June 7th he complained of pain over the right lobe of the liver. This continued till, on June 9th, after taking a little nourishment, he suddenly collapsed and died in a few minutes.

Necropsy.

At a post-mortem examination on June 11th—forty hours after death—the following facts were noted: The wound was healthy and well shut off by adhesions, and neither in loin nor pelvis was there any pus. The peritoneum itself was normal, but its cavity contained a quantity of serous fluid mixed with pus. A number of small abscesses were found in the substance of the right lobe of the liver, and also two larger ones, which had communicated, and by projecting on the right surface of the lobe had caused the abdominal pain complained of from June 7th, and by their rupture into the general peritoneal cavity had caused sudden death. The left lobe and gall bladder were normal. The portal vein was normal, and had no communication with the abscesses, so that it was a lymphatic infection of the liver.

The interesting points of this case are:

1. That, though the patient had his first rigor on the night of April 14th, it was not till the evening of the 17th that the first physical sign was noticed, and then only a slight one.
2. That the antistreptococcus serum did no apparent good, whereas the quinine certainly appeared to lessen the frequency of the rigors.
3. That the right lobe of the liver was affected, but not the left.

The Goulstonian Lectures

ON

THE INFLUENCE OF PREGNANCY UPON CERTAIN MEDICAL DISEASES, AND OF CERTAIN MEDICAL DISEASES UPON PREGNANCY.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

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LECTURE III.—PREGNANCY IN RELATION TO CERTAIN FEVERS.

MR. PRESIDENT AND GENTLEMEN,—The next variety of cases that deserves consideration is that in which the mother, being at the time pregnant, develops one of the commoner fevers. Generally speaking, the pregnant state seems to confer some degree of immunity, the reverse being true of the puerperium. Scarlet fever, for example, shows less tendency to attack a pregnant woman than other persons equally exposed to the infection; whereas a woman who has been recently delivered of a child is particularly prone to take the disease if it is in the vicinity. Nevertheless, pregnancy confers no absolute immunity to the specific fevers, and should the patient contract one the question will arise as to what is likely to be the result both as regards the mother and as regards the child.

TYPHOID FEVER AND PREGNANCY.

Typhoid fever, for instance, may develop during pregnancy. There are a fair number of papers upon the subject, references to several of which have been given by Mr. H. T. Hicks and myself in the *Lancet*.¹ The illness may begin at any period of the pregnancy, and, like typhoid fever in England generally, it is less liable to develop in the summer months than it is in the autumn and winter.

The course of the disease is precisely similar to its course in other persons. Pregnancy does not seem to have any particular influence on the severity of the illness nor upon the prognosis as regards the mother. The death-rate will doubtless vary in different years; in our own cases it was 14 per cent., in Vinay's 17 per cent., and in Dwyer's 16 per cent., figures which do not differ widely from those given by the Metropolitan Asylums Board for all cases. The effect of enteric fever upon the pregnancy is, on the contrary, bad. In the majority of the cases abortion or premature labour takes place. This was the result in 85 per cent. of our cases, in 66 per cent. of Vinay's, in 63 per cent. of Martinet's, and in 65 per cent.

of Penot's. The reasons for this high mortality amongst the children will be discussed below. Meanwhile it is right to mention, however, that it is quite possible in a minority of cases for the mother to pass through a typical and fairly severe attack of typhoid fever and yet for the pregnancy to continue to term and for the child to be born living and well. This was the case in one of our patients who developed typhoid fever in the fifth month of her pregnancy, recovered in due course, and was delivered at term of a healthy child who lived to grow up. There is no period of the fever at which a premature ending of the pregnancy seems more likely to occur than at another. The time at which it takes place depends rather upon the month of the pregnancy than upon the day of the fever. If the patient is already eight months pregnant, for example, delivery may occur during the first week or ten days after the onset of the fever; but if the pregnancy has not passed the fifth or sixth month it may continue into the third or fourth week of the fever and yet end prematurely. The mother seems to suffer remarkably little from the labour. Of course, she may already be in an extremely bad way from her typhoid fever, just as any other person might be, and then the prognosis is grave. It might have been expected that even if she had not hitherto been more than ordinarily ill from her enterica, the additional strain of labour must necessarily have made her considerably worse; this, however, is not the case as a rule. The delivery is most often easy and the patient experiences considerable relief. The uterus involutes just as if there were no maternal illness, and the fever usually runs just the same course as if the incident had not occurred.

Transplacental Transmission of Toxins, Agglutinins, and Bacteria.

Several points of considerable scientific, if not clinical, interest arise in connexion with the child. The following questions might be asked:—If the child were born dead during the course of typhoid fever in the mother, would it be likely that typhoid bacilli might be found in the fetal tissues; in other words, can typhoid bacilli be transmitted directly from the mother to the fetus? If the child's blood serum were tested by Widal's test, would it be likely to give a positive reaction? If so, does the fetus produce its own agglutinins, or does it receive them ready formed from the mother? If the fetus can and does become infected with typhoid bacilli, does it develop ulceration in the Peyer's patches of its intestine; in other words, can the macroscopic condition of the fetal bowel be relied upon as a certain indication as to whether the fetus is infected with typhoid organisms or not? If the fetus becomes infected with typhoid bacilli, does this happen soon after the mother falls ill? and, if not, how long after the mother's infection is that of the fetus likely to occur? Would the child, if it lived, have a natural immunity to typhoid fever, supposing it had remained in *utero* until after the mother had recovered from her fever? If the fetus is not affected in any of the above ways, or even if it is, are there any other lesions that it is likely to have suffered as the result of the mother's illness—lesions which may show their effects if the child lives and grows up?

It is only possible to give limited answers to some of these questions, and no answer at all to others; but it should some day be possible to give full answers if every case as it came under observation were fully investigated. The difficulty is that one does not always realize at the time the precise points to which attention should be particularly directed, and the cases are sufficiently few and far between to make it difficult for a single individual to investigate any large number of them. Here, therefore, is another subject upon which a carefully directed collective inquiry would be good. The great point about typhoid fever in this respect is that it affords a natural experiment in human beings upon the placental transmission both of chemical substances—the agglutinins—and of bacteria—the typhoid bacilli—simultaneously.

Before entering upon the facts known in regard to the placental transmission of agglutinins and bacteria in typhoid fever itself it will be well to summarize shortly what is known about placental transmission generally. It seems clear, in the first place, that transmission might conceivably take place from mother to fetus in one other way than through the placenta; it might occur *via* the liquor

amni. Ferrari² has shown this to be possible, materials being able to pass from the maternal lymphatics into the amniotic fluid, and thence, by being swallowed, into the alimentary canal of the child. It is generally held, however, that the only path of fetal infection that is at all common is that across the placenta. Dr. J. W. Ballantyne³ points out how important this fact is in connexion with the site of the subsequent lesions, for the substances so transmitted reach the child by the blood stream, and therefore if bacteria are conveyed to the unborn child they pass first the placenta, then the umbilical vein, then either the liver or the ductus venosus, then the heart, and so are distributed all over its body. The condition is thus one of general blood infection from the onset. The lesions may consequently be different in the child from what they are in the mother. As an illustration of this, Bidone⁴ records a case in which erysipelas in the mother gave rise to fungating endocarditis in the child.

In the second place, it is clear that the placenta allows chemical substances to pass across it from the maternal to the fetal circulation; the nourishment of the child is thus conveyed.

In the third place, it is evident that a converse transmission of chemical substances takes place across the placenta from fetus to mother; the child gets rid of the effete products of its metabolism in this way. It has been shown that quite abnormal substances may pass from fetus to mother in a similar manner. Charrin⁵ injected diphtheria toxin into animal fetuses *in utero*, the mother dying from the toxæmia. It has been suggested that toxins elaborated by the fetus and absorbed by the mother may be at the root of the herpes gestationis, the nephritis, and the tetany of pregnancy.

In the fourth place, even as regards chemical substances, the placenta can apparently exert some power of selection; that is to say, whereas some elements and compounds pass from the mother to the fetus with comparative ease, others do so with much less readiness. Porak⁶ performed a considerable number of experiments upon guinea-pigs in this connexion; and he found, for example, that whereas copper and lead were easily transmitted to the fetal tissues, arsenic passed across with greater difficulty, whilst mercury, though it reached the placenta and accumulated there, apparently passed no further. This feature of the placental functions has been termed its "barrier action."

Fifthly, this "barrier action" of the placenta, decidedly limited even in health, becomes still less marked when the mother is ill. Charrin and Duclert⁷ showed that the presence in the maternal circulation of certain chemical substances or of various microbial toxins renders the placenta permeable to things which otherwise pass across it with difficulty; in other words, the placental barrier often breaks down when the mother is unwell, and things which would not be allowed to pass across to the fetus if the mother were healthy are then able to do so.

Sixthly, it has been fully established that bacteria can pass from the mother to the fetus via the placenta. There is a good deal of evidence to show that the placenta itself acts to some extent like a filter, and that it may contain an abundance of bacteria before any have escaped past it to reach the fetus. Consequently the fetus seldom contains bacteria in anything like the numerical proportion that the mother's tissues do. Nevertheless, Küss⁸ has shown in animals that tubercle bacilli may actually reach the fetus from the mother via the placenta; and other observers⁹ have demonstrated the same fact in regard to the bacilli of anthrax and of fowl cholera, the pneumococcus, the streptococcus, the meningococcus, the *Spirillum obermayeri*, and the bacillus of glanders.

It must be remembered, of course, that the experiments that have been made upon the subject have been upon animals; that the placentae of different animals, varying as they do in size and thickness, vary also in the extent to which each exerts a barrier action against this substance or that; and that, therefore, the facts that have been found to be true of animals are not necessarily true of man. However, although the details may vary it is unlikely that the general principles taught by animal experiments do not apply to man. These principles are: (1) that abnormal chemical substances and toxins are able to pass from mother to child via the placenta; (2) that the placenta when healthy exerts some degree of "barrier action," allowing some things to pass

less readily than others; (3) that this "barrier action" is not only imperfect but becomes less effective when the mother is ill; and (4) that not only substances in solution but also actual bacteria, even those of the size of anthrax bacilli, can reach the child from the mother.

To return now to the discussion of typhoid fever and the way in which the child is affected when the mother has the disease. It has been found repeatedly that the typhoid bacilli can cross the placenta, reach the child, and be recovered from the infant's tissues immediately after birth. There are, it is true, many cases in which the bacilli have been looked for and not found. This was so in the case investigated by Mr. Hicks and myself,¹⁰ but negative evidence in many cases counts for little as compared with positive evidence in even only a few. Typhoid bacilli have been recovered from the tissues of the human fetus by such observers as Fordyce, Freund and Levi, Etienne, Bolton, Eberth, Hildebrandt, Giglio, Durk, and Ernst.¹¹

The fetal blood stream has been examined by Widal's test in a few cases, and although it has sometimes given no reaction¹² in cases recorded by Fordyce, Chambrelent, Griffiths, Mosso and Danic, Bolton, and Kirton,¹³ it gave a positive Widal's test.

No answer can as yet be given to the question whether the fetus produces its own agglutinins or receives them ready formed from the mother, but it would be a most interesting point to investigate further, especially if it could be shown that the fetus did produce agglutinins for itself. There are at least two ways in which light could be thrown upon the question, neither of them very difficult provided they were kept in mind when an opportunity for using them arose.

First, in every case of maternal typhoid fever the child, if stillborn, should be thoroughly examined by cultural methods for typhoid bacilli, whilst at the same time its serum should be subjected to Widal's test. If several cases occurred in which the latter was positive whilst at the same time no typhoid bacilli could be obtained from any of the fetal organs, it would tend to prove that the child could receive agglutinins ready formed from the mother. Apparently no such case has yet been recorded; in every instance in which the child's blood serum gave a positive Widal's test bacilli were either shown to be present also or else they were not looked for.

Secondly, the precise degree of the Widal's reaction should be determined in all such cases both for the mother's and for the child's serum, with a view to ascertaining whether the child's blood will sometimes give a positive reaction in greater dilution than the mother's does. If, for example, a positive reaction were given by the child's serum diluted 500 times whilst the mother's serum failed to give it when diluted more than 200 times, it would be some evidence in favour of the agglutinins being formed, in part at least, by the child itself. These are points upon which observations are still required, and it is only now and then that an opportunity for making the investigation presents itself.

The next question—namely, whether a child that has become infected by typhoid bacilli *in utero* is likely to exhibit macroscopic evidence of this in the form of ulcerated Peyer's patches similar to those of adults suffering from typhoid fever—may be answered both yes and no. In a few cases, such as those recorded by Charcelay,¹⁴ definite ulceration of the fetal Peyer's patches has been noted. Such macroscopic lesions, however, are quite the exception, and the great majority of the children whose blood and organs have yielded typhoid bacilli on cultivation, or whose serum has given a positive Widal's test, have shown no such macroscopic lesions in the bowel. The absence of intestinal ulceration, therefore, is no proof that the child has not become infected by typhoid bacilli *in utero*. Consequently, it is essential to cultivate from the fetal organs if it is desired to find out whether the fetus has become infected from the mother or not.

The fourth question, as to whether the child, if it lived, would have a natural immunity to typhoid fever, is unanswerable at present. It would be possible to give an answer if a watch were kept upon all children born alive from mothers who had suffered from, and survived, typhoid fever during the pregnancy. If even only one or two such children subsequently developed typhoid fever it would make it probable that none of them had an immunity, acquired either actively or passively *in utero*.

It is a point that is not of any great clinical importance, because the number of living persons concerned is very small; but from a scientific point of view it would be of great interest to obtain an answer to the question, seeing that it bears upon the very complex subject of immunity and constitutes a natural experiment in man. It may, perhaps, be mentioned that the presence or absence of a positive Widal's reaction in the fetus is by no means synonymous with the presence or absence of immunity to typhoid fever. The agglutinins upon which the Widal's test depends disappear rapidly from the blood after typhoid fever in the great majority of cases, as Dr. M. G. Louissou and myself¹⁵ have shown. Acquired immunity to the disease does not disappear in this way. Consequently the fact that Widal's test is negative in a child born of a mother who has had typhoid fever during her pregnancy does not prove that the child is not immune to typhoid fever. The longer before the child's birth the mother recovered from her illness the less likely would the infant's blood be to give a positive reaction, if one may argue by analogy with adults, in whom the rapidity with which Widal's test, having been positive during the fever, becomes negative again a few weeks or months later is often remarkable.

Next comes the question as to whether or not the child, if it survives in spite of the mother having had typhoid fever during the pregnancy, is likely to suffer in other ways as it grows up. There is a considerable amount of evidence to show that this is very likely to be so, though it would be too much to say that it must be so. Professor Osler¹⁶ has recorded a case in which the mother died from typhoid fever and the unborn child was found to have a large recent blood clot in its brain. Had the infant lived, it must have exhibited the effects of this lesion, which was apparently due to the mother's illness. Dr. Ballantyne¹⁷ quotes numerous observers who have found "important pathological changes in the fetal viscera, more particularly in the liver, thyroid gland, brain, and suprarenal capsules, which have a far-reaching effect upon the post-natal life of the offspring. . . . They consist in degenerative and sclerotic alterations unaccompanied by the presence of microbes, but productive of a slackening of body metabolism and lowering of body temperature, along with a tendency to develop bronchopneumonia, gastro-enteritis, and infantile atrophy. The same results are produced by other infectious maternal conditions also, and they are probably due to the transmission of toxic principles through the placenta. . . . It has been thought that typhoid fever of the mother in pregnancy may be the cause of intellectual peculiarities in her offspring developed many years afterwards."

The Question of Advising Artificial Delivery.

Before leaving this subject there is one matter of great practical importance that arises from the question of fetal infection, and that is, At what period of the maternal typhoid fever does the fetus become infected with typhoid bacilli? It is held by some bacteriologists that these bacilli are present in the maternal circulation from an early date in the illness, though it has by no means been established that this is an invariable rule. One would like to know precisely when typhoid bacilli are most numerous in the mother's blood, because that would be the time when the fetus would be exposed to the greatest chance of bacterial infection. In our own case¹⁸ the mother died upon the twenty-fourth day and the fetus was not infected. In the cases recorded by others¹⁹ of recent years—that is to say, since the methods of distinguishing the typhoid bacillus from the *Bacillus coli communis* have been rendered more accurate than they formerly were—the examinations were made in five cases when the mother's illness was in its second or third week, and in none of these did the fetal tissues yield typhoid bacilli, whereas in the three cases when the examination was made during the fourth or a later week of the mother's illness the organism was present in the child each time. This number of patients is too small to generalize from, but the results seem to indicate that before the end of the third week of the mother's illness the child is much less likely to have become infected than it is in the fourth or a later week. It seems probable that the prognosis as regards the immediate and subsequent life of the child will be much

better if the infant could be born before this bacterial infection occurs. If, therefore, the pregnancy has reached the time when the child is viable, and if for any reason it is much desired that a living child should be born, it would seem that the best advice for the physician to give would be that of obtaining obstetric assistance for bringing about delivery before the mother's illness had reached the end of the third week. This advice would not be necessary if the mother's interests alone were to be considered, for in her case the prognosis is not materially affected by allowing the pregnancy to take its own course; but if the child's life is a material consideration it would appear to be very risky to allow it to remain *in utero* beyond three weeks from the beginning of the typhoid fever. With each week of the fever the chances that the child will become infected with typhoid bacilli rapidly increase.

Other Specific Fevers in the Unborn Child.

The discussion upon typhoid fever in conjunction with pregnancy has been somewhat dwelt upon, because, owing to the comparative ease with which both typhoid bacilli and agglutinins can be looked for, the cases afford an admirable field for investigation; they constitute natural experiments in man upon the transplacental transmission of disease upon which there is scope for much more work in future cases. Much might be said about the other specific fevers also, but there is only room for a few words about each here.²⁰

Small-pox has long been known to be transmissible from the mother to the fetus *in utero*. It by no means follows, of course, that the child has the eruption in every case in which the mother suffers from the disease during her pregnancy. Sometimes the fetus has died before the exanthem could appear upon it. Sometimes the child will be born quite healthy and catch the complaint at birth—a postnatal, and not an antenatal, infection. Sometimes when the mother has had variola early in her pregnancy the latter has continued to term, and the child, though exhibiting no external evidence of having had small-pox, has been noted to possess a natural immunity to the disease in after-life. In quite a number of cases, however, the child has been born with the typical eruption of small-pox upon it. The degree to which the infant is affected is very variable, bearing no direct relationship, apparently, to the severity of the disease in the mother. The stage of the eruption in the child may be almost identical with that in the mother, varying from vesicle to scar according to the length of time the pregnancy has continued after the mother was taken ill. It is noteworthy that the eruption goes through a pustular stage in the unborn child just as it does in an adult; and, as a rule, the size of each lesion is greater than that seen in grown-up people. On the other hand, the duration of the eruption on the skin of the child may apparently be much longer than it is in adults, for in Lauren's case,²¹ quoted by Dr. Ballantyne, the mother had small-pox early in her pregnancy, and two and a half months later the premature infant was born still covered with the eruption. Dr. Allan Warner²² records an interesting case of the same kind. The mother was taken ill with small-pox upon January 8th when four months pregnant. The eruption appeared upon her on January 11th; by the 23rd the crusts were falling off, and by February 3rd she was quite free from all scabs. Pregnancy continued until the 15th, when miscarriage occurred; twin female children were delivered, both being well covered with a typical small-pox eruption in the pustular stage.

Another very remarkable fact is that the father may have small-pox at the time of conception, the mother may show no sign of the disease, and yet her child may have it *in utero*—a point which seems directly analogous with some cases of congenital syphilis. This opens up a wide field for discussion, but one upon which it is not possible to enter here.

Three further points may be briefly noticed. First, there seems to be no stage of fetal life, from the third month onwards, at which the child may not be born with the eruption upon it. Secondly, even if there is no eruption upon the child's skin it is very possible that, owing to the route of infection being by the blood stream, the lesions might be found upon mucous surfaces, a point which, as Dr. Ballantyne says, deserves full investigation

in future cases. Thirdly, it might well be asked, What would be the behaviour of the child in regard to vaccination if the mother had been vaccinated successfully during the pregnancy? It seems clear²² that two-thirds of such children are just like other children and "take" well at the usual time after birth, but that one-third prove insusceptible to vaccination for a short time after birth. The latter cases will, however, "take" six months or so later. It seems, therefore, that there may be a transmission of immune substances from the mother to the child *in utero*, but that even when this passive immunization of the infant by maternal vaccination occurs it is quite transitory. It is therefore no argument against vaccination of the child that the mother has been vaccinated during the pregnancy, though it might be wise to counsel waiting for six months or a little longer before vaccination is performed in order to be more sure of its being successful at the first attempt.

Dr. Cordes has published an interesting case. The mother had small-pox during pregnancy and recovered. The child was born later, and was vaccinated in the usual way, but failed to "take." When it grew up, vaccination was repeated on two further occasions, failing to "take" each time. Soon afterwards the young man went to China, caught small-pox, and died from it. It would seem here as though the mother's small-pox had rendered the child insusceptible to vaccination without at the same time rendering him secure from small-pox itself. Not only was he not secure from the disease, but he took it with fatal severity. The importance of a possibility of this kind is obviously great.

Just as variola may be transmitted from mother to child *in utero*, so may other specific fevers. The total number of cases in which such a disease as measles coincides with pregnancy is naturally not great, and the number of instances in which the child is born during the stage of the exanthem in the mother is still smaller. The total number of recorded cases of fetal measles is therefore not great, but Dr. Ballantyne²⁴ describes some and has collected altogether 20. He also records cases of fetal scarlet fever, chicken pox, mumps, pertussis, influenza, rheumatic fever, relapsing fever, yellow fever, cholera, malaria, and even cerebro-spinal fever and anthrax. There is clearly too little time at our disposal to give an account of all of these, but after what has already been said in regard to the transmission of typhoid bacilli from the mother to the fetus it may be of special interest to say a few words about the last two.

A most conclusive case of fetal cerebro-spinal meningitis is recorded by Dr. Ballantyne. The mother died from the disease, the seven months child remaining *in utero*. At the necropsy there was the typical lesion in the maternal meninges, over both the brain and the spinal cord, whilst the meninges of the fetus exhibited precisely similar changes, and the *Diplococcus intracellularis meningitidis* was cultivated separately both from the mother and from the child.

In regard to anthrax, Rostowzew²⁵ investigated three cases in which the mothers died from the effects of malignant pustule, and he found numbers of the anthrax bacilli in the placental intervillous spaces and in the fetal villi, smaller numbers being also present in the fetal blood and viscera.

There is abundant proof, therefore, that notwithstanding the "barrier action" that the healthy placenta may exert in protection of the child from injurious substances, the barrier may become broken down, or at least passed, as the result of many different diseased states in the mother; and that not only chemical substances in solution but also comparatively large concrete bodies such as bacteria may then gain access to the child. Before leaving this subject a few words may be said as to the effects of some of these fevers upon the mother.

THE EFFECTS OF MEASLES UPON THE PREGNANT WOMAN.

Pregnancy does not confer any immunity against the taking of measles. A pregnant woman who has not had the disease should therefore avoid exposure to infection. Should she develop the illness the prognosis as regards herself is good, but there is a considerable danger of abortion or premature delivery during the eruptive stage. It has been suggested²⁶ that measles affects the mucosa of the uterus as it does that of the nose, pharynx, eyes, stomach, bronchi, bladder, and bowel, causing an inflam-

matory congestion similar to that which has been observed in some cases of variola, and thereby accelerating miscarriage. If the exanthem stage is past there seems to be little or no danger either to the mother or to the child, unless the former should develop bronchopneumonia, in which case, owing to the abdominal condition, especially in the later months, the dyspnoea and the repeated attacks of coughing may be a source of greater trouble and anxiety than usual.

THE EFFECTS OF PERTUSSIS UPON THE PREGNANT WOMAN.

The latter applies also to whooping-cough during pregnancy. Pertussis in an adult is very apt to be exceedingly distressing in any case, but when it is combined with pregnancy the patient may be in a very pitiable plight. The paroxysms of rapidly repeated cough, each bout sometimes terminating only in the ejection of some of the gastric contents, render the patient abjectly miserable. There is a danger of premature emptying of the uterus in consequence of the extreme and constantly repeated contractions of the diaphragm and abdominal muscles, but otherwise the prognosis is good both as regards the mother and the child.

THE EFFECTS OF SCARLET FEVER UPON THE PREGNANT WOMAN.

Scarlet fever arising in a pregnant woman has a relatively much graver prognosis than it has in other cases. The complication is least serious when it occurs early in the pregnancy and when it does not lead to abortion. It is, however, much rarer at this time than it is towards the end of pregnancy—so much so that it has been thought that the pregnant state confers some degree of immunity to it. The converse is true of the puerperium, when the patient is particularly liable to the infection, and whether the scarlet fever begins either immediately before or immediately after labour, not only is the intensity of the disease itself, its rash and its pyrexia, apt to be extreme, but also there is a very great liability to sapraemia, or, still worse, to actual septicaemia from streptococcal invasion. This view is not held by all; indeed, Dr. R. Boxall²⁷ in a series of papers before the Obstetrical Society in 1888, contended that scarlet fever begets scarlet fever even in a pregnant woman, and has no relation to puerperal septicaemia. Dr. F. Foord Calger, however, gives it as his opinion, from personal experience, that the conjunction of scarlet fever with present, or recent, pregnancy near to term cannot but be viewed with the gravest anxiety. The maternal mortality varies in different epidemics, but it may be as high as 75 per cent.

THE EFFECTS OF CHICKEN-POX AND MUMPS UPON THE PREGNANT WOMAN.

Chicken-pox is often much more severe an illness in adults than it seems to be in children, but there is no evidence to show that its occurrence in conjunction with pregnancy makes it any worse. The prognosis as regards both the mother and the child is good, though, as has been stated, the child may be born with the eruption upon it if the mother suffers late in the pregnancy.

The same remarks apply to mumps. It is, perhaps, a little surprising that mumps do not act very detrimentally upon the pregnancy, seeing that there is a considerable tendency for the parotitis to be associated with inflammation of the genital organs—ovaritis in woman, orchitis in man. The existence of pregnancy does not seem to render the patient more liable to ovaritis than usual, however, and the pregnancy often continues undisturbed.

THE EFFECTS OF DIPHTHERIA UPON THE PREGNANT WOMAN.

The pregnant state confers no immunity to infection by diphtheria, and the disease appears to have a particular virulence in the case of pregnant women. There was a discussion upon the subject in the *Lancet*²⁸ in 1903, and Dr. Chambrelent and Dr. Michelean²⁹ have collected together a number of cases in Bordeaux. The statistics available are open to the objection that they are based upon cases taken from the literature, and not upon a consecutive series of unselected cases. Nevertheless, two things seem clear: first, that the diphtheria is particularly prone to attack the larynx in these cases, as in children, rather than the fauces, as in other adults;

secondly, that if antitoxin is not employed the mortality is very great. Of Dr. Chambrelent and Dr. Michelean's cases there were 12 who received no antitoxin, and 6 of them died, a mortality of 50 per cent. All their cases in which serum was given recovered. Mr. A. E. Kennedy³⁰ points out that even the giving of antidiphtheritic serum early will not save every such case; nevertheless, the proportion of recoveries is so much greater when serum is used early than when it is not that it should always be given at the earliest possible moment to a pregnant woman who has diphtheria.

THE EFFECTS OF SMALL-POX UPON THE PREGNANT WOMAN.

The effects of small-pox upon pregnancy have been closely observed in an epidemic during which there were opportunities of watching 432 consecutive cases in women under 50, 80 of whom were pregnant.³¹ Of the latter, 15 per cent. died, whilst the mortality amongst the non-pregnant women was 11 per cent. The prognosis is, therefore, rather worse when the woman is pregnant, though not so much worse as might have been expected. The statistics are here, but I need not read them. In the 80 pregnant cases confluent small-pox was seen in 4 and hæmorrhagic in 6; all 10 died. In the 352 non-pregnant cases the confluent form was observed in 3 and the hæmorrhagic in 11; 2 of the confluent cases recovered. Two pregnant women died, though their small-pox was of the mild type. Of the primiparae, 9 per cent. died; of the multiparae, 17.25 per cent. The general impression during the epidemic was that there was a tendency for the pregnant women to suffer from a severer type of the disease than the others. The prognosis as regards the child is grave. Of the 80 cases, 23 aborted or had premature delivery; 16 other children were delivered alive in cases where the small-pox was in progress—8 at term and 8 prematurely; only 3 out of the 16 children lived longer than six months. In 2 cases the small-pox eruption was present upon the child at birth.

CHOLERA AND PREGNANCY.

Cholera is fortunately of rare occurrence in European countries, but occasionally there are epidemics such as that at Hamburg. Schütz³² published a complete report of the influence of cholera upon menstruation, pregnancy, labour, and childbed, in the annual report of the Hamburg State Infirmary at that time. He treated 2,500 adult females during the epidemic, and found that cholera shows a marked tendency to affect the uterus. In the cramp stage of the disease uterine bleeding occurs in one-third of the non-pregnant cases. It is not surprising, therefore, that the effects of cholera upon pregnancy are disastrous. One hundred and fifteen of the patients were pregnant at the time they were taken ill with cholera; and Schütz puts this disease upon a level with small-pox in the way it is almost certain to provoke interruption of pregnancy. Kovalsky³³ finds the same to hold good in Russia, where over 80 per cent. of the pregnancies come to an untimely end in cholera patients. The prognosis as regards the mother, bad as it is in many of the cases, is not much worse in pregnant than it is in non-pregnant persons, particularly if the mother is taken ill when the pregnancy is not advanced. There is nothing to be gained by advising steps to be taken to terminate the pregnancy; indeed, convalescence is greatly impeded during the puerperium, and the risk of sepsis is greatly increased, so that the pregnancy should be allowed to continue if it will.

PLAGUE AND PREGNANCY.

The above remarks concerning cholera apply with equal force to plague. Pregnant women show no particular immunity to this disease. The prognosis as regards the mothers is no worse than it is in non-pregnant patients, but the disease terminates the pregnancy in the great majority of cases. Dr. B. H. F. Leumann³⁴ records some instances in which the mothers recovered exceedingly well, but there seem to be fewer statistics in regard to the effects of plague upon pregnant women than there are concerning cholera.

MALARIA AND PREGNANCY.

The effects of malaria upon pregnancy are necessarily variable, both on account of the varying severity of the

malarial attacks in different patients and in different climates, and also because the immediate surroundings of the patient are so very diverse in different parts of the tropics. It is not easy, therefore, to summarize them in any but quite a broad way. There are papers by Italian observers³⁵ upon the subject and a few in English, notably one by Mr. F. H. Edmonds³⁶ of Demerara. The general conclusions which may be drawn are that malarial cachexia has almost no influence upon pregnancy and its course; that in mild cases of intermittent malaria pregnancy usually continues normally to term notwithstanding the ordinary attacks of fever in the mother; that in cases where the maternal temperature reaches 104° F. during the attacks abortion takes place in a large proportion of cases; whilst in the bilious remittent type of the disease not only is the pregnancy almost certain to terminate prematurely, but also the child, even if it has reached a viable age, is nearly always dead, and the prognosis as regards the mother is distinctly graver than it would be in a non-pregnant person with the same degree of malarial illness. There is a very great tendency for both the fetal movements and the uterine contractions to become excessive during the acute malarial attack. It has sometimes been urged that quinine should not be given in such large doses, or even at all, to a pregnant woman with malaria, on the theoretical ground that this drug itself increases uterine contractions and predisposes to abortion, but in practice it has been found by Mr. Edmonds and others that the greatest tendency to premature delivery is in the cases where no quinine is given, and it is emphatically urged by those who have had experience that quinine should be given all the more on account of the conjunction of pregnancy with the malaria. It actually makes the uterine contractions less than they are in cases in which no quinine is given, and by diminishing the pyrexia and lessening the frequency of the attacks not only is the prognosis as regards the mother's life greatly improved, but also the chances that the child will be stillborn are very considerably diminished. It may be incidentally remarked that the infant is sometimes born with a greatly enlarged spleen though there is not yet any absolute proof that the child's blood may actually contain the *Plasmodium malariae* at the time of birth.

INFLUENZA AND PREGNANCY.

Influenza is a disease the severity of which is so variable in different seasons that its effects upon pregnant women in particular are difficult to gauge. The statistics show that the prognosis is much graver in times of widespread epidemic than it is in sporadic cases, but this applies equally to non-pregnant as to pregnant patients. Jacquennier,³⁷ as long ago as 1837, came to the conclusion that influenza was no more dangerous to pregnant women than to anybody else. The type of the disease was different in those days, however, from what it is now, and Cazeaux regards it as likely to be detrimental to the child. The weakness that is left after the acute phase is past is apt to last even longer in the pregnant woman than it is in other persons, and therefore even if the pregnancy does not come to an untimely ending the child is very apt to be born with deficient vitality and a tendency to die young. Lambinon³⁸ regards the bronchitic or pneumonic form of influenza as the most grave as regards both the mother and the child; but all observers agree that nothing is to be gained by interfering with the pregnancy, and the treatment should be, first, prophylactic in times of epidemic; and, secondly, that of extremely careful medical supervision should the disease be contracted in spite of all precautions taken to avoid it.

During an epidemic of influenza in Paris M. Bar and M. Boullé³⁹ carefully watched the effects of the disease in 40 pregnant women. One of these had the nervous, 2 the gastro-intestinal, and 37 the respiratory form of the disease. Four of the latter developed influenzal pneumonia, 2 recovering slowly after delivery, 1 dying a few hours, and 1 on the third day after the child was born. The prognosis as regards the mother is, therefore, grave in the pneumonic type of influenza, but as regards the course of the pregnancy itself these observers came to the conclusion that it was not affected even if the influenza was severe.

LOBAR PNEUMONIA DURING PREGNANCY.

As regards ordinary lobar pneumonia in a pregnant woman, exclusive of pneumonia developing during the puerperium, the cases that have been in Guy's Hospital point to the following conclusions:—1. *If the pneumonia occurs early in the pregnancy*, the prognosis as regards the mother is little, if any, worse than it is in other patients of the same age. As regards the pregnancy, there is a probability that abortion will take place in about one-third of the cases, whilst in two-thirds of the cases there is a likelihood not only that the mother will recover completely, but also that the child will be born living and healthy at term. 2. *If, on the other hand, the pneumonia develops during the second half of pregnancy*, the probability is that the latter will be then terminated in two-thirds of the cases, and the chances of the mother surviving will be greatly diminished, nearly half the patients dying if the pneumonia sets in after the sixth month. In other words, the more advanced the pregnancy the greater is the probability of an expulsion of the fetus and the graver the prognosis for the mother. Dr. Hirst⁴⁰ found that out of 43 cases of lobar pneumonia in pregnant women, 28 were less than six months pregnant and of these 11 aborted; of the 15 who were more than six months pregnant 10 aborted, and of these 15 mothers 7 died.

The question might be asked: Seeing that the prognosis as regards the child is in any case grave, might it not be wise to counsel termination of the pregnancy for the mother's sake if pneumonia sets in? The answer is definitely, No. Matton⁴¹ records that out of 38 cases of pneumonia during pregnancy labour was induced in 18, and 9 of these patients died—a mortality of 50 per cent.; whereas of the 20 cases left to themselves only 1 died. These figures are not very new, and in interpreting them it must be remembered that labour would probably be induced chiefly in the worst cases, so that the high mortality cannot be entirely attributed to the treatment; but it is clear that the chances of the patient's recovery are at any rate not increased by interfering with the pregnancy, so that the right course to pursue is to treat the patients exactly as if they were not pregnant, unless Nature itself makes obstetric assistance necessary.⁴²

It is wonderful how much illness a patient, even though she be pregnant, can pass through and yet recover from. Dr. Francis Hawkins,⁴³ for instance, records a case of a lady, aged 35 years, who, when four months pregnant, developed double lobar pneumonia, followed by endocarditis, severe bronchitis, acute dilatation of the heart, and finally by empyema. The pregnancy continued up to the sixth week after the onset of the illness, and had it not been for the empyema it would apparently have continued to term. The empyema was treated in the usual way, by rib resection, and ultimately, after a long illness of extreme severity, the patient got perfectly well.

Another case⁴⁴ illustrates the possibility of good results in spite of a grave prognosis. The patient was 38 years of age, and when eight and a half months pregnant she was seized with lobar pneumonia in the left lung. She was extremely ill. The crisis came on the seventh day, but very shortly afterwards she was as dyspnoeic as ever and the temperature rose again. A week after the crisis pus was located in the left pleural cavity and 34 oz. of it were drawn off by aspiration. It was hoped that rib resection might be avoided, but three days later it was necessary to give chloroform and drain the empyema. The patient was now at full term, and a few hours after the operation a strong healthy child was born, labour being easy and convalescence uneventful.

The pneumococcus may cause other lesions than pneumonia in a pregnant woman, but there is little evidence to show that the association is not due to chance. Vinay,⁴⁵ for example, records the case of a woman who, having suffered from great gastric irritability throughout her pregnancy, developed multiple subcutaneous abscesses during the seventh month. The pus gave cultures of pneumococci. The patient made a long struggle, but ultimately died nineteen days after delivery. There was nothing in this case to show that the pregnancy was in any way directly concerned as a causal factor in the pneumococcal infection.

ADDISON'S DISEASE AND PREGNANCY.

We may now pass on to quite a different class of illnesses in the mother.

Addison's disease in conjunction with pregnancy is necessarily rare. There seem to have been only two cases of the kind in Guy's Hospital in the last 20 years, and both patients died. It is always very difficult to give an accurate prognosis in any case of Addison's disease, patients often dying almost suddenly when there has been no objective alteration in their general state for months previously. Consequently it is not possible to say that it was the pregnancy that hastened the end in these two cases. Nevertheless, the impression left upon one's mind is that the added strain of pregnancy was the immediate cause of death, and that pregnancy is therefore a very bad thing for a patient who has Addison's disease.

There is another point to mention, and that is the possible difficulty in diagnosis. Pregnancy itself may cause considerable increase in the pigment of the patient's skin, and the symptoms of weakness, vomiting, and even syncope may be attributed to the pregnancy itself in a case in which the pigmentation is not extreme, and in which the buccal mucosa has not been examined in a good light.

The two cases mentioned above were so similar to one another in most respects that the following notes of one of them may be taken to apply to both. The patient was 40 years of age, had had eleven children, the last two and a half years previously, and she was now five and a half months pregnant. She had begun to suffer from weakness, syncopal attacks, and undue pigmentation of the skin and buccal mucosa six months before she became pregnant, and Addison's disease had been diagnosed. At first the symptoms were not greatly increased by the pregnancy, but from the fourth month onwards the patient became distinctly weaker; attacks either of vomiting or syncope became so frequent that obstetric measures for terminating the pregnancy were adopted in the middle of the sixth month. The pulse-rate rose rapidly after delivery, and the heart's action became very feeble. There were several ill-defined convulsive seizures, and death occurred two days after labour. It may be mentioned that treatment by adrenalin had been pursued. At the necropsy both suprarenal capsules were typically caseous, and there was no other macroscopic disease.

LEUKAEMIA AND PREGNANCY.

Turning now to leukaemia, the cases may be divided into the acute and the chronic; and these are almost synonymous with the lymphatic and the spleno-medullary varieties. The acute form ends so rapidly in any case—usually within a few months of its first symptoms—that pregnancy is not at all likely to arise in a person who already has the disease. Acute leukaemia may, however, develop in a woman who is pregnant, and the summary of what then happens is that, bad though the prognosis is in other cases, the conjunction of pregnancy with the disease makes it still worse. Whether the association is accidental or whether something anomalous about the pregnancy may perhaps cause the leukaemia, it is hardly possible to say; but, judging from the rarity with which the two are associated, their conjunction would seem to be accidental. Hilbert⁴⁶ records the case of a woman, aged 37 years, who had been perfectly well up to the eighth month of her eighth pregnancy. She then complained of severe headaches, diarrhoea, fever, and gingivitis. Rhinitis and purpura followed, and blood examinations indicated typical lymphatic leukaemia. The pregnancy continued to the ninth month, when a macerated child was born spontaneously. The mother died from complete exhaustion ten hours after the labour and a little more than a month from the onset of her symptoms.

Spleno-medullary leukaemia, on the other hand, may last for three or four years after the first symptoms lead to its diagnosis, and pregnancy may arise in a patient who is already known to have the disease. Dr. Herman⁴⁷ has recorded one such case and has collected altogether seven undoubted others. Owing to the enlarged spleen pregnancy gave much more abdominal distension than normal; in some cases, indeed, it is wonderful how both the huge spleen and a full-term pregnancy can be included in the same abdomen. It is not surprising that there is a great tendency to premature delivery. The

puerperium is a very dangerous time, some of the patients dying very soon after the termination of the pregnancy, though if the patient survives the particularly dangerous time that immediately follows delivery considerable temporary improvement in her general health is to be expected. Dr. Herman concludes that pregnancy does nothing but harm to a leukaemic patient, and

diabetes mellitus itself. Nevertheless, seeing that pregnancy thus predisposes to glycosuria, and seeing that, if they can become pregnant, the patients who are suffering from this complaint must necessarily be comparatively young, and therefore predisposed to the worst form of diabetes mellitus, it might well have been expected that pregnancy would be very harmful if it occurred in a patient

Chart 3.—Chorea and pregnancy. Movements violent. No pyrexia. Recovery. A, On admission.

recommends that it should be artificially terminated as soon as possible.

It would be very interesting to know whether the children of leukaemic patients are ever born with enlarged spleens similar to the enlargement of that organ sometimes found in the offspring of parents suffering from malaria.⁴⁸ It would also be interesting to know what effects upon the pregnancy repeated applications of the x rays to the maternal abdomen would have. There are no statistics upon the subject. Evidence is accumulating to show that x-ray applications may be very efficient in diminishing the size of the spleen and in ameliorating the symptoms for the time being in cases of splenomedullary leukaemia. If it were known that their application to the splenic region in the mother had no ill effect upon the child, it might be well to advise leaving the pregnancy to run its course whilst the leukaemia was simultaneously being treated with the x rays. In the absence of evidence either way, however, it would seem likely that the x rays would do harm to the child, in which case, rather than risk the mother's life unnecessarily, the right course to advise would seem to be to have the pregnancy terminated as soon as possible, and then to adopt the x-ray treatment if it still seemed good to do so.

DIABETES MELLITUS AND PREGNANCY.

Diabetes mellitus in conjunction with pregnancy has many points of interest. There has been much discussion as to the nature of the reducing bodies that are often present in the urines of pregnant women, especially in the later months. There is no doubt that lactose is commonly present, both towards the end of pregnancy and during the puerperium; but it seems equally clear that a considerable proportion of pregnant women have actual glycosuria.

Saleim,⁴⁹ as the result of careful examinations, states that two-thirds of all pregnant women pass increased quantities of glucose in this way. This glycosuria of pregnancy causes no symptoms, however, and it disappears without treatment. It seems, therefore, to bear no relationship to

already suffering from diabetes mellitus. It is difficult amongst hospital cases to be sure that the glycosuria has antedated pregnancy, and only two clear instances of the kind have occurred in Guy's Hospital lately. One of these patients was a very stout woman, aged 36 years, whose pregnancy went naturally to term, although her urine was loaded with sugar, and also contained both diacetic acid and acetone in abundance. The other was a younger woman, aged 23 years, whose urine also contained sugar, diacetic acid, and acetone, and whose pregnancy ran a perfectly normal course, ending in the birth of a healthy child at term. In both these cases there was a large excess of liquor amnii; this has been noticed by several observers as being almost characteristic in the case of diabetic mothers, and the amniotic fluid often contains sugar.

It is not every case that passes through pregnancy with as little trouble as the above. Ludwig,⁵⁰ for example, records a severe case in which a woman, aged 42 years, was in her ninth pregnancy. Marked diabetes mellitus had existed for two and a half years, but she had reached the last month of this pregnancy without any trouble beyond pruritus vulvae. The abdomen now became suddenly larger and the patient was admitted to hospital very ill, semi-conscious, with abundance of sugar, diacetic acid, and acetone in her urine. Labour was induced, nine pints of liquor amnii escaping. The fetus was in an advanced state of maceration. The patient was very ill

for two days afterwards, but she slowly recovered, though her diabetes persisted as before. It is interesting to note that the hydramnios occurred suddenly in this case; and it is also noteworthy that the fetus was macerated, for it may have been on this account that the mother was so ill.

The general conclusions that

other recorded cases⁵¹ point to are: That diabetes mellitus is by no means incompatible with pregnancy; that cases of moderate severity are not made materially worse by pregnancy; and that there seldom seems to be any reason for interfering with the pregnancy.

Some observers⁵² have even stated their opinion that pregnancy, instead of making the diabetes worse, actually

Chart 4.—Chorea and pregnancy. Pyrexia. Death. A, On admission. B, Accouchement forcé.

Chart 5.—Chorea and pregnancy. Prolonged and severe pyrexia. Death. A, On admission. B, Spontaneous premature delivery.

ameliorates it for the time being—a point of great interest when one recalls the effects of typhoid fever, for example, in similar cases. A patient with diabetes mellitus may develop typhoid fever, and during that illness the glycosuria may entirely cease, returning again when the fever subsides.

DIABETES INSIPIDUS AND PREGNANCY.

Diabetes insipidus is a condition which may actually arise during pregnancy as a result of a severe mental shock at that time. Should it do so, it seems that it does not go away again after the child is born. It may also have existed previously to pregnancy. The chief trouble to the patient is the fact that when the uterus enlarges there is less room for the bladder; micturition becomes annoyingly frequent and acute retention of urine is apt to occur if micturition is postponed. Sleep may become very broken in consequence of this and also because of the constant necessity for drinking water or other liquid. The pregnancy itself runs no abnormal course, the children may be perfectly healthy, and there is no marked tendency to hydramnios with its inordinate abdominal distension such as occurs in diabetes mellitus.

There seems to have been no case of extreme diabetes insipidus in association with pregnancy in Guy's Hospital, but in one medium case the patient, a very stout woman, was passing up to 15 pints of limpid urine daily, of specific gravity 1003. The water alone was increased, the total solids being normal. In this instance the polyuria and polydipsia had not been present until the middle of the fifth pregnancy, when these symptoms came on suddenly after a severe fright. If the patient failed to micturate directly the desire came she developed retention of urine, necessitating the use of a catheter, and on some such occasions the bladder contained as much as four pints at a time. The child was born normally, but the polyuria and polydipsia persisted.

Cases of diabetes insipidus in association with pregnancy have been recorded by Bennett, Matthews Duncan, Esterle, Merbach, Kleinwachter, Vinay,⁵³ and others. The two following may be mentioned in particular because they are instances of diabetes insipidus developing from mental shock and because they show that although the diabetes insipidus does not seem to be in itself dangerous the patients are apparently more liable than others to contract, and die from, intercurrent maladies of the lungs.

One patient was a woman, aged 32 years, who kept a farm. When she was pregnant a flood destroyed all her crops, and immediately after this severe mental shock, polydipsia and typical diabetes insipidus set in. The patient passed up to 5½ gallons of urine daily, yet became pregnant for the second time. During the pregnancy the polyuria abated somewhat, the least quantity of urine passed in one day being 9 pints. Delivery was normal; thereafter the urine at once increased in quantity again, but the patient left the hospital otherwise in good health. Shortly afterwards, however, she died from double pneumonia.

The second patient was a woman, aged 26 years, who was four months pregnant for the fifth time when a fire destroyed her house and all she possessed. Diabetes insipidus set in directly, 20 pints of almost pure water passing daily; the total solid constituents of the urine were normal. Labour occurred normally at term, but the child was sickly and died in two weeks. The patient continued to have polyuria; she developed phthisis and died 19 months after the fire.

MYXOEDEMA AND PREGNANCY.

There do not seem to be many recorded cases of pregnancy in patients suffering from myxoedema. Apparently this disease is not incompatible with conception, at any rate in persons who are receiving thyroid treatment. In the one case observed by me the pregnancy had no ill-effect upon the mother's condition, and if it had not been for the accident that her pelvis was much contracted, there seems to be no reason why she should not have borne children naturally. As regards the child, the main danger is that it will have a deficient thyroid gland and be a cretin, unless upon the first suspicion of this, treatment with some preparation of thyroid gland is begun. The patient in question was 40 years of age and enormously stout. She had

been receiving thyroid treatment for her myxoedema for over two years. Her pregnancy went to full term and natural labour came on, but there were great obstetrical difficulties which need not be recounted. The recuperative power of the patient, notwithstanding her myxoedema, is evidenced by the fact that she ultimately got quite well in spite of long-continued sapraemia and a "white" arm due to thrombosis of the right axillary vein.

There is no time left for the discussion of a number of other conditions that one would like to enter upon, such as the effects of pregnancy upon Graves's disease, upon ordinary goitre, upon malignant disease, upon phthisis, upon heart disease, upon chorea, and upon many other things which are full of interest. The varieties of jaundice that may occur during pregnancy might form a chapter by themselves. There is a whole group of cases in which a pregnant woman dies and nothing very abnormal is found at the *post-mortem* examination to account for her death. It is with regret that one is obliged to leave out these for want of time. My views have already been expressed about some of them elsewhere,⁵⁴ however; and if I may be pardoned for making one more remark it is in connexion with chorea gravidarum.

CHOREA AND PREGNANCY.

Mr. H. T. Hicks and myself⁵⁵ have expressed the view that "simple" chorea gravidarum is to fatal chorea gravidarum as 'simple' endocarditis is to fungating endocarditis, and that the violence of the choreic movements is not of nearly so great importance in estimating the prognosis as is the presence or absence of pyrexia. Out of 29 consecutive cases of the disease at Guy's Hospital, 26 patients recovered and 3 died. In none of the 26 cases of recovery was there any material pyrexia, although in some of the cases the movements were very violent; in the cases that died, on the other hand, there was marked pyrexia in every instance. There will doubtless be exceptions, but, as a broad rule, we suggest that, provided the temperature remains almost normal, as in Chart 3, the prognosis is good even if the movements are very violent; whereas if the chart shows marked pyrexia, uninfluenced by salicylates, as in Charts 4 and 5, the prognosis is very grave, provided no obvious cause—such as pleurisy, acute tonsillitis, and the like—can be found to account for the fever. It will be very interesting to see whether other observers will find this to hold good in future cases that may come under their notice.

I thank you, Mr. President and gentlemen, for listening so patiently to these lectures, and I will conclude by reverently recalling to your thoughts the name of their founder, Dr. Goulston.

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MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL:

CALCIUM CHLORIDE IN MELÆNA NEONATORUM.

CASES of melæna neonatorum are sufficiently rare to justify the following report. On March 29th I was called at 10 a.m. by a midwife to see an infant she had delivered on March 27th. I found the clothes stained with blood, and saturated with a dark, treacly fluid, and from the anus bright blood was issuing. The child appeared pale and collapsed, previously having been, I was told, the ruddy hue usual to infancy. There was no vomiting or jaundice. I paid two further visits during the day, and found the discharge still continuing, but of a brighter colour. On my second visit I took with me a solution of calcium chloride, a teaspoonful of which was given every half hour (the child during the following thirty-six hours taking 20 grains). On the following morning the discharge was less in amount, and the child appeared better. On the third day the discharge stopped, and the child made a rapid recovery. The child took the breast well throughout. The midwife informed me that the labour was normal in all respects. There was no sign of sepsis in mother or child, and the latter appeared healthy in other respects. The cord was quite healthy, coming off on the fifth day. I certainly think that the calcium chloride had a beneficial effect in this case, as when first seen the prognosis seemed anything but good.—I am, etc.,

Worcester.

S. C. LEGGE, M.R.C.S., etc.

A CASE OF GASTROSTOMY.

DR. BERTRAND DAWSON, in the *JOURNAL* of May 9th, makes the statement that "Gastrostomy prolongs life, but prolongs misery also." I quite agree that to perform the operation when the patient can swallow liquids is not good practice. The following case shows that the operation can prolong life and allows the patient to die a less painful death than if Nature had been left to herself. W. C., aged 61, came to me on August 24th, 1907, complaining of difficulty in swallowing. On several occasions bright red blood was thrown up. There was no evidence of aneurysm and I concluded that the case was one of cancer of the gullet near the lower end. The patient rapidly lost flesh, and, to satisfy his relatives, I sent him to a consulting physician in Manchester. He agreed with the diagnosis and advised gastrostomy, although he pointed out that the relief given was so temporary that many physicians did not strongly advise their patients to submit to the operation. Within a few days the patient could with the greatest difficulty only swallow about a pint of milk a day, and, I believe, for three days before the operation, which was done on November 22nd, 1907, he could not swallow water. Gastrostomy was performed in the Blackburn and East Lancashire Infirmary by the method of E. J. Senn. The object of the operation is to invert a cone of stomach wall into the cavity of the organ, a No. 10 soft catheter passing through the apex of the cone. The principle is the same as that of a safety ink bottle. The patient can be fed at once, and there is no regurgitation if the operation is properly done. There was considerable shock after the patient left the table, but he rallied and went home on December 1st, as he seemed likely to die, and asked to be allowed to go home. Instead of dying, he improved so much in appearance and strength that he was able to go out of doors, and even attended meetings of the board of a philanthropic society of which he was a member. There was no regur-

gitation, and he was able to take and digest four or five pints of milk and two or three eggs daily, and he could not be said to be in anything like so miserable a state as he was before operation. He died rather suddenly on May 7th, 1908, having been confined entirely to bed for about a week. One case is of no value if for every one which does well a dozen do badly, but I think the operation has a sphere of usefulness in picked cases, and that this operation of Senn's gives the best results. Mr. Moynihan, in his recent book *Abdominal Operations*, gives his reasons for this opinion: it is simple, speedily performed, effects a valvular opening and does not sacrifice any part of the stomach wall.

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REPORTS

ON

MEDICAL AND SURGICAL PRACTICE IN THE HOSPITALS AND ASYLUMS OF THE BRITISH EMPIRE.

LIVERPOOL ROYAL INFIRMARY.

A CASE OF GALACTOCELE.

(By RUSHTON PARKER, M.B., F.R.C.S. Eng., Professor of Surgery in the University of Liverpool.)

MRS. L. M. K., aged 24, was admitted February 27th, 1905, on account of a small tumour of the left breast in the upper central region; it was painless, movable, elastic, and dated from just before the birth of her first child six months previously.

She was a patient of Dr. H. W. Nott, who attended the operation performed on March 2nd of the same year. The tumour was previously supposed to be a cystic adenofibroma, and a preliminary puncture was made with a trocar and cannula. There issued, however, instead of

Photograph, about half the natural size, by Fred. Halliday, museum assistant.

any thin liquid, an intensely white, inspissated, milky substance which was caught on a plate in a coil, as shown in the photograph. On cutting down upon the growth, it was found to be a single cyst filled with similar material, and was accordingly dissected out. A portion of the white milky substance, and the cyst itself containing the remainder, were separately put on the plate, and are shown in the illustration. The wound healed somewhat slowly, and the patient went home in four weeks.

REMARKS.—The case derives its chief interest, in addition to its rarity, from the illustration. In spite of the rarity, much has been written about true galactocoele, which is due to the obstruction of a duct during lactation. Milk is found in other morbid conditions of the mammary gland, mostly tumours, but the term "galactocoele" is not applicable to them.