long a period as the patient could reasonably be asked to remain in the water. On almost every occasion distress was marked not later than forty-five minutes after the commencement. The average loss of weight during each bath amounted to $4\frac{1}{2}$ to $5\frac{1}{2}$ lb., the minimum being 3 lb. and the maximum 6 lb. 10 oz. By the next morning this loss had sometimes been more than made up. During the nine months of treatment the patient showed a net gain of 47 oz. (9 st. 11 lb. 13 oz. to 10 st. 12 oz.), and at one time he actually reached 10 st. 7 lb. 1 oz. The treatment did not hinder him from going to his work. He left work at 4 p.m. and started his bath at 4.45 p.m. Then he left for home at 7.30 p.m. (by which time he had cooled down to 100° to 101°), had his supper, and went to bed; by next morning he was fit to resume work.

The results of this experimental treatment have been most striking. Until July there was no definite change in the patient's condition, though there did not seem to be any progression of the disease. The course of eight baths in July, however, produced a very marked improvement. This was noticed particularly by the patient's wife, who said that he was no longer depressed, and only occasionally irritable. His speech was clearer, and his gait was slightly more steady. He was eating much better, and his insomnia had gone. The blood Wassermann reaction at the end of July remained strongly positive. Baths were started again in October, and twelve were given by the middle of November. Steady progress, both mental and physical, was shown. The patient's employers remarked on the improvement in his work, and he felt that he was much less easily tired. We noticed a distinct betterment in co-ordinated movements, and he could get into and out of his bath unaided. Up till that time he had to be assisted on both sides, especially when getting out of the bath.

On November 21st a complete examination of the cerebro-spinal fluid (which was still under fairly high pressure, but not so great as in April) was again made, with the following results:

Clear, colourless, no clot	
Foam test	Positive.
Globulin test	Positive.
Protein	0.09 per cent.
Sugar	0.07 per cent.
Cells	12 per c.mm.
Colloidal gold test...	0000421100.
Complement-fixation test...	Strongly positive.

Towards the end of January, 1931, we decided to give the patient another series of baths. This series was more prolonged than any of the previous ones, and sixteen baths were given by February 23rd—a total of forty-one. The result of this final series was exceedingly satisfactory. The patient is now a different man, both mentally and physically. In a letter which we recently received from his wife (an intelligent woman) she says:

"At the present time he has double the energy. He rarely gets depressed, never irritable, and he is mentally much sharper. Previously he was irritable beyond all words, and if things did not go just as he wanted he was beyond endurance. He walks faster and stronger, his speech is much clearer, and his writing is greatly improved. He can now digest almost anything, and he sleeps generally from 10 p.m. till 6 or 7 a.m. without waking."

In conversation with us, she said that all their friends were remarking on the recovery of her husband's memory. He enjoyed playing cards again, and could do so in an intelligent way. He was a different man to live with, and was like the husband of three or four years ago. In walking in the dark she gave him no assistance, but he never fell.

Our examination at the end of February showed that he was alert and much more confident in himself. He still tended to be rather voluble, though much less so than a year ago; and he could now concentrate on the point under discussion. There was a very marked

improvement in his memory. Speech was definitely better. It was sometimes slightly hesitant, but the slurring had gone. Writing was more even. The tremor of hands, arms, and lips was completely absent. There was still some tremor of the tongue, though it had greatly decreased. Gait was much steadier. He continued to walk on a broad base, though he did not throw his feet out so far. Romberg's sign was indefinite. When turning sharply there was some unsteadiness, but he could turn quickly without support and did not fall. Condition of arm movements was now good, and his sense of position was more accurate. There were no definite changes in the reflexes.

On April 6th, 1931, lumbar puncture was again performed. The cerebro-spinal fluid was still under pressure. A complete examination showed:

Foam test	Positive.
Globulin test	Positive.
Protein	0.06 per cent.
Sugar	0.08 per cent.
Cells	50 per c.mm.
Gold curve... ..	4444332000.
Complement-fixation test...	Strongly positive.

We have asked the patient's wife to send us a monthly report of her husband's condition. Meanwhile all treatment has been suspended.

COMMENTARY

It is to be noted that only the last gold curve is a true paretic curve. All other symptoms are suggestive of taboparesis. It will be admitted that the symptoms of this patient have improved very materially. His reflexes and Wassermann reaction are so far unaltered. The cerebro-spinal fluid shows signs of approaching a more typical paretic type, though the protein is definitely less and there is a slight diminution in the intensity of the Wassermann reaction. It should be clearly understood that we do not wish to draw any conclusions from this one case, but he has had no antisiphilic or other sort of treatment than the hot baths. We hope that others who have more clinical material with which to work than ourselves may be induced to try this treatment and prove or disprove its utility. If it should prove successful, we believe it has much to commend it when compared with other methods of inducing hyperpyrexia.

We are indebted to the Bath Spa Committee and to Mr. John Hatton for the facilities allowed us in the bathing establishment, and to the attendants for the assistance given us in carrying out this experiment.

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INDICATIONS FOR THE INDUCTION OF PREMATURE LABOUR*

BY

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Under this title I want to include the indications for the induction of therapeutic abortion as well as the induction of premature labour; for in a large number of cases we may be faced with the problem of whether to evacuate the uterus in the early stages of pregnancy or to allow it to proceed, and, later, to induce premature labour.

NEPHRITIS

The commonest case brought to us for this reason is the chronic nephritic. In these cases one has to consider three things: first, the number of pregnancies; secondly, the term of pregnancy at which signs or symptoms of

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the nephritis were first observed; thirdly, the severity of the nephritis. The third, of course, is the most important, and for this the help of the physician and the laboratory is necessary; in fact, the last word in all these cases, whether or not to empty the uterus, should rest with the physician. Clinically, I consider the most important points to observe in these cases are: the quantity of urine passed in the twenty-four hours, the amount of albumin, the blood pressure, and the presence or otherwise of symptoms of impending uraemia, such as persistent vomiting or severe headache. In pregnancy two types of cases are met with. The first is that in which the patient is known to be a nephritic, and who, with or without treatment, shows signs of severe kidney dysfunction early in pregnancy. In this type of case I would advocate early evacuation of the uterus in order to prevent further damage to the kidney, because I do not think it is fair to the mother, unless it is her wish, that pregnancy should be allowed to proceed, with the consequent risk to her life and health, and with the probability of a stillborn premature child at the end. The second is that in which there has been a previous minor lesion of the kidney, which is able to deal adequately with excretion under normal conditions, but which with the added stress of pregnancy eventually breaks down. This type of case usually shows signs of failure much later in pregnancy than the first type, and also, if recognized earlier in pregnancy, responds to treatment. Induction of premature labour rather than therapeutic abortion is indicated. In either of these two types, if it is a first pregnancy, or even a later pregnancy, which is much desired by the parents, the patient may be placed on dietetic and medicinal treatment, and termination of pregnancy postponed until near term, unless danger signals arise. But in all cases of chronic nephritis I consider that induction is indicated between the thirty-sixth and thirty-eighth weeks in order to save the kidney further damage and, in many cases, to save the life of the child. Many of these children die *in utero* towards term.

The true albuminuria of pregnancy manifests itself only during the last month or so of gestation, and is usually amenable to dietetic and medicinal treatment. Induction, however, is indicated when treatment fails to keep the amount of albumin very low or absent, or when pre-eclamptic signs appear, such as persistent frontal headache, vomiting, visual changes, or gradual diminution of the daily output of urine, while the patient is under treatment. If the patient has not been treated, then the effect of treatment on these symptoms should be observed first. A case of pregnancy albuminuria which has reached the thirty-eighth week, and which, in spite of treatment, still shows albuminuria, should be induced, especially in the presence of marked oedema. Induction is performed in all my cases by drawing off a measured quantity of liquor amnii, without an anaesthetic if necessary. From 1½ to 1 pint is usually removed, depending on the amount of liquor present. The relief of tension by drawing off the liquor amnii seems to have a definite beneficial effect in these cases, and labour usually begins in from twelve to twenty-four hours; occasionally it may be delayed for three days.

PERNICIOUS VOMITING

A large majority of these cases are cases of hysterical vomiting, or of vomiting induced in order to find an excuse for the termination of an unwanted pregnancy. Many of them develop an acidosis from carbohydrate starvation, and may go on from this to definite toxæmic vomiting. The presence of acetone and diacetic acid in the urine is not an indication for inducing abortion; it merely denotes the existence of an acidosis, which will usually clear up under hospital or nursing home treat-

ment. The indications for clearing out the uterus in these cases are progressive loss of weight, bilious vomiting unconnected with the taking of food, scanty and albuminous urine (especially if blood is present), rises of temperature, rapid pulse, and the slightest sign of jaundice. Any one or more of these signs and symptoms may be present, making evacuation of the uterus imperative if the patient's life is to be saved. No pregnancy should be interrupted merely on the patient's statement of intractable vomiting, but only after a reasonable period of observation and treatment. Neither is pernicious vomiting in a previous pregnancy an indication that a present pregnancy should be terminated.

PYELITIS OF PREGNANCY

This condition usually yields readily to treatment, but severe cases are sometimes seen in which the condition does not clear up under treatment, or frequent relapses occur and the patient's general condition becomes progressively worse. In such cases induction is indicated. I have not seen a fatal case of pyelitis of pregnancy, but last year I was shown the kidneys of three patients who had died from this condition. There was in each case not only a pyelitis, but multiple small abscesses in the kidney substance, which I presume is the end-result of a *B. coli* infection.

CARDIAC DISEASE

Patients with compensated heart disease pass through pregnancy and labour usually without ill effect; but labour should be shortened by forceps delivery, or, better still, by an induction about the thirty-eighth week, especially if there is the slightest suspicion of disproportion. It is always of advantage in moderately severe, and necessary in severe, cases of cardiac disease, for them to rest in bed under supervision during the last month of pregnancy. In all cardiac cases the advice of a cardiologist should first be sought as to the advisability of pregnancy at all, and as to whether an accomplished pregnancy should be terminated at an early stage or allowed to go on to maturity. When compensation fails during pregnancy, then labour, whether commencing naturally or induced, is fraught with danger for the mother. Rest in bed and suitable treatment may re-establish compensation, in which case an easy labour should be ensured by induction at a period when the child is likely to survive and yet is small enough to pass through the maternal passage easily—that is, from the thirty-sixth to the thirty-eighth week.

PHTHISIS

Active phthisis is an indication for early evacuation of the uterus. Should pregnancy, however, have gone beyond the fourth month there is nothing to be gained by interrupting its course. During pregnancy there is usually a definite improvement in the patient's general condition, and labour proceeds normally; but in the puerperium the disease becomes rapidly worse in a large number of cases, and I have seen two patients in whom the disease progressed so rapidly, and with such swinging temperatures, as to simulate septicaemia. In my opinion no woman suffering from active phthisis should be allowed to become pregnant, or, if already so, pregnancy should be terminated at the earliest moment. It is useless waiting to see "how she gets on."

EPILEPSY

Cases arise in which the number of fits greatly increases during pregnancy; in fact, they always tend to do so. In some cases the first manifestation of epilepsy may be the occurrence of fits during gestation. Interference with the pregnancy is not necessary unless the fits become

too frequent, or uncontrolled by drugs and endanger the patient's life. Too rapid child-bearing has a bad effect on epileptics, and I consider that the number of children should be limited, both for the sake of the mother and of posterity. I recall one case, especially, of a young woman who had frequent children and more frequent fits, and who was fast losing weight and health. She came to me for her fifth pregnancy five months pregnant and with fits so frequent that she always had to have some one with her. I terminated the pregnancy by doing a subtotal hysterectomy. Now she is healthy, well nourished, improved mentally, and her fits are few and far between.

INSANITY

With the "bad family history of insanity" we are not concerned in this paper; but we may be asked to evacuate the uterus in these cases. Whether we do so depends on our individual outlook, as we have no legal status in this matter. Puerperal mania, or insanity of lactation, in the previous pregnancy is, in my opinion, a definite indication for the termination of pregnancy.

DISPROPORTION

This is the condition above all others in which induction of labour is indicated. By this means there has been a large saving of maternal and foetal lives, the number of operations for Caesarean section has been decreased enormously, and patients who have previously had prolonged labours, with 'probably difficult forceps deliveries, have by a judicious induction been given a normal labour without instruments. No definite measurements and no definite term of pregnancy can be laid down as to the exact time when induction should be performed. Each case must be frequently examined, especially from the thirty-fourth week onward, and induction performed directly it is difficult to press the head into the brim; definite overlapping should not be waited for. Induction should not be advised unless the true conjugate is at least $3\frac{1}{2}$ inches, and unless pregnancy can be allowed to proceed to the thirty-second week. If these conditions are not present, then Caesarean section should be performed in order to deliver a child that is likely to survive.

OCCIPITO-POSTERIOR POSITIONS

Induction of labour is often most successful in this condition. If cases of posterior lie with a normal-sized child and small pelvis, or a large child and a normal pelvis, are allowed to go to term there is either a prolonged labour before the head rotates forward or the occiput is unable to rotate forwards at all owing to the size of the head approximating so closely to the size of the pelvic cavity. This difficulty can be avoided in almost every case by induction of labour at the thirty-eighth week. This allows for a smaller head, which has more room in the pelvic cavity to rotate forwards, and as a result no further intervention is necessary in the majority of cases. At the same time as the induction is performed an attempt may be made to rotate the head and anterior shoulder into an anterior position, which may be maintained by pads and binder. This is by no means always successful, but in every case an attempt is worth while.

BREECH CASES

In some cases of breech presentation where external version has been unsuccessful (and these are generally found to be cases in which the legs are extended) induction at the thirty-eighth week, depending on the size of the child, is indicated. In breech cases another method of induction, other than the one described below, must be carried out. The advantage of induction in these cases is to get a smaller child and so make it more easy

for a natural delivery to take place. Unfortunately even after induction it may be necessary to bring down the legs in order that the child may be delivered, but the smaller child makes this manoeuvre easier.

METHOD OF INDUCTION

The method of induction which I always employ is a modification of the old method of rupture of the membranes. For this purpose I have had made a double curved silver catheter, similar to a prostatic catheter, with a blunt-ended stylet, which can be protruded at the distal end of the instrument. The vagina and cervix are cleaned up thoroughly with ether soap, and then with surgical spirit. Thorough cleansing of the vagina and cervix is essential in order to prevent any chance of introducing sepsis with the passage of the catheter. A Sims's speculum is introduced, and the cervix may be seized with vulsellum forceps, but this is not necessary unless the cervix is very posterior. No dilatation of the cervix is required. The catheter, with the point of the stylet withdrawn, is passed up the cervical canal until it meets the child's head; the proximal end is then raised and the point of the catheter is passed behind the head, between the uterine wall and the membranes. When the point of the catheter has passed above the child's head the stylet is pushed home and the proximal end depressed; by so doing the distal end ruptures the membranes. The eyelets of the catheter are now in the amniotic cavity, and liquor amnii commences to flow through the catheter, and is collected in a measured vessel. From half to one pint is drawn off, depending on the amount of liquor amnii present, and when sufficient has been collected the catheter is withdrawn. After the withdrawal of the catheter there is practically no further escape of liquor, so that when labour commences a definite quantity of amniotic fluid is still present.

The advantages of the method are that the opening in the membranes is made well away from the cervix, so diminishing the chances of septic infection of the liquor, that the bag of membranes is retained, and that there is no foreign body left in the uterus to invite sepsis or damage the uterine wall. The method is extremely simple and safe, both for the mother and for the child. Labour usually commences within twenty-four hours, but may be delayed for three days, or in a few cases for seven days. In spite of this delay I have not had a single case in which the liquor became infected. I can confidently recommend this method of induction of premature labour for all cases in which the foetus presents by the vertex, and I hope shortly to publish the results of its use during the past two years.

GONOCOCCAL STOMATITIS

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This condition is rare; only about forty cases have been recorded since Neisser discovered the gonococcus in 1879. Our findings have an additional interest in view of the recent discussion in the *British Medical Journal* (February 14th, p. 263) on gonococcal infection of the nose.

Mouth infection in the newly born, like ophthalmia neonatorum, occurs during transit of the maternal passages (Rosinski,¹ Leyden,² Kast³). In adults infection is usually direct, but Chevelle and Georgel⁴ have reported a case of metastatic involvement of the buccal cavity. Rosinski¹ gives five to twelve days as the incubation period in infants. In adults, for obvious reasons, it is more difficult to determine, and seems to vary from one day (Petrassie⁵) to seven days (Bronson⁶). The parts most often affected are the soft palate, the pillars of the fauces, the anterior part of the tongue, and the gingival margin