

CHAPTER 22

VENEREAL DISEASES

BEFORE the 1914-1918 war and even at its beginning, powerful taboos still imposed an obstacle to the fullest realisation of scientific methods in the prevention and treatment of venereal diseases. It might have been expected that in 1939 these inhibitory influences would have disappeared. In the main this was so, and in 1940, 1941 and 1942 the realistic measures taken in caring for this aspect of health of troops overseas reflected an enlightened viewpoint. The swing from the predominantly moral outlook to one which was predominantly medical was felt by some to be excessive, but the old rigid disciplinary measures were still being applied with unwise rigour in parts of Australia. The isolation wing of the 107th Australian General Hospital at Puckapunyal in Victoria in February 1941 was a compound under armed guard supplied by the camp duty unit. There were still non-medical officers in the army who regarded soldiers with venereal disease as criminals, though this attitude produced among them the atmosphere of a prison camp. No coordinated prophylactic measures existed, and preventive outfits were not readily available to units. Fortunately a picket of convalescent patients soon replaced the guard, and finally it too was abandoned. This instance was not typical of the general military policy however, and in the Middle East prompt measures were adopted.

By March 1940 a special treatment centre under Major N. W. Francis was attached to the 2/1st Australian General Hospital, and a few months after, fifty beds were available in special accommodation, where work began as an independent unit. As was expected, facilities for the training force were needed early. Prophylactic centres were provided in each camp and kept open day and night; these were the responsibility of the units concerned, and their medical officers acted in an advisory capacity. Standard procedures were drawn up and later embodied in an official administrative instruction. An important forward step was made in 1942 when the control of preventive measures was vested in experts in venereal disease. By contrast, prophylactic centres were not systematically organised in Australia nor well sited, nor was a code of standards for prophylaxis and treatment drawn up there till 1943.

Even admitting that a certain amount of venereal disease seems inevitable in any military community near urban areas, the incidence rates during 1940-1941 in the Middle East were too high. These rates were 35.21 per 1,000 in 1940, and 48.46 in 1941; for these years the corresponding rates for all forms of infectious disease (including the venereal) were 275.09 and 219.67. These rates for venereal disease were certainly much lower than the 79.89 per 1,000 experienced in the First A.I.F. in Egypt in 1916, but, as the Consulting Physician to the Second A.I.F. in the Middle East pointed out in May 1941 in a review of the position, the incidence was "unnecessarily high and caused a constant drain on man-

power". It should at once be realised that even these rates as quoted understate the true incidence, for military statistics are based on bacteriological confirmation. The so-called "non-specific" urethritis, which will be fully discussed later, is responsible for a fallacy. Though usually no less of venereal origin than proven gonorrhoea, and probably due to several causes, it is excluded from most statistical surveys, or treated as something apart from those diseases which have an undisputed aetiology. A War Office letter of 5th October 1940 directed that when doubt existed a diagnosis of "urethritis" only be made, and classed as a disease of the generative system. At the time when the high incidence of these diseases was disturbing the officers of the A.I.F. Headquarters Middle East a survey of the period April-August 1941 showed that of 327 cases of officially proven venereal disease 15 were classed as syphilis, 151 chancroid, 144 gonorrhoea and other varieties 17, but 243 cases of "non-specific urethritis" occurred during the same time.

The loss of men from training and military operations caused a good deal of uneasiness, for the average time then spent under treatment was nearly four weeks, during which the men were virtually useless. Men from combatant units were keener to be cured and to rejoin their units than troops from base or depot units. Naturally a higher proportion of patients in special hospitals came from the latter, as the best and fittest men were soon reabsorbed into their own units. It was impossible to overlook the reasons for the considerable incidence of these diseases. The cities and towns of Palestine with their mixed populations were full of temptation for soldiers on leave. Prostitution, though officially discouraged in the Jewish cities, was a major problem, and even hygienic control was most untrustworthy as a preventive measure. Cairo and Alexandria were worse, with a large prostitute population, practically all infected. Even placing the worst areas out of bounds was a measure difficult to enforce. Syria and Lebanon introduced a most difficult problem, again with mixed populations, and with an inheritance of easy-going methods tolerated under the previous regime. In Greece, before the swift campaign gained impetus, it was noted that syphilis was not infrequent amongst men reporting with infections. Even in Crete in May 1941 during the early lull considerable numbers of men were found to require attention for venereal disease.

Up to the summer of 1941, an average strength of 76,000 troops in the A.I.F. produced about 40 cases of venereal disease per 1,000 per year, excluding non-specific urethritis, the inclusive rate being 67 per 1,000.

During the occupation of Syria the venereal risk continued; the rate for 1942, when little more than one A.I.F. division was in the Middle East, was 47.22 per 1,000 per year. The A.D.M.S. of the 9th Division A.I.F. (Colonel H. G. Furnell) reported at the end of March 1942 that the problem in Syria was still a serious one "especially with the Australians who appear to be either more promiscuous or more careless". There can be no question that alcohol played a part in lessening caution and control.

The measures taken to counter these diseases included educational activities, intimate group talks with men, amenities for sport and diversion, physical training, discipline through control and penalty, prophylactic centres in all more or less settled areas, availability of preventives on request, and control of prostitutes. Sometimes it was possible to identify infected persons and to hand them over to civil police. Educational methods included the issue of special pamphlets to men going on leave, emphasising the importance of preventive measures, and the giving of addresses of prophylactic centres where these were available. Later, strip films were distributed through the Services and were found most valuable. Discipline through curtailment of pay to men with venereal infection was the subject of much discussion. Soldiers soon realised that "non-specific urethritis" was not visited with loss of pay, and surreptitiously took tablets of sulphonamide drugs to mask the true diagnosis of gonorrhoea. The headquarters of the A.I.F. in the Middle East sanctioned an order which imposed forfeiture of pay on men who had contracted the disease otherwise than accidentally in the course of duty, or in a congenital form, and then only after 35 days. This encouraged men to report early, and was of undoubted value. In June 1941 this order was cancelled by order from army headquarters. In 1944 following the practice of the navy, the measures laid down in this A.I.F. order were adopted as uniform practice by all Services.

Experiments in control were carried out in Palestine and Syria in 1941 and 1942. Immediately after the fighting ended in Syria steps were taken to control brothels in Tripoli, Latakia and other centres. Colonel F. Kingsley Norris, A.D.M.S. of 7th Division A.I.F., reported fully on the experiences of this division over a period of fifteen months in the Middle East. All the measures described above were vigorously pursued. Preventive outfits were issued free on request from most aid posts, in some units a nominal charge was made, but all did not agree with this principle. The siting of prophylactic centres in some cases negated their value, for example in police barracks, but improvements were soon made. In Beirut during 8 weeks when leave was granted no less than 18,000 attendances were registered at the divisional prophylactic centre. This is a horrifying figure, yet venereal infection occurred only once in each 443 attendances. In the Tripoli experiment 134 cases of suspected venereal disease occurred out of 13,500 troops in a period of 12 weeks. The extent of the social and medical problem is made even clearer by the fact that there were in Tripoli over these weeks 11,955 attendances in known and controlled brothels. These brothels were practically free of venereal disease, particularly of chancroid. Since chancroid was the commonest cause of admission to the 14th Australian Special Hospital at Bhamdoun, at this time, there seems little doubt that many of the overt infections were derived from other sources in the villages. Figures for venereal disease infection in Palestine in the 1914-1918 war are of course not comparable, as the conditions were not the same, but an average proportion of 1.13 per cent was constantly under treatment for venereal disease during that Palestine

Campaign, rising to a peak of 2.35 per cent. Even in bad areas like Latakia and Aleppo it was estimated that only 0.23 per cent of the force was affected in 1941-1942. Responsible officers believed that these figures would have been considerably greater if efficient prophylactic control had not been exercised. The most controversial feature of this was brothel control. This was done officially; women were tolerated only if under strict conditions of identification and examination. Gynaecological and bacteriological control was carried out, which at least would reduce risk of infection. The administrative difficulties were considerable. Similar medical control was carried out in the Jaffa-Tel Aviv area, with the help and cooperation of the Provost Corps, a most necessary adjunct in all areas. The institution of these precautions in Jaffa-Tel Aviv was followed by a drop in the incidence rate from 70-80 in November 1941 to 45 in January 1942. It is probable that increased attendances at prophylactic centres were largely due to the "voluntary compulsion" exercised by the men over their fellows, who were more swayed by public opinion than caution.

In October 1942, when the A.I.F. was soon to leave the Middle East, Lieut-Colonel D. B. Loudon reported from the 8th Special Hospital that in 1941, 5,774 cases of venereal disease had been admitted to this unit. He estimated that in the A.I.F. in the Middle East there had been 11,000 cases of venereal disease, 373 of which were due to syphilis. The average stay in hospital was three weeks. He considered that control of prostitution was only partly effective as the amateurs were at least an equal source of danger. Personal protection was rather illusory too, as the men would not use it, even if deterioration had not weakened the reliability of the outfits provided. Loudon proposed a venereal diseases control unit which could move to all units and areas as required. This could aim at abstinence as an ideal supported by educational propaganda, control methods of prevention, and see that early treatment was undertaken. Disciplinary action was suggested as a measure to be taken against men who took risks but refused prevention. The prophylactic methods then in use showed no advance on those of a generation before, and it was also proposed that skilled personnel only be employed who would carry out as an additional routine measure the injection of 5 per cent argyrol with a urethral syringe. These measures were never fully adopted, but the training of orderlies was vigorously pursued in special hospitals.

Turning to the clinical aspects in the Middle East, a difficulty early arose with the treatment of syphilis, as a period of eighteen months surveillance was required. For a time the men concerned were drafted into a special company attached to the special hospital, and used for guard duties. Once free from active contagion, they could have been returned to Australia, but so easy a back door of escape to home surroundings was undesirable. Where continuity of treatment could be assured in their units or neighbouring hospitals they were discharged to these units again, but could not well serve under conditions of active warfare. A certain number of bad characters always collected, usually awaiting court martial,

and for these a special compound was necessary. It should be noted that, although detention cells were necessary in special hospitals, disciplinary measures were seldom needed. Indeed, absence of patients without leave was not a frequent misdemeanour in these hospitals. In spite of administrative difficulties, the guard company did useful work. Treatment of syphilis at this stage was by arsphenamine (novarsenobillon) and "sulphastab", and as soon as available, after initial delays, bismuth.

Gonorrhoea was treated with sulphapyridine at first, over an average period of 13 days. Later sulphathiazole was obtained and was used instead. It is of interest that evidence of sulphonamide-resistance appeared as time went on: primary cures of gonorrhoea fell from 60-75 per cent in 1940 to 40-55 in 1942. Some local investigations were made into the causes of non-specific urethritis, but not much headway was made. Staphylococci, diphtheroids and trichomonas were often found, as well as other unidentified organisms, but there was no evidence that these played a causal part. Complications of the adnexa were fairly common, sometimes quite early in the attack.

A more scientific classification of urethritis was now suggested from the medical general headquarters in the Middle East: this recognised endogenous and exogenous forms, the latter including gonococcal, non-specific and chemical causes.

Pathological and serological facilities were developed at the 8th Australian Special Hospital in Palestine, greatly to the benefit of accurate and speedy diagnosis. The work of Major C. B. Cox in proving that guinea-pigs could be bred successfully in Palestine, not only made full serological methods available to special hospitals but benefited the pathological services of the A.I.F. in the Middle East.

The problem of venereal disease in other campaign areas will now be briefly outlined; then we may return to Australia and study the position there, with some evaluation of the whole question.

SOUTH-EAST ASIAN ZONE

In Malaya there was nothing unusual to record about venereal disease. In the pre-action phase the maximum incidence was fairly steady at 31 per week in 7,700 troops, though the arrival of a new brigade group raised this figure temporarily to 58 per week.

In Singapore after liberation from the Japanese a number of ex-prisoners of war suffered from chemical urethritis, due to self disinfection methods of undue potency. In spite of this a number of them, especially a group from Thailand, contracted various forms of venereal disease. Chancroid was not uncommon in the South-East Asian Area, and appeared in some of these repatriates. Treatment by sulphonamides was very effective.

THE SOUTH-WEST PACIFIC AREA

In the Pacific Islands venereal disease was not a problem because of lack of opportunity of acquiring infection, and the absence of settled areas

where soldiers might spend leave. The rates of incidence in the army were as follows:

	1942	1943	1944	1945
Strengths . . .	23,266	74,872	72,072	104,868
Rate per 1,000 . . .	2.33	1.06	0.36	7.69

Movement of troops confused the statistical issue somewhat, especially in the later stages of the war when the military operations fanned out over a wide zone.

In the brief campaigns against the Japanese in Borneo and related areas more infections occurred than in former island campaigns, for known sources of infection existed among natives in various areas in Borneo. A small number of cases of syphilis was recorded there, and trouble was experienced with sulphonamide-resistant forms of gonorrhoea.

After the end of the war, but while troops were acting as an occupation force, though often in a state of idleness, the rate of incidence rose sharply. Intractable forms of non-specific urethritis also appeared, unquestionably of venereal origin; even after 70 to 80 days of treatment by all methods, including the use of penicillin and sulphonamides, cure was sometimes not complete. Chemical urethritis was also seen in British Borneo.

IN AUSTRALIA

Venereal disease caused considerable anxiety in Australia by reasons of the risks run by servicemen on leave in towns and cities. The following table shows that there were reasons for anxiety:

Rates of incidence of venereal disease in the army in Australia				
	1942	1943	1944	1945
Strengths . . .	350,779	380,289	345,004	219,843
Rate per 1,000 . . .	18.93	16.85	13.18	17.08

Lieut-Colonel N. M. Gibson, Commanding the 120th Australian General Hospital, reported from the N.S.W. area that 85 to 90 per cent of the venereal infections in soldiers were transmitted by amateurs. This made control very difficult. The influence of alcohol in increasing the risks of exposure was also considerable. After a good deal of trouble prophylactic depots were established near all camp areas and in all centres of population. Special care was taken in the selection and training of the staffs. A high standard of cure was insisted upon. In fact it was higher than the standard officially exacted by service instructions, and some critics thought it too high. At this time the average stay in the 120th A.G.H. was 52 days, owing to the reliance placed on the complement deviation test. A steady rise in the incidence of syphilis also caused anxiety when it increased from 4.5 per cent in 1941 to 8.1 per cent of all venereal disease in 1942. Non-gonococcal urethritis was common, varying in different series from 45 to 60 per cent of all forms of urethritis; careful treatment was necessary as complications were not infrequent. Research was carried out in this hospital and elsewhere on the aetiology.

The public health aspects of venereal disease were discussed at representative conferences in Queensland and Victoria in 1942. The need for research was emphasised, also for standards of prophylaxis, diagnosis, treatment and social control. The latter was regarded as of particular importance and strong recommendations were made to the Commonwealth Government to pass regulations under the *National Emergency Act* which would give power to civil health authorities to detain and examine persons suspected of carrying infection. In September 1942 these regulations were promulgated, enabling control of carriers of venereal disease to be effected and prohibiting sale of such drugs and appliances as might be used in disorders of the generative system.

Early in 1943 a uniform statement was issued governing the prophylaxis and treatment of venereal diseases, and laid down standards accepted and used by all the Services. The navy and air force had experienced much the same difficulties as the army. There were, of course, certain differences in the navy. Medical officers called attention to the difficulties caused by overnight leave, which often meant that men reported too late to prophylactic centres. Isolation on ships was a difficulty. Lavatory accommodation was limited, so too was sleeping and messing space. In smaller ships such as destroyers these problems were particularly acute and though treatment was begun at once it was usually more convenient to transfer affected men to hospital when this was possible. Long stay in ports, as for instance when ships were refitting, meant inevitably an increase in venereal disease. Though improvements in outlook and in preventive methods had reduced the incidence over the previous fifteen years it seemed as if no systems of educative effort and prophylaxis could prevent a wave of infections at times.

Air force experience and methods closely tallied with those of the army; and special hospital accommodation was provided, sometimes in units also treating other infectious diseases, sometimes in combined service hospitals.

Details of the standard treatment laid down in 1943 need not be given here. They followed generally accepted lines. Diagnosis of syphilis depended on dark ground examination by a competent pathologist, and later on serological tests. Reference may be made here to the occasional difficulty in interpretation of Wassermann reactions in patients with malaria. In order to distinguish a strongly positive reaction due to malaria from one due to syphilis, a Kahn verification test was tried for a time, sera being submitted to army headquarters. This was not found satisfactory and was abandoned. Francis and Wannan found later that by doing a Wassermann and a Kline test at the same time the two infections could be distinguished. Malarial sera showing a strong Wassermann reaction were found to react feebly or doubtfully to the Kline test unless a syphilitic infection was also present. A ten weeks course each of arsenicals and bismuth, or preferably iodo-bismuthate of quinine was given, the former being repeated if the results of the serological tests were positive, and following with bismuth for twelve months. Disposal of men with syphilis was made according to the stage of the disease and the progress of treatment. Standards of

cure demanded that in early cases the result of the Wassermann or Kline test remain negative for twelve months; no man was discharged from hospital till declared temporarily non-infective. In later cases a special review was made by a board after a minimum of eighteen months treatment. Gonorrhoea was treated by one or other of the available sulphonamides, 2 grammes on admission to hospital, and then 1 gramme every six hours for five days. When sulphamerazine was made in Australia this was substituted, in 2 gramme doses twice daily. Some 20 per cent of these infections were found to be resistant to sulphonamides at first, and as time went on the percentage increased, probably owing to the organisms becoming sulphonamide-fast. Local treatment was given with permanganate of potash 1-1800 and 5 per cent argyrol or equivalent. Massage and sounds were used if adnexal complications ensued. The standard of cure included the examination of post-massage slides taken at the end of treatment and after hard physical training. Dilatation of the urethra and if possible urethroscopy were also carried out. Full information was given in the official booklet about chancroid, or *lymphogranuloma venereum*, which was of importance under service conditions. It responded well to sulphonamides, but patients needed enough observation to ensure that a syphilitic infection was not also present.

The only new method tried in treatment before the introduction of penicillin was the intensive treatment of syphilis by "Mapharsen" given in massive doses continuously over a brief period. Even limited experience had proved unfavourable. Francis and Wannan reported the results of treatment of patients with "Mapharsen" given for ten hours continuously over a period of five days. A death occurred in a series of forty patients so treated, the cause of death being toxic jaundice and encephalopathy. Therefore a ban was promptly placed on this method. In Technical Instruction No. 80 it was pointed out that the risk of fatal accidents varied with the intensity of the treatment. The risk was clearly tabulated as follows:

Duration of treatment	Incidence of encephalopathy	Mortality
5 days	1 in 100	1 in 200
10 days	1 in 100	1 in 300
12 weeks	1 in 1500	1 in 1500-2000
26 weeks	practically nil	1 in 5000

About the same time prophylactic procedures were the subject of a special instruction, which also gave specific directions for the unit monthly parades before a medical officer. Unit medical officers often found these parades useful also for educative purposes, to curb the foolhardy, and to discourage the dangerous practice of only reporting on the last day of leave. Control of venereal disease in the Australian Army was improved by the appointment of a director of venereology, Lieut-Colonel D. B. Loudon, attached to the medical headquarters, and assistant or deputy assistant directors in each area, according to its size and importance. Coordination between the Services and the civilian authorities was on

the whole satisfactory, though in some areas it was felt that more powers could with advantage be vested in the latter in dealing with suspected sources of infection. The Northern Territory had some difficult problems: in the Darwin area, for example, half-castes increased problems of control.

Early in 1944 Lieut-Colonel Loudon reported that there were still weaknesses in control in the army. No complete list of prophylactic centres was available, there was a lack of publicity concerning these, procedures were not always well carried out and methods of training for orderlies did not always conform to a high standard.

When the women's services increased greatly in numbers and were widely diffused over Australia and many forward bases it became necessary to make some provision for the treatment of venereal diseases amongst them. It was not expected that this need would ever be more than minor in degree and experience confirmed this. Among the nursing services these infections were unknown, and in other services the incidence was very small. The highest incidence reached was in Queensland, which was a centre of intense and constant movement with a high military population; it never exceeded 8 per 1,000 per year there for a limited period. The factors concerned no doubt included a fear of publicity, but most important was a higher sense of responsibility, and better educational standards in matters relating to hygiene. The best prophylactic measure was found to be education in personal hygiene.

Special standards of diagnosis, treatment and standards of cure were laid down; these were thorough and included rigid bacteriological control. A woman who refused treatment was not retained in a service. Provision was made for hospital accommodation in special annexes to general women's hospitals.

Before considering the changes wrought by penicillin, we may return briefly to the subject of research, especially into the bacteriologically vague groups of "non-specific" urethritis. In several capital cities investigations were carried out. At the 120th Australian General Hospital in New South Wales 4,000 cases of urethritis were surveyed. Of these half were non-gonococcal. Fifty-one per cent of these were characterised by profuse purulent discharge and many bacteria, chiefly Gram-positive. Forty-nine per cent had some pus but no bacteria. Practically all of these two groups were of venereal origin. A few were due to chemical or traumatic causes. In half the total number organisms of presumed importance as infective agents were found and as similar organisms were isolated from the cervix of infected women a causal role seemed reasonable. The remainder were of obscure origin, consistent with a virus infection. It was from this group that pleuropneumonia-like organisms were isolated. Klieneberger recorded finding these in the human vagina and this work was repeated in Australia.

G. A. W. Johnston at the 120th Australian General Hospital recognised several clinical types of infection, ranging from a mild anterior urethritis to severe purulent conditions often involving the posterior urethra and the prostate. Inclusion bodies were demonstrated in epithelial cells in a number of these, organisms of the pleuropneumonia type. The question arose

whether these acted as secondary excitants or as the primary infective agent. Similar organisms were found by G. A. W. Johnston and Jessica McEwin in exudates.

W. I. B. Beveridge had reported from the Walter and Eliza Hall Institute in 1943 that these organisms could be demonstrated in 6 out of 24 men selected by Squadron Leader K. McLean as having non-gonococcal urethritis. Beveridge and Campbell and Lind carried out complement fixation tests against these organisms; the isolation by culture was also made from 20 per cent of cases of "non-specific" urethritis, and from the genital tract of 17 per cent of normal women examined. The significance of these findings was not certain, but they were consistent with the disease being due to organisms resembling the pleuropneumonia virus, on the analogy of known facts concerning carriers of other diseases. Beveridge found at the Walter and Eliza Hall Institute in 1944-1945 that of 70 cases investigated most were mild in nature, unlike severer types previously seen. The incubation period was about 1 to 3 weeks. Pleuropneumonia-like organisms were found in 14 of these, but none in normal controls.

W. John Close pointed out that quite apart from any suggestion of venereal disease or its complications, a mild chronic vesiculitis of non-specific type was not uncommon in the civil community. Other writers, W. E. Coutts and R. Vargas-Zalazar, have also described a form of abacterial pyuria which appeared to originate by ascending or descending infection of the urinary tract. It has been suggested that the causal agent might be a virus, a spirochaete or other protozoon. The presence of spirochaetes had been recognised in such conditions for a number of years, and successful results have been obtained by injections of arsenic. However, the lack of success of such treatment at the hands of some observers and the varied morphology of spirochaetes make for caution. It is possible that abacterial pyuria may ensue from urethral infection and from blood-spread from another focus. Whether there is a constant cause or not, virus, spirochaete or trichomonas, arsenic seems worth trial. Reference has been made to Reiter's syndrome in the section on infections of the urinary tract. It is mentioned here again in passing, and it may be pointed out that this loosely classified syndrome could hardly be regarded as always causally related to an infection of the lower urinary tract, since so few instances of it were seen among the large numbers of men with urethritis of various causes.

PENICILLIN IN VENEREAL DISEASE

Penicillin has changed the whole therapeutic outlook in the venereal diseases. The end results of treatment of syphilis, particularly with regard to complications affecting the cardio-vascular and nervous systems cannot yet be stated with finality, even though clinicians are less mindful now of latent syphilis. Nevertheless the value of this antibiotic in both gonorrhoea and syphilis was soon established; treatment was simplified and made safer, with the lessened risk of heavy metals. The time lost in hospital was also much reduced. Early use of penicillin for syphilis was based on

a total dosage of 3,000,000 units, 40,000 being injected every 3 hours. Later it was found better and much easier for patients and staff to give 250,000 units twice daily for 8 days, a total of 4,000,000.

Army Technical Instruction, No. 125, was issued laying down the standard treatment for syphilis by penicillin and bismuth. All patients with fresh early infections were so treated, and those whose treatments had begun with arsenic were switched to penicillin. The danger of Herxheimer reactions in nervous and vascular syphilis was stressed, and the conventional preliminary course of bismuth and iodides for six weeks was advised, after which penicillin was given, or before if advised by a senior officer. Bismuth was continued bi-weekly after the penicillin. This method allowed the time in hospital to be reduced to about three weeks, after which the patients could usually be transferred to a works company or similar unit, and attend hospital as an outpatient. The period of observation and treatment was then in all eighty-three weeks. The rapid resolution of all obvious lesions was one of the features of penicillin therapy.

Some of the problems of gonorrhoea resistant to sulphonamides were solved by penicillin, and the creation of sulphonamide-resistant strains lost its previous significance. The carrier state was also found to be much less common than with sulphonamides only. The later introduced slowly absorbent preparations of penicillin have also simplified treatment. Even in the latter stages of the war the great saving of manpower previously lost in hospital for venereal disease was considerable. Three hundred cases were observed in initial trials before penicillin was officially adopted for the treatment of gonococcal infections. In this series 90 per cent were clinically and bacteriologically cured by 100,000 units, this percentage rising to 95 per cent with 200,000 units. The addition of sulphamerazine twice daily for 5 days raised the percentage to about 100 for acute infections. The necessity for adequate drainage of the urinary tract of course remained. It was found that relapses were due to insufficient surgical drainage as a rule and in a small percentage only to penicillin-resistance. Penicillin lowered the risk of epithelial damage with change from normal columnar to squamous epithelium caused by organisms resistant to other drugs. Severe complications lessened in number. The same standards of cure were of course necessary. In women penicillin was found valuable, especially in those forms of infection difficult to eradicate by ordinary means. Special investigation in civilian clinics in Queensland and elsewhere showed this in 1944. *Lymphogranuloma venereum*, though uncommon in Australia, was seen in aborigines at times, and Major F. Boyd Turner found at Alice Springs, where the military hospital undertook all local medical treatment, that good results were obtained with penicillin.

Technical Instruction, No. 104, described the results obtained by using penicillin, and directed that it would be used only for patients who had proven gonorrhoea, or a previous history thereof, and for those with acute anterior infection, with or without the presence of organisms. The combined use of penicillin and sulphamerazine was found in one hospital to

reduce the average stay in hospital from fifty days to less than one half of this.

One other remarkable improvement may be mentioned in the treatment of venereal warts (*condylomata acuminata*). The unsatisfactory nature of operative treatment was accentuated by delays in convalescence. Local application of finely powdered podophyllin resin 25 per cent in liquid paraffin was found to be very satisfactory, and was officially adopted. Pain on application was seldom troublesome, and one to four applications at intervals of four days were usually successful.

A review of the venereal diseases during the war period gives rise to considerable satisfaction from the scientific point of view. Suffering, danger of complications or of risk of transmission of infection have undoubtedly been lessened. The future lot of that most unfortunate innocent subject of the disease, the infected infant, is much happier. It is hard to estimate the changes that have taken place in the impact of these diseases on a civil community. We know that the same improvements have taken away much of the danger and not a little of the fear from men and to a less extent women. The perceptible increase in the percentage of syphilitic infections in the community has been disturbing: possibly the rapid sterilising effect of modern drugs will cause this to fall in the future.

But underneath the medical achievements what changes have been effected in the social milieu? Is it any less difficult to build a sure edifice of prophylaxis on a moral basis? We have seen that evil opportunity waits for many, aided by such influences as alcohol, distance from home, lessened amenities, personal risk in war, and now the relative ease with which cure of venereal disease can be accomplished. Though we are really only concerned with the period of an actual state of war in this history, it is apposite to quote one instance from the experiences of the British Commonwealth Occupation Force in Japan. During part of 1946 Australian troops, though only 25 per cent of the total force, supplied 73 per cent of the venereal disease. There were no doubt intrinsic causes for this high incidence in the men themselves, but there was reason to believe that the publicising of sulphonamides and penicillin have not helped to reduce the incidence of venereal disease.

Though all medical instructions designed to prevent venereal disease attempt to build on the sure foundation of continence and personal responsibility, it is evident that neither such considerations nor those of caution or fear will act as deterrents. During the war remonstrance came from members of the public based on objections to encouraging men to be incontinent without risk. Most medical men will probably admit that to place the armamentarium of protection in a man's hands is open to serious criticism, chiefly because it is in practice often futile. The work of prophylactic centres, if of a high standard, and carried out in the atmosphere of a clinic is based much more soundly, and has been remarkably successful. It is essential for complete success that all procedures are carried out by the attending trained orderlies and never by the soldiers personally.

That a purely medical outlook on venereal disease is undesirable may freely be conceded. There have been definite advances and improvements in the prevention and treatment of venereal infections during the 1939-1945 war. Frankly, these have been based on solely medical issues, and we must admit that little has been accomplished from the moral standpoint. This the doctor, like other citizens may deplore, for he too is concerned with the moral issues. But it is none the less his duty in war to lessen suffering, and to keep men fit for their military duties, using the gifts of science towards these ends.

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