LETTSONIAN LECTURE

ON

SYPHILIS AS A CAUSE OF DISEASE OF THE NERVOUS SYSTEM.

Delivered before the Medical Society of London.

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MR. PRESIDENT,—Before entering upon the subject of which I have undertaken to treat in the present Course of Lectures, permit me to offer to yourself and the Council of this Society my thanks for the mark of confidence you have conferred on me in appointing me to the office of Lettsoman Lecturer. Permit me also to express satisfaction that my lectures are to be delivered in this new and commodious room, secured for the society by the exertions of your predecessor in office, and the council by whom he was aided.

The subject which I propose to bring before you in these Lectures is, as you know, syphilitic affections of the nervous system.

There are perhaps other topics on which I might have spoken with greater authority, and there are certainly other physicians more competent than myself to treat of the one I have chosen. My justification before you is that, while numerous interesting and valuable observations have been placed on record in various periodicals and reports, the subject has not yet been treated of as a whole by any English physician, and the profession generally has not yet become duly aware of the frequency of syphilitic affections of the nervous system; and in consequence of this a class of cases, painful and fatal if not recognised, but eminently curable, and which, indeed, furnish us with some of our most striking instances of success, frequently escape notice and treatment. An additional justification to myself is the interest I have long taken in nervous physiology and pathology, and the opportunities which syphilis has afforded me for the investigation of the effects of morbid changes in the nervous centres.

It will be accepted as sufficient evidence of the frequency of syphilitic disease of the nervous system, that I shall in these lectures have little occasion to quote the observations of other physicians; but that I shall be able abundantly to illustrate almost every variety of syphilitic affection from my own experience, obtained entirely at a general hospital or in private practice, and without the special field of observation afforded either by an institution for venereal diseases, or by a hospital for diseases of the nervous system.

Syphilis is a disease which, from the time of its recognition, or of its introduction into Europe, has largely engaged the attention of each successive generation of physicians, and the literature of the subject is of enormous extent. I cannot pretend to give even an outline of the views which have been held as to its effects on the nervous system, but I may briefly indicate the course of opinion.

Early writers on syphilis attributed vaguely to this malady almost all forms of disease for which they could not otherwise account, including many affections of the nervous system. Vertigo, convulsions, epilepsy, apoplexy, paralysis, tremor, hydrocephalus, hypochondriasis, blindness, deafness, and various others are enumerated; indeed, mention is made in their works of nearly all the manifestations now recognised; and probably, in the fierce epidemic of syphilis in the fifteenth century, the Protean forms of the disease succeeded each other more rapidly than they are now seen to do, and the relation between them was thus more readily traceable. But as has been well said, syphilis was made the "scapegoat of pathology," and upon its head were heaped offences not its own. When this was discovered, much that was true was thrown aside, together with what was false, and for a time it was very generally considered that the internal organs and the nervous system were not liable to be affected by syphilis. Hunter appears to have been of this opinion, as does also Sir Astley Cooper; and for some time after these surgeons we look in vain for records of syphilitic disease of brain, lungs, or liver. Little by little, however, within the last thirty years, clinical observation on the one hand, and pathological research on the other, have gradually identified the morbid changes resulting from syphilis in all the abdominal and thoracic viscera, and in the brain and spinal cord, and have traced in great measure the symptoms to which they give rise.

Of the long list of writers on the subject, it will suffice to mention Lallemand, Vidal de Cassis, Ricord, Cullerier, Rayer, Yvaren, Zam-

baco, Gros and Lancereaux, Hildenbrandt, Esmarch and Sessen, Schutzenberger, Dittrich, Brans, among continental writers; Reade, Budd, Todd, Inman, McDowell, Duncan, Hutchinson, Wilks, Moxon, Hughlings Jackson, Allbutt, and Buzzard.

In considering the diseases of the nervous system, caused by syphilis, the first question which arises is, at what period of syphilis are these affections liable to be induced?

Syphilis is considered to exhibit primary, secondary, and tertiary stages; or we speak of primary, secondary, and tertiary manifestations. These designations have relation not to mere lapse of time, and not always even to order of appearance, but more strictly to character of lesion than to order of succession. We see in one case, many years after the infection, an intractable scaly eruption on the skin, or obstinate superficial ulcerations on the tongue or at the commissure of the lips, recurring again and again, and following, perhaps, two or three distinct sets of symptoms: these are secondary in character, or intermediate, as Mr. Hutchinson would call them, notwithstanding the interval of time and the successive forms of manifestation. In another case, we have a woman impregnated by a syphilitic husband, and infected through the foetus. In her, the first symptom may be a destructive pharyngeal ulcer or a node; or in another case, a chancre may be followed at once by a pustulo-crustaceous eruption, and this by periostitis, gummata, rupia, and other manifestations of like kind. We call these tertiary, or at least we must treat them as such. Again, we have the perplexing instances of hereditary syphilis. A child aged ten or twelve is brought with an ulcerating gumma of the tongue, or a perforating ulcer of the palate; or we find in a healthy young woman of known character and virtue, cutaneous gummata and tubercles—I quote always from my personal experience—these, though the first symptoms, belong strictly to the class of tertiaries. When, therefore, we are endeavouring to determine the stage of syphilis to which a given case of nervous disease belongs, time is not the main element in the question, but the associated or antecedent symptoms. The distinctions which we shall find it important to bear in mind are those pertaining to the character of the lesions. I reproduce here the tables of secondary and tertiary manifestations, drawn up by Mr. Lane for a recent lecture at St. Mary's Hospital.

TABLE I.—*Morbid Changes observed in Secondary Syphilis.*

Affections of Skin.	Erythematous—Roseola; Papular—Lichen; Tubercular—Tubercles that may desquamate, ulcerate, or encrust; Scaly—Psoriasis, Lepa; Pustular—Ecthyma.
	Superficial white aphthous-looking Ulcers on the tonsils, soft palate and fauces; Superficial Ulcers on the sides of the tongue and angles of the mouth; Mucous Tubercles, or Condylomata, on semi-mucous surfaces; Deep excavated Ulcers of tonsils.
Affections of Mucous and Semi-Mucous Membranes.	Iritis; Muscular Pains; Arthritic Pains; Pains in bones; Periostitis; Nodes.

The above table contains the principal affections of constitutional syphilis, termed secondary, in which the venereal poison still exists, and may therefore be communicated by cohabitation and transmitted to the offspring, and in which mercury is beneficial and iodine of but little or no service.

TABLE II.—*Pathological Conditions in Tertiary Syphilis, Syphilitic Cachexia, or Sequela of Syphilis.*

Inflammation of Fibrous Membranes.	Periostitis, resulting in nodes; Caries and necrosis of bone; Affecting fibrous tissues of joints—Arthritis; Fibrous tissues of testicle—Orchitis; Fibrous tissues of globe of eye—Sclerottitis.
	Rupia; Cachectic ulcers of skin; Rapid ulceration and sloughing of the soft palate, fauces, pharynx, larynx, rectum, vagina, nymphæ, and labia.
Affections of Skin and Mucous Membranes.	In the areolar tissue (subcutaneous or submucous tubercles); In muscular tissue, more frequently met with in the tongue, and occasionally in other muscles; Also met with as <i>post mortem</i> appearances in the liver, spleen, kidneys, lungs, and other viscera.
	Deposits of Fibro-plastic Lymph, imperfectly organised.
Lardaceous and Waxy Deposits.	Occasionally found in the <i>post mortem</i> examination of the bodies of persons of dissipated habits.

In the above table are classed the pathological changes which occasionally present themselves in patients who have passed through the

primary and secondary stages of syphilis, but in whom the venereal poison no longer exists, and cannot therefore be transmitted.

The remedies required in these affections are especially iodine and sarsaparilla, and mercury is injurious.

If we admit into our catalogue of nervous affections all the symptoms arising in the course of syphilis, which are capable of being referred to the nervous system, the wandering rheumatoid pains felt in the muscular structures of the limbs in early syphilis, the osteocopic pains of later stages, the sleeplessness, irritability, change of disposition, the liability is coextensive with the disease. But we all recognise a distinction between the disorders of the nervous centres due to the circulation in them of poisoned blood or of a drug introduced into the blood, and the diseases of these centres produced, perhaps, by the same blood-poisons; as, for instance, between the common delirium of enteric fever occasioned by the heated and impure state of the blood in this disease, and the exceptional meningitis set up by the same state of blood. The same distinction obtains in syphilis between the disorders of nervous function and morbid conditions of nervous structures which it can induce.

With this limitation, which will greatly economise my time and permit me to devote more attention to the important part of my subject, we shall find that nervous affections may arise either in the secondary or in the tertiary stage of the disease, but far more frequently in the latter. The affections of the two periods, moreover, are not identical; and I am disposed to think that the diversity will be found more considerable than has generally been supposed. The difference has been recognised by many observers, and it is what might have been anticipated from the different clinical characters and the different pathological tendencies of syphilis in its various stages. It is even better understood, as it appears to me, by reference to the theory of Mr. Jonathan Hutchinson, which brings syphilis into the class of continued eruptive fevers.

According to this, the secondary stage of syphilis represents the fever, the tertiary stage, so-called, the effects produced upon the solids and liquids of the organism by the febrile process. The tertiary stage thus becomes, not a part of the disease itself, but a consequence of it corresponding to the sequelæ of fevers, such as dropsy following scarlatina, or scrofulous affections after measles.

Whatever view may be taken of tertiary manifestations, whether they are to be considered as a continuation or as a consequence of syphilis, the truth of the analogy between syphilis and the continued fevers appears to me to be undoubted. They have, in common, a period of incubation, a febrile stage which runs a more or less definite course, more regular and more definite in the acute and short fevers, such as scarlatina and measles; less regular and definite in those which have a longer duration, as enteric fever; and correspondingly more irregular and indefinite in syphilis, which is essentially chronic.

In this febrile stage, which is attended with symmetrical cutaneous manifestations and disseminated lesions in internal organs, the poison is reproduced in the system, and the individual who is the subject of the disease becomes a source of contagion. Finally, one attack usually confers future immunity from the disease.

Now, just as in fevers, we may have pneumonia or meningitis not distinguishable by any anatomical characters from pneumonia or meningitis due to other causes, and recognised clinically by the super-vention of symptoms of these conditions upon those of the fever, so, in the secondary stage of syphilis, there may occur spinal or cerebral congestions and inflammations which have no peculiarities to indicate the syphilitic character of the affection; and this has to be ascertained almost entirely from previous history or from existing manifestations of syphilis.

In tertiary syphilis, on the other hand, the morbid processes set up are altogether peculiar, as will be described, and the symptoms are often sufficient of themselves to establish the nature of the case in the absence of collateral evidence.

As this will engage our attention later when considering affections of different parts of the nervous system, I shall not dwell longer upon it now, but proceed to the consideration of another question—whether, namely, there is any particular form of primary lesion, or any particular course of the subsequent constitutional manifestations, which is attended with special liability to affection of the nervous system?

An answer to this question is scarcely to be obtained directly. Surgeons who have seen and treated the primary sore and early constitutional symptoms are not often consulted for epilepsy or paralysis, which in the mind of the patient are never for a moment associated with his former affection after an interval of time, perhaps, which has allowed even the occurrence of the disease to be forgotten, or has reduced it in his recollection to an accident of trifling significance. The family medical man or physician, on the other hand, called to deal with the nervous affection, has not watched the course of the disease in its earlier stages; indeed, he may have been expressly kept in ignorance of

it, and the time has not arrived when a collation of observations of surgeon and physician can be made on any large scale.

I have not, however, raised a discussion without an object. From cases which have come before me, and from what I have seen of syphilis affecting other organs, confirmed by inquiries which I have made of surgeons who have extensive opportunities of observing this disease in all its stages, I have formed an opinion that it is chiefly in persons in whom the secondary affections have been transient and insignificant, or even absent, or in those in whom tertiaries arrive early or prematurely, that the nervous system is liable to suffer. I am corroborated in this view by statements of Gros, Lancereaux, Braus, Buzzard, Moxon, and other writers, and it is scarcely possible otherwise to explain the entire absence of syphilitic history in many cases obviously of syphilitic character.

But this is exactly what we see in the case of other tertiary manifestations. We are almost daily called upon to make the diagnosis of syphilis in the absence of a history, and, indeed, in the face of positive assertions that the patient has never been subjected to any syphilitic infection, or suffered from any specific manifestation. In the case of women, and especially of wives, this is not to be wondered at. They are often absolutely ignorant that they have contracted the disease, and I have long since come to the conclusion that it is useless and cruel to ask a woman if she has had syphilis. The primary lesion, especially if situated on the internal parts, as on the cervix uteri, may give rise to so little inconvenience, and any discharge from it is so readily confounded with other secretions, that it may pass entirely unperceived. In women, again, the disease is often communicated by a syphilitic foetus. The father is the subject of syphilis, but has no lesion secreting poison to inoculate directly the mother; the ovum, however, is affected by the father's disease, and through the interchange between the maternal and foetal blood the mother becomes contaminated. In these cases the secondary stage of the disease is frequently altogether absent, as well as the usual primary or initial lesion; and tertiary manifestations are developed forthwith.

A poor woman was under my care in the years 1863-4 and 5, among the patients of the Western General Dispensary, who, after each of three pregnancies, suffered from extensive ulceration of the pharynx, and on one occasion from a node on the maxilla. She had had no primary lesion, and the only ailment of which she was conscious was that during the pregnancy she had a slight sore throat, which ceased to trouble her at confinement. I first saw her five months after the birth of the second child; the ulceration was most formidable, but soon yielded to iodide of potassium. After the third child, it came on earlier and was still more extensive. It appeared as if in each pregnancy she received an additional dose of the poison, and other cases have favoured this view; or it may have been that her strength was giving way from child-bearing, and that the disease was worse in consequence of the debility. The children were not obviously syphilitic, but they became rickety.

Mr. Henry Lee and Mr. De Méric, and some others, are of opinion that not only may a woman be contaminated through a syphilitic foetus, but that, without the occurrence of impregnation, the disease may be conveyed by the semen, or by an unhealthy urethral secretion which need not give rise to any initial local lesion.

Both sexes again may be the subject of inherited syphilis, which is often betrayed by traces or history of infantile or early manifestations, or by the teeth, nose, and conformation of the head, for an account of which medicine is for ever indebted to Mr. Jonathan Hutchinson. These valuable signs, however, may be absent; and, as I have already said, we confidently pronounce many affections to be syphilitic simply from the special characters of the manifestation. I will give a few instances.

In 1871, a boy, aged 10, was brought to me. He was rather small for his age, but otherwise apparently healthy, and the teeth, nose, and head were well formed; he had an ulcerating gumma on the margin of the tongue, which I at once recognised as syphilitic. He was the first child and I found on inquiry that the father had contracted syphilis, and that during the pregnancy the mother had suffered from a syphilitic eruption. This boy had subsequently an attack of interstitial keratitis while at Brighton, early in 1873, and later an ulcer on the soft palate, which had nearly perforated before I saw him, an ulcerating gumma on the tongue, and a second attack of keratitis.

In 1872, I was asked to see the servant of a friend, a ruddy, strong, and healthy-looking young girl of unimpeachable antecedents, and who presented no sign of inherited syphilis. She was suffering from painful cutaneous gummata of the legs, such as I have never seen except in syphilis. They rapidly melted away under the influence of iodide of potassium, as they did also on a second occasion when they had again appeared.

In March 1864, a healthy-looking man, aged 27, with no acknowledged venereal antecedents, or any previous ailment, except rheumatic pains, came to the Western General Dispensary with a large ragged ulceration on the dorsum of the tongue, surrounded by extensive induration. It had begun three months previously as a lump, three weeks before had cracked, and for a fortnight had been a spreading ulcer. This could only be a syphilitic gumma, and it yielded to iodide of potassium in a fortnight.

In most of the following cases there are corroborative facts in the history which support the conclusion drawn from the character of the lesion, and facts of this kind are worthy of attention, since we have to rely greatly upon them to establish the character of syphilitic diseases of the nervous system.

Mary Ann L., aged 36, married, seen in February 1869, at St. Mary's Hospital, had a gummatous tumour of the tongue. She had had eight living children, of whom only two were alive, and she had had nine miscarriages.

Ann W., aged 32, a widow, had had eight children, two only of whom survived. She stated that she had had no illness till, five months previously, she had begun to suffer from sore throat. Old cicatrices and a deep ulceration in the soft palate were seen on examination; the uvula was quite gone.

Elizabeth A., aged 30, married, had suffered from sore throat after previous pregnancies and miscarriages, and presented indications of old destructive ulceration in the left half of the soft palate; and again, whilst suckling a four months' child, she had a deep ulcer behind the left fauces.

Emma R., aged 34, married, had had five children and four miscarriages. She had lost a great part of the soft palate, and was suffering from a deep ulceration low down in the pharynx.

But cases of this kind could be multiplied indefinitely; and the bearing of the whole matter is not so much upon the prevention of attacks on the nervous system, as upon the course to be taken in cases in which syphilis, from the nature and course of the symptoms, is suspected but not known to be the cause of the disease. As syphilitic affections are frequently curable, the patient should have the benefit of the doubt. This is so far recognised, that it has become a sort of rule among those who have given attention to the subject, when in doubt, to give iodide of potassium.

[To be continued.]

IODIDE OF POTASSIUM AND CARBONATE OF AMMONIA IN THE TREATMENT OF SYPHILIS, INTERNAL ANEURISM, AND CHRONIC RHEUMATISM.

SIR JAMES PAGET was the first to call the attention of the medical profession to the following interesting fact; viz., that carbonate of ammonia greatly increases the therapeutic action of iodide of potassium. I have had extensive experience in the treatment of syphilis, and have tried it with the best results, and find that five grains of iodide of potassium, combined with three grains of carbonate of ammonia, are equal to eight grains of the potassium salt administered in the ordinary way. The following case is a good example.

John —, aged 50, consulted me about a sore situated on his left arm. There was a profuse discharge from it, and the smell was intolerable. On asking him a few questions, I got the following history. He had been a married man, his wife having died a short time ago; he had no children. Some years ago he contracted syphilis, and was treated by mercury, pushed to excessive salivation. The secondary symptoms had been well marked, and the sore about which he consulted me was of eight months' standing. He consulted several surgeons, and could get no relief. I ordered him five-grain doses of iodide of potassium, combined with three grains of carbonate of ammonia. After taking a few tablespoonfuls of the bottle, the bad smell altogether disappeared, as a man told me who was sleeping in the same room; at first he could not bear the smell, but after taking a few tablespoonfuls of the bottle he could detect no smell. This man remained under my care for about a month, and in that short time was perfectly cured, and in very good health and spirits. I could publish five cases with almost similar results. I have also found it of the greatest service in the treatment of internal aneurism, by relieving the pain and helping to consolidate the tumour. Dr. Frerichs has recommended iodide of potassium in the treatment of the waxy liver occurring in syphilitic patients. I think that the preceding facts are well worth the notice of the profession; but I would caution medical men how they increase the dose of the iodide of potassium, for, if the carbonate of ammonia be good, it will greatly increase the therapeutic action of the iodide.

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LECTURES

ON

THE PATHOLOGY AND TREATMENT OF DIABETES MELLITUS.

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LECTURE II.

THE second great function of the liver is to give out, during fasting, the nutriment which it has stored up during digestion. This is effected by the glycogen, which has been stored up in the organ, becoming gradually transformed into sugar again, and, being washed out of the liver by the blood, is carried with it into the general circulation. The conversion of glycogen into sugar is effected by means of a diastatic ferment, of which a minute quantity only is present in the liver itself, but which is contained to a much larger amount in the blood. When the flow of blood through the liver is slow, the transformation of glycogen goes on gradually, but it is quickened whenever the current becomes more rapid. It seems probable that, although the blood of the portal vein may have something to do with the transformation of glycogen into sugar, this process is more closely connected with the circulation through the hepatic artery; for those lesions of the nervous system which increase the flow of blood through the liver and induce diabetes, have, according to Cyon,* little influence over the calibre of the vein, but cause the artery to dilate widely. As the blood from the artery flows into the portal vein, any increase in the circulation within it also quickens that in the vein to some extent. The circulation in the liver may be increased either by raising the pressure of blood in the arteries generally, so that the blood flows more quickly through the hepatic artery, although its size may remain the same as before, or by causing it to dilate, so that it receives a greater share of blood, while the pressure in the arteries generally remains the same.

The pressure of blood in the arteries generally may be raised by compressing any large artery, by violent muscular efforts, or by interference with respiration. The operation of these causes is followed by a greater production of sugar in the liver, and its increase in the blood of the vena cava, and even its appearance in the urine. Schiff was able to produce diabetes by ligaturing large vessels, and Pavy† found in his experiments that whenever an animal struggled either on account of discomfort or because its respiration was interfered with, the quantity of sugar in the blood of the vena cava and carotids was at once increased. According to Michea and Reynoso,‡ it appears temporarily in the urine after an epileptic or convulsive hysterical fit. This power of muscular action to increase the proportion of sugar in the blood is exceedingly interesting, for sugar is destroyed in the muscles during their contraction, and is in all probability to be looked upon as part at least of the fuel from which they derive their energy.§ The action of muscles, which causes the destruction of sugar within them, at the same time, leads to an additional supply being furnished to them, and thus the balance of waste and supply is properly sustained. The occurrence of sugar in the urine of persons suffering from cholera, or who have died from exposure to cold, is probably also to be attributed, at least in part, to the contraction of the blood-vessels near the surface of the body increasing the circulation in the liver. The intermittent glycosuria which has been observed to be present during or after a fit of ague, and absent during the interval, may also be ascribed to the rise in the general blood-pressure which occurs during the paroxysm.

Dilatation of the hepatic vessels, and increased flow of blood through them, may be produced by paralyzing their vaso-motor nerves either directly or reflexly. The vaso-motor centre (a), from which those constant stimuli proceed to all the vessels in the body by which their state

* Cyon and Aladoff. Reprint from the *Mélanges Biologiques* (which Professor Cyon was kind enough to send to me); and *Bulletin de l'Académie Impériale de Pétersbourg*, vol. viii, p. 91.

† Pavy, *On Diabetes*, pp. 62, 63, and 145.

‡ Troussseau, *Clinique Médicale*, ed. 2me., tome ii, p. 665.

§ Ludwig and Genersich, *Arbeiten aus dem Physiologischen Anstalt zu Leipzig*, 1871, p. 75.