TWO LECTURES ON ANTENATAL DIAGNOSIS.

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LECTURE I.

GENTLEMEN,—Diagnosis implies difficulty. The making of a successful diagnosis implies the overcoming of a considerable difficulty. It is true that by the elaboration of mechanical aids, and by the long training of the senses, it is possible to reduce the making of a diagnosis under certain circumstances to a very simple and a very rapid process. Then, however, it can scarcely any longer be called diagnosis; it has become recognition, and requires little if any mental effort. In dealing with antenatal morbid states it is diagnosis in its true and best and most interesting sense that is needed. There is no immediate risk that anyone will obtain such facility in the discovery of intrauterine conditions as to convert antenatal diagnosis into a dull and featureless and supremely easy procedure. It ought, therefore, for a long time yet to retain a special attraction for the diagnostician who rejoices in the meeting and overcoming of difficulties, and he is no true scientific physician who does not welcome with the relish of the epicure the truly intricate and obscure problems of his professional work. There is a feast ready for him in antenatal pathology.

Medical and surgical diagnosis began with the separation one from another of the external morbid states and of the injuries of the limbs; after many centuries it passed to the investigation of the pathological conditions of the organs contained in the three body cavities; and while some still alive can look back to the elaboration of the diagnosis of intrathoracic and of intra-abdominal diseases and injuries, many of us who have not yet become old in the profession regard with almost personal pride the development of intracranial diagnosis. All these advances have meant the overcoming of many difficulties, some of them not inconsiderable, some of them at first sight insuperable, but all of them yielding before the active brain of man. The brain itself has been the last to yield up its secrets. It is now full time that an energetic and sustained effort be made to carry the diagnosis of intra-abdominal pathological states further than it has ever been yet taken. The task is difficult, for we have to investigate the condition of things in a cavity within a cavity, we have to diagnose not merely intra-abdominal morbid states, but intrauterine intra-abdominal morbid states. The difficulty ought to be, is all the stimulus we need.

It is often concluded that by antenatal diagnosis is meant the recognition of antenatal morbid states during antenatal life or intrauterine existence—this and nothing more. The definition of antenatal diagnosis, however, is a wider one than that, for by it are understood the recognition and the separation one from another of all the pathological conditions which are produced during antenatal life, not only while that period of existence is still in progress, but also after the product of its pathology has been expelled from the uterus, and even during the time it is passing through the vagina on its way to the exterior. The birth of a diseased or malformed infant does not remove the necessity for a diagnosis of its particular disease or malformation, nor does it always clear away the difficulty in making it; even if the child be already dead it will be for the advantage of future treatment that the medical man make out the cause of death. It must therefore be kept constantly in mind that the diagnosis of antenatal pathological states may be made at three times—during antenatal life while the foetus is still *in utero*, during the act of parturition or intranatally, and after birth or in post-natal existence. It is, of course, easier to make the diagnosis intranatally than antenatally, and much easier to do so postnatally; but with decrease in difficulty has come decrease in value, and the chance of successful treatment may have passed away. It is necessary, therefore, to give the first place to the discussion

of antenatal diagnosis made during antenatal life, as well on account of its difficulty as of its value.

ANTENATAL DIAGNOSIS.

Emphasis has already been laid upon the difficulties of diagnosing morbid states while the subject of them is still *in utero*, and it is true that while the facilities are few the difficulties are many; but it must not be forgotten that after all they are not more than impediments, they are not insuperable obstacles to the making of a diagnosis of intrauterine diseases and teratological conditions. Further, can the medical man declare upon "soul and conscience" that he makes in every case of pregnancy that comes under his care a full and searching effort to remove these obstacles? It is not that he does nothing: he listens for the foetal heart, he notes the growth of the uterine tumour, he asks about the foetal movements, and he examines the maternal urine for albumen, not once if he be wise, but several times. But he is content with little; he is satisfied with far less from his examination of the pregnant woman's abdomen than he would be, for instance, from the investigation of her husband's chest. In the case of an obscure lung complaint in the pregnant woman herself this same medical man would doubtless percuss and auscultate and palpate the thorax till he had cleared up the diagnosis, and would feel not a little guilty and ill at ease if he failed to do so; but I fancy there are few practitioners who would pay the same amount of attention to the examination of the abdomen and uterus if the patient complained of unusually active or unusually inactive foetal movements, or of acute pain in the hypogastric region. Further, I have known a surgeon, on the hunt for an abdominal cancer, by careful abdominal palpation follow a hard lump of faeces up and down the colon for a couple of days, but I have yet to meet the obstetrician who was willing to devote as much attention to the palpation of the pregnant uterus. There can be no doubt that in antenatal diagnosis the means of clinical investigation at our disposal are seldom made full use of, and are too often nearly completely neglected. It may be urged that the medical man has little or no opportunity of examining pregnant women in such a manner as would enable him to form an opinion on the health or disease of their unborn infants, and it may further be stated that patients do not offer themselves for such an exhaustive examination and even refuse to allow it when it is pressed upon them. Now, for this state of affairs the medical profession is largely responsible; it has not demonstrated the value of such a procedure, and it cannot be expected that the public will follow where the profession does not lead. I doubt not the willingness of the pregnant woman to submit to examination, even to suffer to some extent in so doing, if it can be shown to her that she is thereby ensuring her own welfare and that of her unborn infant.

Antenatal diagnosis includes the discovery of normal pregnancy and of plural pregnancy, of foetal death, of diseases and monstrosities of the foetus, of hydramnios, and of morbid conditions of the placenta. All these matters must be kept in mind in examining a patient who may be pregnant, and in all of them there is at any rate an increasing probability that the diagnosis may be thoroughly well established under favourable circumstances and with care and skill.

The making of the diagnosis of the antenatal morbid state during antenatal life will best be accomplished by taking up the following lines of investigation in order. First, the previous medical history of the woman, both general and sexual, must be inquired into, for there are certain circumstances which may be regarded as commonly preceding the development of morbid states in pregnancy; secondly, the past history and present state of the father and the family history on both sides ought to be taken into account, for there are foetal diseases and embryonic deformities which appear to be hereditarily transmitted; thirdly, the maternal symptomatology during the pregnancy which is in progress must be carefully investigated; fourthly, a very complete physical examination ought to be made of the maternal organs, and especially of the abdominal viscera; fifthly, the foetus should be fully examined by the hands, by the ear, by the cephalometer, by the Roentgen rays, and by any other means of exact research that may yet be invented; and, finally, the maternal urine and blood should be subjected to chemical

and microscopical investigation, as it is beginning to be realised that the condition of the foetus *in utero* is to some extent reflected in the composition and characters of the maternal excretions. The rest of this lecture will be devoted to the consideration of some of the diagnostic possibilities suggested by these lines of research.

MATERNAL MEDICAL HISTORY.

The investigation of the clinical history of the mother of a stillborn or deadborn or diseased or deformed infant must, in the first place, deal with certain purely medical questions. The bearing of these questions upon antenatal morbid processes may not in the meantime be very evident; but it is of importance in a subject of such complexity that all available information should be secured, and in other branches of medical diagnosis the physician is every day learning that details at one time considered of no value in the etiology of maladies sometimes take on a sudden and preponderating importance—for example, the precancerous phenomena. Reference is now made to the medical conditions of the mother existing prior to and apart from her sexual and obstetrical history, and the question that has to be solved is whether there are maternal medical states which predispose to, or at any rate precede, the morbid occurrences of reproductive life. Are there any facts which shall enable us to predict that in a given case the future will show either morbi-parity or monstriparity or mortinatality? Can, in other words, a typical past medical history be looked for in the mother who gives birth to diseased, deformed, or dead infants? *A priori* it may be expected that women who have had a healthy childhood and girlhood, who have suffered not at all or but slightly from the maladies of early life, who show no signs of rickets or of congenital syphilis or of anæmia, and who are not the victims of evident cardiac, pulmonary, hepatic, renal, or nervous disorders, will give birth to healthy infants. On the other hand, it may be expected that women with a past medical history the very reverse of the foregoing will produce offspring dead or dying, or diseased or deformed. Now, it is not difficult to find cases which apparently contradict or disappoint these expectations, for perfectly healthy mothers who have not suffered from severe illnesses in early life give birth occasionally to deformed offspring, and delicate and diseased mothers sometimes astonish everyone by bringing forth strong and well-formed infants; but such instances do not altogether prove that the past medical history of the mother is of no importance as a premonition of future reproductive irregularities, they simply remind the investigator that there is a second factor to be taken into account—the state of health of the father. But, even admitting the occurrence of contradictions to the expectation that a woman who has been previously healthy in other ways will be healthy also in the matter of reproduction, the past maternal medical history ought to be inquired into. I have been struck on several occasions by the frequency with which women who have had disastrous obstetrical histories have also suffered previously from neuroses of various kinds, from tubercle, from alcoholism, from syphilis, from kidney trouble, from rheumatism and gout. It does not necessarily follow that these medical conditions of the mother prior to her pregnancy have so altered the ova in her ovaries as to make them incapable of healthy development, nor does it even prove that her whole system has been so altered as to be unable to react in a healthy fashion on the contents of her uterus. It may be taken as supporting the idea that both the morbi-parity and the bad medical history of the mother are results of a common cause, that they are both hereditarily transmitted to her; and this is, I think, the more correct way of looking at the question. Further, it gains support from the fact that the degenerative conditions, such as nervous diseases, insanity, arthritic developments, some neoplasms, tuberculous predisposition, and the tendency to take alcohol and other toxic agents to excess, are apparently governed by the same laws as to transmission, etc., as preside over malformations, morbi-parity, mortinatality, pluriparity, abortions, congenital debility, and the other numerous phenomena of antenatal pathology. They show family prevalence very markedly, and they exhibit the form of heredity which has been called dissimilar. This association between the insanities, the nervous diseases, the arthritisms, the tumours, and

the morbid phenomena of antenatal life has been strongly insisted upon by Féré in his most suggestive work, *La Famille Névropathique*.

It will, therefore, be of the greatest importance for the progress of antenatal pathology for observers to investigate the medical history of morbi-parous and monstri-parous mothers along the lines which have been suggested. So far as my own observations have proceeded, they tend to show the existence in the mothers of congenitally malformed or diseased infants of more than the ordinary amount of manifestation of nervous disease and even of insanity, of arthritic manifestations, and of tubercle, and syphilis and alcoholism. It must be repeated, however, that it by no means follows that all these medical states are the causes of the morbid phenomena of antenatal life; some of them may be, but others will be the associated manifestations of a common cause or causes which appear most evidently in the form of impaired nutrition of the tissues. Nevertheless their presence has a diagnostic value if it can be fully established that they are met with more often in women who give birth to dead or stillborn infants, to diseased or malformed fetuses, to twins, or to congenitally weak children.

MATERNAL REPRODUCTIVE HISTORY.

The mother's previous reproductive history is of much more immediate value in the diagnosis of antenatal morbid states than is her purely medical record. Now the phenomena are closely associated; they are to a certain extent manifestations of the activity, physiological or pathological, of the same organs. There is a close connection between menstruation and ovulation and pregnancy; and there is a very close connection between successive pregnancies, for although it may not be correct to say, "*ab uno disce omnes*," yet there can be no doubt that the occurrence of one abnormal gestation greatly increases the chances of the supervention of others. The inquiry into the maternal reproductive history may be made along the following lines:

1. *The menstrual habit and type* ought to be ascertained, and any abnormal conditions, such as excessive or diminished flow, pain, etc., noted, for from such information something may be learned of the state of the genital organs and their fitness for the discharge of the reproductive functions. It will be of special importance to elicit the presence of symptoms pointing to the existence of endometritis, for it is well known that a diseased uterine mucous membrane predisposes to various forms of antenatal deviations from the normal.

2. *The condition of the mother as to marriage* must be inquired into. It will be well to ascertain whether she married at a very early age or late in life, for in neither of these circumstances are her pregnancies likely to be normal. Further, the fact that she has married a relative such as a cousin, and much more an uncle, must be referred to, for although the marriage of first cousins need not of itself lead to abnormal developments during pregnancy unless the heredity and individual health on both sides be bad, yet the fact is of importance; and certainly the marriage of relatives nearer than cousins—for example, uncle and niece, aunt and nephew, would seem to produce pathological results.

3. *The history of the previous pregnancies* of the patient may yield information of the very greatest value in the making of a diagnosis. As case after case of antenatal disease or disorder has come under my notice, I have been more and more impressed by the tendency of abnormalities in pregnancy to repeat. I do not mean that a given foetal disease or embryonic monstrosity will occur several times in succession in the uterus of the same patient, although that also has been observed, and I have myself noted its occurrence in foetal dropsy, in anencephaly, in polydactyly, in tylosis palmæ et plantæ, in absence of the radius, etc.; but I refer rather to the very commonly noted fact that pregnancies that are pathological—although not pathological in the same way—are almost certain to be associated. Over and over again there is the history of abortions, foetal death, foetal disease, stillbirth, congenital debility, twins, hydramnios, malformations, and possibly also monstrosities in the same mother, who may on this account be called morbi-parous. Necessarily, these phenomena do not often all occur in one patient's history, but the appearance of any one of them ought to prepare us for the possible supervention of any other of them in a future pregnancy. Further, other pathological events of rarer occur

rence might be added to the list, such as the hydatid mole and extrauterine and extra-amniotic pregnancy. Yet, again, it is wrong to think that syphilis is the only morbid state that determines this long series of morbid developments. Alcoholism at least does so also, and possibly tuberculosis, lead poisoning, and other infective and toxic and toxicological states. Syphilis and alcoholism offer a striking contrast, in that, while the antenatal phenomena of the former tend to diminish in virulence as the reproductive history of the woman progresses, those of the latter morbid condition show a marked tendency towards intensification. This peculiarity of maternal alcoholism has been very strikingly brought out in a recent contribution by Dr. W. C. Sullivan in the *Journal of Mental Science* (July, 1899). Enough has been said to show the supreme importance of a knowledge of the mother's previous obstetric history in forming an estimate of the probable character of the gestations of the future, and it is unnecessary to do more than refer to the diagnostic aid that may be received from the record of previous confinements in which the size of the foetus or its malformed or diseased state caused delay or danger, or both, or in which it was noted that the placenta or membranes were abnormal in any way. So well recognised is this tendency to repeat in antenatal pathology that the terms "habitual abortion, habitual premature labour, and habitual fetal death" have been used to express it; but a more correct nomenclature would be "repeating abortion," etc., for the idea of habit is scarcely what is meant, and we ought to look not so much for the repetition of identical morbid phenomena as for the repetition of gestations abnormal in some way, but not necessarily in the same way.

PATERNAL MEDICAL AND REPRODUCTIVE HISTORY.

In most cases of foetal disease and monstrosity little or nothing is said with regard to the health of the father. This is unfortunate, for it seems to be certain that paternal morbid states acting through the spermatozoa are potent in inducing antenatal pathological conditions. It is a striking comment upon this line of inquiry that cases have been reported in which women have given birth to healthy infants by one husband and to diseased offspring by a second consort. I have myself seen several cases in which I believe I was justified in tracing to the father the origin of the antenatal malady or deformity of the infant; further, the condition of the father was not invariably syphilitic, although it is true that more is known of the paternal factor in syphilis than in any other morbid state which is capable of transmission to the foetus. It is, therefore, necessary to take note of the age of the father when he begets his child, of his age in relation to that of his wife, of his habits especially in respect to alcohol, of his state of development, and of certain diseases such as syphilis, nephritis, diabetes, cancer, tubercle, malaria, lead poisoning, mental disorder, etc., from which he may be suffering or have suffered, for there is good reason to believe that any of these pathological states may have a direct and injurious effect upon the offspring engendered by him. It may also be that the morbid paternal influence is transmitted directly to the foetus without the mother suffering from it save secondarily through the foetus; this is believed in respect to syphilis, and there is some evidence that it holds also for malaria,¹ and probably for other diseases. The influence of paternal alcoholism has not yet been fully worked out, but one of the striking results obtained from Sullivan's contribution already referred to,² was that total abstinence on the part of the father did little, if anything, to improve the prospects of the unborn infant so long as there was still maternal alcoholism.

FAMILY MEDICAL HISTORY.

In forming a diagnosis of antenatal morbid states the observer cannot afford to neglect the family medical and obstetrical history, for such conditions are not infrequently hereditary. The heredity, further, may not always be of the same kind. Direct and similar heredity is sometimes met with, and when it occurs it is so striking that it seldom passes unnoticed, thus the late Dr. George Elder and myself have recorded a case in which tylosis palmæ et plantæ—a condition of excessive formation of the epidermis of the palms and soles—had been handed down from mother to daughter and then to granddaughter and great-granddaughter with such regularity that it was expected and looked for at once when a female infant

was born into the family. The same thing has been noticed in anomalies of the fingers and toes, and especially in polydactyly, in congenital cataract, in retinitis pigmentosa, in harelip, in cleft palate, in fistulæ of the lower lip, in navi materni, in microphthalmus, in aural fistulæ, and in a very large number of other anomalies and congenital diseases. In other phenomena of antenatal pathology the same tendency is evident. I have, for instance, given striking statistics illustrating the heredity of twin-bearing and of large families³ and the heredity of triplets has also been established by various records. The following case I cite from the contribution made to the Edinburgh Obstetrical Society to which I have just referred. Mrs. I. was one of a family of seventeen children, and one of her sisters has had twins while another sister has had triplets. She herself has had twenty-two children in eighteen confinements, four times twins and fourteen single births. The first confinement produced a boy dead born; the second, twin boys at the sixth month, both dead; the third, a boy, dead born; the fourth, a girl, who lived six weeks; the fifth, a boy at the eighth month, who died in ten days from umbilical hæmorrhage; the sixth, a boy and girl at the sixth month, dead born; the seventh, a boy, dead born; the eighth, a boy, still alive; the ninth, a boy, died in sixteen days from umbilical hæmorrhage; the tenth, a girl, still living, aged 10 years; the eleventh, a girl at full term, died shortly from convulsions; the twelfth, a boy, who died at the age of 1 year from wasting; the thirteenth, a boy, who died at six weeks from wasting; the fourteenth, a girl, who died at 18 months from whooping-cough; the fifteenth, a boy, still living; the sixteenth, twin boys at the sixth month, one of whom alone survived his birth, and that only for twenty-four hours; the seventeenth, twins, a boy and girl, of whom the girl soon died from wasting; and the eighteenth, a boy, who died at the age of 6 weeks.

Of course, teratological states which are incompatible with extrauterine life cannot be transmitted by direct and similar heredity; but dissimilar heredity may and does occur, and occasionally a parent with a minor malformation which permits the continuance of prolonged postnatal life procreates a foetus with a monstrous condition which renders it quite non-viable. I have already in these lectures referred to a woman with malformed thumbs, the daughter of a woman similarly deformed, who gave birth to infants with anencephaly, hydrocephaly, and absence of radius and thumbs, a case in which there was both similar and dissimilar heredity. Dissimilar heredity also is very common in antenatal pathology, and in estimating its presence it is necessary constantly to bear in mind that the phenomena of antenatal pathology are not confined to one group of conditions such as malformations or foetal diseases, but include also abortions, twin births, mortinatalities, congenital debility, extrauterine pregnancy, and placental and membranous abnormalities. It has sometimes been said paradoxically that sterility is hereditary, and the statement is true if it be meant that a woman or a man in whose ascendants (for example, in aunts or uncles) sterility has been common, will also run a great risk of being sterile.

In the family history of morbi-parous and monstri-parous mothers it is not uncommon to find, very markedly, morbid predisposition to various diseases developed postnatally, but in all probability present potentially antenatally; in this group the neuroses find a prominent place, as do also susceptibilities to be acted on abnormally by such toxic agencies as alcohol, morphine, and tobacco.

REFERENCES.

¹ Felkin, *Trans. Edin. Obstet. Soc.*, xiv, 71, 1889. ² *Loc. cit.* ³ *Trans. Edin. Obstet. Soc.*, xxii, 29, 1897.

THE Portuguese Geographical Society has decided to send this summer an expedition to Serra Nogueira in the Province of Traz-os-Montes. The expedition includes a medical section, which will study the medical hydrology of the district and local diseases.

REPRESSION OF THE SPITTING NUISANCE.—According to the *New York Medical News*, Dr. Robert A. Black, chief of the Health Department of Brooklyn, is taking active steps to enforce the law against spitting on the floors of public buildings, ferry boats, or street cars. Several arrests have been made for breach of the law. The penalty for breaking this ordinance is a fine varying from 1 dollar to 250 dollars.