Knee-jerks.—In one of Dr. Macnamara's cases the lost knee-jerks not only returned but in an exaggerated degree. In another case, though the jerks did not return, the quadriceps could be felt to contract.

Urinary Symptoms.—In all cases in which these were present they showed improvement.

General Health.—Nearly all the patients expressed themselves as feeling much better as the result of the treatment. This improvement in the general health has, indeed, been one of the most striking results of the treatment.

While it would be impossible wholly to eliminate the influence of suggestion in bringing about some of the improvement referred to (for example, the diminution of the ataxia, lightning pains, and urinary disturbances), other effects of the treatment (for example, the rapid increase of weight,* the return of the lost knee-jerks, and the marked changes for the better in the cerebro-spinal fluid) obviously cannot be placed to its credit.

CONCLUSIONS.

In parenchymatous syphilis the intrathecal treatment is the only one yet devised which is capable of arresting the morbid process. It acts by destroying the spirochaetes within the central nervous system and the cerebro-spinal fluid. The treatment should be begun as early as possible. Neurons, once destroyed, are incapable of regeneration. Unfortunately, cases of general paralysis and tabes rarely come before us until wide tracts of nervous tissue have been irretrievably damaged.

The intrathecal treatment is also indicated in cases of interstitial syphilis, especially of the spinal cord, which do not readily respond to salvarsan, mercury, or iodide of potassium. The latter drug should be given in not less than drachm doses three or even four times daily.

All the details in connexion with the injections were supervised and carried out by Mr. H. E. Batten, and to his unremitting care the entire absence of any kind of complication is to be attributed. To him I am also indebted for careful notes of the cases. The examination of the blood and cerebro-spinal fluid were undertaken by Dr. Braxton Hicks with his accustomed care and skill.

NOTE.—Since this paper was written Mr. Ballance has treated two of my patients suffering from general paralysis by introducing salvarsanized serum intracranially. The operation was well borne, and both patients made a speedy recovery. It is yet too early to speak positively of the therapeutic result, though the indications, in one of the cases at least, are distinctly hopeful.

BIBLIOGRAPHY.

F. W. Mott, M.D., F.R.S., *Syphilis of the Nervous System*, 1910; The Degeneration of the Neuron, *BRITISH MEDICAL JOURNAL*, November 15th, 1913. James McIntosh and others, Parasyphilis of the Nervous System, *Brain*, July, 1913.

SOME PROBLEMS IN THE TREATMENT OF VENEREAL DISEASES.†

By A. LOUISE McILROY, M.D., D.Sc.,

SENIOR ASSISTANT TO MUIRHEAD PROFESSOR OF OBSTETRICS AND GYNAECOLOGY, UNIVERSITY OF GLASGOW; ASSISTANT GYNAECOLOGICAL SURGEON, GLASGOW ROYAL INFIRMARY.

THE problem of the treatment of venereal diseases is at present creating a considerable amount of interest in the medical profession, more especially from the standpoint of the relationship of these diseases to the general health of the community. In the light of modern research it has been shown that they are far-reaching in their consequences, and are more prevalent than was hitherto supposed. By means of laboratory tests it has been found that many diseases of obscure origin are now traced to the incidence of venereal disease either in the individual himself or in his parents before him. It is a subject which is closely related to such questions as infant mortality, care of the blind and insane, the maintenance of mentally defectives, and the treatment of patients under the Poor Law administration. If so much evil arises from the transmission of venereal diseases as we are led to believe, and if they influence the creation of the unfit, then it is the duty of the State to attack the source and take measures leading to eradication if possible. Such measures in time will be found to lessen the present financial expenditure

upon institutions for the reception of mental and moral degenerates. Eradication of venereal diseases, or even a certain degree of control over their dissemination, would cause a considerable diminution in the numbers of those blinded by ophthalmia neonatorum, and those mental defectives who go to swell our pauper and criminal classes. One could almost have wished that the Royal Commission had not been appointed until some time later, when, as the result of further investigation, the evidence of the prevalence of venereal diseases, more especially among the poorer classes, would have been so overwhelming that the public itself would have awakened up to a sense of the dangers and the necessity for some measures of reform.

NOTIFICATION.

In the discussion of methods for prevention and treatment the most prominent question is that of notification. It is argued that if this measure has done so much for the control of other contagious diseases, why should it not be employed successfully with regard to venereal diseases? Two arguments against notification to the public health authority may be mentioned. The first is that the length of time taken for the treatment and cure of syphilis would be out of all proportion to that required for the treatment of other diseases—such as diphtheria or scarlet fever—and would necessitate a very great expenditure on the part of the State, and a loss of the wage-earning capacity of the individual under treatment. This argument has much in its favour, but when compared with tuberculosis it is unfounded, although the latter disease having a more direct influence upon the shortening of life appeals for more active measures for its treatment. The second reason against notification is that it conveys with it a moral stigma, and brands the individual as an outcast from the society of his family and friends. It is admitted by all that private interest must give way to public safety, but if the history of many patients suffering from venereal disease were known, the punishment seems out of all proportion to the transgression, which has been committed in so many cases through ignorance, or under the influence of strong temptation; not to mention those cases of the innocent victims of disease, hereditary or acquired. Even if notification on the usual lines were enforced, evasions would be so numerous that the ends of the measure would be entirely defeated. In private practice, more especially, many conditions suggesting the presence of venereal disease would be purposely ignored, and cases requiring skilled advice and treatment would seek relief at the hands of unqualified persons who at least were free from the duties of a moral policeman. Notification in a modified form, however, is necessary if we are going to cope with these diseases in any efficient manner. We must have an estimate as to their prevalence and suitable measures for prevention will follow. Our information as to the amount of venereal diseases in the community is at present confined to the publication of clinical records of groups of cases, and to investigations as to the origin of certain clinical manifestations by means of bacteriological and serological methods. These, however, as a rule apply to the hospital class of patient, and not to private practice. Statements in the lay press as to the percentage of the general community having acquired venereal disease are entirely without any scientific or accurate basis, as any numbers estimated hitherto by the medical profession are in the form of ratios to those suffering from other pathological conditions, and not to average healthy individuals. The majority of statistics so given are supplied from patients of the hospital or lower classes, among whom, for obvious reasons, the percentage is greater. We want much more work on the lines of that published by Dr. Carl Browning.¹

Statistics as to the returns on death certificates are utterly worthless and their discussion a waste of time. As long as the certificate is public property and not a confidential document, the medical attendant will endeavour to allocate the cause of death to some other source when possible. It will ever be *De mortuis nil nisi bonum*. The medical profession is the only one for the supervision and treatment of venereal diseases; it is in close confidential relationship with the community, and to it should be entrusted all measures of notification and

* The difficulty of getting tabetics to put on weight is well known.

† Read at the Scottish Nursing Conference.

treatment. Registers could be kept and reported to a central medical authority, so as to be available for the collection of statistics; for the prevention of the overlapping of cases in the hands of practitioners the names and addresses of the patients should be obtained. These registers should not be available for perusal by the general public, just as case-books and hospital reports are confidential at present. If information were required at any time, it could be given with regard to numbers in a district, or in a particular trade, etc., but no clue would be permitted as to the identity of any individual. The public health authorities have a considerable number of non-medical assistants in their departments, and for this reason an objection could be raised as to the advisability of notification in this direction. No police supervision or its equivalent should be permitted unless in very exceptional cases and only where indicated by the medical profession.

The treatment of venereal diseases resolves itself into two divisions: I, Preventive; and II, Curative.

I. PREVENTIVE METHODS.

Prostitution.

Although in the present discussion the moral aspect of the question is not touched upon, yet mention must be made of the part played by prostitution in the dissemination of disease. Prostitution in a country, it is well recognized, is a source of great danger to the community, and efficient methods for its control have baffled legislation of all times. That prostitution will ever be abolished is a matter of much doubt when we consider its history (Sanger²). We can do much in the meantime to abolish compulsory prostitution for women by making them socially and economically independent in other directions, so that it will be no longer a means of livelihood, but a profession from choice. In time the State will profit by the increased good health on the part of its citizens. A knowledge of the evils of prostitution and its consequences should be disseminated; this in itself would help as a deterrent to those tempted to engage in it as a calling. All remedial measures for venereal diseases hitherto directed against prostitution were instituted with a view to strike the evil at its source; and in the face of the investigations of Ferguson Watson, as quoted by Browning, where out of 104 girls, aged 14 to 18, of the better and poorer class of prostitutes all gave a positive Wassermann reaction, it is not surprising that legislation should be demanded. But, with regard to the inspection and control of prostitutes as carried out in other countries, are there any drawbacks to the system? Apart from all moral considerations, the segregation and cutting off from employment of a large number of individuals for the purpose of treatment will have as its consequence, as conditions at present exist, the filling up of their places by uninfected recruits, and in this way there would be an even greater dissemination of the disease among women than hitherto. In addition to the professional prostitute there is the clandestine one, who is said to be a source of greater danger. This class would never come under control, as the individuals are unknown to any authority. If control regulations were in force, examination and treatment would necessitate a considerable expenditure of public money, as owing to the nature of the disease the period of quarantine is somewhat prolonged. For although the patient herself may be certified as cured, we cannot say how long she is potentially infective to others. On returning to her profession reinfection may take place immediately and dissemination occur before the next period of inspection is due. This is the weak point in the administration of the regulations and renders them useless. In such regulations there is no provision made for the inspection of the carrier of the disease to the rest of the community, and any legislation would be entirely ineffectual unless means were taken to ensure that women should have a certain amount of protection, and assurance that they are not to be exposed to reinfection after having undergone the penalties of treatment. If prostitution is to be encouraged and regulated by the State as some would have us believe, then it is an honourable profession, and it is only logical that it should be made as safe as possible for those engaged in it. Such assurance of safety would involve the inspection of the male carrier of infection. In Britain venereal disease is not more prevalent than in

those countries where there is State control. Indeed, if we were to credit statistics and opinions as to the prevalence of venereal disease as a causative factor in many pathological conditions we would conclude that we had less on the whole than our Continental neighbours. It is obvious that if there is to be any regulation or control as in other contagious diseases, there is to be no distinction of sex, so as to ensure the efficiency of those methods of administration. This matter, I venture to assert, can be safely left in the hands of the medical profession.

Transmission of Infection.

Life-long segregation of the mentally deficient is a necessary measure of reform, and would in time do much towards lessening disease, as this class is responsible for a considerable amount of spread of infection, and for the transmission of hereditary tendencies to their possible offspring.

It should be looked upon as a penal offence to communicate knowingly these diseases to others who are already unaffected or are ignorant of their consequences. Is it too much to ask of a State in some future time that when it enforces, as it does at present, a form of licence for the legality of the marriage ceremony, this licence should contain a clause as to the necessity of the partners being in a state of health not injurious to one another or to the children which they may eventually bring into the world? More amendments as to the laws on separation and divorce should be enacted to deal specially with those cases where it is found that one or other partner is the victim of venereal disease. When we look at children born into the world with evidence of congenital hereditary disease we question the advisability of the continuance of such a union, which should have had as its original aim the upbringing of a healthy offspring.

Notification of Premature Births.

Dr. Amand Routh³ has suggested that all specimens of abortion and premature births should be systematically examined with the view of ascertaining the causation of such conditions. I would suggest, further, the compulsory notification of all abortions and premature births to the public health authority, on the lines of notification of stillbirths as carried out in Glasgow. By this means we would have not only an accurate estimate of the amount of loss of ante-natal life and its probable causes, but facilities would be given for the examination of all such specimens, and methods suggested for the treatment of the mother and other members of the family if it were found on examination the condition was due to syphilitic infection. Notification of ophthalmia neonatorum as carried out in Glasgow has done something towards the provision of free treatment for the mothers of those children notified.

II. CURATIVE METHODS.

All measures for the treatment of venereal diseases should be in the hands of the medical profession only, and for this reason treatment by unqualified persons should be a punishable offence. The aim of all methods should be as far as possible to induce patients to present themselves readily for treatment without the fear of any moral stigma being attached to that form of treatment. On this one point depends the success of the methods and the possible eradication of these diseases, rather than upon any system of inspection or control. In consideration of this suggestion we ask, What are the methods of treatment in existence at present? In private practice the difficulties of treatment are not great, as the patients by their education are more alive to the dangers of the diseases and therefore seek early treatment without any fear of breach of confidence on the part of the medical attendant. But among the industrial classes, for whom treatment is provided by State or charitable institutions, there is a considerable degree of uncertainty as to the publication of the nature of the disease, in so far as its treatment has to be carried out under the direction of an institution or department set aside for these special diseases and frequently labelled as such. Respectable members of the working class community, who may in many cases be the innocent victims of the disease, naturally shrink from the suspicion of moral degradation which treatment so frequently conveys. Such places as lock hospitals and

venereal wards in the Poor Law infirmaries are, with a few exceptions, the only institutions where at present residential treatment can be procured. In the large infirmaries and hospitals there is practically little provision (Dr. Johnstone's report⁴) made for such patients, nor are they encouraged in their attendance as out-patients. Where the women of the prostitute class obtain free treatment is a matter of uncertainty. Our hospitals make the excuse that they are kept up by voluntary contributions for the relief of the deserving poor and not for the encouragement of vice. With our present-day knowledge such excuses are invalid.

Admission into a lock hospital practically means notification, and a sojourn in the venereal wards of some of our workhouses is little better than incarceration in a prison, the patients being looked upon as moral lepers and isolated accordingly. All such places should be abolished, and treatment should be carried out in the general hospitals, where no distinction is made between the patients other than that confined to the division into special disease departments. No labelling under the term "venereal diseases" should be permitted. At the expiry of residential treatment as advised by the medical attendant, patients should be advised to attend as out-patients for a considerable period, both for treatment and for observation. Out-patient departments should be provided at hours suitable for those who would be most likely to attend. It should be the aim of the medical attendant to induce patients to bring the other members of the family for treatment if required. Advice should be given as to the prevention and spread of infection. It must be noted, in view of the general prevalence of the administration of salvarsan for syphilis, that residence in hospital may only imply one or two days at varying intervals of time, and that a limited number of beds will serve for the accommodation of a large number of patients. Therefore even a few beds set apart in some of the casualty departments of large hospitals would be of immense benefit, if in the meantime no other accommodation could be provided. The argument that such diseases, being of the nature of notifiable diseases, should be treated in institutions under the control of the public health authority is not to be accepted, as it would mean a continuance of the present system of isolated departments bearing the stamp and reputation of such.

In those cases where a patient has been under treatment for venereal disease, and where he or she is engaged in some industrial occupation, a continuance of which, while in an infective condition, would be a source of danger to the community, power should be given to the medical attendant to enforce further treatment or exclusion from occupation. This suggestion has to be considered with caution, as it might lead to the avoidance of treatment at the hands of qualified practitioners. It is a subject of much difficulty to ascertain how far we should act for the public good and yet preserve the liberty and interests of the individual, more especially in such cases as those with infective sores who insist upon returning to the factory or workshop. Legislation is required for that class who are a danger to themselves and to others as the result of their own ignorance. Regulations and punishment with regard to the verminous conditions of school children do not prove irksome except in those cases of the submerged classes who always require State aid and protection. Some years ago, when assistant surgeon at the Lock Hospital, I was frequently struck with the want of power for the detention of infective women, who would insist on returning to work for mainly economic reasons before their cure was complete. Some cases showing infective syphilitic lesions earned a livelihood in factories for the manufacture of confectionery, etc. In private practice the medical attendant should impress upon the patient the advantage of being kept under observation, just as is done for any other disease of a long-standing and serious nature.

Every facility should be provided freely by the public health authority to practitioners to enable them to confirm the diagnosis of venereal diseases—serological and bacteriological. Salvarsan and other drugs should be obtainable for those who are unable to meet the expenditure. In this city Dr. Chalmers, M.O.H., has made arrangements for the carrying out of the Wassermann test free to any practitioner. In the Royal Infirmary there is a

ward for the treatment of venereal diseases in men, and we hope in the near future to have one for women patients. An out-patient department has been instituted lately in the infirmary under the care of specialists in these diseases, and lectures are arranged for the students in attendance. Courses of lectures on modern methods of diagnosis and treatment should be arranged by university and hospital authorities for practitioners, students, and nurses, and greater scope should be given for clinical and laboratory research. Much more will be done by methods such as here suggested than have been obtained hitherto when venereal diseases were looked upon as a deterrent or just retribution for the breaking of the moral code. In time a knowledge of their dangers will be disseminated judiciously by the medical profession through the community, and prevention will follow, just as we have broken through the ignorance of the causes of such diseases as malaria, typhoid, and plague.

As to the treatment of venereal diseases by actual clinical methods I have little to say in addition to what has been said by others. One word of caution with regard to dependence upon salvarsan alone in the treatment of syphilis. While thoroughly in agreement as to its efficacy, I find prolonged treatment by mercury is necessary in many cases in addition, and although to all appearances cured a patient should be kept under observation for a considerable period of time before we can confidently assert that he or she is entirely free from the risk of communicating the disease to others.

CONCLUSIONS.

I.—Preventive Methods.

1. That all measures which have as their aim the prevention of compulsory prostitution for economic reasons should be encouraged.
2. That legislation should be directed towards the permanent segregation of the mentally deficient.
3. That the judicious education of the people by the medical profession should be undertaken with a view to promote a knowledge of the dangers of venereal diseases both to the individual and to the community.
4. That it should be a penal offence for any one to communicate knowingly venereal disease to others who are unaffected or are ignorant of its consequences.
5. That compulsory notification of all abortions and premature births should be given to the public health authority, and that facilities could be obtained from that authority for the carrying out of diagnostic methods as to the possible cause of such conditions.

II.—Curative Methods.

1. That all measures of treatment should have as their aim the encouragement of patients to present themselves for observation without the fear of any moral stigma being attached.
2. That all methods of treatment and notification should be in the hands of the medical profession only, and that treatment by unqualified persons should be a punishable offence.
3. That advice should be given to patients to continue under observation for a prolonged period of time. Methods of precaution to be adopted for the prevention of the spread of the disease to others should be indicated, and other members of the family should be induced to present themselves for observation and treatment if required.
4. That treatment should be carried out in the wards and out-patient departments of the general infirmaries and hospitals, and that all special institutions for the treatment of venereal diseases, such as lock hospitals, should be abolished as such.
5. That in those cases of venereal diseases where the patient is in an infective condition, and where he or she is engaged in a trade or occupation the continuance of which would prove a danger to the community, powers should be given to the medical attendant to enforce further treatment or to prevent resumption of that occupation.
6. That in no way should there be police supervision or control of persons infected with venereal disease except at the instigation of the medical profession.
7. That public health authorities should provide methods of diagnosis and treatment for private practitioners in the

case of patients who are unable to afford the expense of such.

8. That more specialized lectures for practitioners, students, and nurses should be given on venereal diseases, and opportunities for clinical and laboratory research:

REFERENCES.

¹ C. Browning, *BRITISH MEDICAL JOURNAL*, January 10th, 1914.
² W. W. Sanger, *History of Prostitution*, 1913. ³ Amand Routh, *BRITISH MEDICAL JOURNAL*, January 24th, 1914. ⁴ R. W. Johnstone, Report on Venereal Diseases, Local Government Board, 1913.

ARSENO-THERAPY IN SYPHILIS, WITH MORE PARTICULAR REFERENCE TO "GALYL."

BY

J. JOHNSTON ABRAHAM, M.A., M.D.DUB.,

F.R.C.S.ENG.,

SURGICAL REGISTRAR, THE LONDON LOCK HOSPITALS; SURGEON, THE KENSINGTON GENERAL HOSPITAL.

ALMOST since the introduction of syphilis into Europe, three of the heavy metals—mercury, arsenic, antimony—and their salts have been used in its curative treatment. Of these, mercury has until recently held pride of place, because the *dosis curativa* of both arsenic and antimony was so much greater than the *dosis tolerata* as to render them too dangerous for continued use. For this reason, therefore, they held until recently the mere secondary position of adjuvants; and it was not until it was shown that relatively enormous doses of the organic salts of arsenic could be tolerated in the successful experimental treatment of spirilloses and trypanosomiasis that the possibility of using these synthetic preparations in the analogous disease—syphilis—occurred to clinicians.

Naturally the idea, once mooted, was eagerly acted upon. In the last six years, therefore, a considerable number of these organic preparations have been tried successfully, and already an enormous literature has arisen therefrom. At the London Lock Hospitals we have had experience of a number of these—atoxyl (soamin), orsudan, arsacetin, arsenophenylglycin, hectine, salvarsan, neo-salvarsan, and lately galyl. All of these have had rapidly curative effects in certain of the lesions of syphilis, particularly in those occurring on mucous surfaces—primary sores, condylomata, mucous plaques—less markedly on some of the secondary eruptions and tertiary lesions, least of all on the general adenitis of the secondary stage.

All these substances have one characteristic in common—the presence in their molecule of one or more benzene chains in which one of the hydrogen atoms has been replaced by an atom of arsenic; and it is to that their efficacy was and is due.

Therapeutically, most of these earlier substances were excellent; but the selective action on the optic nerve, producing amaurosis after the use of some of them, has caused all before salvarsan to be rejected, and many are now almost forgotten, although some of us who used them still remember how exceedingly rapid and gratifying the clinical results following their administration were.

SALVARSAN AND NEO-SALVARSAN.

Remembering these former disasters, when salvarsan was introduced syphilologists were naturally chary of using it at first; but the accumulated experience of the last four years has largely calmed this fear, and now several hundred injections a month are given at the London Lock Hospitals, with practically no fear of any distribin; complications. Nevertheless, a study of the literature shows that, although no such spectacular catastrophe as total blindness is likely to follow the use of salvarsan, yet the substance is not without danger, even in competent hands.

Mouneyrat,¹ the discoverer of "hectine," states from the results of experiments on animals, that in acute salvarsan poisoning death is due to an "intense congestion, with minute haemorrhagic foci in the brain, liver, kidneys, spleen, and lungs," and that both salvarsan and neo-salvarsan can produce haemorrhagic meningo-encephalitis.

Delayed salvarsan poisoning, he states,² is due to the substance being "*un corps neurotrope*," since, in spite of assertions to the contrary, a certain proportion of each injection, varying with the individual, becomes fixed by the nervous tissues. The toxicity, however, he maintains, is not due to the arsenic content, but rather to the presence in its molecule of functional groups rendering it vaso-dilator, and allowing it to fasten on nervous tissue—"acting towards the nerve nuclei in exactly the same manner as the basic dyes, fuchsin, thionin, methylene blue, and vesuvian—bodies whose basic character is due to the same functional group present in salvarsan." That there is considerable clinical support for these statements is undoubted. We have seen an acute nephritis, almost fatal, set up by one injection, and we now refuse to use either salvarsan or neo-salvarsan in any case with albuminuria which will not yield first to mercury. Moreover, evidence is slowly accumulating showing that salvarsan and neo-salvarsan occasionally have a special affinity for the eighth nerve. Several cases of stone deafness have occurred within our knowledge after an injection; and any tendency towards deafness is now, therefore, looked upon at the Lock Hospitals as a distinct contraindication to their use.

Galyl.

Although, then, our experience with salvarsan and neo-salvarsan, extending now to some three thousand cases, has been exceedingly fortunate as regards complications, yet, recognizing that most of our patients are drawn from young and otherwise healthy lives, and that it is in older lives that delayed symptoms are more likely to occur, we are always ready to try any improvement offered which has any claim to be free from such risks.

Mouneyrat has synthesized two such bodies, "galyl" and "ludyl," which he claims to be without vaso-dilator tendencies, and less neurotropic than salvarsan. By his courtesy a small supply of galyl, sufficient for ten cases, was sent to us in July, 1913.

Chemically, it is a rather more complex body than salvarsan. As sent out, salvarsan is the di-hydrochlorate of dioxy-diamido-arsenobenzol; and as injected, after neutralization, its formula (neglecting the "CH's" of the benzene chain) is:

Galyl is "tetroxy-diphosphamino-diarsenobenzene," with the formula:

Its arsenic content is 35.3 per cent., its phosphorus content 7.2 per cent. As sent out for intravenous injection in ampoules, it is a light yellow powder consisting of galyl and an appropriate amount of sodium carbonate to make it easily soluble in distilled water, forming an isotonic solution. It must be prepared immediately before use.

The average dosage for a male is 0.45 gram for the first, 0.5 gram for the second, and 0.55 gram for the third injection; for a woman 0.4 gram, 0.5 gram, 0.5 gram. The dose is calculated as being 8 to 8½ mg. per kilo of body weight in the adult male, and 7 to 7½ mg. in the female.