The friends gave permission for *post-mortem* examination of the spinal cord only. The spinal canal was normal; there was no evidence of caries or of any cause of compression of the cord. The spinal dura mater was normal. The upper dorsal region of the cord was softer than the other parts. No other changes were detected on naked-eye examination. After hardening in Müller's fluid, pieces of the cord were embedded in eolloidin, and the sections stained according to Weigert's method, and with aniline blue black and logwood. Microscopical examination showed an area of transverse myelitis in the upper dorsal region of the spinal cord. The white matter was chiefly involved. Above the lesion, in the uppermost part of the dorsal region and in the cervical region, was the usual ascending degeneration in the direct cerebellar and posterior median columns. In addition to these usual tracts of degeneration, there was degeneration of each anterior or direct pyramidal tract for about 4 inches above the lesion (Fig. 1). In the upper third of the cervical region, the direct pyrami-

Fig. 1.

dal tracts were not degenerated, but commencing about the junction of the upper and middle third of the cervical region there was marked degeneration of the direct pyramidal tracts. This extended down to the area of transverse myelitis in the upper dorsal region. There was marked degeneration of these direct pyramidal tracts, therefore, in the lower two-thirds of the cervical and in the upper dorsal regions. Above the transverse myelitis, in the uppermost dorsal and in the whole of the cervical region, there was no affection of the crossed (lateral) pyramidal tracts. The degeneration in the direct pyramidal tracts could be detected quite readily on naked-eye examination of the cord after hardening in Müller's fluid, this and other degeneration tracts being of a paler colour than the rest of the white matter. It was seen best in sections stained according to Weigert's method; it was also seen in sections stained with aniline blue black and logwood. The degenerated tracts showed the usual excess of neuroglia connective tissue and the disappearance of nerve fibres. The degeneration was very well marked, and quite as distinct as that in any other part of the cord. Below the area of transverse myelitis there was

Fig. 2.

the usual descending degeneration in the crossed pyramidal tracts; there was also degeneration in the direct pyramidal tracts down to the lower dorsal region (Fig. 2).

In the posterior median and posterior external columns there were numerous small irregular patches of degeneration, most marked just below the transverse lesion, and gradually diminishing towards the lower part of the cord. They extended to the upper lumbar region.

At the uppermost part of the degeneration in the direct pyramidal tracts. At the junction of the upper and middle thirds of the cervical portion of the cord the changes extended laterally into the white matter, a little beyond the limit of these tracts. It seems probable that at this level there was originally a small patch of myelitis at the anterior part of the cord, just in the region of the direct pyramidal tracts, and that this had been followed by descending degeneration in the direct pyramidal tracts. Any such area of myelitis must have been very small, and strictly limited to the region just mentioned. There was no descending degeneration in the crossed pyramidal tract of the cervical region. That the direct pyramidal tracts had their normal position is shown by the fact that they were degenerated in the usual way below the area of (dorsal) transverse myelitis down to the lower dorsal region.

In this case the direct pyramidal tracts were markedly degenerated from the junction of the upper and middle thirds of the cervical region down to the lower dorsal region, and yet the arms were not paralyzed: destruction of the fibres of these tracts in the parts just mentioned was, therefore, not followed by paralysis of the arms.

PRELIMINARY NOTE UPON A NEW METHOD OF PREPARING THE SPINAL CORD FOR MICROSCOPICAL EXAMINATION.

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In attempting to prepare sections from the fresh spinal cord for microscopical examination I have hitherto met with disappointment. As far as my knowledge goes, attempts of the kind have always failed. My own experience is that sections can be made from the ether-frozen fresh cord, and floated on water with comparative ease, but that they become quickly spoiled by further manipulation. If they are treated after the method employed for the fresh cortex cerebri¹, the tissue composing the white matter is thrown into a number of folds, and the sections are thereby rendered useless. But a still graver defect, and one which effectually condemns this procedure when applied to the spinal cord, is the complete absence of fixation of the elements of the white substance. The ordinary appearance of nerve tubes in transverse section is wanting; in place of it one sees a tangled skein of connective tissue fibres and axis cylinders, the latter especially being twisted and corkscrew shaped. There are literally no nerve tubes to be seen. As regards the grey matter, the nerve cells are well stained, and considerably larger than in a hardened specimen, but other tissue elements appear but indifferently.

The following are briefly the steps of the method now adopted:—

1. Remove spinal cord from a recently-killed animal.
2. Place a portion 6 to 8 millimetres high on the ether-freezing microtome; freeze and cut. The precautions used in freezing the brain cortex to be observed here also.
3. Float the section on to water. It should be quite free from wrinkles; if allowed to sink beneath the surface they appear at once.
4. Take the section up as soon as possible with a perforated lifter, drain off excess of water on blotting paper, and float the section on pure piridin,² kept at hand in a watch glass; it may presently be pushed beneath the surface of the liquid. Hitherto I have kept sections in the piridin for at least one hour, usually several hours. In one case one quarter of an hour sufficed to fix the tissue elements, so that the time above mentioned is, perhaps, unnecessarily long.
5. Wash well in water.
6. Stain.
7. Dehydrate and clear in piridin (possibly desirable to pass through piridin diluted with water into the pure reagent).
8. Mount in balsam suitably thinned with piridin.

In this way sections free from wrinkles are obtained. It certainly may occur that out of a large number of sections some present a slight fold at the point of exit of one of the nerve roots, but most obtained are quite free from wrinkle. Such sections are instructive, even unstained, examined simply in water upon the slide. The horns stand out in relief against the darker white substance, and the nerve roots are clearly seen, sweeping outwards in broad bundles. Within the horns appear large colourless ganglion cells, and an intricate meshwork of fine nerve tubes. All these structures approach very nearly the natural size. Such fresh specimens would probably show tract degenerations well under the low power. In stained specimens the transverse sections of the nerve tubes in the white substance are brought out exceedingly well; the contour of the tubes is sharp, the axis cylinders are well stained. The appearance of the white columns is such as one is accustomed to see in sections from hardened cord; the effects of corrugation are, however, absent, and the wealth of structure is greater than in the latter case. Any of the dyes ordinarily used for the purpose may be employed for staining the axis cylinders and connective tissue of the white matter, but I have mostly used anilin blue-black ($\frac{1}{4}$ per cent. aqu. sol.), followed by picrocarmine, as I find the combination more effectual than any single stain in bringing out all the structures in the section (grey and white matter). Kernschwarz, diluted to one-third its original strength (5 to 10 minutes), is an excellent stain for the axis cylinders; nerve cells it stains rather too uniformly. By using subsequently the Biondi-Ehrlich stain (10 minutes) they are brought out better. An entirely satisfactory staining of the grey matter is yet to be obtained. By

¹ Bevan Lewis.

² First recommended, I believe, by De Souza (*Zeitschr. f. wiss. Mikroskopie* Bd. v, H. 1.) as a hardening reagent for brain substance.

means of Loeffler's alkaline methylene blue (aqu. sol. dilute before use with an equal vol. water) the nerve cells and the connective tissue throughout the section can be stained, but the nerve tubes are poorly shown. Excess of dye is removed by the piridin which follows. Picrocarmine (half an hour) stains all the structures present; but I have hitherto got the most satisfactory results by staining first in anilin blue-black, of the strength given, for 20 minutes, and subsequently in picrocarmine for 15 to 30 minutes. The staining of the grey matter will, I hope, be presently improved upon. My immediate object is more especially to bring to notice the fact that by means of piridin sections of the fresh cord can be fixed and preserved unwrinkled, each nerve tube being well defined. Sections prepared and mounted in the manner described show scarcely any diminution in size when compared with the original cord. The rapidity of the method is noteworthy, for by it the cord can be removed, cut, stained, and mounted in the course of a day; indeed, it is probable that from 2 to 4 hours would suffice.

In conclusion, I may state that I have hitherto practised with the cord of the cow, cat, and rabbit respectively, in each case successfully, with the reservation regarding the grey matter alluded to. The longest period which has elapsed between the death of the animal and the time of cutting sections (after which the elements were thoroughly fixed) is an hour and a-half (cow's cord). I have not yet cut any later than this.

Judging from certain specimens in which nerve roots appear outside the cord in transverse section, I am disposed to think that the same method may be advantageously employed for peripheral nerves.

HYPERTROPHIC ELONGATION OF THE CERVIX AS A CAUSE OF OBSTRUCTED LABOUR.¹

By SAMUEL GRIFFITH, M.D.,
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HYPERTROPHY and elongation of the cervix and os uteri, or hypertrophic elongation of the cervix, is a very uncommon cause of obstructed labour. In an experience of forty years I have met with only the two following cases.

CASE I.—On November 17th, 1888, I was called to visit Mrs. W., stated to be in labour of her second child. I found her complaining of very severe but irregular pains in the back. The os uteri was between the vulvæ, looking excessively swollen and livid, with a posterior and anterior slit at least an inch deep in the cervix; the cervix was also very hypertrophic, and was elongated to the extent of three inches. Both the external and internal os, as well as the cervical canal, were so patulous that I had no difficulty in inserting my finger and feeling the presenting part above the brim. There was no bulging of the membranes with the pains, so I left the house, prescribing rest, opiates, and purgatives. I was not summoned again until November 24th, and as I was not at home when the messenger came, my assistant went there and remained with the patient all night. On November 25th, about midday, he sent for me, stating that the patient was making no progress, that she had been having pains all night, but they were not at all strong; that shortly before he sent they had ceased altogether, and that the patient looked very weak. When I arrived it was quite evident that rupture of the uterus had taken place.

Tait's modification of Porro's operation having just been made known, I was very anxious to perform it, and for that purpose sent for my friend and former pupil, Dr. Jones-Morris, to assist me. The husband, however, refused his consent unless we could guarantee that the operation would be successful; this, of course, we were not able to do, but we assured him it was the only chance for the poor woman. She died in about fifteen hours after the rupture had taken place.

I was allowed to make a *post-mortem* examination. The rupture was a transverse one, and exactly on a level with the peritoneal surface of the roof of the vagina—that is, imme-

diately above the internal os; there had been very little hæmorrhage, and evidently death was caused by shock.

CASE II.—In August, 1892, Dr. Jones-Morris requested me to see a multipara with him, as the case resembled very much the one he had seen with me. There was, however, good dilatation, and he had applied the long forceps, but could make no headway. The pulse was fairly good, but the pains weak. We applied the forceps again, but as soon as we did so the pains stopped altogether; we had, therefore, to remove them, and wait for pains to return. This was on Sunday evening, the pains did not return with any force until Monday evening; we then applied the forceps again, and delivered her of a stillborn child after a very tedious and difficult operation; metritis set in, and in five or six days the patient succumbed.

This complication is so rare that in most of our obstetric literature it is not even hinted at, but in Spiegelberg's *Textbook of Midwifery* "prolongation of the cervix, especially of its intravaginal portion," is just mentioned. It is stated that it must not be confounded with prolapse, that the condition is unimportant, and causes no trouble during labour, except, perhaps, by a delayed softening of the lips of the os, interfering with its dilatation. This, however, is wrong, as it is clear that hypertrophic elongation of the cervix may lead to very serious difficulties in delivery. Professor Simpson² describes in the Edinburgh Obstetrical Society's *Transactions* a case in which "it became necessary for him to break up the head of the child in a woman in whom the cervix was between four and five inches long, and correspondingly thickened; and he mentions other cases where lateral incisions nearly two inches deep had to be made through the cervix before delivery could be effected."

MEMORANDA: MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

PSOAS ABSCESS TREATED BY REPEATED ASPIRATION AND INJECTION OF IODOFORM EMULSION.

H. B., aged 20, in August, 1891, complained of weakness and lassitude, which had come on after two severe attacks of influenza. In October, 1891, he complained of aching in the lumbar region, but careful examination showed nothing to indicate spinal mischief. In a few weeks the pain disappeared; but in January, 1892, he came again with a swelling in the right groin, which proved to be a large psoas abscess; there was no deformity or tenderness of the spine. In fact, the patient had been daily following a somewhat laborious occupation. The apices of both lungs showed impaired resonance and marked crepitations.

Treatment.—It was decided to try a method of aspiration recommended by Mr. A. W. Mayo Robson in the *BRITISH MEDICAL JOURNAL* of April 25th, 1891. On January 26th the first aspiration was performed, with antiseptic precautions, and 24 ounces of pus drawn off. Aspiration was stopped immediately the pus became tinged with blood. Pads were applied above and below Poupart's ligament, then cotton wool and a bandage, and over all elastic webbing, so as to get considerable elastic pressure. The patient was kept perfectly at rest on his back in bed, and disturbed as little as possible, whilst cod-liver oil and as much nourishing food as possible were given. The temperature, previously hectic, became at once almost normal, with a variation of 1° between morning and evening. In two weeks the temperature became hectic again (a variation of 3° between morning and evening), and the abscess cavity was found to be refilling. On February 15th it was again aspirated, 17 ounces of pus drawn off, and 1 ounce of iodoform emulsion injected. The after-treatment was the same as before.

On March 7th the cavity was again aspirated; 11 ounces of pus drawn off, and 1½ ounce of iodoform emulsion injected. The temperature again improved for a time, and then resumed the hectic type.

On April 5th aspiration was performed for the fourth time,

¹ Abstract of a paper read at a meeting of the North Wales Branch of the British Medical Association.

² Quoted in Lawson Tait's *Diseases of Women and Abdominal Surgery*.