CHAPTER 13

DISEASES OF THE SKIN

SKIN affections were of frequent occurrence in tropical climates and at one time casualties in the Australian Army from this cause exceeded those from malaria. The skin diseases encountered in the navy were in general the same as those seen in the army, but differences in environment caused altered distribution of the common types. Surgeon Lieut-Commander C. G. Semler of H.M.A.S. *Platypus* recorded that "prickly heat" or *miliaria rubra* occurred most frequently and noted that it was often the precursor of other secondary dermatoses, particularly those of an inflammatory type. In order after that came the variants of impetigo, tinea, furuncles, and ulcers arising from insect bites or minor trauma.

Prickly heat, aptly named because of the curious prickling sensation it caused in the affected parts, was troublesome by reason of its almost general distribution and its sequel of sweat rashes.

Experiments carried out by the Royal Naval Personnel Research Committee yielded some information on the disease. For a certain time each day over a long period subjects, wearing plimsolls and freshly laundered shorts or overalls or nothing at all, entered climatic chambers where they were subjected to a high temperature. On each occasion they were given two freshly laundered towels, one for use during the experiment and one for use after the hot and cold showers with which it was concluded. Their plimsolls were rinsed in fresh water and placed in a drying cupboard each night, and the climatic chambers and bathrooms were scrubbed out with disinfectant once a week. Only 4 per cent of the subjects showed any evidence of prickly heat, and even then the diagnosis was somewhat doubtful. The rarity of this condition during the experiments indicated that repeated exposure to very warm conditions for a few hours each day for as long as five months will not cause the condition, provided those exposed can spend some of the time between exposures in an atmosphere where their skin is not moistened with perspiration.

There has been considerable argument about the intake of common salt in prickly heat as a vehicle for the sodium ion. There seems to be a general opinion that an adequate intake of salt has a beneficial effect. Those factors which favour excessive sweating, such as covering the skin with clothing, and undue heat and humidity, as under blackout conditions, are just those which cause excessive loss of sodium chloride in sweat. Therefore a diminution of salt in the daily ration would not be expected to relieve *miliaria rubra.* A. A. Bartholomew[1] from personal experience believed that salt had not only prophylactic but therapeutic value in prickly heat.

Numbers of Australian medical officers recorded their experiences and conclusions. The possibility of a deficiency of riboflavin was raised by

[1] *British Medical Journal,* 12 Apr 1952.

Surgeon Lieutenant C. L. Statham at H.M.A.S. *Melville,* where some debilitated men showed oral lesions indicative of this deficiency during the hot, humid weather. All had been on the station for over a year. Surgeon Lieut-Commander Semler noted that in men wearing a working rig of only shorts and sandals prickly heat was confined to the "pants" area; given a cool change, even if for only a short time, their condition improved appreciably. Surgeon Lieut-Commander E. L. Susman and Surgeon Lieutenant F. R. Fay made a study of the condition, taking into consideration various possible aetiological factors, such as clothing, latitude of the ship, diet, age, weight, complexion, exposure to the sun, psychological aspects, occupation, types of sweat reaction and salt intake. The most extensive work was carried out by J. P. E. O'Brien and S. D. Allen, who studied in the army in the Northern Territory the relations of *miliaria rubra* to other anhidrotic states and dermatoses. This work is described in Volume I of this series. In the Royal Australian Navy supervening dermatological complications were not a common feature but *miliaria rubra* was none the less troublesome.

In assessing the results of investigations control of all factors is obviously necessary. Fay and Susman doubted if any absolute prophylaxis were possible. This might be true. However, it seemed that high temperatures, profuse sweating, and clothing which prevented exposure of the skin to the sun, were important causal factors; and that a sufficient intake of salt and the wearing of a minimum of clothing were useful prophylactic measures, indicating that rather more than a "healthy stoicism" could be achieved.

Surgeon Lieutenant A. O. Parker observed men in H.M.A.S. *Lachlan* with the so-called "sweat rashes" following prickly heat. He treated this series of patients, usually with success, by exposure to sunlight and the use of an antiseptic spirit lotion, but sometimes the use of one of the acridine dyes was called for. A number of cases with either a history or the symptoms of chloride imbalance were given salt tablets. Figures suggested that most of the cases carried out their duties in hot, sunless areas between decks. A small group of cases in *Lachlan* showed a lesion of the nature of a cellulitis, slowly spreading to form a hard indurated area which did not form pus. Sulphonamides produced only a temporary improvement but penicillin cured the lesion rapidly. Similar conditions have been described in other tropical zones.

Pemphigus contagiosus was occasionally seen as a probable sequel to *miliaria rubra.* No set bacteriological studies could be made in the R.A.N., but it was believed that the indolent lesions were usually streptococcal in origin. Auto-haemotherapy was sometimes used in addition to local treatment: the results were indefinite.

The number of cases of scabies occurring in the navy was not high. During the winter of 1941 fourteen cases were recognised in *Stuart* while that ship was on the Mediterranean Station. Sulphur treatment was not satisfactory, but the condition responded to benzyl benzoate. In *Vendetta* Surgeon Lieutenant J. F. Rutter also found that benzyl benzoate was

more effective and comfortable than sulphur ointment, ointments in any case being unsuitable in the tropics as they tended to spread infection. Disinfection of fomites, at first thought necessary in *Vendetta,* was abandoned without further spread of infection. In these and in later outbreaks in *Doomba* and *Hobart* the problem arose of providing space for isolation, always a difficult one, as it involved a disturbance of the normal working of the ship.

Other parasitic infestations were troublesome at various times. In *Platypus* Semler reported that cases of *tinea cruris* and *circinata* were common though readily controlled. The eczemoid type proved more obstinate, especially when it affected the toes. Copper sulphate electrolysis therapy was used with some success, but the cure was only temporary. In *Manoora* prophylaxis was encouraged by the use of foot baths of mercury bichloride and by a regulation compelling the wearing of shoes. As compared with other preparations, gentian violet dye 2 per cent was found most valuable in treatment. At H.M.A.S. *Melville* one case of *tinea circinata* was treated successfully with 1 per cent Brilliant green aqueous solution. Two men with resistant conditions were persuaded to abstain from bathing for a few days and to anoint their bodies with olive oil instead. Cures resulted in both cases.

Tropical ulcers—"desert sores" to the troops in Libya and Cyrenaica—were seen frequently in the navy, caused by a combination of trauma and infection of skin already macerated by sweat. An occlusive dressing, particularly as a first-aid method, was often successful. Numbers of naval medical officers held that a diet deficient in vitamins, particularly vitamin *C,* predisposed to this condition, basing their belief largely on the local and general improvement seen in patients when sufficient fresh food was added to their diet. It will be realised that trauma as a factor has a wide connotation, including not only injury by violence to the skin surface, but also by bites of insects. Many of these ulcers showed as a characteristic feature an indolent centre, reluctant to heal, and surrounded by satellite vesicles which became pustular. Such lesions could spread rapidly. Surgeon Lieut-Commander S. A. Sewell noted frequent cases of tropical ulcer at the Darwin Naval Hospital, the appearance of which corresponded closely to that seen in dermal leishmaniasis. As the disease occurred mainly among ratings working around the waterfront the possibility was considered of dermal leishmaniasis, spread by sandflies, being present in the Darwin area. In the treatment of these ulcers skin grafting was frequently necessary. The condition appeared to be identical with that usually referred to in Northern Australia as Barcoo Rot. In Sewell's experience vitamin therapy had no effect on the course of the disease, which led him to believe that its cause did not lie in a vitamin deficiency. At H.M.A.S. *Melville* Surgeon Lieutenant Statham noted an alarming increase in the number of epidermophytic lesions when the grass, which was from 6 to 8 feet high, was drying after the rains. Despite preventive measures infections continued to occur, the most extensive among members of the work-

ing parties clearing away the grass. Various lotions were used, each with varying success from case to case.

On the whole, local factors were not usually found important in skin affections arising on board ship, but a sick-berth attendant in H.M.A.S. *Benalla* noted that ulcers were common on the lower part of the legs of as many as 80 per cent of the ratings who had been in contact with coral and sea-water. The resultant ulcers commonly recurred and early treatment was important.

As mentioned in a previous chapter, Surgeon Lieutenant W. J. McLaren-Robinson of *Yarra* reported that while the ship was lying in the Shatt-el-Arab there was a lowered resistance to disease in personnel due to the heat, the limited diet, lack of leave and malaria. One result of this was a high incidence of infected bites and scratches. These lesions were very resistant to treatment and tended to develop into ulcers of an indolent type. They were treated with hot hypertonic saline baths and foments, eusol, magnesium sulphate with glycerine, acriflavine in aqua and spirit, and with occlusive dressings.

Closely allied to tropical ulcers were other forms of pyodermia such as furuncles and impetiginous eruptions. Though no set observations were made in the R.A.N., it was likely that these latter were commonly staphylococcal in origin and the indolent ulcers streptococcal. Acne often became pustular in the tropics, and Surgeon Lieutenant Semler noted that tropical conditions appeared to have definite effects in producing a recurrence of subsided cases of acne. These cases were very resistant to treatment and abscesses requiring incision were common. Various treatments were used for pyodermia, including the local application of sulphanilamide and mild antiseptic lotions and the internal administration of sulphapyridine. Experience later proved that the local use of sulphonamides had its risks owing to sensitisation. Elastoplast or similar occlusive dressing was useful, particularly in the mild cases seen in aid posts. Such treatment was best supplemented by adequate diet with added ascorbic acid if the diet was deficient in vitamin *C*. Auto-haemotherapy was also used occasionally.

Chrome dermatitis, so called, gave rise to no appreciable trouble in the navy. Most of the khaki clothing material likely to come into contact with the skin was vat dyed and did not produce sensitisation. Moreover, there was the possibility of other allergic mechanisms as well as the suggested action of trivalent salts of chromium on the skin. Some garments such as flannel shirts were obtained by the navy through army channels. The naval men did not like these garments, especially when worn in direct contact with the skin, but no trouble arose from them. Khaki socks were not made from chrome-dyed wool, so that whatever the method of production of this controversial form of dermatosis, chromium salts apparently played no significant aetiological role in the skin diseases seen in the R.A.N.

Generally speaking, the friction of clothing and the soddenness of macerated skin were among the most important causal factors of skin disease. Where circumstances permitted free access of sunlight to the

body the benefit was immediately apparent. Surgeon Lieutenant A. H. Robertson of *Arunta,* with the approval of the executive department, encouraged men on duty in warm climates to wear sandals and only the minimum of clothing, and as a result the frequency of mycotic and other infective lesions in the ship was noticeably reduced.

The necessity for wearing anti-flash gear in operational areas was, of course, an aggravation to skin conditions commonly encountered in the tropics. Surgeon Lieutenant J. H. Begg in *Warramunga* found that 20 per cent of the ship's company wearing this type of protective clothing at action stations had prickly heat. In relation to the necessity of preventing or limiting the lesions caused by burns, however, this consideration was unimportant.

Lack of proper laundry facilities was also a factor. In the New Guinea area there were laundry units for the Australian Army and the American forces but not for the Australian Navy. The laundry units of the other Services naturally moved with their own personnel and could not offer assistance. Surgeon Commander A. E. Rowlands commented on this in October 1944 after a visit of inspection to the New Guinea area. He believed that a laundry established where large bodies of the R.A.N. were congregated would lead to a heightening of morale, mitigate against the discomfort of the tropics where in the high humidity clothes were never completely dry, and finally help to prevent skin diseases.

Reference has already been made to the suggestion that dietetic deficiencies, particularly a deficiency of Vitamin *C,* were of aetiological importance. While no convincing evidence of this was obtained, the belief was helpful in securing a good mixed diet for naval personnel whenever it was available. General improvement in health often carried with it some degree of resolution of skin lesions.

It had been found in the British Eastern and Pacific Fleets that about 10 per cent of ships' companies and 6 per cent of those on shore were treated every month for some form of skin disease. Early in 1944 when it seemed that the defeat of Japan could be accomplished only by a series of amphibious and air operations which would keep a big fleet in tropical waters for many months, or even years, the Board of Admiralty invited the Medical Research Council's Royal Naval Personnel Research Committee to examine the effects on ships' companies of tropical climatic conditions. The experiments already described showed that clean bodies and clothes, and clean and well-equipped bathrooms, routine inspections, and frequent and early treatment where necessary would do much to reduce the wastage of man hours in areas where skin disease was rife. F. P. Ellis,[2] however, considered that these measures were inadequate and that ships which would be operating for long periods in the tropics should be specially built for the purpose. The truth of this was illustrated by the dramatic reduction in skin diseases and other heat illnesses when air conditioning was installed during the war in submarines operating in the tropics and more recently in frigates patrolling the Persian Gulf.

[2] *British Medical Journal,* 4 Sep 1954.

As might be expected, skin diseases were prevalent among naval men in Japanese prisoner-of-war camps. The conditions in some of these camps, described by S. E. L. Stening, were conducive to the spread of such affections. At Fukuoka, in Japan, there was a shortage of soap and hot water, and the men had no changes of clothing. Medical supplies with which to treat the affections were scanty: they consisted of potassium permanganate and copper sulphate, the latter being stolen from the near-by shipyard and brought in when required. It was at Fukuoka that an advanced case of leprosy was found among the Dutch prisoners. Infections of the skin were also common at Oeyama. When these were treated with sulpha drugs poisoning sometimes resulted. At Taisho the skin condition of the prisoners deteriorated with the onset of the cold weather and, when the Japanese placed limitations on the use of the bathroom, furuncles and carbuncles became very common. At Takefu the prisoners worked in the near-by carbide factory. At first they were given a 10 minutes' spell in the open air when they began to sweat. Later they were pushed harder and the spell was discontinued. They suffered from abscesses and acute irritative dermatitis caused by sweat combined with carbide, lime, fertilizer and other chemicals burning into the skin.