velop to the cercarial stage, which is infective for man and other mammals. The cercariae, as opportunity affords, penetrate the skin of the human host, and after a prolonged cycle of development, appear as sexually distinct trematodes in the radicals of the portal vein.

The prevention and eradication of the disease may advantageously be considered from two aspects: first, its eradication in endemic areas, and second, prevention of its introduction into non-infected districts. Eradication in endemic areas is complicated by the agricultural customs of the various tropical and Oriental lands of its occurrence. To illustrate, the paddy field system of cultivation in China and Japan, together with the use of night soil for fertilizer, constitutes one of the most serious sanitary problems of these countries, not alone for schistosomiasis, but also for hookworm and other parasitic and bacterial diseases, such as the typhoid group, cholera and the dysenteries. The paddy fields are well-nigh universal, which means that all tillable land is terraced into small level patches with surrounding dikes, and the water overflowing from one small field to the one below it. This affords an excellent and thorough distribution of infection present in the fertilizing material. The farmers work barefooted, often being knee deep in the mud and water. In the water lily and lotus fields they are almost immersed in the muddy water. The fields are heavily fertilized with human excrement, a system of conservation which, in modified form, will undoubtedly obtain eventually in the west. One of our great economic wastes is the non-utilization of this great source of plant food. Here, as in many other things, we can take example to our advantage from the lands of the east. In the paddy fields, then, is found an excellent culture bed for pathogenic parasites and a well-disposed system for their wide distribution.

Leiper found that schistosome cercariae die almost at once in a 1.1000 solution of sodium bisulphate. He advises that unfiltered water containing cercariae can be rendered safe for drinking and bathing by heating to 50 degrees C., by storing at least 48 hours, which exceeds the survival period of the cercariae, and by adding disinfecting agents, such as sodium bi-sulphate in 0.1 per cent. strength.

In the case of Schistosoma Japonicum, Katsurada has shown that the eggs will die, or hatch miracidia which will die, within ten days. Storage for this length of time would, therefore disinfect the material, and would not be objectionable to the Oriental farmer, who already knows that the fertilizer is enhanced in value by maturation and decomposition. It has constantly to be remembered that native customs and methods cannot be easily and often cannot be safely changed. This fact is the major sanitary problem of the tropics. Eradication of schistosomiasis in endemic areas is no small task, and the means to be used must be elaborated more or less independently in each district.

From our standpoint, however, the problem of prophylaxis resolves itself into preventing the creation of new endemic areas. In the United States the cases, so far as known, have been sporadic and imported. As illustrated in those here reported, the chronic carriers of the infection are discharging ova in unlimited numbers through long periods of time. Provided an appropriate intermediate host is available, these ova will at once develop into the dangerous infecting cercarial forms. The problem, therefore, becomes the question whether, in the United States, are found molluscs capable of acting as intermediate hosts. This is a public health problem of some importance. If intermediate hosts are found in the United States, then every case of schistosomiasis should be rigorously quarantined and the stools disinfected, and all immigrants from endemic areas should be examined to detect carriers. Alien carriers ought to be excluded. If a proper survey of the molluscs of the United States shows no probable host for schistosoma, then the imported cases of the disease are harmless and may safely be disregarded. It is to be hoped that such a molluscan survey can soon be undertaken.

350 Post street.

VENEREAL DISEASE CONTROL IN CALIFORNIA*

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The Surgeon General's reports [1] show that as high as one-fourth of the total sickness in the Army has in the past been due to venereal disease. In an army made up for the most part of trained men, during times of peace when the incapacitation of a certain number of men mattered not so much, even this amount made these diseases one of the real problems of the Medical Corps.

In contrast to this, consider how the problem increases when, in the twelve-week period following the mobilization of our new Army,[2] venereal diseases were almost five times as prevalent as all other communicable diseases put together. The figures for the annual admission rate per thousand for this period were—for venereal diseases 121.9; for other communicable diseases 25.7. Under communicable diseases are included pneumonia, dysentery, typhoid, paratyphoid, malaria, meningitis and scarlet fever; measles is not included.

The point to be especially emphasized is that this rate occurred at a time when large numbers of new men were undergoing intensive training; when incapacitation was fatal not only to the training of the individual, but also it retarded decidedly the training of the group of which he was a part. In this same twelve-week period (2) previously referred to, there were reported from 31 cantonments 21,742 new cases of venereal disease. In a communication [1] received by the

* Read before the Forty-seventh Annual Meeting of the Medical Society, State of California, Del Monte, 1918.

(1) Syllabus of an address to assist company commanders in the instructions of their men in the knowledge of venereal diseases. Issued by the Surgeon General. Page 2.

(2) Based on figures and reports from Surgeon General's office.

Bureau of Venereal Diseases about March 1, was the statement that since war had been declared against Germany, over 30,000 men in our Army had been on sick report because of venereal diseases; it was estimated that this resulted in a loss of more than five hundred thousand days of military training besides the cost of treatment. The figures obtained at the time of the mobilization of the National Army in September and October, 1917, should appeal above all others to civilians. Here the rate is based decidedly upon the incidence of these diseases in civil life. In the week ending September 28, 1917, the National Army records show the unprecedented rate of 388 per thousand per year. This should demonstrate the need, particularly at this time when the United States is contemplating an army of four or five million men, of suppression and control of venereal diseases in the civil communities.

In attempting the solution of the problem of venereal diseases, the complexity of which must be recognized, it will be impossible in the time allotted to this paper to deal in detail with all phases of the control of syphilis and gonorrhea. It may, however, be approached from four points:

1. Control of the Carrier.

Many physicians who are interested in venereal diseases have said they were concerned only in the medical phases of the subject; the moral and sociological sides not concerning them. In this way they have attempted to dodge the issues of prostitution and alcohol. In dealing with this problem from a public health standpoint, physicians must interest themselves in all sides of the problem. Prostitution is essentially a matter for the courts to deal with, but history has shown that until the civil authorities have been taught to recognize the relationship of prostitution to venereal disease, no adequate action is taken by them. It is therefore necessary to be concerned not only with the medical diagnosis and treatment of prostitutes, but by demonstrating to the civil authorities the amount of infection in these women to urge upon them adequate enforcement of the laws against the business in general.

In a paper read before the San Francisco Medical Society and published in the March issue of the California State Journal of Medicine, Sperry has gone into many of the details of the plan for control of this group of infected persons, so that at this time it is desirable to emphasize only the need of enforced quarantine. So far as prostitutes as a class are considered, when found diseased quarantine must be rigidly enforced, otherwise it will avail little to give them medical treatment, especially from the standpoint of gonorrhea. Attention must be called to the fact that unless adequate provision is made by the State to prevent these women from returning to their business, the medical efforts are wasted, inasmuch as they almost immediately become reinfected. It is necessary, therefore, that there be adequate facilities provided for the three classes of prostitutes; that is, for the feeble-minded—permanent care, for the confirmed offender—long commitment to reformatories, for the young girl—rehabilitation by social service agencies.

The commercial prostitute is a prolific spreader of disease because she nearly always has gonorrhea, perhaps chronic in nature, and if allowed to practice her profession openly she daily exposes from ten to twenty or more patrons. From the standpoint of syphilis she is not so important, as she contracts it early and thereafter may take sufficient treatment to keep the disease under control. Clandestine prostitutes are a danger, not so much on account of number of persons they individually expose, but because they are more numerous, and being youthful offenders, are more likely to be acutely infected and less informed as to the care of themselves and their patrons.

With commercialized prostitution the burden of blame rests on the woman, as she more frequently solicits the man; exception should be taken, however, to the pimp and the panderer who exploit her. With clandestine prostitution the man and woman alike should feel the weight of the law, and it is certain there would be fewer such exposures if the man could also expect a jail sentence or hospital quarantine for his syphilis or gonorrhea. The question of commercial prostitution is becoming of less consequence in our campaign, as there are now not many cities which tolerate open or licensed houses of prostitution. In this regard, Riggs[3] of the Navy found that at the naval station at Norfolk, Va., when there were 80 commercialized houses of prostitution in that city, 85 per cent. of the infections were due to commercialized vice.

Facilities for Free Diagnosis and Treatment.

There is a very large number of patients afflicted with venereal diseases who cannot afford to pay for adequate treatment. These patients are not treated at all, or they apply to the druggist and are supplied with nostrums, or they are insufficiently treated at the hands of private practitioners. Emphasis should be placed on the fact that a small amount of treatment with these cases does little good from a public health standpoint; this is of course more true with gonorrhea than syphilis, since it is infectious as long as it is present; whereas syphilis may possibly be rendered temporarily non-infectious. The great need is to place each patient in a condition so that he will not be a danger to others; this means, generally speaking, a cure. The man or woman, then, who can only afford to pay for a little treatment should be sent at once to a dispensary or hospital where they may receive sufficient treatment. This brings up the need for increased hospital and dispensary facilities. In many cities of forty or fifty thousand people there are no free dispensaries. It is to be hoped that this campaign against venereal disease will demonstrate the need not only of facilities for these diseases, but for others as well. When these dispensaries are formed, they should be standardized according to the regulations of the State Board of Health.[4] There should be adequate social service facilities provided so that cases will be carefully followed up and not al-

(3) Venereal Prophylaxis in the Navy. Riggs, Chas. E. Journal Social Hygiene, July, 1917.

(4) See Special Bulletin No. 24 for venereal disease control. Published by the California State Board of Health.

lowed to neglect their treatment. Inasmuch as many physicians, especially in the smaller communities, have not the means at hand for laboratory diagnosis, this has been provided free by the State.[5]

3. CONTROL OF PRIVATE PATIENTS.

Adequate provision must be made for the control of private as well as indigent patients. This necessitates the passing of laws or of rules and regulations by the State Board of Health under which these patients can be required to take the necessary amount of treatment. There should be a system of notification, identifying in some way those persons venereally diseased, providing for the reporting of the name and address when under certain circumstances the patient permits himself or herself to become a danger to others. Health officers should be responsible for the control of these individuals when they are reported. The rules should also state the responsibility of parents and guardians for the compliance of minors. Many physicians believe that notification is bad, inasmuch as they think it will have a tendency to drive patients away from them and into the hands of druggists and quacks. The public in general and patients in particular should be informed carefully that these reports are absolutely confidential, and that so long as they continue treatment and conform to the necessary rules their names and addresses need not be divulged, and that even if that be done the health officer's record is also a private and confidential one. Rules should be passed preventing the counter-prescribing by druggists, or the sale of any preparation or nostrum to be used in the treatment of gonorrhea or syphilis. England's venereal disease act of 1917 embodies these principles. We also believe it will be possible by a campaign of education to practically put the quack out of business. The control of these cases depends entirely upon the hearty co-operation of the medical profession, both individually and collectively, and it is to be hoped particularly at this time when all of us are anxious or should be anxious to do everything possible by way of war service that physicians will pledge themselves to this co-operation.

4. EDUCATION.

The systematic education of both laity and physicians to the dangers of these diseases, to their prevalence and the needs of adequate treatment, is perhaps the most important of any single method of attack. This must include talks to girls and boys on sex hygiene by proper persons, talks to mothers and fathers, the distribution of literature and the placing of exhibits, the stimulation of provision of proper recreational facilities in communities now without any, and the greater use of those at hand. Proper education will do much to prevent the individual from becoming infected, to stop the recruiting of prostitutes and to bring under treatment those persons already infected. It is necessary to teach parents to supervise more carefully their children's conduct; it is necessary to obtain more women police and better juvenile detention homes; it is necessary to prevent sex immorality and to insist upon the single standard of morals in order that the venereal diseases may be as readily prevented as other communicable diseases.

WHAT HAS BEEN ACCOMPLISHED IN CALIFORNIA.

With these four points of attack as a basis, what has been accomplished and is being done in this campaign? It should be understood that the Bureau of Venereal Diseases does not pretend to take credit for all that is being accomplished. Those things are stated which are the results of the campaign in which the Bureau has taken an active part.

Law enforcement is now being actively carried out in every large city of the State. This means that police departments are seeking evidence against places conducted as houses of prostitution, that prostitutes are being apprehended, that district attorneys are generally making use of the red-light abatement law, and that police judges are giving jail sentences to guilty offenders. In many small cities there were still segregated districts where houses of prostitution were allowed to run openly. During the past six months these places have been closed. In each instance our Bureau has attempted to see that all inmates were properly examined, quarantined and treated. That this has had a marked effect on reducing the problem is shown by the police court records of San Francisco, where, in the Women's Court in October, before the campaign started, nearly 400 women were charged with crimes of moral turpitude, whereas, in February, only 85 appeared in court. This in spite of the fact that not only an efficient morals squad is continually working, but many federal investigators as well. The reduction in the number of prophylactic treatments in the various military and naval stations through the State is suggestive of the decrease in number of exposures resulting from the suppression of the prostitute.

In connection with this work, San Diego has appropriated over $25,000 for building, equipping and maintaining a special detention hospital. The medical work is done by a special staff organized under the Health Department; the hospital has thirty-two beds. Los Angeles has also equipped and is maintaining a special detention hospital. So far, about $30,000 has been appropriated, and it is under the charge of a special staff of the local health department.

San Francisco set aside a special ward in the San Francisco Hospital for isolation of these court cases and organized a clinic at the jail for examinations. In Oakland, Sacramento, San Jose, Fresno, Bakersfield and many smaller communities arrangements have been made for examination and isolation of these patients in the county hospitals.

In San Diego, Los Angeles and San Francisco arrangements have also been made for the examination, diagnosis and treatment of all prisoners in the city and county jails. Nearly 20 per cent. have been found to have syphilis when Wassermann surveys were completed, and nearly 50 per cent. to have syphilis and gonorrhea.

All military and naval stations in the State re-

(5) Containers may be had by application to State Hygienic Laboratory, Berkeley, Cal.

port sources of infection to the State or local health authorities and a definite effort is made to apprehend and place the infecting individuals under treatment.

In England the expense of venereal disease clinics is lessened for the local communities by a subsidy from the Government to the extent of 75 per cent. of the cost of establishing local clinics. Such a plan as this has not been necessary in California. The Bureau is distributing free salvarsan for syphilitics, and this undoubtedly has resulted in getting more people treated. This, of course, is not in itself sufficient to insure the desired result, namely, the cure of every syphilitic, Up to April 1, 1760 doses have been distributed.

In San Francisco, in addition to the facilities for treating court cases, the five emergency hospitals have been opened for treatment of venereal disease cases.

In Los Angeles the County Hospital now admits all acute cases of syphilis and gonorrhea needing hospital care. A clinic has been organized in the County Jail, in which all prisoners are examined and treated. The dispensary already in operation as a men's night clinic has been given more rooms and equipment, and the service is now extended to women as well as men.

In Fresno the County Hospital is paying special attention to venereal disease patients; a social service department has been inaugurated which is in charge of follow-up work, and up to March 1 a total of 35 patients were being treated for syphilis. Fresno has enlarged its municipal clinic to include venereal diseases and has now a well-equipped department, with excellent laboratory facilities and a social service department. The dispensary is open two nights a week, as well as during the day.

In Bakersfield the supervisors have agreed to supply funds necessary to devote a ward of the County Hospital to venereal disease, and to supply the present County Physician with an assistant, who will take particular charge of this work.

Plans are under way for the opening of a municipal clinic in Stockton, Oakland and Riverside. Arrangements have also been completed whereby infectious cases can be treated under the direction of the local health officers, this particularly in small communities, salvarsan to be supplied by us on their requisition.

As an emergency, the Bureau has been able to offer the services of the State Board of Health laboratory to all army and navy posts for Wassermann tests. Many camps have taken advantage of this, as laboratory facilities in the camps have been insufficient. For several years California has had a law requiring reporting of venereal diseases, but only by initials or office number. In October these rules and regulations were amended to better cover the situation, and again at the March meeting amendments were made so that at the present time the rules and regulations conform generally to the standards suggested by the Surgeon General's office, and are being adopted by other States.

Briefly, notification is required by serial number furnished by the State Board of Health, said number to be made a part of the physician's record of the case. If the patient lapses from treatment, the name and address are to be reported to the State Board of Health. Provision is made for the compliance of minors as well as for preventing druggists from prescribing for these cases.

Patients known to be in an infectious condition and so conducting themselves as to endanger others may be placed under quarantine. A further explanation of the rules and regulations will be made in a circular letter to be addressed shortly to all members of the profession which will be the inauguration of a definite campaign to enforce the law in this regard.

The Bureau has issued and distributed to physicians several thousand copies of a pamphlet on syphilis and its treatment. A pamphlet on syphilis and gonorrhea, with information and instruction to patients, has been issued and over 10,000 distributed. There is now a rule that every such patient shall be given one of these pamphlets. Members of the staff of the Bureau are frequently asked to address clubs or other groups of men or women, and this offers opportunity for considerable educational work. Plans are being made for definite courses of lectures in various parts of the State, and an exhibition is being planned which will tour the State. There will be an attendant, who will answer questions and give advice. A particular effort will be made to advertise in each place the local dispensaries. Literature will be distributed.

The Bureau has co-operated with the Commission on Training Camp Activities by arranging for physicians to give supplemental lectures in the army and navy camps. These men are officially accredited by the Commission and the Bureau pays their expenses. The lectures follow a standard syllabus issued by the Surgeon General's office and are illustrated by stereopticon slides. Up to date such lectures have been given at Camp Kearny, Camp Fremont, the naval training stations at San Diego, San Pedro, Mare Island and San Francisco. It is estimated that not less than 45,000 men have been reached by these lectures.

The Bureau has purchased and is lending a stereomotograph to the Army. This is at present at Camp Kearny. It shows automatically a series of 52 slides illustrating much of the pathology of syphilis and gonorrhea, and giving considerable information in reading material. It has been in use for several weeks, and the entire command will have had opportunity to benefit by this instruction. The psychology of this method of presentation is excellent, and Colonel Murray, the Division Surgeon, has expressed himself as particularly pleased with it. Several thousand placards for use in comfort stations and latrines have been issued by the Bureau. These have been supplied to Camp Kearny, Camp Fremont, Army Aviation Camp at North Island, San Diego; Presidio, San Francisco; Fort Winfield Scott, Mare Island, Naval Training Stations at San Diego, San Pedro and San Francisco. They contain a few brief statements concerning syphilis and gonorrhea, a warning against quacks and fakers, and drug store treatment, and in the case of those supplied to civil communities directions as to where free treatment and advice can be had.

In conclusion, we desire again to emphasize the need of recognition of the complexity of the venereal disease problem. A determined and a continuous campaign must be waged against commercialized prostitution, as it passes from the segregated district and the open brothel to the hotel, rooming-house, automobile and roadhouse. And with all of these there is the street-walker. Energetic and willing civil officials can reduce both the volume and the intensity of this traffic to a minimum, and infections will decrease as the source is made inaccessible. Adequate facilities for diagnosis, treatment and control must be at hand for every class of patient. The knowledge of the prevalence, dangerousness and need of long-continued treatment must be spread broadcast. The role of liquor and idleness and the lack of clean recreational facilities should not be forgotten. The complete success of the work depends very much upon the closest co-operation of all concerned, and not upon the activity of any single group.

LABORATORY TECHNIQUE CARRIED OUT IN STUDIES OF LOBAR PNEUMONIA IN BASE HOSPITAL LABORATORY, CAMP LEWIS, WASH., WITH REPORT OF SUBSTITUTION OF RABBITS FOR WHITE MICE, IN DETERMINATION OF PNEUMOCOCCUS TYPES.

By CAPTAIN KENNETH J. STANIFORD, M. R. C. (Fresno, Cal.), Chief of Laboratory Service, Base Hospital, Camp Lewis, Wash.

Pneumococcus Type Determination is being carried out in this laboratory, both by agglutination and precipitin reactions. Experience has shown that of the two procedures, the precipitin reaction offers numerous advantages over the other, and is of such delicacy as to justify its routine use alone, in type determination, in the event that mice or rabbits are not readily obtainable.

It has been found in this laboratory that rabbits can be very satisfactorily substituted for white mice for agglutination tests, these animals having been used here for several months with excellent result. Half-grown rabbits are most suitable. The use of food animals is an objection to which we have given due consideration, but the importance of the work in question seemed to us to be sufficient justification for their employment at a time when white mice were not obtainable.

It is the intention to use precipitin tests as routine in the future, and to make use of rabbits only when it is thought there is special indication for more exhaustive study.

In order to expedite the laboratory work which is of diagnostic, prognostic and therapeutic value in relation to the respiratory infections, the following procedure has been instituted by the laboratory:

All laboratory examinations of specimens from cases of pneumonia—particularly lobar pneumonia—including sputum, urine, blood (cultures and counts) and pleural effusions have been made by a "Pneumonia Unit" of workers rather than in various departments of the laboratory, which would necessitate getting the different reports together later, and offering the probability of confusion. In the present "unit," the work is centralized and the workers are consequently familiar with the various phases of the case in point. This provides a standardized routine, which functionates as follows:

A. The laboratory is notified immediately upon admission to a ward of a case with a tentative or absolute diagnosis of lobar pneumonia.

B. One of the unit workers at once provides a sterile petri-dish and gives proper attention to the securing of a satisfactory specimen of sputum.

C. Another unit worker makes, immediately, a complete blood count and takes blood for a blood culture.

D. Instructions are left with the ward-master to send a specimen of urine to laboratory at earliest possible moment. (Special containers are provided for this purpose, and it has been so arranged that the laboratory office clerk, upon receipt of such container with urine, delivers it directly to the unit, and not to the routine urine department.)

The above routine has resulted in many advantages. Frequently, several hours' time are saved in submitting a report to the ward surgeon than would otherwise be the case. In some cases several days' time are saved, as the early practice of routine blood culture, complete blood count and urine study make it possible for the ward surgeon to have the first complete picture presented by the laboratory usually not later than the first day following the admission of the patient. With this routine in operation, the type determination of the pneumococcus can be frequently reported upon the same day that the patient is admitted. Early treatment with specific serum in certain instances can be instituted accordingly. As for the benefits to the laboratory service, we have found that our work has been greatly simplified through this standardization. Furthermore, in the event of a serious number of pneumonia cases arising in this cantonment, the situation could be much more promptly and efficiently met.

This report has dealt specifically with acute lobar pneumonia. In the studies made, streptococcic infection of the lung, with subsequent pleural involvement (purulent effusion accompanying) and also involvement of the pericardium (at times, also with purulent effusion) was frequently noted, blood cultures frequently showing streptococci.

The unit work is carried out in other respiratory infections as well as in the case of lobar pneumonia.

Standardized technique being observed in pneumococcus type determinations in this laboratory are as follows:

TECHNIQUE FOR PNEUMOCOCCUS TYPE DETERMINATION.

Procedure: *Collection of Sputum*:

This is one of the most important steps in the preparatory technique. Due importance will only be given this proper collection of sputum, after