to answer: Do organic lesions of the cord result from this molecular disturbance?

It is important in this connection that we should exclude pre-existing disease, for it has been stated on good authority that organic disease never starts from a traumatism such as is here implied, and that where it is stated to have done so the probability is that there was pre-existing disease.

I shall submit notes of a case where pre-existing disease was seriously aggravated, and I hope to prove that organic disease may originate in miners after injuries such as I have described.

CASE IV. Aggravation of Pre-existing Symptoms.—J. F., aged 55, was examined October, 1888. He attributes his condition to an accident during the previous year. He states that in November, 1887, whilst walking down an incline in a coalpit he slipped and fell backwards, straining his back and striking it against the ground. He was carried home, and remained in bed for three weeks, during which time his legs were very weak, and he could not retain his urine, having to get up seven or eight times in the night. After this he got up and moved about the house. Twenty years before this he fractured his right leg. For ten years previous to the fall he was not quite steady in his walk. He was obliged to steady himself with a stick, and his gait somewhat resembled his present one, except that since the accident it had become more unsteady. He is fairly well nourished, but gives the impression of a man in failing health. There is a general shaking of the body when he stands; the walk is very unsteady and jerky. When he stands with his eyes closed his condition is typically ataxic. The tongue is unsteady, constantly tremulous. The patellar reflexes are exaggerated. Wrist reflexes are marked. There is no ankle-clonus. The head twitches. Very sensitive to pressure on the spine.

CASE V. Organic Disease following Injury.—T. T., aged 29, single. He met with an accident in April, 1886. He was completely buried under a very heavy fall, which altogether he estimates must have been about 3 tons. He was carried home on a man's back and put to bed at once. He passed urine the day after the accident without instruments. The bowels, he says, acted all right. He was in bed for a week; could not move his legs. He got up and walked about the house for a few days, and then went out "hobbling" about on sticks. He began to work three weeks after the accident. Occasionally after working hard he had pains in the lower part of his back. He left the Mon. Valley for the Rhondda in July, 1887, and pain in the lower part of the back was still felt after working hard. From this time forward he continued to suffer from pain in the back, and, as far as could be made out, it was after his return again to Monmouthshire in August, 1893, that he began to notice weakness and trembling in his legs, and, as he stated, in "his system generally." There was no history of specific disease. When seen in April, 1894, he crawled about the room. There was evident weakness of both legs; the reflexes were exaggerated; tactile sensation was defective up to the umbilicus; he said he had complete control over his bladder; occasionally he had to run off quickly to relieve his bowels. There was an acne rash on the shoulders, and some discoloured spots on shoulder, arms, and thorax. There were no scars on the neck nor in the throat; he had right external squint; the upper extremities were apparently normal; he said he could use them as well as ever.

This case appears to me to be clearly one of organic disease resulting from molecular disturbance of cord. I have notes of two other cases in which it seemed fairly certain that organic disease originated in this way; and, moreover, as side-lights upon this interesting question, I have brought with me sections of the spinal cord from a case of disseminated sclerosis under the care of Dr. Bastian when I was his house-physician which are interesting because the patient's condition was attributed to the class of injury which we are considering. I have no doubt we can most of us adduce evidence from cases in practice other than mining of some causative relationship between accident and disease such as is assumed under the present class.

If, then, organic disease does originate in this way, the next question is, how often? The kind of evidence we want I have indicated, and it is of very great importance that extreme accuracy should be observed on account of the important bearing these cases must of necessity have upon medico-legal investigations.

IV.—MOLECULAR DISTURBANCE OF THE WHOLE NERVOUS SYSTEM.

The most diverse and often extraordinary symptoms are included under the term "railway spine." It is the general belief amongst those members of the profession not familiar with mining accidents, and put forth as a conclusion by Dr. Byrom Bramwell, based, as he states, on a large body of evidence collected, but not from any under his personal observation, that miners very rarely manifest the train of nervous symptoms which frequently occur after railway accidents and injuries. Upon this point I desire to join issue with him, and to state that I have frequently observed in miners these nervous symptoms. The most common symptoms have been general debility, prostration, and exhaustion of a very marked character, marked emaciation, extreme

nervousness, often a morbid condition of excitability (in one case there was a clear history of a condition of unstable mental equilibrium of an extreme nature, bordering upon the maniacal), extreme hypersensitiveness of skin, not confined to the spinal regions, defective memory, weakness of sight, feeling of weakness in one or both legs, and exhaustion after walking short distances, pain and weakness in the back, loss of weight, loss of appetite, vomiting. There was no evidence in these cases of organic mischief of the brain or cord.

Mr. Thorburn divides these cases into two classes, (a) neurasthenic, and (b) traumatic hysteria; the former characterised by a general defect in nutrition and nerve power, the latter by well-defined and localised symptoms dependent upon localised molecular disturbance, probably of some portion of the cortex.

The very great difficulty in cases where compensation is claimed or where a fund is involved is to differentiate between real suffering and the feigned symptoms of unscrupulous individuals—between voluntary and involuntary excitement of the imagination.

With these few preliminary remarks may I be permitted to invite discussion upon the following questions:

1. How long do the symptoms of simple spinal sprain in miners last?
2. Do miners frequently suffer from molecular disturbance of the spinal cord?
3. Does organic disease of the spinal cord originate from molecular disturbance, and, if it does, how often?
4. Do miners often manifest the nervous symptoms which are so frequently met with after railway accidents and injuries?

5. What influence, if any, has the establishment of the South Wales and Monmouthshire Permanent Miners' Fund had upon the genesis of neuroses?

I have purposely avoided the introduction of such terms as concussion of the spine and concussion of the spinal cord, because I consider them singularly unhappy and inappropriate as applied to mining injuries, and because they have caused endless confusion and misunderstanding in the past.

[The result of the discussion went to show:

1. That symptoms of spinal sprain vary in duration mainly according to age—the younger the individual the more quickly he recovered. Old men might suffer for long periods. The difficulty was to exclude neurasthenia.
2. That molecular disturbance of the cord after accidents necessitating the use of a catheter was very rare—less rare, perhaps, were temporary and sensory disturbances.
3. That organic disease following upon molecular disturbance was very rare.
4. That neurasthenic disturbances were common after spinal accidents.
5. That the South Wales and Monmouthshire Permanent Miners' Fund had a good deal to do with the genesis of nervous symptoms after accidents.]

TUBERCULOUS DISEASE OF THE PORTIO VAGINALIS.

By JOHN D. WILLIAMS, M.D. EDIN., B.Sc.,
Freeland-Barbour Fellow Univ. Edin. 1888-90,
Cardiff.

RECENT observation has shown that tuberculous disease of the female pelvic organs is not so rare as was formerly believed to be the case. The *post-mortem* investigations of Pollok,¹ Kiwisch,² Courty,³ Schramm,⁴ Cornil,⁵ Zweigbaum,⁶ and Whitridge Williams,⁷ has thrown considerable light on its frequency, and according to these authorities the disease was met with in from 1 to 8½ per cent. of the cases examined. In 100 necropsies examined by myself, tuberculosis of the female pelvic organs was encountered in 3 cases, one of which, a case of primary tubercle of the Fallopian tubes and uterus has already been published.⁸ The percentage of genital tuberculosis as determined in the operating theatre by different operators, varies: Edebohls gives a percentage of 4, Martin a percentage of 3, whilst Whitridge Williams,⁷ who carefully examined the operative material of the Johns

Hopkins Hospital, found tuberculosis present in 8 per cent. of all appendages removed for inflammatory diseases.

In the present communication I propose to describe very briefly two cases of undoubted tuberculous disease of the vaginal portion of the cervix uteri supplied respectively from private practice and the *post-mortem* theatre.

CASE I.—J. C., aged 63, married, and the mother of several children, was admitted to hospital suffering from pulmonary phthisis, from the effects of which she died three weeks later. Prior to this illness, which according to her statement was only of a few months' duration, she had always enjoyed excellent health. There was no history of consumption in her family. *Necropsy*.—Both lungs were in a state of advanced phthisis. There were enlarged calcareous glands in the mesocolon and enlarged glands in the mesentery. The pelvic organs were matted together with chronic fibrous bands. The uterus was enlarged, retroflexed, and measured 10 cm. in length, 7 cm. in breadth, and 3 cm. in thickness. There were two small subserous fibroid tumours in the posterior wall (see figure), and one of a larger size in the left border. The utero-

Fig. 1.—Posterior view of the uterus and appendages. A. The enlarged uterus. B. B. Subserous uterine fibroids. C. C. Right and left utero-ovarian ligament. D. D. Right and left ovaries. E. Left Fallopian tube opened to show the longitudinal folds of mucous membrane, and the continuity with the ovarian fimbria. F. Right Fallopian tube. G. G. Right and left ovarian fimbria, "pen-shaped," reaching to the outer end of the ovary. H. Pedunculated cyst from the tubules of Kobelt. I. Posterior lip of the cervix. J. Anterior lip, hypertrophied, firmly adherent to the vaginal wall, and covered with tuberculous ulcerations. K. Vagina, one-third natural size; removed *post mortem*.

vesical pouch and the posterior bladder wall were inflamed and covered with flakes of recent lymph. Having removed the pelvic organs, the anterior lip of the cervix was found to be extremely hypertrophied and firmly fixed to the anterior vaginal wall, so as completely to occlude the anterior fornix. Its dimensions were 4 cm. by 3 cm. Its inner surface was ulcerated. The ulcers were of a varying size, almost circular in shape, with a crenate, sharply cut and slightly raised margins, and a depressed base studded with greyish semi-transparent granulations. The disease had extended to the adjoining vaginal mucous membrane, which was the seat of two small similarly characterised ulcers (see figure). The surrounding tissue was marked with minute greyish spots. These were tubercle follicles. The Fallopian tubes and ovaries were bound together by firm bands of fibrous tissue (perisalpingo-ovaritis), and the ostium abdominale of the right tube was blocked up with inflammatory material. The ovaries were cystic. The bladder wall was hypertrophied, and towards its base and posterior aspects showed submucous hæmorrhages in its substance. On section the mucous membrane of the tubes, the uterus, and the upper two-thirds of the cervix appeared normal. Microscopic examination of the ulcerated areas revealed the presence of typical giant cell tubercle follicles in the bases of the ulcers as well as in the tissues immediately surrounding. In the former position the follicles showed a disposition to coalesce, forming nodules, which were in various stages of caseation. The mucous membrane was intact, except at the seat of ulceration. Numerous tubercle bacilli were readily seen in and around the follicles, and a few between the fibres of the dense fibrous tissue underlying the ulcers. The cervical glands in the lower third of the cervix were atrophied, and represented by solid columns of irregularly shaped and atrophied epithelial cells. The ovaries, tubes, uterus, upper two-thirds of the cervix, and the hypertrophied bladder wall were carefully examined for tubercle follicles and bacilli, but with a negative result. The disease, so far as it pertained to the generative organs, was strictly limited to the lower third of the cervix, the anterior lip, and the upper part of the anterior vaginal wall.

CASE II.—A. M., aged 36, married, 2-para, consulted me in July, 1893, complaining of severe backache and profuse leucorrhœal discharge of several months' standing. She was married at the age of 26. Her last baby had been born six years. Subsequently the above symptoms manifested themselves, and became aggravated towards the early part of the year 1893. Menstruation, which set in at the age of 13, recurred every twenty-one days, was painful and scanty. For one year before marriage it was in abeyance. Her two pregnancies went on to full term, and terminated in natural labours. Her previous health was delicate, but there

was no trace of tuberculous disease in her family history. When I first saw her she had a slight cough, unaccompanied by expectoration; the percussion note over both apices was dull, and expiration was prolonged. A cardiac presystolic murmur was audible in the mitral area. On bimanual examination the uterus was found to be smaller than normal and abnormally anteverted; the right ovary was tender, and the right broad ligament the seat of cellulitic thickening. The cervix was lacerated in two places towards the right, and gave a peculiar irregular indurated impression to the examining finger quite different from the usual smooth and yielding feel. On exposing it to view it was seen to be intensely injected, reddened, and the seat of an ulcer, the base of which was yellowish grey in colour, and its margins indurated and sharply cut. The slightest touch caused bleeding. On wiping away the discharges with cotton wool a caseous cast of the ulcer was detached, leaving behind a bleeding nodular surface. The cervix was freely swabbed with tincture of iodine, the vagina douched, and the patient was told to come again in a week. During the interval it occurred to me that the ulcer might be of a tuberculous nature, so when she next called I removed from the cervix a small piece of the ulcerated tissue, and collected a specimen of the vaginal discharge for microscopic examination, which at once decided the diagnosis. Tubercle follicles and bacilli were seen in the removed bit of cervical tissue, and the latter were abundantly evident in the vaginal discharge. Having thus cleared up the diagnosis, I decided, before proceeding with the appropriate treatment, to allow the patient time in order to try to allay the ovarian tenderness and cellulitis, for which purpose I ordered the hot vaginal douche to be used twice daily. At the end of three weeks, when the tenderness had gone, I proceeded to dilate the cervix, curetted and applied strong carbolic acid to the denuded surface. Syrup of hypophosphites, cream of malt, and cod-liver oil (Oppenheimer)—in no other form could the oil be tolerated by her stomach—and a change of air were prescribed. At present she is much improved in health; the pain (except a slight recurring menstrual pain) as well as the discharge have entirely disappeared.

In these two cases we have illustrated the limitation of tuberculous disease to the vaginal portion of the cervix uteri and the adjoining vaginal mucous membrane, with non-involvement of the rest of the generative tract. In both the disease was of the ulcerative variety, with the eruption of tubercle follicles in the immediate surrounding tissues; and it may, I think, be very properly regarded (certainly in Case I, and probably in Case II) as occurring secondarily to a tuberculous lesion in the lungs. Like these, the majority of the recorded cases of cervical tuberculosis are cases in which the disease is secondary to a tuberculous mischief existing elsewhere, and associated with a similar lesion of the neighbouring vaginal mucous membrane, the uterus and Fallopian tubes remaining unaffected. Tuberculosis of the uterus, which also involves the cervix, is, according to Whitridge Williams,⁷ rarely met with, and, as far as he could ascertain from a careful survey of the literature, has only been noted in 7 cases. To this list I would add Haidenthaler's⁸ case, reported in 1890. The former authority also writes: "A most interesting feature of this affection is that it is almost always limited to the body of the uterus, rarely extending beyond the os internum to involve the cervix." Cornil⁵ states that cervical tuberculosis may constitute the sole manifestation of the disease in the entire body, as in a case reported by him in which a tuberculous ulcer of the cervix was mistaken for carcinoma, and the uterus extirpated. Zweigbaum¹⁰ has noted 29 cases of tubercle of the cervix, 3 of which were cases of primary disease.

Thus it seems as if tubercle of the cervix, whether primary or secondary, tends, in obedience to some unascertained law, to limit itself to that structure, thereby constituting in the first instance the only tuberculous lesion in the whole of the generative tract. These observations must have a most important influence upon the theory of causation. Inasmuch as the cervical disease, whether primary or secondary, is in some instances the only representative of tuberculosis in the whole of the reproductive system, one is warranted in believing that the etiological factors must embrace something besides the usual and well-worn theory of infection from tuberculous discharges springing from diseased areas existing higher up in the passages or the peritoneal cavity. In some cases, of course, such an explanation is quite sufficient to account for the extension of the disease to the cervix, but in others, as in instances in which the disease is present only in the cervix, it is quite inadequate, and therefore one must fall back upon infection through the blood, or direct infection from without for the *vera causa*. Direct infection may be conveyed by the use of bacilli-laden instruments, by the examining finger of the practitioner or nurse, and by coitus. There may very probably exist an inherited predisposition to genital tuberculosis, and this must be borne in mind. Infection by coitus is stated by Cornil⁵ and others to occur but rarely. They base their statements on the rarity of tuber-

culosis of the vagina and cervix as compared with the uterus and tubes, for they say they should be more often the seat of the disease if infection follows the introduction of bacilli into the vagina. To recognise the fallacy of such an argument it is only necessary to consider the great rarity of tuberculosis of the mouth and pharynx, in which infection from without is the rule. It is probable that the disease cannot be produced unless the presence of bacilli in the vagina be associated with an injury to or a devitalisation of the cervical tissues as well as an inherited local predisposition to tuberculosis. The introduction of tuberculous material by Oncarani¹¹ into the vagina of rabbits, even if previously irritated by rubbing with tincture of iodine, never produced genital tuberculosis, but the animals usually died of general tuberculosis. Whitridge Williams,⁷ who conducted similar experiments, could not detect a trace of tuberculosis anywhere in the body when the animals were killed from four to six weeks later. Zweigbaum¹⁰ believes that chronic gonorrhoea predisposes the patient to tuberculous infection.

The period at which cervical tuberculosis most prevails is the period of maximum sexual activity—20 to 40 years of age. Genital tuberculosis may occur as early as ten weeks and as late as 83 years.⁷ The ages of the patients described in this communication are 63 and 36 years respectively, and they had borne children. As to its frequency some idea may be gathered from the fact that out of 119 cases of genital tuberculosis collected from the literature by Späth¹⁵ 6 were cases of cervical disease. Zweigbaum has collected 29 cases. At one time its occurrence was denied by Rokitsansky,¹² Lebert,¹³ West,¹⁴ and others, although the condition had been accurately described by Kiwisch² previously in 1854. The disease has, however, been thoroughly demonstrated and is now fully recognised, but unfortunately in some of our modern text-books it is only referred to in order to be dismissed with a few words either as a museum curiosity or a rarity of no importance to the clinician.

Great importance is to be attached to the correct diagnosis of cervical tuberculosis, inasmuch as the ulcerated variety may readily be mistaken for cancerous disease, and this error of diagnosis has actually been committed. Cornil and Zweifel¹⁶ record cases in which, hæmorrhage and suppuration being the symptoms, a diagnosis of carcinoma was made, and in one instance the uterus was removed *per vaginam* for a tuberculous ulcer of the cervix mistaken for carcinoma. By aid of the microscope Zweifel rectified his diagnosis before operating. The possibility of mistaking the two conditions must be always borne in mind by operators.

There are no signs or symptoms which can be considered pathognomonic save the detection of tubercle follicles and bacilli by the microscope. The honour of bringing this method of investigation into prominence belongs to Babes,¹⁷ who in 1883 demonstrated the presence of tubercle bacilli in vaginal discharges. As regards prognosis, all the authors consulted agree that it is grave, for the risk of general infection is always great. The treatment adopted has been various; some have successfully used iodine and iodoform, the ulcers healing up by granulations; others have trusted to curetting followed by the application of the thermo-cautery; whilst others have excised the ulcer and sutured the incised edges. Some, when reasonably sure that the disease was limited to the cervix, have amputated.¹⁸ The disease has a tendency to recur, and Zweigbaum's case, which was cured within three weeks of the application of the thermo-cautery, but died five months later of general tuberculosis of the lungs and intestines, is an example.

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TUBERCULOSIS OF THE TONSIL.

By J. PURVES STEWART, M.A., M.B., C.M. EDIN.,

Practice of Physic Laboratory, University of Edinburgh.

THE presence of tubercle in the tonsil has hitherto been regarded to be of such rare occurrence that the following case seems worthy of being placed on record.

With the clinical history of the case I am not familiar, as the case was a private one under the care of Sir Thomas Grainger Stewart, who sent the specimens to me for microscopic investigation. I understand, however, that the case seemed to be merely one of ordinary chronic enlargement of the tonsils, with pharyngeal adenoids, associated with post-scarlatinal otorrhoea and enlargement of cervical lymphatic glands, in a child aged about 10. The scarlet fever occurred about two and a-half years ago, prior to which the child was absolutely healthy in every respect. There was no history of tubercle in the family.

The tonsils, on naked-eye examination, in no way differed in their appearance from ordinary chronically enlarged tonsils. The tonsillar crypts were unusually well marked, and here and there admitted the point of an ordinary probe.

On microscopic examination, however, the following appearances were found: The lymphoid tissue of the tonsil, covered on its surface by stratified squamous epithelium, was seen to be much subdivided by the dipping down of folds of epithelium, forming crypts, in which lay masses of amorphous debris containing numerous micro-organisms (see figures). Scattered through the substance of the lym-

Fig. 1.—From a photograph by Dr. R. A. Fleming. About 125 diameters magnification. At upper left hand quadrant of the section a tonsillar crypt is seen filled with amorphous debris, and lined by squamous epithelium. In lower right hand quadrant three giant cells are seen amongst the lymphoid tissues of the tonsil.

phoid tissue were large numbers of tuberculous giant-cell systems, apparently most numerous close beneath the epithelial surface of the tonsil. These giant cells were of the typical multinucleated form characteristic of tubercle, surrounded by the usual epithelioid and lymphoid cells. There was no overgrowth of connective tissue around these areas, nor, indeed, anywhere in the tonsil, but the stroma of the gland seemed here and there to have undergone hyaline