LUMLEIAN LECTURES

ON

THE CONVULSIVE DISEASES OF WOMEN.

Delivered at the Royal College of Physicians.

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LECTURE I.

The Changes in the Vascular and Nervous Systems wrought by Pregnancy. — The remarkable Influence of Pregnancy in creating and evoking Disease. — Three epochs of special proclivity to Convulsive Disease. — Special provision of Nerve-force and Irritability of Nervous Centres for Parturition, and probable special Hypertrophy of Spinal Cord. — All Generative Acts manifest an Emotional and Convulsive Element. — The factors necessary to produce a Convulsion. — The Eclampsia of Uremia.

MR. PRESIDENT AND GENTLEMEN,—The graceful account of the foundation of these lectures, given by a predecessor, relieves me from the duty of doing more than to add my humble tribute to the honoured memory of Caldwell and of Lumley. Benevolent and beneficent men they undoubtedly were. The design of their foundation was to promote the cultivation of learning, by holding out the prize of honour to those who should be called upon by the College to impart it. I fear that in my case, at least, their benevolence exceeds their beneficence; and I am even tempted—suffering acutely as I do the pangs of parturition—to question their benevolence. I felt, however, that I had no right to decline a task which you, Mr. President, who rule the College with so much love and wisdom, have thought fit to assign to me. You were swayed, no doubt, by the thought that one who, like myself, has spent many years in the active practice and unintermitting study of a branch of medicine cultivated by only a small number of Fellows, might, even ought, to have gathered up some clinical facts, and made some reflections, which it would not be uninteresting to submit to the consideration of his brethren.

Facts comparatively unfamiliar, and reflections suggested by contemplation from a different standpoint, must almost necessarily be useful, as complementary to the knowledge picked up in our peculiar fields, and as corrective of the conclusions we are apt to draw from our special studies. We can always set each other thinking; and thought is always prolific.

This interchange of experience and ideas is clearly one of the great uses of lectures such as these. If this thought were present—and I have no doubt it was—to the minds of Caldwell and Lumley, how infinitely more useful, even necessary, is such interchange now! how greatly has Time proved their sagacity and wisdom!

If the motto of our College were true in the days of Hippocrates; if it were true at the day when the College was founded; does it not grow truer and truer every day? Life is as brief; but Art—who shall now attempt to measure its infinitude?

The Father of Medicine, a great intellect, himself might master all the medical science of his age; but such a comprehension has never fallen to the lot of his posterity. Grasping what he did, and epitomising it for future ages, one can imagine the old seer, inspired by the vastness of his thoughts, seeking to embody in one pithy and pregnant formula his prescient estimate of the wonderful growth of the art which he practised and taught.

How far that clear intelligence, or the still brighter genius of Harvey, who practised midwifery, would have approved the actual minute, and still proceeding, subdivision of medical practice, it is now useless to speculate. It is hopeless for any one man so to practise, and so to study all the branches of medicine, as to combine harmoniously and profitably for science, the diverse materials that would accumulate upon him. He would be crushed under the overwhelming load.

There is nothing to be done, then, but to distribute the work amongst any workmen; and on all suitable opportunities to call them together aid in building up the ever-rising, but never-to-be-completed, Temple of Medicine.

Yet it must surely strike those who reflect, that subdivision of medical practice may be carried out to an injurious, even to an absurd, extent. The true medical mind will always refuse to look upon any one organ of the body as anything more than a dependent part of a whole. But the public seems to grow less and less reasonable upon this subject every day. I have recently been honoured by a visit from a lady of typical modern intelligence, who consulted me about a fibroid tumour of the uterus; and lest I should stray beyond my business, she was careful to tell me that Dr. Brown-Séquard had charge of her nervous system; that Dr. Williams attended to her lungs; that her abdominal organs were entrusted to Sir William Gull; that Mr. Spencer Wells looked after her rectum; and that Dr. Walshe had her heart. If some adventurous doctor should determine to start a new speciality, and open an institution for the treatment of diseases of the umbilicus—the only region which, as my colleague Mr. Simon says, is unappropriated—I think I can promise him more than one patient.

The fragmentary way in which medicine is studied, more especially in this town, undoubtedly interposes a serious barrier to the advancement of true knowledge. And it is not difficult to see that it acts injuriously upon the medical mind, disposing those who too exclusively study one branch to underrate the merit, and even the honesty, of those who study a different branch. This extreme splitting-up of medicine renders almost impossible the attainment of a full perception of pathology, or even of the import or any disease or symptom. It destroys the very idea of correlation, of the mutual reaction of different organs, and of the modes by which all the organs may be affected by one common condition.

It is a miserably narrow view to take of the practice of obstetrics, to regard it as simply the art of delivering women in labour. The study of menstruation, of pregnancy, of labour, of childbed, and of the phenomena connected with these conditions, opens up to the earnest practitioner a rich mine of facts illustrative of many of the most interesting problems in medicine. Out of this mine he may extract materials in profusion which he would look for in vain elsewhere.

There is scarcely any department of medicine or surgery upon which the clinical study of obstetrics may not throw the most valuable light. And in many instances this light partakes of the brilliancy of a well-designed experiment. For example, the interesting phenomena of thrombosis and embolism are hardly ever so well traced all through their etiology and pathology, as in many cases of childbed. The history of pyæmia or of septicæmia, or of irritative fever, would be very incomplete without taking into account the puerperal cases.

Many other blood-diseases are produced under the transforming power of menstruation or pregnancy, in a manner to bring before the eye of the clinician some of their most striking features. Thus, leucocythæmia may almost be said to be a disease of pregnancy. One of the most constant effects of pregnancy is a diminution in the proportion of red corpuscles and an augmentation in that of the white corpuscles; and in some cases this double abnormality is carried to the extent of producing the typical leucocythæmia. True, there are still missing links; but it is not bringing us something nearer to a solution of the problem when we start with a healthy woman, and see the disease grow up under the modifications wrought by pregnancy?

So it is with that remarkable disease, acute yellow atrophy of the liver, or malignant jaundice. A considerable proportion of all the known cases have arisen in pregnant women.

Not even surgeons witness more frequent or more instructive lessons as to the effects, immediate and remote, of rapid and profuse, or of repeated losses of blood.

Peritonitis in women must be continually misunderstood or misinterpreted, unless it be studied in connection with puerperry, menstruation, and the diseases of the ovaries and uterus.

The alterations in the constitution of the blood and in the dynamics of the circulation bring about the most remarkable changes in the general system, and in particular organs. Thus, the heart undergoes a normal hypertrophy under the double influence of increased demand to supply the uterus, and the embryo growing at an accelerating ratio, and to overcome the pressure exerted upon the abdominal aorta or pelvic branches. The heart is compelled to beat more powerfully and more frequently; and the inferior obstruction tends to divert the current of the blood propelled from the heart towards the head, causing inordinate tension of the cerebral arteries; hence at times, even during pregnancy, brain-apoplexy, and almost sudden death. And if we continue our observations to the act of labour, when the glottis is closed, the chest fixed, and the return of venous blood from the head is arrested or impeded, we find the tension of the cerebral vessels enormously increased, and extravasation is a more pressing danger. Another effect

of the altered dynamic relations of the circulating organs, and of the attendant altered quality of the blood, marked, amongst other changes which chemistry fails to trace, by loss of red corpuscles, by increase of white corpuscles, by excess of fibrin and of water, and by the empoisonment produced by the ingestion of an increased amount of matter that ought to be excreted, is of necessity greater strain upon the liver, upon the spleen, and especially upon the kidneys. Under this unwonted strain, the liver and the kidneys are often overpowered; they give up their appointed work, or perform it imperfectly. One of the most instructive chapters in the history of Bright's disease is that which relates to the almost sudden rise and rapid progress of albuminuria in pregnancy. Except in the case of the albuminuria consecutive on scarlatina, and in that of acute dropsy which follows exposure to wet and cold, we hardly know any instance where we can observe all the steps of the disease from its beginning. But here, in pregnancy, we may almost see the disease manufactured; we know some at least of the factors essential to its production, and we know, because we start with a healthy subject, that many conditions complicating the disease as observed in man, may be excluded as non-essential factors.

This form of disease, marked by albuminuria, has the most interesting relations to the nervous system; and these relations will form a larger part of the subject of my lectures. Convulsions are not unfrequently observed in association with the scarlatinal albuminuria, and with the albuminuria of advanced kidney-degeneration, to which the name of Bright's disease is more especially applied. But the outburst of convulsions in the albuminuria of pregnancy is far more frequent. Why is this? To account for this greater frequency, is there not some new factor, or at least some common factor, in a state of exalted energy? This is one of the questions which I propose to discuss.

Although many nervous disorders or phenomena in women are closely allied in etiology and nature to convulsion, I propose—not unduly to extend my theme—to limit myself almost strictly to the convulsive diseases. These are:—1. Eclampsia of Pregnancy and Puerperium; 2. Epilepsy; 3. Chorea; 4. Vomiting; 5. Tetanus; 6. Hysteria.

I do not pretend to deal with these diseases exhaustively, but simply to study them in some of their physiological and pathological relations, which seem to have been hitherto imperfectly apprehended, and to endeavour to define upon a rational physiological and clinical basis the principles of treating them.

I take the convulsions of pregnancy and labour first, not because this is a logical or physiological order, but because the conditions under which convulsions break out in pregnancy and labour, and the nervous phenomena, are so striking and so open to observation that they will best serve as a type which will guide to the more ready understanding of the other varieties of convulsion.

There are three epochs, or rather stages in the life of woman, at which she exhibits special proclivity to nervous diseases marked by convulsion. In the first stage, that of infancy, the proclivity is common to both sexes, but still, I believe, more marked in the female. Convulsions in children is a subject beyond my task. It has been treated by Dr. West in this place in a manner at once so masterly, and yet so full of grace, that it were presumptuous indeed to enter upon his domain. It is enough for my purpose, if I recall attention to the peculiar state of the nervous system in infancy. I mean its preponderant development, its special susceptibility to emotional and physical irritation. That this state is intimately connected with the wants of a rapidly developing organism, is one of the elementary facts in physiology. It has a direct application to my argument.

The next stage of proclivity to convulsion begins with the advent of menstruation, and terminates with the cessation of that function. This stage, of course, includes, and is continuous with, that of sexual life or reproductive capacity. It is during this stage that the proclivity to convulsive action is the most strongly marked.

The third stage runs almost imperceptibly on from the second. It is difficult to draw a sharp line of demarcation between them. Theoretically, however—that is, physiologically—the two stages are distinct. The third stage begins with the decay of the reproductive capacity, and is prolonged for an indefinite period, ranging from one or two to five years, or more, but is seldom prolonged into the age of senility.

This third stage may be called the stage of aberrant nervous action. During the two earlier stages the nerve-force is employed, except when disordered by morbid influences, in the work of definite functions. These functions being at an end, and the organs by which they were performed undergoing the involution of decay, there follows a period of anarchy, during which nerve-force, no longer finding useful employment, goes astray in every direction, provoking the wildest and most extravagant manifestations. By-and-by, the stage of adaptation or re-adjustment arrives; the nerve-force generated finds appropriate occupation, and all settles down into comparative order and calm.

The degree of proclivity to convulsive disorder varies greatly in these three stages of life, and in different individuals; so greatly, that we cannot help concluding that, in those who are the most prone to such disorder, there must exist some additional factor beyond the ordinary physiological factors which are common to all. And this we know to exist in some cases in the form of the strumous or the syphilitic diathesis, or in some more subtle condition of hereditary transmission. But in a large proportion of the cases of convulsive disease in pregnant women, we cannot invoke a factor of this kind. All the factors, whatever they may be, are produced under the proper conditions of pregnancy; grafted, as it were, upon a stock otherwise perfectly sound.

If we now inquire into the conditions which raise the nervous system of women into this state of inordinate convulsive and emotional affectability, we are led to the irresistible conclusion that they depend upon influences springing out of the reproductive function. The great convulsive disorders of women are almost strictly limited to the period of activity of the reproductive organs.

Every function requires for its performance a supply of nerve-force directed *ad hoc*. The functions of ovulation, of gestation, of labour, and of lactation, which in turn dominate over the entire organism of women, require a special and additional supply of nerve-force beyond that required for the ordinary functions of nutrition, locomotion, and thought.

The history of the animal kingdom abounds with illustrations of this proposition. I will draw but one from comparative physiology, and that shall be from the physiologist's devoted friend, the frog. In the spring, at the commencement of the breeding season, so great is the nervous excitability of this animal that a slight irritation of the skin, which at another time would produce no obvious effect, will induce almost tetanic convulsions.

It is easy to perceive analogous phenomena, sometimes quite as pronounced, in the human female, at the advent of puberty, at the periods of ovulation, during gestation, and eminently during the act of labour.

It is a fact deserving to be remembered, that during all the three stages of life marked by convulsive proclivity there is an exalted degree of emotional sensibility. We might even generalise further, and affirm that emotional sensibility proceeds *pari passu* with the convulsive liability. Almost always co-existing, it might be said that the two conditions are convertible into each other. Certainly, it may be said that each will often excite the other. Nothing is more common than for an emotion which, under ordinary circumstances, would be completely controlled by the subject, to evoke a fit of hysterical, epileptic, eclamptic, or vomitive convulsion, when the nervous centres are in a state which we may describe as *convulsive tension*. And on the other hand, if the convulsive fit be excited by reflex irritation, it is almost surely followed by an exalted degree of emotional sensibility.

It further deserves to be noted here, that emotion takes a large part in every act or process of the generative function. In short, emotional affectability is the measure of convulsive liability.

Another proposition I would state is the correlative of the preceding one. It may not be quite so obvious in its truth, but I think I shall be able to show that it is equally constant. It is this: an energy which may be compared with, if not identical in nature with, convulsion, is an essential element in the leading acts of the generative function. I have known instances of an epileptic fit being repeatedly induced by the sexual act. I have heard of several other like cases. Voisin mentions one. La Motte knew a woman who, not pregnant, always vomited "*solâ actione coitûs*".

In the female, and especially so in the lower mammalia, the sexual aptitude is strictly periodic, like the ovulation upon which it depends. What idea can we form of periodicity, unless it be that it is dependent upon an accumulation of nerve-force in readiness to be used when the returning occasion arrives?

Then, as to the *influence of menstruation*, or rather of its *primum mobile*, ovulation. In all ages the frequent association of this function with epilepsy and hysteria has attracted attention. Hippocrates said, "Nubile virgins, particularly about the menstrual periods, are affected with epileptic paroxysms, apoplexies, and groundless fears or fancies." He thus records his observation that the emotional faculty was exalted as well as the convulsive. What was true then is true now.

It is a matter of frequent observation that the first attack of hysteria or epilepsy coincides with the first effort at menstruation, and that a fit is liable to recur at successive menstrual epochs. In girls and women who do not exhibit hysteria or epilepsy, vomiting is a frequent attendant upon ovulation.

Dr. Laycock, who has illustrated this subject with great research and clinical sagacity (*On the Nervous Diseases of Women*, 1840), says, "The catamenia are seldom established without aching and neuralgic pains of

the back and lower extremities, partial anæsthesia (numbness), and tetanic contractions (cramps) of the legs."

In *pregnancy*, again, we see further manifestations of emotional and convulsive susceptibility. The vomiting of early pregnancy is familiar to every one. I shall study some of its more serious aspects in a succeeding lecture. I need not do more than cite the influence of pregnancy upon the mind; how it exalts emotional affectability; how it modifies character; how it even disorders perception and judgment. I will dwell upon what is not so familiar. I have known such an exalted state of reflex or centric irritability in many women, arising in early pregnancy, that the legs were seized with sudden uncontrollable twitchings or jerking, so that the subjects were afraid to go out into society.

One woman, by no means fanciful, or given to introspection, the wife of a tradesman, active and earnest in business, describes herself "as if she had a galvanic battery within her at work": an apt illustration, marking well the irritability and explosive tension of her nervous centres. In these cases there is no albuminuria. Were this condition, that is, the correlative toxæmia, to arise, these women could hardly escape from eclampsia.

I know women who always are troubled with a cough when pregnant. It is not attended with any bronchial secretion; it is purely nervous; it is of explosive or convulsive character.

Labour.—It is no stretch of hypothesis to describe labour as a series of convulsions: convulsions, it is true, well directed to a specific end. So great is the nervous tension at this crisis that slight peripheral physical, or mental, irritation will easily provoke and maintain a renewal of the so-called "pain". The obstetric practitioner turns this irritability to account when he wishes to accelerate a labour actually begun, or to initiate the parturient process. When this irritability is in excess, or when some other cause impairing the cohesion of the ovum with the uterus is imported, spontaneous abortion or premature labour is the result; that is, if the nervous energy be well directed towards the uterus; otherwise, it finds a vent in the production of convulsions.

To show how nearly an expulsive labour-pain is allied to convulsion, we have but to observe the course of a pain towards the end of labour. A premonitory shudder, the forerunner of the storm, often a rigor, often vomiting, ushers in the pain, just as we frequently observe before the outbreak of a fit of epilepsy. Women have told me that at this moment they felt sure they were on the verge of convulsion. From the moment when the uterine contraction begins, voluntary power to stop the action ends; the patient may, indeed, give intensity to the effort by adding the force of voluntary effort, but she can hardly lessen it. And in a true expulsive pain she is even unable to withhold the aid of the voluntary muscles. This may seem contradictory; but the fact is, that at a certain point the expiratory muscles, which are usually under the control of the will, cease to be so. The glottis is closed; the chest-walls are fixed; the expiratory muscles contract powerfully; the muscles of the neck compress the veins. There is, as in epilepsy, trachelismus; black blood circulates, or is delayed, in the brain. Delirium or temporary unconsciousness supervenes. The resemblance to epilepsy is, for the moment, so close that the two conditions can hardly be distinguished. If in such case a dose of ergot be given, the convulsive character is so intensified as to make the resemblance even closer still. The ergotic contraction may last for ten or even twenty minutes; it is almost tetanoid in its character. Under the strain it puts upon the lungs I have seen universal emphysema occur, spreading from the neck; and the strain upon the vessels may cause rupture and extravasation, apoplexy; and this even when no ergot has been given. This is the history of some cases of sudden death in labour.

How can we account for that enormous supply of nerve-force by which the work of parturition is effected? It is hardly an exaggeration to say that, in many women, there is a larger expenditure of nerve-force in the execution of this function, all spent within a few hours, than they have ever before expended upon muscular exertion for weeks and months together. For many women, the day of childbirth is the only day's hard work they have ever known. What does this imply? It seems to me to be a physiological necessity that to generate the inordinate supply, a corresponding development, a physiological hypertrophy, analogous to that which takes place in the heart, should take place in the spinal cord. This is a distinct proposition from that of Dr. Robert Lee, that the nerves distributed to the gravid uterus themselves are increased in bulk and number. I cannot avoid the conclusion that, since organic development must keep pace with functional activity, the spinal cord really does undergo an increase of development during pregnancy; and that we may find in this increased organic development and power the explanation of the readiness with which it responds to the normal demand of the uterus and embryo for their de-

velopment, to the sudden extraordinary demand for the muscular energy of labour, and to the abnormal waste or diversion of nerve-force under certain morbid conditions.

It is right that I should state that this hypothesis is based purely upon physiological and clinical inductions; that I have no anatomical data upon which to support it. The truth is, we know little of the peculiarities of states of the nervous centres in pregnancy and childbirth. The brain is occasionally examined; but chiefly so when symptoms, such as those of apoplexy or embolism, point to some definite pathological change. The spinal cord is rarely examined at all. The subject is worthy the attention of a Lockhart Clarke.

At this point we find ourselves naturally led to ask, why it is that labour-pains do not more frequently pass into epileptic convulsion? The question can be answered with some precision. In the ordinary condition, the healthy correlation of resisting power, of irritation, and of nervous energy is so harmoniously preserved, that all works in an orderly circle. But disturb this correlation, and the nervous energy is wasted or misapplied. What are the chief causes of disturbance? Clinical facts show them to be: 1. Altered condition of the blood; 2. An hereditary or acquired peculiarity in the nervous centres.

Both of these conditions need not co-exist; one of them is enough.

To bring together the factors which combine to produce a fit of puerperal eclampsia, we find them to be:

1. Accumulated irritability of the nervous centres, the product of an altered state of nutrition induced in them by pregnancy, so as to provide a due supply of nerve-force for the work of the uterine muscles and the muscles auxiliary to the uterus.

2. An eccentric stimulus usually conveyed from the uterus to the nervous centres, calling these into action.

When these two factors only exist, a healthy labour may result.

3. But a new factor may be superadded. An example of this we find in that peculiar state of the blood which is marked by albumen in the urine. The blood is literally poisoned. The effect of the circulation of such blood in the system generally, and in the nervous centres, is to increase enormously their irritability. Much slighter causes will now evoke the dormant energies of the cerebro-spinal axis; and the danger is great, that the excess of irritability will run into pathological action. When this toxæmic condition exists in pregnancy, two things are always threatening: the one is premature labour, the other is eclampsia. Either event may be first in order, each may provoke the other. It has been commonly supposed that labour is the immediate cause of the convulsion. But this is only true in a limited number of cases. At any moment a pregnant woman, the subject of albuminuria, may be seized with convulsion without the slightest evidence of an initiatory attempt at labour. The fact is, that the poison in the blood, intensifying the irritability of the nervous centres, disposes them to respond by a storm of nervous energy on any excitation; and thus to anticipate the normal advent of labour. A third, and a negative result may happen, which it will be convenient to dispose of at once. The pregnancy may continue to term, and no convulsion may occur. This event, which experience has amply established, was stoutly denied by the late Dr. Lever, who was one of the first, if not the first, to establish the connexion between albuminuria and puerperal eclampsia. I have heard him affirm, without qualification, that albuminuria always induced eclampsia, and conversely that eclampsia never existed without albuminuria. He also affirmed, as absolutely, that albuminuria was the product of pressure upon the kidneys or the emulgent arteries by the gravid uterus, adducing in proof its frequent occurrence in women pregnant for the first time.

My own observations enable me to set aside both these conclusions. Absolute, universal dogmas in medicine are always dangerous. They are probably always wrong.

Analysing the histories of fifty-three cases of puerperal eclampsia, of which I have preserved notes, I find that in sixteen the convulsions broke out without any antecedent sign of labour; labour being either an epiphenomenon caused by the convulsion, or induced by the medical practitioner. I believe it is scarcely possible for eclampsia to break out, and for the pregnancy to go on. One of two things will almost certainly happen. First, if not delivered, the cause of the toxæmia persisting, the convulsions will be continued and prove fatal by exhausting the sufferer by shock or by direct lesion of the brain; or, secondly, labour will be induced by the circulation, or stagnation, in the nervous centres and uterus, of blood charged with excess of carbonic acid. Such blood acts, as Marshall Hall and Brown-Séquard have shown, as a direct stimulant to muscular contraction. Under its influence—and I am not now speaking from the authority of these great physiological experimentalists, but from my own careful clinical observations—the convulsion occurs first; one feels the os uteri perfectly closed, and no uterine contraction. Presently, when one or more fits

have occurred, when black blood is circulating, uterine action begins. Once started, the nerve-storm seizes the uterus as well as the voluntary muscles; the sphincters relax, the os uteri dilates, and the labour proceeds.

It is only thus that we can account for the large proportion of cases in which labour comes on prematurely at six, seven, or eight months of gestation.

I have, however, seen a case in which uræmic eclampsia broke out in the eighth month, and the pregnancy went on to term.

I have said that the convulsion may be the immediate cause of labour. The converse is also true. Labour may be the immediate cause of the convulsion. Uterine action, with or without the pressure of the head upon the irritable neck of the uterus, acts as an excitator of convulsion. In a certain proportion of cases, the first fit follows upon the dilatation of the cervix, and the contact of the head with the os uteri. The influence of uterine action may be clearly traced. After a fit there is a period of comparative calm, marked probably by stertor, coma, and mental unconsciousness. We hope that the calm will continue; but, presently, we see the patient writhing uneasily as if from abdominal pain; on placing the hand upon the abdomen, we feel the uterus contracting; and then a fit breaks out again. This order of events may be repeated several times. So long as the uterus is quiet there is no fit.

We may test the effect of uterine irritation more directly still. We may ourselves apply the irritation by touching the os uteri with the finger for the purpose of examination, or with the view of accelerating the labour. In many cases a convulsion immediately follows.

And this is an observation I have often made. Is it at times necessary to pass the catheter. So great is the nervous tension, so lively the irritability of the nervous centres, that the merest touch of the vulva induces such resistance—albeit the patient's mind is unconscious—that it may be impossible, without the aid of chloroform, to pass the instrument. Nor is the hyperæsthesia limited to the genital organs. The whole surface of the skin is irritable to an astonishing degree. It is a common impulse, from which some medical men are not free, to seek to exorcise the fits by dashing cold water on the face, by applying blisters or sinapisms to the neck, or calves. A fit is too often the consequence. Irritation of the skin, especially the sudden impression of cold upon the face or chest, by its action upon the respiratory nerves, is a pretty sure way to provoke a fit. I have seen the jar, the shaking of the house, caused by a heavy carriage passing along the street, produce a fit. And when the stage of coma is passing off, when consciousness is returning, and with it emotional susceptibility, almost any mental impression will act like a physical shock, and again a fit is produced.

I detail these observations, not only because of the light they throw upon the pathology of convulsion, but also because of the great practical lesson in treatment which they enforce.

But convulsion in pregnancy or labour may occur without albuminuria. In this case we must invoke an equivalent *tertium quid*, something which lends intensity to the normal physiological erethism of the nervous system. This something may be another kind of blood-affection, or it may be some altered condition of the nerve-substance associated with the strumous or syphilitic diathesis, or some indefinite hereditary taint.

In another order of cases, the outburst of convulsions is deferred until the natural term of gestation. Here we may suppose one of two things: either the albuminuria did not begin until near this term—and this is probably often the case—or, existing for some time before, the induced irritability of the nervous system was not intense enough, or the stimulus was wanting to start the convulsions. This latter hypothesis is also often true. For albuminuria may exist, beginning in mid-pregnancy, and go on to the end without necessarily inducing either convulsion or labour. Of this I have seen unequivocal examples. The subjects have been tolerably robust, not very impressionable, and they have had the good fortune to escape those exciting influences, moral and physical, which commonly cause the storm to burst.

I have offered the conjecture that the blood-change indicated by albuminuria may arise rapidly, even suddenly. The observations must be very rare in which the urine, being free from albumen one day, has been found changed the next. Naturally, the urine is not examined unless there is a present pathological indication.

In some cases, the albuminuria existed before the pregnancy, depending upon chronic Bright's disease. Of course the pregnancy does not mend matters. The albuminuria persists. But if I may trust the few observations to the point which I have been able to make, convulsion is less likely to ensue than in the rapidly-produced acute form. We may imagine that in chronic Bright's disease a process of accommodation takes place, whilst in acute albuminuria the nervous centres, suddenly invaded by poisoned blood, are unprepared for resistance.

But there is another hypothesis, one which may have some facts to rest upon, but which is decidedly negated by other facts. It has been said that the convulsion is the first event, and the albuminuria the second; in short, that the convulsion causes the albuminuria.

I have notes of cases which are directly adverse to this hypothesis. I have seen not a few cases in which, either on account of a history of convulsions in a former pregnancy, or because anasarca, headache, amaurosis, the frequent attendants of albuminuria, appeared, the urine was tested, and found to be albuminous. In some of these cases eclampsia broke out, in others it did not.

In a considerable proportion of cases, the appearance of amaurosis, vertigo, anasarca, preceding the fit, affords the strongest presumption that albuminuria has set in. Again, to show that a convulsive fit will not produce albuminuria, we have a number of cases of epileptic fits, even attended by protracted stertor, in which no albumen could be found.

It is interesting in this connexion to remember that, whilst there appears to be no poison of animal origin so efficacious in causing convulsion and labour as that which attends albuminuria, all the so-called zymotic poisons, as those of scarlatina, variola, typhoid, typhus and relapsing fevers, exercise a marked influence in provoking premature labour.

We see, then, in these observations, the conditions under which convulsions are produced. Even Brown-Séquard could not demonstrate on his guinea-pigs the etiology of convulsion with more precision. Given, the two conditions of pregnancy and a peculiar blood-poisoning, and convulsion may be predicated, almost with certainty, so soon as an adequate emotional or peripheral irritation is applied. Take away either of these two conditions, and the probability is that irritation will fail to produce convulsion.

After labour, the albumen commonly disappears rapidly, and with it disappears the liability to the recurrence of convulsion.

OBSTETRIC MEMORANDA.

LIABILITY TO MALPRESENTATION OF THE FŒTUS DURING LABOUR.

THE following cases open up a wide field for inquiry. During the summer of 1872, I was asked by Mrs. M. to attend her in her confinement, which she expected in a few months. She told me that she had already had eight children, all at full time, and that four of the eight had been either breech or footling-presentations—two of each, she thought. About the time she had mentioned I was sent for, and, on making an examination, I found the os half dilated and a breech presenting. All went well, and in half an hour she was delivered of a large male child. On thinking over this case, I remembered that, when a student, I had been sent out from the Maternity Hospital, in which I was taking out my practical midwifery, to attend a woman who, I found on my arrival at her house, had had a breech-presentation in her previous confinement. She was confined soon after my arrival, and, as before, had a breech-presentation.

The object of these observations is to induce others to contribute to the solution of the question, Is a woman who has had a breech or footling-presentation at one labour more liable to the same at her subsequent labours than any other woman of the community? It will be seen that I leave shoulder and all cross-presentations out of the question, as they have been more closely investigated, and definite though not similar causes have been assigned for them, as form of the pelvis, obliquity of the spinal column, irregular action of the abdominal muscles and position of the placenta, etc. We confine ourselves to the reversing of the ovoid. Churchill gives the number of breech cases in 197,318 deliveries, as 3,325, or one in 59½; and the number of footling or knee-presentations in 192,174 deliveries, as 1,831, or one in about 105; so that there must be something more than chance in one woman having three breech and two footling-presentations in nine deliveries, and another having two successive breech-presentations. Statisticians have given us the percentage of every sort of presentation. Most obstetric writers tell us of the forceps having been used, or the perforator several times with, or the Cæsarean section even having been performed, more than once in the same woman; but none, so far as I am aware, have mentioned the fact of a woman having had an abnormal presentation of the fœtus in more than one labour. If those of our brethren who have a large obstetric practice will give us the benefit of their experience, we shall soon know whether to answer the above question in the negative or in the affirmative.

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