SECTION OF OBSTETRICS.

ARREST OF DEVELOPMENT IN INTRA-UTERINE LIFE.

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THE case which I desire to bring under your notice is one which excited considerable interest in legal circles during the trials of actions arising out of the terrible railway disaster which occurred near Armagh on the 12th of June, 1889. On that day a Mrs. Walker happened to travel in the ill-fated train, and while in the act of rising she was thrown violently on her back against the hard seat of the carriage, sustaining very extensive contusions over the lower dorsal, lumbar, and sacral regions. She was conveyed home, where she was confined to bed for a considerable time, suffering from deep-seated lumbar pains, tenderness along spine, stiffness of the legs, and vesical trouble. From all of these she recovered in time, with exception of the spinal tenderness, which caused her anxiety. On the 1st of December (five months and eighteen days after the accident) she gave birth to a child a little before the full term of gestation had been reached. This child—the claimant in the now well-known Walker case—forms the basis of this communication.

Born on the 1st of December, I had not an opportunity of examining it until the 10th of February, when I found it of average size, and apparently in good health.

Head.—On examining the head I found that ossification

was very incomplete, the only bones which showed solidity corresponding to the age being the temporals, supra-orbital parts of frontal and basilar portion of occipital. The remainder of the brain was covered by membrane, and that of very thin character. The deficiency measured $8\frac{1}{4}$ inches antero-posteriorly; at coronal suture, $4\frac{1}{2}$; at sagittal, $3\frac{1}{2}$ —the appearance being that represented by Fig. 1.

There was no protrusion of brain, and the tension was very slight.

Spine.—For the upper two inches the spinal canal was complete. The lower cervical and upper dorsal region was marked by a fluctuating area 4 inches long and 3 inches wide. The lower dorsal, lumbar, and sacral showed a similar condition, the measurement of the defective parts being here 7 inches long by 4 inches wide. The condition is fairly well shown in Fig. 2.

Fig. 1.

Fig. 2.

On deep examination I found that the vertebræ in both these regions were devoid of spinous processes, and the rudimentary laminæ could be felt distinctly, the transverse measurement between them being considerable, as shown by dots in Fig. 2. The stage of development of the neural

arches reached between the third and fourth month is roughly shown by Fig. 3. This stage was reached about the time the accident occurred to the mother of this child, and no further progress in development was made until I examined the child nearly three months after birth.

Indeed, I believe no improvement occurred until death robbed the lawyers of the most interesting case which had engaged their attention during many years.

Fig. 3.

Limbs.—The arms were normal, but the right leg showed a curious arrest of development. While the lower part extending to the knee was of fair size when compared with the opposite limb, the femoral portion was so short that one would be inclined to expect a dislocation of the hip. On examination, however, the joint proved to be in a foetal condition. Motion was perfectly free in every direction, showing that congenital dislocation was not present. The neck of the femur was short, the great trochanter small, and the femur measured two inches less than that of the opposite side.

The appearance of this defect is roughly shown in Fig. 4, where it may be seen that from above the knee downwards the limb is normal.

Taking now for consideration the condition of the skull, we find, as shown in Fig. 1, that although the basilar and lower frontal and temporal regions were fully developed, the upper frontal, parietal, and part of the occipital portion of the calvarium were just in the same position as regards development as they would be normally at the end of the third month. This is especially true about the parietals, which were in a most rudimentary state. Now, the ossific centre for these bones appears about the third month and progresses more quickly than in the basilar portion of the skull, and yet here was a case in which all signs of ossification were absent from the upper part of these structures, showing that growth had been arrested here about the time of the injury.

Passing now to a consideration of the spinal lesions described, let me call your attention to the drawing (Fig. 2) which I took from the case related. You will find that in the upper dorsal region the spinal arches have coalesced, while at the junction of the cervical and dorsal and in the entire lumbar areas the neural arch is incomplete. The neural laminae project directly backwards, showing no tendency to inward growth. Compare this condition observed in the living child with a picture drawn by Humphreys, and here reproduced, of a foetus at or about the third month, and you will have conclusive proof that the arrest of development here as in the skull occurred at the time of the injury to the mother. You see that the closure of the neural arches is complete in the dorsal region, the spine being represented by dotted lines, while a double row of dots marks the points where the laminae stand out, showing no inclination to join. In the accompanying figure, taken from Humphreys' work on the human skeleton, you have a dorsal view of a foetus of three months, showing that at that time coalescence of the neural arches in the dorsal region has taken place,

where, as he points out, “in the cervical, lumbar, and sacral regions there is a considerable interspace between them.” The last vertebra in which these arches meet is the upper sacral, and hence the frequency of spina bifida here—that is, arrest of development may occur during a much longer interval in the upper sacral than in any other region; and I now exhibit a case in which, although the spinal canal was apparently perfectly closed, yet long after birth the membranous covering of the cord yielded and a spina bifida resulted.

Fig. 4. *Fig 5*

Fig. 4 roughly represents the difference in the lower extremities. It will be seen that the leg is the same on both sides, but the right thigh is shortened, the arrest of development being confined to the neighbourhood of the hip-joint, which retained the fœtal state which one would expect to find about the third month.

I have briefly described the appearances noticed in February, 1890, and bring the notes of the case before this Section with the hope that I may elicit your opinions as to

the correctness or otherwise of the views I hold in regard to this want of proper development in this subject.

The opinion I expressed at the time of the trial was "that the injury to the mother, which necessitated her confinement to bed, lowered her vitality, and thus a lessening of the nutrition (taking place just at the time the neural arches should be closing) is accountable for the imperfection described."

As to the effect of mental emotions in the productions of deformities I can say little. The only birth-mark I saw in all the cases I examined was in the child of a Mrs. Murphy, who was in the early stage of pregnancy (seven weeks) at the time. The lady sustained a severe lacerated wound on the left hand, and in the left hand of the child there were and are subcutaneous streaks corresponding to the parts injured in the mother. On the left side the mother has still evidences of very extensive bruising, and over this area on the child there is a large purple *nævus*, with here and there brown mottling. It is possible that constant direction of the mother's mind to special parts of her own body, and of how her marks would influence the growth of her baby, may in some way interfere with nutrition. In Mrs. Walker's case she was constantly worrying about her own spine, and wondering if it would injure her child.

Whether the arrest of development I have so briefly brought before you arose in part from this mental anxiety, I leave you, the members of this Section, to be the judges.

DR. M'CULLAGH said the case of spinal bifida he had shown was ascribed by the mother to a blow on the back between the third and fourth months of pregnancy. On examination at the time he could see a distinct swelling over the dorsal region. The *laminæ* of the *vertebræ* were only in a rudimentary condition.

DR. SMITH said the whole case really rested upon the point of

maternal impressions. Cases of ordinary deformities and arrested developments are commonly known as amniotic adhesions. But here they had this interesting fact; they had a distinct accident occurring at a distinct period. There was no abortion and no miscarriage, and the woman went on to her full term. The child was born of apparently normal length and weight, but with a well-marked deformity that is referred to that part of the child where the mother received the injury, *i.e.*, in the back. The question then arises as to the maternal impressions, and he believed that nervous impressions sometimes produced these strange deformities.

DR. SMYLY did not believe in it at all. Mr. M'Ardle brought forward an ingenious theory; but the case was probably a remarkable coincidence, and nothing more. The degree of nutrition does not influence the foetus. For instance, women are seen in the last stage of consumption bringing forth fairly well-nourished children. His experience was, that if you give the woman twelve hours to consider she will account for any deformity.

DR. BROOMFIELD said there were other organs that were equally tender in this stage of foetal life, and he failed to see why disease should concentrate itself altogether on the laminæ of the vertebræ. The foetus was well developed, except in the laminæ and in the bones of the cranium. Mr M'Ardle would therefore have to fall back upon the theory of impressions. But as the uterus influenced the whole structure, why should not the other structures suffer as well as the vertebræ? The coincidence was certainly very curious, but he thought that the doctrine of mal-nutrition would scarcely bear it out.

MR. M'ARDLE said the object he had in bringing the case forward was to elicit the opinions of his *confrères* on the subject. Dr. M'Cullagh's case of spinal bifida shows the truth of Dr. Humphrey's remark, that the vertebræ are the last closed. He simply queried the point regarding the maternal impression. Special injury to a nerve centre might interfere with certain nerve fibres, and it was absolutely certain that nervous influence must act upon the developing foetus. And as in case of injury to the spinal cord, only one toe of the limb was found to slough; so in like manner, the mal-nutrition of the foetus was regulated also. Therefore he did not see why the cause of local mal-nutrition could not be explained in the one case as well as in the other.