related to meningitis: 24 were found unfit because of some sequel of the illness, and 66 could not be assessed from the available records.

It was found that medical boards often gave no reason for their decision. Even "post cerebro-spinal meningitis syndrome", sometimes used as a self-sufficient clinical diagnosis, is meaningless unless amplified by further description. The impression given by the records perused was that lowering of the classification was not always defensible. The same subject was reviewed also from time to time in convalescent depots. It was found that where medical officers were particularly interested in the rehabilitation of men convalescing from meningitis the results were correspondingly better. This question will be discussed in connection with treatment. The later years of the war did not add anything specially to the subject. The better supply of powerful sulphonamides, particularly in soluble form suitable for infection, and more widely diffused knowledge helped greatly in securing early and efficient treatment.

IN THE SOUTH-WEST PACIFIC

The Pacific war did not produce conditions in which meningitis flourished, but at least some of the lessened incidence was due to an increase in the general level of immunity in the community. One outbreak occurred which illustrated that the introduction of the active organism into suitable soil will produce the disease. In June 1944 some 300 recruits arrived at Wampit in New Guinea in an area where cerebro-spinal meningitis had broken out among local natives. These troops were not of good physical types and were suffering from a respiratory infection. Soon a death occurred from cerebro-spinal meningitis, and another severely ill man was rescued by early large doses of sulphapyridine. Wider dispersal of the men in their living quarters and mass treatment of native and Australian troops with sulphapyridine and sulphathiazole for two days checked further spread.

The figures for the whole of the Australian Army in Australia and the South-West Pacific Area are as follows:

	Australia		South-West Pacific	
	Number of cases	Rate per 1,000	Number of cases	Rate per 1,000
1942	448	1.24	16	0.74
1943	106	0.27	6	0.07
1944	30	0.08	2	0.02
1945	11	0.05	10	0.07

Several cases of meningococcaemia of the benign type were reported from the Royal Australian Navy Hospital, Canonbury, Sydney, and a

special technical instruction was issued in view of the possibility that other instances of this infection might occur in naval establishments. The onset in these was often insidious, and intermittent periods of pyrexia with sweating and pains in joints and muscles were observed. The direction was given that such symptoms without obvious cause were sufficiently characteristic for a clinical diagnosis. This was made more probable by the appearance of crops of rose-pink macules with haemorrhagic centres during each episode, especially if the muscles and joints were tender, even with small joint effusions. *Erythema nodosum* has occasionally been observed also, as a misleading sign suggesting rheumatic fever. Neutrophile leucocytosis and distribution of the rash about the wrists, ankles and fingers were further confirmatory signs.

In a different category were the fulminating blood infections, where the patient's best chance of survival lay in the immediate administration of a large initial dose of a soluble sulphonamide in an intravenous infusion. Where this could be promptly done some dramatic recoveries occurred. The diagnosis was usually clinical, inasmuch as the appropriate treatment was administered immediately reasonable suspicion was entertained. Army Technical Instruction No. 6, dealing with fulminant meningococcal infection, directed that toxaemia in a patient with widespread purpuric rash was to be regarded as sufficient evidence on which to base treatment.

A special caution was given against regarding a normal cerebro-spinal fluid as excluding the septicaemic variety of the disease. The number of cells found in the fluid naturally depended on the intensity of the meningeal reaction. Occasional instances of the Waterhouse-Fredericksen syndrome were seen, where intense haemorrhagic spoiling of the adrenals was found at autopsy.

A correct clinical diagnosis was at least once made by a relatively untrained orderly, who observed head rigidity and a faint rash in a patient admitted to a tented hospital ward during the night with a provisional diagnosis of pneumonia.

Although precipitin tests on the cerebro-spinal fluid have been found useful by some for quick diagnosis, immunological tests in general were not relied up on in the Australian services. Bonnin and Bryce recorded their findings in a series of complement fixation tests in meningococcal infections, but found that false positives occurred, and also cross fixation with gonococcal antigen. Blood cultures were sometimes, but not always, helpful: in subacute or chronic septicaemic infections clinical and therapeutic trial were the best practical methods.

TREATMENT

At the outbreak of war treatment had become a question of prompt and efficient dosage with a suitable sulphonamide. For the first two years sulphanilamide and sulphapyridine supplies were restricted, particularly of the injectable forms, and there is little doubt that several severely ill men in hospital owed their recovery to the zeal with which medical officers used gavage at any needful hour of day or night to administer

powdered sulphapyridine. When sulphamerazine was manufactured in Australia it largely replaced sulphathiazole and sulphadiazine, the latter in particular being difficult to obtain freely, and was used in successive doses of 12, 8, 8, 8, and 4 grammes a day, or 9, 6, 4, 4 and 2 grammes a day according to the severity of the infection.

PROPHYLAXIS

Prophylaxis by mass "blanket" dosage was never considered necessary on a large scale. It was sometimes used for limited groups, in order to eliminate carriers. An historically interesting example of the treatment of carriers with sulphapyridine was recorded by Meehan and Merrillees. Meningitis had occurred among 300 children in a foundling hospital in Melbourne, 30 cases appearing over the period November 1937-March 1939. Seventy-five carriers were found among limited groups of the children, who lived in separated age groups. One gramme of sulphapyridine daily for five days per 14 lbs of body weight was found to be well tolerated, and the carriers dropped in number to three. No cases occurred during the following year, up to the time of the report. This appears to be the first published account of mass dosage of carriers to stop an epidemic of cerebro-spinal meningitis.[1]

After penicillin was introduced the therapy of meningitis was still further improved, and sulphonamide-resistant strains could be successfully countered. There was also the advantage of intrathecal treatment by penicillin, though local irritation occurred at times. With full supplies of powerful diffusible sulphonamides and penicillin available, only the severe fulminant septicaemic types offered a very bad prognosis. As Cairns and his co-workers showed, local intracranial abscess formation was still a possible sequel of severely suppurative meningeal infections, a complication demanding full neurosurgical cooperation.

SEQUELS

The sequels of cerebro-spinal meningitis cannot be ignored. Extremes of opinion have attributed these on the one hand to actual irreversible damage to the central nervous system, and on the other hand to neurosis due to bad handling during the illness and the convalescent period. There is surely no doubt that neither of these views completely represents the position. There is no question that organic damage can occur. In a few instances organic palsies occurred in the series studied here, involving the facial muscles, *serratus magnus,* and muscles of the buttock and leg, though it is not certain that in every case such palsies were due to meningitis. Usually, however, no organic lesion could be discovered. The most frequent sequels were backache, headache, giddiness, loss of concentration, and sensitiveness to glare. A complaint that effort, either physical or mental, increased the headache was common. Insomnia and poor

[1] This was drawn to my attention by Professor Loeb's staff in the Medical Centre, Presbyterian Hospital, New York, U.S.A.

resistance to fatigue were also frequent complaints. The personality of some patients during convalescence was found to be of the poorly integrated type, but it is not certain that this was not part of the man's original make-up. Occasional patients were of frankly hysterical or neurasthenic types. There appeared to be some relation between the severity of the attack and the frequency of these sequels. The duration of coma seemed to be significant also, and it seems reasonable to regard this as some index of the severity of disturbance of the central nervous system. These factors were apparently of greater importance than the length of the illness.

On the whole the parallel with patients who have had a closed head injury is striking. Cairns and his associates have shown how important the handling of these men is. The same applies here. There can be little doubt that confidence of the man in his power to recover with a nervous system equal to reasonable demands is an important factor in rehabilitation. There arrives a time in the convalescence of such men when a decision must be made as to what environment is best for them and what type of activity. This decision should be individual, giving men who have been severely ill time to recover, but not allowing them to drift without confidence or incentive. The label of the medical board, officially not disclosed to the men, but almost invariably known to them, does not always give reassurance. Probably the total invalidity due to cerebro-spinal meningitis is not great in the Australian armed forces in this war, but it should be capable of further reduction.

APPENDIX

Instructions—Cerebro-spinal Meningitis

The following is a consolidation of instructions which have been issued in relation to the control of C.S.M. and which should be strictly observed.

In connection with the occurrence of cases of C.S.M. in camps the attention of all Medical Officers should be drawn to Medical Memorandum No. 1 C.S.M. Addendum No. 1 to Manual of Injuries and Diseases of the War notified in the A.A.O. March 1940. A copy of Medical Memorandum No. 1 should be in the hands of the Medical Officer in all camps.

The principles indicated in Medical Memorandum No. 1 should be enforced in dealing with C.S.M. Briefly the following procedure should be adopted:—

A. When a case of C.S.M. occurs in camp.

(1) The patient should be isolated and treatment with sulphapyridine or sulphathiazol in full dosage should be commenced at once. Naso-pharyngeal swabs should be taken.
(2) The patient should be isolated immediately.
(3) He should be removed with the least possible delay to the nearest hospital selected for treatment of these cases.
(4) A full statement of diagnostic action taken, and of treatment given including the dosage administered must be sent to the hospital with the patient.
(5) As administration of sulphonamide affects the subsequent determination or confirmation of diagnosis by bacteriological methods, lumbar puncture and examination of cerebro-spinal fluid for diagnostic purposes should, whenever practicable, be performed before chemotherapy has rendered bacteriological diagnosis difficult or impossible. This should be done only where adequate experience and facilities for this purpose exist at the camp hospital. Treatment

should not be delayed for this purpose, nor should removal of the patient to the special hospital be deferred.

(6) Immediate steps should be taken to confirm diagnosis by bacteriological methods. Every facility and assistance must be given to the pathologist for this purpose.

(7) The close contacts of the case should be put under observation, but need not be isolated. Close contacts are those who occupy beds immediately adjacent to the patient, and any other persons judged by the medical officer to have had a specially close or prolonged contact. At the discretion of the D.D.M.S. or S.M.O. naso-pharyngeal swabs may be taken from close contacts and examined if facilities for the efficient performance of this work are available.

Routine swabbing for detection of carriers serves no useful purpose and should not be carried out.

(8) If any close contact develops catarrhal or other signs or symptoms suspicious of meningococcal infection, he should be isolated, and treatment with sulphapyridine commenced without awaiting result of naso-pharyngeal swab examination.

(9) Constant vigilance should be maintained in the unit and in the camp generally in order to detect clinically suspicious cases at the earliest possible moment. Men suffering from catarrh should be especially watched.

(10) Overcrowding in camp must be eliminated. Instructions for avoidance of overcrowding must be scrupulously enforced. In any rearrangement of accommodation to overcome overcrowding, opportunity should be taken to separate, where this is practicable, men suffering from catarrh, especially if severe and associated with coughing, from the others.

(11) Strict attention must be paid to ventilation in the sleeping and other quarters, and to prevent overcrowding in recreation rooms and canteens, etc.

(12) The following action should be taken in the tent or hut in which the case of C.S.M. has occurred:—

(a) Floor boards, ground and inside of the tent should be exposed to direct sunlight.

(b) The floor of the hut should be washed with disinfectant solution, and the hut thrown open to free air circulation.

(c) Bedding and personal belongings of the patient should be disinfected.

(13) Leave from the camp need not be interfered with, except that close contacts under observation should not be given leave until the period of observation has expired.

(14) Visitors need not be debarred from the camp, but must have contact with the troops only in the open air.

(15) Lectures to troops should be arranged, and the men instructed in personal hygiene in relation to droplet infection, and in the methods by which the disease may spread.

Sufferers from colds and "catarrh" should be encouraged to report for treatment.

B. If cases of C.S.M. continued to occur in a camp, thus indicating the presence of camp infection, all the above measures should be continued, in addition:—

(16) Regular daily medical inspection should be arranged.

(17) Entry of recruits, or troops from other camps, should be reduced to a minimum and carefully safeguarded. Movements should be carried out gradually and not on a large scale. (Recruits should be received into a separate portion of the camp.)

(18) Transfer of troops from the infected camp to any other camp should, as far as practicable, be avoided. When it cannot be avoided, it should be carried out under carefully conditioned precautions in order to reduce contact and overcrowding.



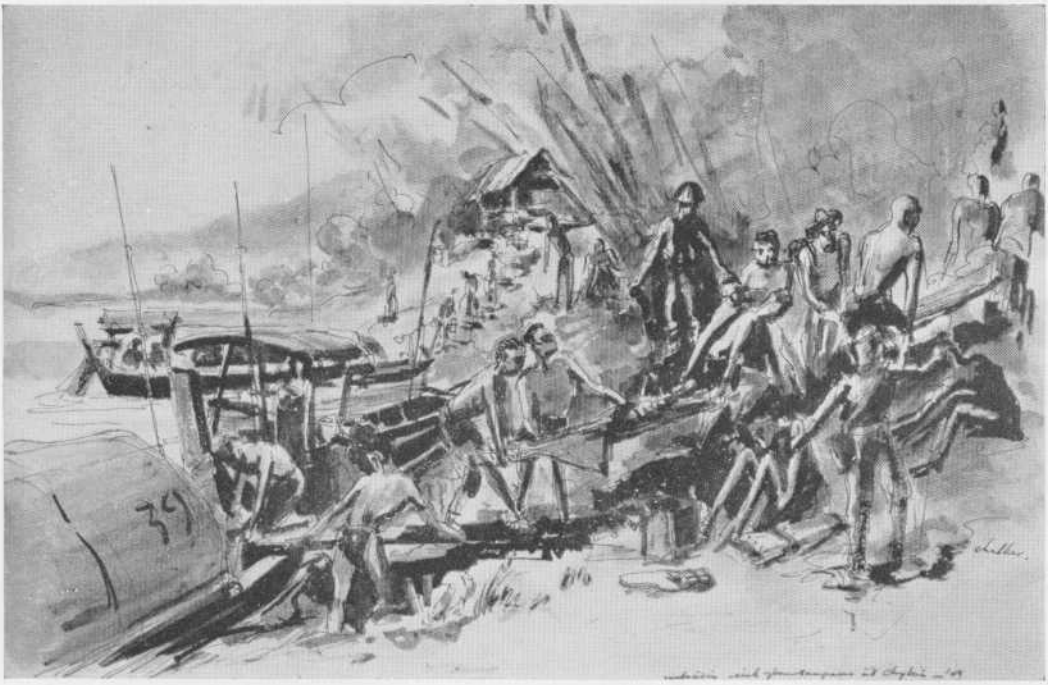
(Australian War Memorial)

Wounded arrive in Ramu Valley by jeep ambulance.



(Australian War Memorial)

Evacuation by air in New Guinea.



(Drawn by J. Chalker)

Unloading sick from sampans at Chungkai.

(19) Troops in the camp should not be worked to the point of fatigue. Action should be taken to ease training until the manifestations have subsided.

(20) Strict care should be exercised in relation to permission for visitors to enter camp. Entry of children to the camp should be forbidden.

(21) Leave of troops from the camp should be controlled, and troops going on leave should receive special instructions as to personal hygiene in relation to the possibility of conveying droplet infection while on leave.

Notification.

(22) The medical officer must immediately report any case or suspected case occurring in camp or elsewhere to the S.M.O., who will immediately notify the D.D.M.S.

(23) The D.D.M.S. should at once notify the D.G.M.S. by wire or other most rapid method, of every case or suspected case notified to him. This notification should include the name, unit, camp, date and place of isolation, and date of onset and whether a member of the Permanent Forces, Garrison Battalion, A.I.F., Militia, or Universal Service Personnel.

(24) The D.D.M.S. should, as soon as practicable, confirm the telegraphic notification to the D.G.M.S., by mail (in the case of Northern and Western Command and the 6th, 7th and 8th M.D.'s by air mail), giving in addition the following details:—

Regimental number (indicating whether A.I.F., Militia, etc.).

Age.

Details regarding action to clinch diagnosis.

The result of bacteriological investigation (followed by a copy of the pathological report as soon as available).

Brief statement of treatment employed with progress of case.

Length of time under military training (that is, period since joining camp from civil life).

Patient's movements within the few days prior to onset, together with any ascertainable facts of epidemiological importance which might indicate whether infection was contracted in camp or outside.

(25) The D.D.M.S. should advise District Records Office immediately of all cases of C.S.M. occurring in military forces, whether Permanent Forces, Garrison Battalion, A.I.F., Militia or Universal Service Personnel.

(26) The D.D.M.S. should notify the State Department of Health of each case, and maintain touch with that Department for consultation, and for mutual exchange of information regarding cases of C.S.M. and close contacts, which may be of value in relation to control measures.

12.9.41.

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