by the intravenous-drip method over a period of twenty-four hours; however, thrombosis again occurred after less than 50 c.cm. had been administered. Eight thousand units of heparin were then given intramuscularly, and an hour later another cannula was inserted into a fresh vein and 8,000 units of heparin were injected through it. The bilirubin-bile-salts mixture was again administered by the intravenous-drip method, this time with success, and the amount previously stated was given without untoward effect during the next twenty-four hours.

The results were disappointing: there was some slight limbering of the wrists and elbows about the fourth day of treatment, and the sedimentation rate dropped about 15 mm. The experiment was hardly worth the trouble taken or the expense of the bilirubin.

At the time of writing we are proceeding with gold therapy carefully so as to avoid reactions: 0.01 mg. of solganal B in oil was the initial dose; this was repeated weekly for two doses, then 0.02 mg. was used for two weeks, followed by 0.05 mg. weekly. This latter dose will be given until 0.5 gramme is reached. Then after an interval of six weeks another course of gold therapy will follow if the sedimentation rate is still raised.

The sedimentation rate remains at 35 mm., but the general clinical condition of the child is altogether changed. On arrival at the hospital he was unable even to sit up or raise his head, and his arms and legs were held rigidly flexed. Now, although the disease as judged by the sedimentation rate is still active, he has so far progressed as to be able to walk unaided, and with continued therapy we may expect a return of reasonable activity, as the disease burns itself out.

The following three-day routine was carried out until the patient was able to stand:

1st Day: (a) Radiant heat to affected joints for 25 minutes. (b) Effleurage and pétrissage for 10 minutes. (c) Active assistive exercise for 5 minutes to each joint.

2nd Day: (a) General luminous heat, raising body temperature to 102° F. for 20 minutes. (b) Effleurage and pétrissage for 10 minutes. (c) Active assistive exercise of affected joints for 5 minutes.

3rd Day: (a) Raising body temperature to 102° F. in bath for 20 minutes. (b) Effleurage and pétrissage for 10 minutes. (c) Active assistive exercise for five minutes.

When he was able to stand unaided the last day of the routine was omitted, and graduated walking exercises, at first with the aid of a "walker," later without it, were incorporated after each treatment.

Discussion

The two cases bring out the fact that this form of rheumatoid arthritis tends to occur in bouts which are separated by periods of remission. In the end the disease tends "to burn itself out"; this usually occurs before the child reaches 16 years: we believe this happened in Case I. This fact is of fundamental importance when considering therapy. Clearly, every effort should be made to bring about remissions by carefully chosen specific measures (i.e., gold, fever treatment, and, possibly, artificial jaundice), and at the same time to improve the general health. But whatever specific treatment is used the correct physiotherapy is of the utmost importance. If the child is allowed to become or to remain crippled by contractions his life is ruined, for he will never be able to take his place as a normal member of society. Early, regular, and carefully controlled physiotherapy is therefore essential. Indeed, it may be said that the ultimate fate of the child in after-life depends upon whether the physician grasps this point clearly, and his subsequent conscientiousness. It is not easy to continue treatment for months, sometimes for years, but if crippling contractures are to be overcome continuous and prolonged treatment is essential.

Summary

Of the many methods of treatment used in rheumatoid arthritis the best results are most likely to follow the employment of physical therapy over a prolonged period and the injection of

gold salts. The patient should be educated in the use of simple physiotherapeutic measures so that these may be carried out in his own home. Other forms of treatment of possible value are eradication of focal infection, the use of vaccines, and high-vitamin low-carbohydrate high-calorie diet.

It is emphasized that all treatments should be carried out concurrently rather than singly.

Two cases of Still's disease (rheumatoid arthritis in children) are described. In a boy aged 11 the disease is considered to be quiescent. The other boy, aged 10, had the disease for two years and it is still very active. There was swelling and redness of the peripheral joints with limitation of movement.

Treatment along the above lines resulted in considerable improvement in the second case. Intravenous injections of bilirubin-bile-salts mixture were given in an endeavour to confirm the work of Thompson and Wyatt, who obtained remissions by the artificial production of jaundice. The result in my case was disappointing.

I wish to thank Dr. W. R. F. Collis for allowing me to work up these cases of his at the National Children's Hospital, Dublin, and the Board of the Hospital and the Hospitals Commission for their help in the matter of the bile-salts and pigments used.

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OBSERVATIONS UPON BREECH DELIVERY

BY

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For several generations the problems connected with breech delivery have aroused great interest on account of the high infant mortality rate. In 1931 the statistics of four large hospitals suggested that this should be placed as high as 28% of uncomplicated cases in primiparae and 15% in multiparae (Gibberd, 1931). In recent years there has been much improvement, and many institutions can now show a corrected mortality rate of 10% or even less; but the average rate is still too high. The series analysed below comprises 84 consecutive breech deliveries, representing all cases dealt with at the Woking Maternity Home since 1935. Admittedly, the number is small, but every effort is made, by prophylactic version, to avoid the presentation. Uncomplicated breech deliveries are really not very common, representing in our series about 2% of 3,500 deliveries. This, indeed, is an artificially high incidence, as many cases are sent in from the surrounding district because of the presentation, so that the natural incidence can scarcely be more than 1.5%, and possibly may be even less. In order to avoid confusion I have omitted all cases of twins, all very premature infants under 5 lb. in weight, and all cases complicated by toxæmia, ante-partum haemorrhage, and other foetal and maternal abnormalities. Although the results of a small series must be interpreted with caution, I have attempted to gauge the percentage incidence of some of the common difficulties met with, and particularly the

relation to complications of that most important factor, the size of the foetus, which has such marked effect upon the descent of the breech.

Size of Foetus

The ease and rapidity with which a "normal" breech delivery takes place, with a minimum of interference, must suggest that this is the ideal to be aimed at in all cases. Of the factors which may ensure smooth progress, without any hitch in expulsion, smallness of the foetus must be placed first. This applies especially to primiparae, in whom the very fatal complication of high impaction may develop if the child is large, and in whom also the much less serious but nevertheless disturbing arrest of the breech at the vulva is so common. In Table I all cases in the series are analysed to show the relation between these complications and the size of the baby.

TABLE I

	Small		Medium		Large	
	5 lb. to 6 lb. 7 oz.		6 lb. 8 oz. to 7 lb. 7 oz.		7 lb. 8 oz. to 9 lb. 2 oz.	
	Living	Dead	Living	Dead	Living	Dead
High impaction { Primip. Multip.	0 0	0 0	0 0	0 0	0 0	1 0
Low impaction { Primip. Multip.	3 ² 0	0 0	6 ⁴ 0	1 ² ³ 0	3 ² 0	0 0
No impaction { Primip. Multip.	30 ¹ 9 ⁷	2 ² 0	9 ⁴ 7 ⁹	1 ⁶ 0	5 ⁴ 6 ⁹	0 1 ³

¹ Includes 15 cases with legs extended. ² Legs extended in all cases. ³ Difficulty with the head. ⁴ Includes 4 cases with legs extended. ⁵ Difficulty with the head noted in 3 cases. ⁶ Difficult extraction of arms and head. ⁷ Includes 2 cases with legs extended. ⁸ Includes 1 case with legs flexed. ⁹ Includes 3 cases with legs extended.

This table shows the slight risk of foetal impaction in small babies. When the weight of the child is less than 6½ lb., even in primiparae this appears to be only 8.6%, and high impaction is rare, if indeed it occurs at all. The impaction rate in primiparae rises to 50 to 60% in the higher weight groups. Although the series is so small I am sure the difference is significant. It follows that in these cases every effort must be made to avoid a large baby.

Induction of Premature Labour

It is usually a simple matter to control the size of the child by induction of labour at the appropriate moment. In a primipara the breech, like the vertex, should engage early, and several weeks before term the cervix will be found to be taken up and the os may be open. This development is particularly obvious when the legs are extended (half-breech), and induction by artificial puncture of the membranes is then technically very simple. Three or four weeks before term it is common to find that the cervix will admit two fingers. When the cervix is in this condition puncture of the membranes will lead to a safe and rapid onset of labour. On the other hand, if in a primipara the presenting breech is high and the cervix closed the case is not suitable for induction: persistent attempts will probably lead to a prolonged induction period and a disappointing result. In such cases it is wise to make a particularly careful examination to exclude disproportion. Induction of premature labour in breech presentations has recently been referred to by Bourne (1939), who recommends a rubber bougie, and Danforth and Galloway (1938) found puncture of the membranes quite satisfactory. I have used simple puncture of the fore-waters since 1935, and the results have been so successful that I now employ it as a routine in all suitable cases. The induction should be undertaken when it is thought that the child weighs from 5½ to 6 lb.—usually about the thirty-seventh or thirty-eighth week. Unfortunately some breech cases pass undiagnosed until the child is already too large; but even at term or later

I believe that induction will give better results than those obtained by awaiting the onset of labour, which may be considerably delayed. Table II presents the results obtained since the year 1935 in 36 cases of breech presentation in which induction has been practised. Dr. J. Cargin and Dr. Isobel Mitchell of Woking have kindly allowed me to include several of their private cases in order to make the table complete.

TABLE II.—Induction of Labour in Breech Presentations

Number	Age	Parity	Gestation (weeks)	Induction-Delivery Interval	1st Stage (hours)	2nd Stage (hours)	Arms	Legs	Babies' Weight (lb)	Result	Delivery
1935											
1	22	P	38	?	18½	2	Fl.	Ext.	6.0	G.	Normal
2	22	P	40	49	42	2½	Fl. Ext.	Ext.	6.9	G.	"
3	26	P	37	14	1½?	1½	Fl.	Ext.	8.1	G.	"
4	23	P	38	6	4½	1½	Fl.	Ext.	7.1	G.	"
5	20	P	38	30	3	1½	Fl.	Ext.	5.8	G.	"
1936											
6	32	P	37	3	3	2	Fl.	Ext.	6.1	G.	"
7	22	P	38	12	3	2	Fl. Ext.	Ext.	5.8	G.	"
8	31	P	38	25	11	2	Fl.	Ext.	8.0	G.	"
9	29	P	37	28½	11½	½	Fl.	Ext.	5.13	G.	"
1937											
10	36	P	40	26	4½	½	Fl.	Ext.	5.11	G.	"
11	23	P	38	17	7½	2½	Fl.	Ext.	6.7	G.	"
1938											
12	19	P	40	10	5½	1	Fl.	Ext.	5.3	G.	"
13	22	P	37	13	5½	2½	Fl.	Ext.	5.15	G.	"
14	21	P	40	25	22	2	Ext.	Ext.	5.10	G.	"
1939											
15	19	P	38	8	4½	1	Ext.	Ext.	6.10	SB.	Arrest of head
16	24	P	39	6½	5	1½	Fl.	Ext.	6.8	G.	Normal
17	22	P	38	16	9	1½	Fl.	Ext.	6.0	G.	"
18	30	P	39	13	2½	1	Fl.	Ext.	8.0	G.	"
19	31	P	39	47	36	1½	Ext.	Ext.	6.12	G.	Low impaction
1940											
20	24	P	38	32	20	½	Ext.	Ext.	6.0	G.	"
21	25	P	40	18	14	1	Ext.	Ext.	7.10	G.	"
22	27	P	38	46	43	4½	Fl.	Ext.	6.4	G.	Normal
23	27	P	38	29	22½	4½	Fl.	Ext.	7.2	G.	Low impaction
24	21	P	37	24	7½	1	Fl.	Ext.	5.11	G.	Normal
25	25	P	39	8	6½	1	Fl.	Ext.	5.3	G.	"
26	27	P	37	49	42	3	Ext.	Ext.	5.11	G.	Low impaction
27	21	P	37	23	18½	1½	Ext.	Ext.	5.5	G.	Normal
28	32	P	42	15½	4½	1	Fl.	Ext.	7.0	G.	"
29	21	P	40	30	17	1	Fl.	Ext.	6.14	G.	"
1941											
30	19	P	36?	8	4½	1	Fl.	Ext.	8.5	G.	"
31	33	P	36	12½	1½?	1½	Fl.	Ext.	6.3	G.	"
32	25	P	40	9½	7	1	Ext.	Ext.	6.6	G.	"
33	22	P	40	33	23½	1	Fl.	Ext.	8.2	G.	"
34	24	P	37	24½	6	1	Fl.	Ext.	5.13	G.	"
35	22	P	38	20	9	1½	Fl.	Ext.	5.2	G.	"
36	28	P	39	21	8	2	Fl.	Ext.	5.12	G.	"

With the exception of Case 15, all babies did well.

Some apprehension may be felt at the destruction of the forewaters, when it is still commonly taught that in breech presentations special care must be taken to preserve the membranes intact. There appears to be little clear evidence to support this view, except in cases of presentation of the cord. It is well recognized that labour often starts early in breech cases, with spontaneous rupture of the membranes, which is usually followed by normal delivery. This point has been investigated by Patton and Mussey (1940), who in a series of 302 cases found no adverse effect from premature rupture. In the present series the membranes ruptured spontaneously before the onset of contractions in 21 out of 43 consecutive cases not induced—approximately 50%—which is almost twice as high an average as in vertex presentations (28%). Among these 21 cases there is no evidence of increased difficulty in delivery, and only one gave trouble—a footling-breech in a primipara aged 30, which finally ended in a difficult extraction and a stillbirth. Early rupture of the membranes in these cases need cause no anxiety. It often occurs at the thirty-seventh or thirty-eighth week, and should be regarded as a natural mechanism to ensure a small child by promoting early labour.

Arrest of the Breech

In spite of every care, impaction will occur in some cases, with arrest high in the pelvis or at the vulva, and these two conditions should be carefully distinguished. If

the breech ceases to descend at the level of the mid-pelvis or even at the brim, it is probable that definite disproportion exists. In 550 consecutive cases analysed by Cannell and Dodek (1934), bony dystocia (pelvic contraction) was recorded only five times—less than 1% of the whole, and probably a lower rate than in vertex presentations. This agrees with my own experience, that difficulty in a breech presentation is very unlikely to arise from pelvic contraction. When this is present the breech frequently fails to engage, and version is possible. When high arrest occurs it is more often due to tense and rigid soft parts, with a large child. Pelvic mensuration by radiography is unreliable in assessing disproportion of this kind. Attention should be given to the high presenting part, which fails to distend the cervix as term approaches, and consequently labour may start late. The external os is tight and often rigid. Such cases, which are not uncommon in patients over 30, are not suitable for vaginal delivery. It makes little difference whether the limbs are flexed or extended; manual extraction is likely to be excessively difficult, and a dead baby will result. I will give one instance which remains fresh in my memory.

The case was that of a primipara aged 31, married two years. The child, of fair size, was presenting as a footling-breech. Attempted version was not successful. The soft parts felt firm, but the pelvis seemed adequate. An extremely careful x-ray examination showed clearly that the true conjugate was at least $4\frac{1}{2}$ in., and suggested an ample pelvis. I was uneasy about this woman, as the presenting part felt high up, and the cervix was not opening in the later weeks, so that induction was not possible. She came into labour at 42 weeks, and the infant's feet appeared at the vulva. After three hours in the second stage the breech did not descend. An extremely difficult extraction produced a dead baby of 8 lb. 4 oz. This mortifying experience was the result of a serious error of judgment. The woman should have been delivered by Caesarean section either before labour started or when it became obvious that the breech was arrested high up near the pelvic brim.

Arrest of the breech upon the perineum is an entirely different problem, which most commonly occurs in primiparae when the foetal legs are extended. This position increases a tendency to impaction at the vulva, but if the child is reasonably small spontaneous delivery will occur nine times out of ten (Table I). If impaction should occur it can be dealt with, and it does not seem a very serious matter provided the child is not large. I have not been able to find that any considerable number of cases have been investigated to decide this point, but my own experience suggests that bringing down a leg has little effect upon foetal mortality. It is true that there must be interference, but the manipulation is usually simple. The perineum is often stretched or torn, and delivery of the head is made easier on this account. In the present series one or both legs required extraction in 12 out of 37 primiparous deliveries with the legs extended, with loss of one baby. Probably 30% would be an average figure for the incidence of this operation, including all weights of baby. It is often taught that extension is of grave significance in primiparae, and there is a distinct tendency to divide primiparous breech cases into two categories—those with the limbs flexed, in which an easy delivery may be awaited with confidence, and those with the legs extended, in which serious difficulty will certainly arise. Nothing could be more misleading than this outlook. Marshall (1934) has pointed out that the half-breech is a good cervical dilator which prepares the way for the head. With this opinion I agree, and examination of radiographs in these cases will show that the infant's feet reach the chin, and the legs must hold open the cervix until it is filled by the head. It is not the case with extended legs which needs most care, but rather the footling-breech. In dealing with low impaction, as in all cases of

arrest from whatever cause, it is a sound practice to make an ample episiotomy, which may be all that is required to allow the breech to continue its descent. Local anaesthesia or a few breaths of gas-and-oxygen will allow this to be done painlessly, and the sequence of contractions need not be disturbed. In other cases it will be necessary to give more complete anaesthesia and to bring down one or both legs, and then it is my own practice to proceed at once to complete the extraction of the child. This classical manoeuvre should not be difficult, but it is essential that it should be undertaken at the proper moment. In this presentation progress should be easy and continuous once the breech has reached the perineum, provided always that the cervix is completely dilated. If the breech at the vulva makes no advance in twenty to thirty minutes it is impacted, and it is wise to proceed at once with the extraction, before the uterus retracts so much that the foetus can scarcely be pushed up enough to permit the introduction of the operator's hand, which must be inserted high into the uterus to seize a foot. If the disproportion is more than very slight it is better to bring down both feet, but make sure that the cord is not between the legs. Many infants are lost through deferring intervention until the child's breech is tightly fixed low in the pelvis, when the technical difficulties are much increased. I do not regard impaction at the vulva as a grave complication unless interference is delayed, which amounts to a serious error in management. The most important adverse effect is indirect, from extension of the head and arms, which is so apt to occur after any interference in breech delivery before the umbilicus is born.

Difficulty with the Foetal Head

The birth of the head is a moment of great importance, with potentialities of disaster far more serious than low impaction of the breech. Ten years ago Holland (1931) drew attention to this fact and expressed his opinion that "the death of the foetus occurs at the vaginal outlet." At this moment the natural expulsive forces can accomplish no more, and responsibility for completing the delivery rests with the attendant. In the present series especial difficulty was noted eight times—slightly over 9% of all cases and including five out of six cases of stillbirth. Of this total, five babies came into the smallest group, two in the medium, and one in the largest. The relation between the size of the child and difficulty in birth of the head is certainly less close than is the case with difficulties in the birth of the breech. Unfortunately there appears to be no extensive series in which this point has been investigated, and published figures are impossible to analyse on account of the wide variation in the technique of the delivery, which is certainly of much importance. Although good results have been reported from rapid extraction of the infant, and even elimination of the second stage of labour, such methods require a high degree of technical skill or the results will be disastrous. DeLee (1939) with his great experience says: "Routine breech extraction under full anaesthesia gives poorer results than if the breech is allowed to deliver itself until the navel appears, when manual aid is rendered." There is no doubt that the advancing breech is best left alone by the average obstetrician, and interference is dangerous, as it is so likely to produce extension of the head and arms and an awkward extraction. The ease with which this displacement can occur is illustrated by the very high incidence reported by some authors, yet extension of the arms rarely appears in radiographs taken before the onset of labour, and it must usually arise during delivery. In the present series the arms were displaced 14 times out of 44 deliveries in which the legs were extended, an incidence of about 32%, and in several of these the cause no doubt lay in premature attempts at extraction.

While ordinary experience suggests that it is easier to deal with a baby of moderate size than with a large child, it is clear that small babies are by no means immune from arrest, and in fact their skinny bodies form a poor dilator for the after-coming head. This is a most important point. Of all the factors which influence the birth of the head none is so important as full dilatation of the cervix. Complete dilatation will occur in half-breech presentations, but in some cases of complete breech, and particularly in the footling-breech, full dilatation may not take place. It is in these cases that the head may be caught high up—a very dangerous complication—and a special word of caution is required in their management. As the presenting part slips lower through the dilating cervix the patient may begin to make expulsive efforts, and it is easy to assume that the second stage has begun. The woman may be encouraged to bear down, or extraction of the foetus may be undertaken, in the mistaken idea that advance has become arrested. Nothing could be more unfortunate than this error, and efforts at delivery before the end of the first stage are likely to lead to extension of the head and arms, with arrest at the pelvic brim and serious difficulty at the worst possible moment. The following case will illustrate the result which may follow.

The patient was a primipara aged 26. Labour started at the thirty-seventh week. The breech presented with the legs extended, and when the second stage began (i.e., expulsive efforts) an anaesthetic was given and delivery as far as the shoulders was easily accomplished, but the head was arrested high up at the external os. When I saw the woman the dead baby was hanging by the head, fixed in the cervix, which had contracted with the rigidity of a steel band just below the occipito-frontal plane. I was told that a narrow cervix had been felt at the time the trunk was extracted. All efforts at delivery were fruitless until the head was perforated through the mouth. In this case the partly dilated cervix failed to open further, and the head was caught. Unfortunately the size of the baby is not recorded, but the child was not large.

Minor degrees of this condition are not uncommon, and I believe it is a frequent source of trouble. Should the patient wish to bear down, with the breech in the mid-pelvis before the cervix is fully dilated, it does no harm to give morphine and to wait an hour or two. Goethals (1940) in an interesting study reports that 16 out of a series of 27 stillbirths were delivered through an incompletely dilated cervix. He adds: "The effect of this factor upon the mortality rate is tragically apparent." In this connexion I have come to look askance at the footling-breech, which appears at first sight so simple. Special caution is called for at the delivery, when difficulty with the head and shoulders is common. Out of a total of 9 cases in this series this difficulty occurred three times, with two foetal deaths. Although the number of cases is so small I feel sure that such results are not uncommon. The infant's legs descend easily through the partly dilated cervix, expulsive efforts are made too soon, and the head and arms are caught and extended in the cervical ring. External version is difficult in these cases, and in this respect the condition resembles extension of the foetal legs. Occasional reference to the footling-breech is made in the literature, but the dangers of this presentation are not always appreciated.

Delay with the Head Arrested at the Pelvic Brim

It is very unfortunate that in the delivery of the infant's head there is the strongest temptation to hurry. At the slightest difficulty or delay, fear of delivering an asphyxiated baby may lead the attendant to forget the importance of methodical extraction, and in such cases I have seen the child torn from the mother in the wildest manner. Nothing could be more fatal. It must never be forgotten that the

majority of these babies die with gross cerebral haemorrhage and rarely from asphyxia. All investigations are conclusive upon this point. It is in these cases that tentorial tears are so common, especially rupture of the inferior border of the falx at its insertion into the tentorium cerebelli, with damage to the great vein of Galen. Yet the foetus can stand a remarkable degree of asphyxia, and Chassar Moir (1936) has recorded a case in which the infant survived removal by post-mortem Caesarean section fifteen minutes after the death of the mother. In any case there is always time to allow the child to hang downwards at the vulva for a few moments as suggested by Burns (1934), which will usually bring the head down on to the perineum. In my experience this is a valuable manoeuvre. If the head remains high the essential assistance must come from an experienced attendant, who stands on the left side of the patient and gives a hearty push on the head in the fundus at the proper moment. The pressure must be made in the correct direction, and undoubtedly there is a knack in doing this properly. In order to avoid any delay the attendant detailed for this work should be standing ready to make the fundal pressure when required. The fundal pressure is a most important manoeuvre when the head is arrested at the pelvic brim. So far I have seen no harm resulting, and in my opinion it is much more satisfactory to have an assistant to give the pressure than for the accoucheur to attempt to do it himself with the disengaged hand, which is apt to push too directly downwards and not in the plane of the pelvic cavity. Since the head is pushed upon directly it is not essential to await a uterine contraction, although delivery is naturally easier with an active uterus. If there is unexpected difficulty it is possible that the child's head is not fully flexed, and the jaw should be pulled down with a finger in the mouth in the classical manner. It is worth while, also, to try turning the infant's head towards the transverse diameter of the pelvis; then it will often pass more easily. The application of forceps to the after-coming head arrested at the pelvic brim is far from easy, and cannot be recommended, as it is likely to lead to bungling.

Delay with the Head Arrested in the Pelvic Cavity

It is unfortunate that in the present series the notes fail to distinguish between arrest of the head at the pelvic brim and arrest on the perineum, except in the later cases. Consequently it is not possible to gauge the relative frequency of these complications at all accurately. Experience suggests that high arrest is a serious affair and relatively uncommon, while low arrest is easy to deal with and relatively common. In fact, it may be said to occur in the majority of primiparae unless the vulva is opened by rupture or episiotomy, which is all that is required in many cases. It is really surprising how resistant the intact muscles can be after the birth of the trunk, and it cannot be doubted that too great regard for the inviolate perineum has been responsible for innumerable disasters. Any attendant who undertakes a breech delivery must at least be prepared to make an episiotomy if this is called for, and my own practice is to do this as a routine measure in all cases. If these simple methods fail, fundal pressure is not likely to help, but delivery can be accomplished with the greatest ease by the application of forceps. The child's legs should be held upwards by the nurse who has charge of the fundal pressure, and it is then a most simple matter to apply the forceps, which should always be ready to hand. I have used this method very often, and recommend it with confidence. It is interesting to note that Patton and Mussey (1940) report that the free use of forceps reduced their foetal mortality from 4.4% to 2.7%, a figure which is really remarkable. If by chance the forceps are forgotten, hold

up the infant's legs and pull down the perineum with the fingers, or with a speculum; the blood in the vagina can then be wiped away and the child will be able to breathe. This may be a life-saving procedure, and I have twice had the child crying lustily with its head still in the vagina while forceps were being prepared. Above all, remember that the child dragged out forcibly will surely die. Arrest of the head on the perineum is particularly likely to occur when birth up to the shoulders has proceeded normally, and fatal foetal injury is therefore all the more unfortunate.

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THE DIAGNOSIS OF "BACK-PRESSURE" KIDNEYS IN CASES OF ENLARGED PROSTATE

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The communication on hemiprostectomy by Mr. W. Sampson Handley in the issue of the *Journal* for November 15, 1941 (p. 681) has induced me to write this paper.

Diagnosis by Intravenous Urography

A few years ago, with the help of intravenous urography (I.U.), I examined about 500 cases of enlarged prostate. Before the introduction of I.U. post-mortem examination in these cases sometimes revealed the presence of unilateral or bilateral hydronephrosis. The pathology was not then well understood, back-pressure in itself being considered sufficient explanation.

The application of I.U. to these particular cases soon brought the conviction that the damage caused by the different forms of prostatic enlargement was both anatomical and functional—the latter being by far the more important. The double nature of the damage can often be read in the x-ray picture. The late Sir John Thomson-Walker and other authors must have known of or suspected the two kinds of damage and have tried to estimate their relative importance.

Now, it is well known that one-third of all men over the age of 50 have an enlargement of the prostate of some degree, but that only a small proportion of them are forced to seek medical help. This shows that the mechanical obstruction of the urethra by an enlarged prostate is not the explanation for most of the symptoms of this disease. As knowledge gained by examination with I.U. proceeded, it became evident that some patients showed radiological signs of an infection of their urinary tract although their urine was free from bacteria. The pictures seen in cases of prostatic enlargement and sterile urine were almost identical with those obtained from cases of chronic prostatitis and prostatic abscess. This fact has convinced us that there are cases in which the diagnosis "infection of the urinary tract" can be made only by I.U., and that it must be maintained even in the presence of an aseptic urine.

Having learned to diagnose an "infection of the urinary tract" from the radiograph, we were soon able to recognize in the prostate a major centre of focal infection. The diag-

nosis "cystitis" was very quickly regarded with scepticism. I.U. will convince the observer of cases of "cystitis" in grown-up male patients that cystitis is only a sign of the infection of the urinary system and not a disease *sui generis*.

In many patients with an aseptic urine I.U. revealed the presence of pathological conditions of ureters and kidneys for which no reason could be given. I believe the answer often lies in the prostate. It became evident that there was a strong resemblance between the urogram of the prostatic case and that of the case with urinary infection caused by prostatitis. In order to understand the urograms of some cases of adenoma with a sterile urine one had to assume that at some time previous to the adenomatous enlargement the prostate must have been the seat of a focal infection. Only thus could the apparent anatomical and functional changes in ureters and kidneys be understood.

An Aid to the Surgeon

It is beyond the aim of this paper to describe the different manifestations of urinary infection in ureter and pelvis of kidney as observed by I.U. It is enough to say that with its help even the inexperienced will quickly be able to diagnose the presence of pathological conditions in ureters and kidneys in cases of enlarged prostate. To the surgeon who enucleates prostates I.U. is of undeniable value. With its aid he is enabled to make a better selection of his cases and to predict, and therefore to avoid, post-operative complications.

The surgeon who contemplates the removal of an adenoma of the prostate has first of all to decide whether the patient is "a good risk" or not. He has to decide if the bladder and prostate are also infected and/or if the kidneys are not too seriously damaged by back-pressure and infection. He will ascertain the amount of blood urea and carry out other tests for renal function. I.U. may come last, but it will give most information. Not only is I.U. a functional test of the kidneys so far as their secretory activity is concerned, but it also gives valuable information about the presence or absence of a "back-pressure kidney."

It could never be satisfactorily explained why a pure adenoma of the prostate should cause hydronephrotic kidneys. Communication between the bladder and the ureter, the vesico-ureteral reflux, cannot be accepted as an explanation. In the urogram we see how, but not why, the ureter in its juxtavesical portion first loses its normal peristalsis and becomes dilated and "dislocated." The pathological changes always begin juxtavesically, and they ascend. How far a mere atonic condition and how far periureteritis can be held responsible for the presence of dilated, dislocated, tortuous, and kinked ureters cannot be estimated from a radiograph alone. It can only be surmised.

Post-operative I.U. in cases of adenoma of the prostate showed that these back-pressure kidneys with tortuous and distended ureters improve not only their secretory function but also the tonus and peristalsis of kidney pelvis and ureter. The prostatectomy therefore must have a double aim: (1) the restoration of normal evacuation of the urinary bladder, and (2) a decompression of back-pressure kidneys and the reappearance of normal tonus and peristalsis of kidney pelvis and ureter.

It can be assumed that the patient suffering from an enlarged prostate which has led to damaged kidneys can be looked upon as "cured" only if the method adopted to free him from his subjective symptoms has also achieved a satisfactory decompression of his kidneys and the restoration of a normal peristalsis of the atonic ureters. If this aim can be achieved by transurethral resection this method will certainly be the most promising even if performed by the