

greatest care to all those who are obliged to handle animals so inoculated.

Another point which stands out clearly is that when once the animal substances produced by a micro-organism have penetrated into the blood, the poisons secreted by the same micro-organism in other parts of the body fail to attract leucocytes. See, for instance, the results I obtained with the bacillus pyocyaneus. Injecting a drop of the culture into a rabbit's eyes, the leucocytes emigrated to the spot in large quantities. But when the poisons produced by the bacillus pyocyaneus were already circulating in the blood, the leucocytes no longer left the vessels. Notice again that the same result was obtained when the *bacillus Chauvvei* was injected both subcutaneously and intravenously. In the case of the bacillus pyocyaneus, there is some evidence to prove that the leucocytes are actually paralysed; for Charrin and Gamaleia have shown that the application of croton oil to the ear of an animal poisoned with the products of the bacillus pyocyaneus is not followed by inflammatory reaction at the point where the oil is applied. This explanation, however, does not hold good for the results obtained with the *bacillus Chauvvei*. Here the leucocytes in the bloodvessels and in the spleen were extremely active, but absolutely powerless to emigrate into the surrounding tissues, in order to attack bacilli of the same species. Their absence of emigration was not due to some change in the vessel-wall, however, for the leucocytes left the vessels to attack another bacillus—namely, the bacillus pyocyaneus. Similarly the leucocytes of an animal afflicted with anthrax declined to attack anthrax bacilli but cheerfully accepted any other diet offered them. And here again, the refusal to emigrate was not simply due to spasm of the vessels or any other vascular cause, as these same cells emigrated freely when any other stimulus was applied. The reason for these apparent anomalies is, that as long as the chemical substance which attracts the leucocytes is present outside the vessels only, the cells emigrate to the spot where this chemical substance is to be found; but as soon as this chemical substance is present in equal or larger quantities in the vessels as in the surrounding tissues, the leucocytes no longer attempt to leave the vessels.<sup>3</sup>

Having brought this paper to a conclusion, it remains but for me to thank the committee of management of the conjoint laboratories of the Royal College of Physicians of London and the Royal College of Surgeons of England and Dr. Woodhead for allowing me to carry out these researches in their laboratories. Not being a graduate of either of these colleges, I, more than anyone else, should feel grateful for the kind hospitality they have granted me in this building.

## ON MATERNAL CONDITIONS IN CONGENITAL SYPHILIS.<sup>1</sup>

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PATHOLOGICAL LAWS supposed to govern the advent and progress of the phenomena of hereditary and of infantile syphilis have been enunciated, and by repetition widely promulgated; but it may be suspected that the alleged facts which are said to have revealed these laws have been more or less but opinions and conjectures, for of all diseases syphilis is one of the most capricious and irregular in its manifestations. At the discussion on syphilis at the Pathological Society Dr. Wilks said, "There is not a disease like it in our nosology"; and Mr. G. D. Pollock, the President, further said that, "when we have to deal with such a poison as syphilis, I think we must look at it entirely as a disease *per se*."

The far-reaching mischief of syphilis in the woman by the resulting contamination of her offspring offers a problem of momentous importance, which has still to be thoroughly solved. The arriving at all the facts in cases of hereditary syphilis is often difficult in a variety of ways, and sometimes it is only by a fortuitous concurrence of circumstances that these facts are laid bare. The degrees with which

and the mode in which the state of the maternal blood, the condition of the uterine and allied tissues, affect the ovum of a woman the subject of constitutional syphilis, and the part played by the placenta in a syphilitic pregnancy, demand further investigation; and there still is some divergence of opinion as to whether the sperm of a once syphilitised man can at any time and at all times poison the woman indirectly through the medium of the ovum or foetus. Assuming such poisoning to be possible, we thus have, in the consideration of the maternal relations of hereditary syphilis, the mother on the one hand, and a possibly contaminated ovum on the other; since immediately the ovum is fertilised, it is no longer exclusively of the mother. Infection of the foetus by the blood of a syphilitic mother would seem to be inevitable; nevertheless anomalies have been recorded. Where the woman has been the subject of direct infection previously to conception the road by which the disease shall reach the progeny would seem short. But we have to ask, When does the noxious quality of the blood first begin to injure the ovum? Is the ovum already syphilitised when about to pass into the uterus? Is it syphilitic in the sense in which the seminal particles of a syphilitised male are supposed to be syphilitic? Does the ovum, so to speak, carry its own syphilis, or is the contamination commenced only when it begins to absorb the maternal juices from the uterine walls?

The specific action of constitutional syphilis in the woman, however derived, may declare itself in the reproductive organisation, including the placenta, by giving rise to endometritis, to interstitial metritis, and to changes limited to the cervix. The placenta is involved by the endometritis persisting during pregnancy, and complications as regards the foetus are entailed. Since Dr. Robert Barnes led the way in the study of the pathology of the placenta, Dr. Wilks and others have described syphilitic changes in that body. Dr. More Madden (in Quain's Dictionary) says that inflammation of the placenta is "generally syphilitic in its origin." The damage of the placenta by the maternal syphilitic cachexia or the escape of the placenta from syphilitic degeneration may carry the explanation of the remarkable phenomenon, in the case of twins, of one child being born diseased while the other child is born healthy—a phenomenon which M. Fournier in his recent work, "*L'Hérédité Syphilitique*," 1891, describes as being "one enigma the more in a subject full of enigmas." Such cases have been recorded by Campbell, Caspary, Diday, Hutchinson, Fournier, and others. Mr. T. Bryant in his "*Surgical Diseases*" relates that he "has notes of an instance of twins born of syphilitic parents. One went through all the series of complaints common to hereditary syphilis, and the other escaped altogether—that is, at the end of a year and a half no symptoms had appeared." Could it have happened in this case that there was a double placenta, and that the difference in the diathesis of the twins was due to a difference in the healthiness of the placenta? Mr. Bryant mentions another instance of twins "born under like circumstances, in which one child showed symptoms of hereditary syphilis at a month, and the other at four months." Now the degeneration of the placenta is mostly described as being unequally diffused, as being in circumscribed areas. This limitation of morbid change, if the placenta were not distinct, might have a share in the eccentric transmission of the syphilitic poison, but, all the same, the matter would be still enigmatical.

Syphilitic deterioration of the body of the uterus from constitutional syphilis and from carrying a syphilitised foetus may be illustrated by the following case. The patient had suffered from secondary symptoms previously to conception. A lady aged thirty-one consulted me this year on account of severe hypogastric pains, bearing down, and backache. She was married twelve years since, and is now a widow. Within a year of her marriage, being in India, she gave birth to a healthy child. Four months after this event she was infected by her husband, and had, as one of the consequences, rupial eruption, of which she bears marks. Sixteen months later a second child was born, which at the age of three months had symptoms of congenital syphilis (this child was for a long while sickly, and is described as being at present extremely excitable). Fifteen months later, having lost her husband (his death was accidental), and being pregnant, she returned to England, and bore a third child, which is now eight years old, and has not suffered from ill-health of any kind. At the date of the patient's visit to me I found the uterus very

<sup>3</sup> See also Massart and Bordet, *Annales de l'Institut Pasteur*, 1891.

<sup>1</sup> A paper read before the British Gynaecological Society.

much enlarged and excessively tender; there was abundant pus-stained leucorrhœa, menstruation being profuse and accompanied by pain. Treatment based on the assumption that a syphilitic dyscrasia was the cause of the symptoms has been followed by satisfactory results confirmatory of that view. As the mother's syphilis in India was recognised and treated, it is not altogether a matter of surprise that she did subsequently bear a healthy child; but it may be that the treatment was not sufficiently long continued, or was not renewed so as to eradicate the dyscrasia, which after ten years again has betrayed itself.

Constitutional syphilitic disease confined to the cervix may have as its most obvious symptom profuse leucorrhœa. A young woman in domestic service, a lady's maid, applied to me suffering from severe leucorrhœa. She reminded me that several years before, then very young, she had been under treatment by me in the Middlesex Hospital for secondary syphilis. She informed me that she was now about to be married. The speculum showed the cervix large, broad, and somewhat flattened, and upon its surface and around the os grey patches having the same general appearance as the patches of old-standing ichthyosis linguae. I could discover no distinct engorgement of the body of the uterus. Had the patient not enlightened me as to her past history I should have found difficulty in diagnosis, as she presented no other tokens of old syphilis. She had never been pregnant. The question is whether the condition of the cervix would interfere with pregnancy, and whether, if pregnancy took place, the residuum of syphilis would prevent the patient bearing a healthy child.

A case of much more recent infection occurring during pregnancy, and having an exceptional history, followed by disease of the cervix uteri, came under my observation in November, 1889. Mrs. M—, when first seen by me, had a large indurated chancre on the lower lip, near the angle of the mouth. The lymphatic glands below the jaw were enlarged. She had been taking mercury under medical advice, and was severely salivated. After a short time all doubt as to the nature of the sore was removed by the eruption of a syphilitic rash, and the appearance of the characteristic sore-throat and of mucous tubercles on the vulva. She was confined in January, 1890. The infant was congenitally syphilitic, dying, it is said, of bronchitis at the end of fourteen weeks. I have lately seen the patient. The throat is no longer sore, but there remains some hardness (indistinct) at the cicatrix of the sore on the lip, which swells if she over-fatigues herself. There is a gummatous patch on the inner side of the left thigh, and a few spots of lepra on the same limb. Mrs. M— has profuse leucorrhœa; the vagina is tender. The speculum shows the cervix enlarged, especially at its posterior lip, which is tumid and highly congested, and is bathed in a purulent discharge. The margin of the os is of a purplish red colour. Previously to the illness menstruation had been quite regular, but since very irregular, the intervals being occasionally five, six, and seven weeks; the flow lasts ten days, and clots are passed. The patient is rather pallid; the hair is thin, and inclined to fall. The source of the inoculation of the lip is a mystery. The husband has no trace of syphilis, and has never suffered from venereal disease. In this case, I may suggest that had pregnancy not occurred, perhaps the uterine tissues would have escaped. The foetus, however, being contaminated by the blood of the mother, developed a new focus of infection within the uterus, and thus determined a syphilitic condition then in that organ.

A question that opens up a wide field of pathological speculation is the infection of the ovum by the blood of a mother who is herself congenitally or hereditarily syphilitic, and is one that does not appear to have been illustrated by many recorded examples, probably from the rarity of this form of transmission, and as well from the difficulties of obtaining reliable data. The following case, remarkable in more ways than one, was under my care as out-patient at the Middlesex Hospital. A woman nearly sixty of age applied with an oval sore, about  $\frac{5}{8}$  in. by  $\frac{3}{8}$  in. in measurement, on the radial side of the left index finger. It was alongside the free edge of the nail. It did not implicate the root of the nail like an ordinary whitlow, but was said to be extremely painful. The edges were slightly raised, the surface unhealthy, having one or two small sloughy spots. The sore, in short, had the character of syphilis; but as the woman was not a laundress or a midwife, I was at a loss to explain the occurrence of a syphilitic sore in such a situa-

tion. I observed, however, that the patient had old-standing palmar psoriasis. Two or three weeks after my first seeing the patient, a daughter of hers came and urgently begged me to visit her mother. I remarked that this young woman had signs of being hereditarily syphilitic: she had neither eyebrows nor eyelashes, and her upper incisor teeth were defective. The patient resided near the hospital, I found her to be suffering from the acute stage of secondary syphilis, eruption over the face and body, and sore-throat. I learnt that the daughter whom I had suspected of being the subject of hereditary syphilis was a married woman, and at the time was the mother of an infant a few months old. I had the opportunity of inspecting the child. It had snuffles, brown discolouration of the lips, with fissures and sore nates. I further learnt that the patient, the grandmother of the aforesaid infant, had been tending it, washing it, &c. It transpired that previous to the patient giving birth to the mother of the syphilitic infant, she had suffered from syphilis communicated by her husband, and that the palmar psoriasis above mentioned was one of the sequelæ. I obtained an interview with the father of the infant. He was, I may say, a person of unusual intelligence. I made the most critical examination of him, and I could discover no trace whatever of any constitutional syphilis, and he assured me he had never suffered from any venereal disease, a statement I could see no reasonable ground for disbelieving. Unless there lurks some defect in the evidence, here were three generations syphilitic from the same source, the disease in the two later generations being hereditary, the syphilis of the infant being an example of syphilis of the second generation. There could be no doubt that the grandmother had been syphilitised, presumably by her husband, yet that syphilitisation had conferred no immunity, and had not protected her from reinoculation, for the sore on the finger was a chancre, and was the initial lesion of the constitutional outbreak which I witnessed.

At the Pathological Society in 1872 I brought forward a case of syphilis of the second generation. It was that of a girl who at six years of age had disease of the lower end of the diaphysis of the femur affecting the intervening cartilage, the epiphysal cartilage, with the result of gradually producing a curve forwards of the bone from unequal growth of the anterior and posterior longitudinal halves of the bone by the time she was seventeen. No other bone was deformed, and therefore the disease which caused the deformity was not rickets. The mother of this patient was examined by me. She had deficient development of the right supra-orbital ridge of the frontal bone, and I ascertained that she had suffered when young from congenital syphilitic eye disease. The girl, her daughter, had, it would seem, inherited from her a liability to bone affection. Sir John Simon (then Mr. Simon) mentioned at the discussion on syphilis (1876) a case of syphilis of the second generation. Atkinson, in the *Archives of Dermatology* (1877), gives an account of a case of syphilis inherited through two generations. M. Fournier, quoting from *La France Médicale* (1889), says that Atkinson had reason eventually to feel less sure of his facts in that case. Further, M. Fournier remarks that the possibility of the transmission to the second generation, although it may rationally be imagined, requires more facts to make it irrefutably proven.

Infection of the mother by syphilis of the foetus presupposes that the ovum can receive the syphilitic virus by impregnation—that is, through the semen. That syphilis can be so conveyed, although questioned by some, is almost universally admitted. Dr. Wilks, at the discussion above mentioned, expressed it thus: "A healthy man has a small amount of virus introduced into him, perhaps an infinitesimal amount, and the whole of his nature is changed. .... The man brings into the world a number of puny, ill-formed children, and the result is seen in even the next generation." This was not traversed by any speaker who followed. Dr. Fournier stoutly maintains and elaborately illustrates<sup>2</sup> the transmission of the syphilitic virus by the sperm (the syphilis of conception), and the contamination of the mother by the foetus so impregnated. Dr. Brandis of Aix-la-Chapelle writes to me that "in a good many cases we must feel very much inclined to believe in the very semen being the only medium of infection." Hutchinson goes so far as to say that in a large proportion of the cases met with in practice the taint is derived from

the father only. Bryant admits that a man in good health a year after all evidence of the disease has vanished may beget a healthy child, but he adds that if his health subsequently fails, the poison seems to have the power of reasserting itself, and his offspring may be feeble or diseased. And yet, it seems to me, one does not meet with children congenitally syphilitic in proportion to the number of fathers who have at some time or other suffered from constitutional syphilis, or with wives who have become syphilised by bearing children to such fathers. I have watched the children of fathers whom I have known to have suffered from constitutional syphilis some years before marriage, and I have not seen them to be marked by a hereditary taint. I acknowledge, however, that the experience of one practitioner taken alone is entitled to little weight in a question of such magnitude. But in such case either the patient had outgrown the syphilitic diathesis, or had been cured, or enjoyed especial immunity. As regards the transmission of syphilis by men who have married in the early months or years after having had primary syphilis it is far otherwise. Contamination of the wife and, if she become pregnant, of the foetus is an almost certain disaster, and under such circumstances the poison remains in the woman ready to crop up with virulence long after, provided she has not been submitted to steady and repeated treatment. I was requested to see a lady who had been married some years, and had borne children, and who was staying in London for a short time. It was told me that she was suffering from piles. On examination I discovered no hæmorrhoidal trouble, but numerous mucous tubercles. On inquiry as to the history of miscarriages, I learnt that a few months after marriage she aborted, and she incidentally mentioned as a curious (to her) circumstance that about that time she completely lost her eyebrows and eyelashes. As this gave me sufficient clue to the nature of the case to guide me in treatment, for obvious reasons I made no further research, but I took the husband (who I observed had marked palmar psoriasis) aside, and questioned him as to his antecedents. He disclosed to me that six months prior to his marriage he had been under treatment for chancre. I was enabled to refer to the surgeon whose patient he had been, and I was informed that at the date of his patient's marriage it was doubtful whether the induration at the cicatrix of the chancre had entirely disappeared. I have seen the eldest child of the marriage; he is liable to epileptic seizures. It is submitted, in a considerable proportion of the cases which are set down as contagion by the sperm, that the husband has married within a comparatively short time of having had chancre, and before secondary symptoms have been developed, or before they have been effectively treated. The discharges from some of the secondary lesions, or the secretions of some of the mucous surfaces of persons suffering from constitutional syphilis, have a contagiousness not exceeded by the discharges in congenital syphilis, which have been particularly characterised by Diday as differing from those of ordinary syphilis, by an infinitely greater power of contagion. It is by such discharges and secretions that the wife becomes directly contaminated, a contamination of which she remains ignorant. The initial lesion produced by contact with an individual the subject of constitutional syphilis may be so slight as to be easily overlooked; it may be a minute papule or superficial excoriation. I had the opportunity in private practice of verifying this. Two gentlemen who I accidentally discovered had had intercourse with the same woman came to consult me about the same time. In one there was a slight excoriation only, near the frænum; in the other nothing but a small papule on the outer surface of the prepuce; both patients, however, in due course had secondary symptoms. I obtained an inspection of the woman, and found that she was in an early stage of constitutional syphilis; she had mucous tubercles, sore-throat, &c. Without this inspection I could have given no certain diagnosis. The light thrown on the state of affairs by it enabled me to warn my patients of what was to be expected. I may say that I have not known an instance where, contrary to advice given by me with the deepest sense of responsibility, the man has married, that the wife escaped contamination, even when no pregnancy resulted from the marriage.

Can a mother who has been syphilised either directly or through the foetus ever bear a perfectly healthy child? This is a most vital question. Does the syphilitic diathesis ever exhaust itself? To what degree of saturation with syphilis

does repeated pregnancies by a syphilitic husband reach? Is there a law of gradual diminution of syphilitic intensity? Does a diminution of syphilitic intensity modify the appearance of syphilitic symptoms in the offspring, and can treatment help? One word in respect of treatment. I have observed, as doubtless everyone else has done, that specific treatment during the course of pregnancy appears to have little effect, and does not save the infant from congenital syphilis. I have supposed, in explanation of this, that the foetus, being syphilitic already, as it increases in bulk continues to send a fuller stream of fresh virus to the mother, and thus the specific remedies are neutralised or overwhelmed. But when once the pregnancy is terminated, treatment has a fair field. It must then be steadily put in force, and must be periodically repeated. I believe it is only by the repetition of treatment that immunity can be gained. But may we not hope, when the methods by which Pasteur has obtained such mastery over many morbid poisons or processes, and the experiments of Koch and his followers have been more fully worked out, that we shall arrive at a further knowledge of the nature of syphilis, and get beyond a treatment which at the present time is almost empirical?

There is a maternal condition of vital importance to the child after intra-uterine life—namely, in the mother's capacity as nurse. Infection after intra-uterine life by the milk of the mother, who may have become syphilitic while nursing her child, or by the milk of the wet-nurse under similar circumstances, or who may already have been suffering from syphilis in its constitutional form at the time of her undertaking the duties of foster-mother, is a point that cannot be passed over, but I anticipate that the opinion of Dr. G. Gallois,<sup>3</sup> that the milk of even a syphilitic wet-nurse is preferable to artificial feeding, will not be endorsed. A

<sup>3</sup> Recherches sur la question de l'innocuité du lait provenant de Nourrices Syphilitiques (1877).

case is recorded by Mr. Henry Morris in which infection by the milk of the wet-nurse appeared to be most probably the source of the patient's syphilis. In this case the five children antecedent to the diseased one were healthy, and a subsequent child was also healthy.

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## TRACHEAL TUGGING IN AORTIC ANEURYSM.

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SINCE the publication of Dr. MacDonnell's cases in THE LANCET, illustrating the physical sign of tracheal tugging in aortic aneurysm, I have come across two cases of this disease in which the above-named sign was well marked.

A. B—, aged fifty-two, steward of a camp establishment. Complains of pain over the præcordia and corresponding space on the right side; pain radiates to back, encircling whole body; dry cough; occasional palpitation.

*Previous history.*—Has been healthy all his life, with the exception of occasional attacks of lumbago; has been a sober man; has had gonorrhœa, but never syphilis; has had several falls from horses; on one occasion he fractured the ensiform cartilage in the act of mounting on horseback.

*Present history.*—Eighteen months ago he began gradually to feel the pain of which he complains at present. The pain is chiefly over the præcordia, sometimes over the corresponding right side, and sometimes radiating backwards and encircling the body. The pain is of a dull character, and is aggravated by violent exercise of any kind. When the pain is very bad he finds great relief by sitting down and flexing the body over the abdomen. He is, nevertheless, able to attend to his work, which he effects on horseback. About nine months ago he began to suffer from a dry cough, which gets worse after violent exercise, when he also has a wheezing respiration, to relieve which and the accompanying pain he assumes the flexed position. Breathing quiet when not undergoing exertion. Occasionally he feels his heart thumping on his side. Eats well; has a good digestion. When in bed his easiest position is lying face downwards. He generally sleeps on his left side, which is his second best position. He is not so comfortable lying on his