during that day. Examination showed limitation of movement between the third and fourth lumbar vertebrae. She had two treatments at a week's interval, and when seen on the third occasion had just got over a period which, she said, was the best time she had had in her life. After two more treatments, carrying her over the next period, her mistress wrote: "I am happy to have to report about my maid that her period arrived before she got home on Wednesday. She was able to keep about that evening, and was only sick twice the next day, kept about, did her work, and ate her food apparently quite normally . . . altogether since being treated by you she has been much less moody, and much more cheerful than she has been since her periods first started—more like the happy child I first knew when she was still at school."

While dealing with the lumbar region it may be mentioned that manipulation of these vertebrae often has a very marked influence on constipation, and it is not unusual to find that people who have not had a motion for years without the use of medicine are able to return to normal habits.

Certain disorders of the alimentary tract seem to be related to the dorsal spine. For instance, there is the person who complains in a vague way of indigestion. He has pain or discomfort after food, not at any particular time after food, but he has discovered that he must be careful what he eats. He may probably say that he has no appetite or feels sick. Faddy about his food, he will not take the general run of food provided for the rest of the family. Very often he goes on a "diet," either prescribed by his medical adviser or made up by himself with the help of books and well-meaning friends. All this only goes to prove that the patient is miserable and unhappy; it does not necessarily prove that he is a neurotic subject. In such cases one often finds tenderness on either side of the spine in the mid-dorsal area, but more generally on the right side, and the corresponding vertebrae show a want of motility. Freeing up of these vertebrae may materially alter the patient's outlook and get rid of his discomfort.

CASE VII

Mrs. A., aged 40, complained that for the last two years life had been a misery through sickness, loss of energy, and sleeplessness. She could not take ordinary food; in fact, she had been "put on a diet" by a physician six months previously, so she had the trouble of preparing separate food for herself and her husband. Treatment was given to overcome certain tissue tension which was discovered in the mid-dorsal region. After the second treatment she commenced to take ordinary food, and very soon resumed full ordinary diet, but said she had to avoid mutton fat. She soon gained seven pounds, slept soundly, lost her miserable feelings, and took altogether a brighter outlook on life. Instances of this nature are frequently happening.

Herpes zoster is mentioned in connexion with the dorsal region, because the only two cases I have treated were related one to the upper and the other to the mid-dorsal vertebrae. In both cases the patients were women, and the rash fully developed. They each had one treatment, and the subsequent events were similar. In each case the pain went within a few hours, and although the irritation remained they were grateful to be free from pain.

Reference ought to be made also to asthma, but, although spinal treatment often does produce a profound influence, there are many more cases where it has no effect, or at any rate produces no lasting beneficial effect.

CASE VIII

Mr. S., aged 49, had been chief officer in a large liner, but was forced to give up his job on account of asthma. This was partly owing to the fact that the asthma was worse at sea, and he found that he was easier in London than

elsewhere. Extreme heat or cold affected him, and he was worse at night. He had dysentery twelve years ago, which lasted five years, and then the asthma became unbearable. Nine years ago he had rheumatic fever, being in bed for three months, but had no asthma while the fever persisted. He had also noticed that during bouts of malaria he had no asthma. As he took aspirin for malaria he discovered that this drug helped his asthma. It is worth noting that up to the age of 21 he was doing hard manual work as a sailor. Only after that, when he assumed the more sedentary habits of a ship's officer, did the asthma show itself. He had his first treatment on April 30th, 1930, and this was intended to loosen up the whole of his dorsal spine and free the ribs. At the same time he was encouraged to do hard work in his garden. That night he was more comfortable than he had been for a very long time. Up to the middle of May he had altogether six treatments. On October 3rd he wrote: "In reply to your inquiries I am glad to be able to say that I am very much improved in health. I have not had a single bad spasm since I had your treatment, although I have had some slight attacks, which yielded readily to the simple remedy of aspirin and inhalations of burning powder. . . ." In March, 1931, he consulted me about something else, but said that his asthma was still well under control.

TWO CASES OF SARCOMA FOLLOWING KNOWN TRAUMA

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It is stated in Ewing's *Neoplastic Diseases* that "trauma often seems to be the sole tangible factor in originating many tumours. By trauma is here understood a single or repeated more or less contusing, crushing, or lacerating injury." Below are recorded two cases of malignant tumour formation in association with two different types of known trauma—indirect and direct. In both cases the growth proved to be sarcomatous.

The first case presents several points of considerable interest, because the patient was under continuous observation from the time of one single definite injury to the time of amputation of the affected limb. That this observation was complete may be seen from the fact that, during this period, not only was the joint x-rayed twice, but it was also opened and explored, and the one damaged structure therein removed. The type of growth recorded is a comparatively unusual one.

CASE I

Synovial Sarcoma following Indirect Trauma

A single woman, aged 41, jumped off a chair on March 23rd, 1930, and experienced for the first time an intense pain on the medial aspect of her right knee. The joint became locked in a semi-flexed position; rapid swelling of the joint ensued, and the condition was diagnosed as dislocation of the medial meniscus. This was treated by reduction and splinting. At this time the swelling was excessive, and in spite of treatment did not subside during the subsequent seven months. As the joint continued to be swollen and painful, the patient was admitted to hospital, where, in view of the extensive synovitis present, extension was applied for ten days, after which the joint was opened and explored. All the joint structures were found to be normal, with the exception of the medial meniscus, which was ruptured horizontally, and was consequently removed. On examination it showed no pathological macroscopical change.

In December the patient was discharged with the note, "Knee still slightly swollen."

In January, 1931, she was readmitted with increased swelling of knee. The joint was grossly swollen, but there was no evidence of intra-articular free fluid, and the anterior patellar surface was easily palpable. A bivalved plaster was applied and the patient confined to bed. Large doses of potassium iodide had no effect on the local condition; the

Wassermann reaction, the von Pirquet test, and a provocative injection of gonococcal vaccine gave negative results; there were no special alterations in the blood count.

On March 12th the x-ray report was: "Slight periostitis of the lower end of the femur—joint appears normal. No evidence of new growth on tibia or femur." At this time no fluid was obtained by needle exploration of the joint.

By March 20th the swelling had increased, the maximum diameter being 22 inches. A large, hard, discrete, freely movable lymph node was discovered in the right groin. In view of tentative diagnosis of sarcoma, weekly doses of deep x rays were given, without avail.

On April 2nd the limb was amputated through the middle third of the femur. Convalescence up to date has been uneventful, but skiagrams of the chest show several areas suggestive of secondary deposits.

Description of Specimen.—Right lower limb amputated through middle third of femur. Knee-joint grossly swollen; overlying skin atrophic, healed operation scar visible over inner aspect; maximum diameter, 23½ inches. Patella displaced medially, softened, and extensively invaded. Joint cavity filled with a white, waxy, homogeneous growth, the limits of which are determined by a fibrous zone approximately following the distended joint capsule. The tissue is almost uniform in consistency, except for an area of hyalocolliquative degeneration at the postero-external aspect of the lateral femoral condyle. The medial meniscus is missing, and the lateral semilunar cartilage is extensively infiltrated with growth, as are the articular cartilages—particularly in the region of the degenerate area.

Microscopical Report.—"A round and spindle-celled sarcoma of joint capsule—probably synovial in origin."

The interest of this case lies in the history of what may be termed an indirect type of trauma, the resulting symptoms of which steadily merged into those of a neoplasm, while a careful exploration of the knee-joint undertaken only four months before amputation showed no evidence of tumour formation.

The second case presents a history of the direct type of trauma, and here the symptoms of a haematoma insensibly merged into those of a sarcoma.

CASE II

Sarcoma of Peroneal Intermuscular Septum following Direct Trauma

In December, 1930, a married man, aged 37, while getting on to a bus, knocked his right leg just below the knee; within two days a large, hard bruise appeared, which steadily increased in size.

In February, 1931, a piece of the tumour was removed, and on microscopical examination it was found to be a spindle-celled sarcoma.

In March, 1931, the patient was admitted to hospital with a lump about 3 by 1½ inches by 1 inch lying on the heads of the peronei muscles and over the upper third of the shaft of the right fibula. The tumour was freely movable laterally, but not vertically. The overlying skin was reddened and bore a centrally situated recent operation scar. The lesion was not tender or hot, and there was one small gland just palpable in the corresponding groin. The tumour, together with its associated muscles, was freely excised.

Description of Specimen.—Reddish-brown tumour lying in the deep fascia, encapsulated from surrounding muscles; edges firm and well defined. No areas of haemorrhage were seen; the lump was almost entirely solid, and showed a faintly whorled cross-section. There was no apparent invasion of surrounding structures.

Microscopical Report.—"Spindle-celled sarcoma of leg, apparently arising in deep fascia not actively invading muscle; but the growth cells vary a good deal, and the tumour contains many wide vascular spaces."

I should like to acknowledge my indebtedness to Mr. R. Coyte, under whose care these patients were, for permission to publish details of their cases.

BIBLIOGRAPHY

- Ewing: *Neoplastic Diseases*, 1922, p. 109.
Presse Médicale, Toulouse, xxxviii, 1178.
 Benete and Stieder: *Arch. f. Clin. Surg.*, 1920, clix, 361 (abstr. *Cancer Rev.*).

Memoranda

MEDICAL, SURGICAL, OBSTETRICAL

PAIN IN THE ARM AND A DEAD TOOTH

I venture to publish the following personal experiences in case they should be of general interest.

In 1924 I began to suffer from pain in the left arm, acute enough to wake me every night during three weeks. This pain was a continuous ache deep in the arm, with tingling and numbness of all the fingers, and with exacerbations that interfered with any other activity. I could not further localize the pain, and could only compare the sensations with those in a limb that has been "asleep." I concluded that there was some disturbance of the innervation of the brachial artery. Sometimes there occurred also fibrillary spasms in the left pectoralis major muscle. I tried various remedies without success, and then had my teeth x-rayed in the search for a septic focus. Sure enough the first left upper molar had an apical abscess. This tooth had had the nerve removed nine years previously, and was then stopped. After its extraction the pain in the arm ceased and I ascribed it to toxic neuritis.

Five years later I had the first left upper bicuspid tooth stopped. Something went wrong, the nerve was destroyed and the roots were cleaned out and stopped, the latter process being quite painless. A few weeks later the old pain in the arm returned, and I consulted the dentist, who informed me that there was periapical inflammation around the stopped tooth. I elected to have local anaesthesia for the extraction, and he employed a "sulcus injection." As the left half of my upper lip seemed to swell up and disappear, I was astonished to find that the pain in my arm had gone. About twenty minutes after the extraction I tested the left half of my upper lip and found that pin-pricks were without effect until the corner of the mouth was reached, and the same held good for hot and cold sensations. Wondering if tactile anaesthesia affected the same area, I was astonished to find that I could feel the touch of cotton-wool over the whole upper lip.

I decided to look up the literature on the trigeminal nerve, and found a paper by Margaret Gerard (*Archives of Neurology and Psychiatry*, ix, 1923). According to this investigator the nerve fibres from the Gasserian ganglion enter the pons, and some end there. But a large proportion descend in the medulla and cord, and reach as far as the second cervical segment. The fibres ending in the pons are those conveying tactile sensations from the face, whereas those going down into the spinal cord convey sensations of pain and of heat and cold. Now these latter sensations were the very ones affected by the sulcus injection which abolished the pain in the arm. I then tried to find out the nerve supply to the brachial artery, but the only reference I could find in Cunningham's *Anatomy* was to a twig given to the artery by the musculocutaneous nerve from the fifth and sixth cervical segments. These segments also supplied the pectoralis major muscle. As the pieces in this puzzle fitted so well I consulted Keiller's *Anatomy of Nerve Tracts of the Brain and Cord*. Keiller states: "The sensory nuclei of the fifth nerve are connected by association fibres with the seventh and twelfth motor nuclei for face and tongue reflexes, and probably also with the motor nuclei of the brachial plexus." The pain in the arm and spasms in the pectoralis major muscle seem, therefore, to be due to long-distance disturbances from the trigeminal nerve. This would explain their localization in a way that the theory of toxæmia from a septic focus does not.

The phenomena suggest to my mind that disturbance in a tooth causes facial neuralgia, but that when the nerve to that tooth is destroyed then sensory stimuli from neighbouring structures can cause pain at unexpected distances from that tooth. Since the second tooth was extracted the pain in the arm has been absent.

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