sidered as a gradual return to the physical state. Organic matter, whether animal or vegetable, when undergoing decomposition, is being gradually transformed from colloids into crystalloids; ammonia, carbonic acid, and mineral carbonates and phosphates, being the main final crystalloid products, which diffuse away readily through the agency of water. They are taken up by plants, and again converted into colloids, thus establishing an interesting rotation in nature. The wet state of muscular tissue in phthisis which I have frequently observed, especially when there is much emaciation, appears to me to be due to the same cause as that which makes a piece of meat become damp and tender from spontaneous decomposition some time before it emits any smell. Now this *post mortem* phenomenon of the separation of the water from the solid constituents of tissues is due to a loss of the property possessed by living tissues, by means of which they hold in a colloid (gelatinous) condition the water which they contain; and it is this *post mortem* change which, I believe, commences before death in consumption. A similar remark applies to the pulmonary tissue; although in that case the loss of this remarkable relation between water and solids leads ultimately to a greater alteration than the mere moistening of the tissue. Might not the fine crepitation attended with the first shade of dulness at the apices of the lungs be due to a diminished colloid attraction of the water for the solids of the tissue during its process of nutrition? And might not that peculiar harshness, frequently heard at the back of the chest of those who are in a weak state of health, be equally due to a state of malassimilation?

The results which I have obtained, and which have been embodied in the present communication, may be summed up as follows.

1. Blood and tissue must be considered as colloids.
2. Animal tissues are formed by three classes of constituents. The first has been called the *tissue proper*; it is insoluble in water. The second has been called the *nutritive material*; it is soluble, and consists of a mass of colloid substances—the composition of this nutritive material being the same as that of the tissue proper. The third has been called *effete material*, and consists of crystalloid substances which, it is concluded, are on their way out by diffusion.
3. Muscular and pulmonary tissues consist of albumen, phosphoric acid, and potash, in the colloid and crystalloid forms, together with a small proportion of magnesia; and a fact not stated in this paper is, that I have succeeded in obtaining, artificially, phosphoric acid and potash, in the colloid condition, by dialysing a mixture of chloride of potassium and phosphate of soda. I have no doubt that magnesia may also be obtained colloid, by some similar means: it is certainly colloid in the tissue proper of flesh, and in its nutritive material.
4. The phosphoric acid and potash in the effete material of muscular tissue occur precisely in the necessary proportions to form a *crystalloid pyrophosphate of potash*, or a crystalloid tribasic phosphate of potash with two equivalents of fixed base. This is, of all the results which I have obtained, the most interesting, as proving the correctness of the method of investigation which I have adopted, and placing beyond doubt, it appears to me, the truth of my view as to the constitution of animal tissues.
5. In pulmonary tissue, the effete material contains much more potash than is necessary to form a pyrophosphate—the excess being, in all probability, eliminated as a crystalloid carbonate.
6. In muscular tissue in *phthisis*, the water has a tendency to separate from the solid tissue; or that peculiar relation between the water and solid constituents, which preserved the dry state and normal consistence of the tissue, undergoes a gradual alteration, apparently because of an incipient loss of colloid condition, due to a physical change. The pulpy state of tubercular lungs undergoing softening appears to be due to a loss of the colloid attraction of water for the cheesy material which had been exerted before the softening commenced.
7. Muscular tissue in *phthisis* is nourished according to the same process as in health, although its rate of nutrition is slower.
8. Pulmonary tissue, in the state of cheesy consolidation and softening, undergoes nutrition, which, however, is slower, and not of the same nature as it is in health. Lungs thus affected are found to be nourished much in the same way as muscular tissue—the phosphoric acid and potash effete occurring nearly in the necessary proportions to form a pyrophosphate.
9. Finally, death from *phthisis* is apparently due in a great measure to the physical forces residing in the constituents of the tissues, encroaching upon and getting the better of the vital phenomena, so that the ebb of life in *phthisis* may be considered but a gradual return to the physical state of matter.

I gladly avail myself of this opportunity of acknowledging the valuable aid of Messrs. F. A. Manning, H. Bassett, and M. J. Salter, in the analytical portion of these inquiries.

ON A FORM OF CONCEALED HÆMORRHAGE BEFORE THE EXPULSION OF THE PLACENTA, RARELY NOTICED.

By J. BRAXTON HICKS, M.D.Lond., F.R.S.,
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DR. BLUNDELL, in his lectures on the treatment of twins, says the following: "Foot-traps, however, are set for us here as usual, and hence in managing these investigations caution becomes necessary. Thus when a child is away, its membranes may fall over the os uteri, and then blood collecting in clots behind the membranes, which push forth into the vagina, something like the bag of a second foetus may be felt; so that, if guided by internal examination, you neglected to examine externally also, you might persuade yourselves that there was a plurality of children, when in fact there was not. Cases of this kind are not very infrequent: one occurred to Dr. Haighton, and one very remarkable case fell under my own eyes. By rupturing the membranes, these cases can easily be unmasked, for then the blood comes gushing forth, and, on examining, you find that the womb is very completely contracted, so that for a second foetus there is no room." Three such cases having occurred to me; and having failed to find in other works on midwifery any allusion to this form, I have thought it worthy of a short notice, in order that attention may be more directed to a hæmorrhage which might be attended by fatal results before its nature might be made out.

CASE.—I had been called in consultation to a primiparous labour, which had been both tedious and laborious in consequence of a masculine-typed pelvis and a large-headed foetus. The forceps had been required to deliver; the uterus had ceased to contract rhythmically, but had contracted after the birth of the child naturally around the placenta, and was left supported by the hands of the nurse, while attention was directed to the infant with a view to restore animation. After about ten minutes I observed the mother to be altered in appearance; her aspect having, from a swollen and congested state—common after long and hard labours—changed to a pale livid kind. I instantly put my hand on the uterus, and found it to have become distended to the height of the umbilicus. I examined the diaphragm, but found no hæmorrhage. I explored the vagina, and found a bag of membranes similar to that which occurs in twin cases after the delivery of the first foetus, projecting nearly to the vulva. Being confident that the uterus had been of the proper size after delivery, I saw at once that hæmorrhage had taken place internally. I ruptured the bag of membranes; a large quantity of blood escaped; and, grasping the uterus externally, I immediately removed the placenta. The uterus contracted well, the flooding ceased, and no further trouble arose. In removing the placenta, I found how the condition arose. The membranes were adherent all round the inner surface of the lower part of the uterus; the placenta, in part, and membranes attached to the interior of the uterus, had been detached by the blood which had been poured out between. The detached portion had gradually been inverted into the vagina, into which it was bulging full of blood.

About a year afterwards I met with another case, and about two years after a third. These were so like the one above described, that it is not necessary to detail them. It is not improbable that many of those cases of sudden gush before the expulsion of the placenta result from this state of affairs. The capacity of the cavity of the uterus, *plus* the capacity of the bag of membranes protruding into the vagina, is variable; but it is easy to see that sufficient loss to cause a fatal result may occur without any external sign—an additional reason in favour of the rule that, so long as the placenta is undelivered, we should not leave the uterus without support, nor without close examination.

I need scarcely allude to the treatment, following as it does the general rules laid down in modern midwifery. Compress externally the uterus; at the same time rupture the membranes, or detach them. The blood of course escapes, and, whilst it is flowing, remove the placenta by the hand passed within it; follow down and grasp the uterus with the external hand, and employ the usual means to insure its contraction. In the cases which I have seen, I found no difficulty in regard to this latter point.

The explanation given by Dr. Blundell in the above quotation is, I think, scarcely the correct one. As I understand his expression, I should conclude he thinks the membranes free from the inner surface of the uterus before the effusion; whereas, as far as I have observed, the membranes remain attached to the lower part of the uterus, while the part of them towards the fundus becomes, along with a portion of the placenta, separated by the effusion of blood, which gradually pushes it down towards and through the os uteri.

Dr. Matthews Duncan's paper on the "Mechanism of the Expulsion of the Placenta", alludes to Schultze's and Baudelocque's description of the mode in which they conceived this hæmorrhage to occur. In differing from them, he suggests that the mode which they describe as the ordinary one, is in reality very rare, and liable to be attended by flooding. In Schultze's work, *Lehrbuch der Hebammenkunst*, drawings are given, showing the collection of blood behind the placenta, in which it is forced down, inverted, into and through the os uteri, in a manner similar to that described above by myself as occurring to the membranes.

The cases above described confirm Dr. M. Duncan's opinion as to this mode of placental delivery being liable to be accompanied by flooding; yet I expect that the position of the attachment of the placenta to the uterus has considerable influence on the mode of expulsion, especially during varying conditions of uterine tonicity; influenced by the amount of traction made on the fundus either manually or by the natural efforts of expulsion, and also by the amount of separation produced by the latter throes of labour. If complete separation take place upon the last pain, then the mode described by Dr. M. Duncan is probably the usual one; but if it be incomplete, then it is easy to understand that a greater or smaller quantity of blood would be effused, which would produce something of the effect described by Schultze; yet the blood lost would not be sufficient to be alarming, but by no means a rare event even when no traction is made on the funis, at least manually. Still it cannot but be admitted that nothing can facilitate the occurrence of hæmorrhage before the delivery of the placenta more than the slight and imperfect dragging on the funis, so frequently done, in order to find out if the placenta be detached, especially while the uterus is unsupported.

OBSERVATIONS ON A FORM OF DISLOCATION OF THE HIP.

By HENRY ARNOTT, F.R.C.S.,
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In the BRITISH MEDICAL JOURNAL for December 23rd, 1871, there appeared an Extract from a Lecture on Dislocation of the Hip-joint by Mr. Jonathan Hutchinson, in which the views of Dr. Bigelow as to the usual nature of the displacement and the means required for its reduction are set forth at some length. In this extract the following sentences occur. "Next, gentlemen, let me say that I regard the researches of Dr. Bigelow in respect to our subject as amongst the most valuable of recent additions to the science of surgery....Amongst the special services which Dr. Bigelow has done is that of explaining the peculiarity of 'the dislocations into the ischiatic notch', and of teaching us how to reduce them. His assertion is, that they differ very little from the majority of so-called dorsal dislocations, for in both the head of the bone lies not so much on the dorsum ilii as just behind, or behind and above, the acetabulum; and in neither does it really pass so far back as the sciatic notch.....Extension horizontally, whether in a straight line or obliquely, he for the most part opposes strongly.....Extension with the thigh bent at right angles to the pelvis he warmly advocates."

I wish to point out, in connexion with this subject, that the special points alluded to by Mr. Hutchinson as constituting "the most valuable of recent additions to the science of surgery", have long been known to English surgeons, and largely practised by them.

In the thirty-first volume of the *Medico-Chirurgical Transactions*, published in 1848, there is a paper by Mr. Quain, in which precisely the same views are put forth, founded on dissections of recent dislocations and on experiments on the dead body made with a view to illustrate the subject, and on the subsequent successful application in practice of the principles deduced therefrom. In the private note-book kept by me when Mr. Quain's house-surgeon in 1865, I find a case recorded which so well illustrates the points under discussion, that I have thought it may interest the readers of Mr. Hutchinson's lecture if I briefly quote some of the notes which I made of the facts of the case and of Mr. Quain's clinical remarks upon it.

"On December 15th, 1865, J. P., a railway-porter, aged 26, was kneeling on the left knee beside a loaded railway-waggon, when a bundle of young trees fell from the waggon on to his back. He fell with his left leg under him; and, being unable to rise or to stand, he was at once sent to University College Hospital. He was admitted under Mr. Quain's care, with all the signs of dislocation of the left hip towards the sciatic notch, the axis of the luxated femur pointing across the junction of the middle and lower thirds of the sound thigh, the ball of the left great toe resting on the dorsum of the right foot, the

distance between the anterior superior iliac spine and the great trochanter being increased, and the left limb being three-fourths of an inch shorter than the right. Moreover, on moving the limb, the head of the bone was easily felt in its new position, nearer to the sacrum than it should be. Chloroform was administered, and a wet bandage was applied for some way above the left knee, a strong jack-towel being fastened over it with a clove-hitch knot. A padded strong leathern perineal band was fixed on, and tied firmly to the rails about the arena. Then a pulley and cord was fixed to the rails nearly on the opposite side, and hooked into the jack-towel on the left thigh. The table was conveniently moved, and the left thigh given into the charge of an assistant, and flexed to a right angle with the abdomen, the knee being also well bent. Then, the man lying on his right side, and Mr. Marshall taking charge of the hip, the pulley-cord was slowly tightened—thus drawing the thigh in a direction at right angles to the trunk. After a few minutes of steady traction, the bone quietly slipped into its place. A long splint was then applied."

In the course of his clinical remarks upon this case, Mr. Quain gave an account of the cases of dislocated hip which had been dissected by himself and by others. "He stated that, in a case of recent dislocation dissected by himself, he found the head of the bone close to the sacrum, just behind the acetabulum, between it and the ischial spine, but not reaching so far as the great sciatic notch; and here he thought it was generally placed. He also found that extension in the usual manner caused a painful stretching of the sciatic nerve; and he was hence led to suggest that the knee should be well bent during reduction. It was best to make the necessary extension at a right angle with the trunk, instead of across the middle of the opposite thigh, as recommended by Sir Astley Cooper. Mr. Quain had tried both methods, and had found his own to succeed better. He tried, in his first case, Cooper's plan for some time without success; and then, on well flexing the thigh on the abdomen, the bone slipped into its place easily and at once. In this reduction, the head of the femur is not pulled forwards straight into the acetabulum, but it is sent downwards over the ischial tuberosity, then forwards towards the obturator foramen, and so up into the acetabulum at the spot where the ligaments have been ruptured."

It will thus be seen that, in the teaching and practice at University College Hospital six years ago, the views now ascribed to Dr. Bigelow were fully set before the students, as they had been for many years previously at the same place. In Sir Astley Cooper's own school, Mr. Cock (to whom I applied, at the suggestion of Mr. Quain) has been good enough to inform me that for many years he has been accustomed to reduce these luxations by flexion and manipulation, instead of by the method of extension with pulleys as recommended by Cooper.

A brief reference to Mr. Quain's original paper will assist in placing the claim of novelty and originality asserted for Dr. Bigelow by Mr. Hutchinson in its true light.

1. The paper contains an account of the dissection of a case of dislocation of the head of the femur backwards. The case is identified by measurement and appearance with the so-called dislocation into the great sciatic notch, but shown to be wholly different from those which such a displacement would produce. 2. The history of experiments on the dead body is given, showing the position of the limb in which the displaced bone is most easily reduced. 3. The deductions drawn from those experiments are: that, in the ordinary form of dislocation backwards, the femur does not reach the sciatic notch, but lies on the base of the ischial spine, just behind the acetabulum; that, during the extension made to restore the bone to its place, the thigh is most advantageously directed across the pelvis, so that it shall form a right angle, or nearly a right angle, with the abdomen; that at the same time the limb is to be in a state of abduction; and that the knee is to be bent, the extending force being fixed above this joint. 4. Reference is made to cases illustrating the difficulty of replacement when the usual position is adopted, and the immediate facility of reduction when the limb is placed in the position now recommended.

It further appears from the perusal of this paper, that so little traction is needed with the thigh flexed on the abdomen, that the position alone, with very little force, is sufficient to guide the bone back into its place.

I am, of course, aware that reduction of this form of dislocation by flexion has been advocated by very many writers both before and since the publication of Mr. Quain's paper in 1848. But the merit which I venture to claim for my former teacher's views is that, being founded, not on supposition of what might be the case, but on accurate observation of what actually occurs, and on experiments undertaken to throw yet further light upon the subject, they were confidently announced to the profession more than twenty years ago, and constantly taught and acted on by him, in opposition to views which had been published by Sir Astley Cooper, and which had received such universal sanction as