PERITONEAL ADHESIONS

DR. JAMES T. LACEY (by invitation) read a paper entitled, "The Use of Amniotic Fluid in the Prevention of Peritoneal Adhesions," for which see page 281.

DR. DAMON B. PFEIFFER said that he agreed with the proposition that when two peritoneal surfaces were brought in contact with each other and the endothelium survived, the adhesion was temporary, but if granulating surfaces were allowed to come in contact with each other the adhesions formed were permanent. In spite of the great variety of substances which have been used for the prevention of adhesions, nothing has changed their picture.

INTRAPERITONEAL PRESSURE

DR. RICHARD H. OVERHOLD (by invitation) read a paper entitled, "Observations on Intraperitoneal Pressure."

VESICAL NECK OBSTRUCTION

DR. ALBERT E. BOTHE read a paper entitled, "Pathological Study of Posterior Vesical Neck Obstruction," for which see page 300.

STATED MEETING HELD APRIL 7, 1930

RECONSTRUCTION OF AN ARM IN BRACHIAL PLEXUS INJURY

DR. BENJAMIN F. BUZBY reported the case of a man, aged forty-four, who, while at work on December 19, 1928, was struck by a falling plank and knocked down and then fell fifteen feet. He was admitted at once to the General Surgical Service of Cooper Hospital, Camden, N. J., wildly delirious. When admitted there was evident a laceration, four inches long, extending upward from the right eye-brow and a fracture of the right acromion shown by X-ray to be one of a simple transverse type. He had a marked concussion of the brain but an X-ray of his skull was negative. His scalp wound was cleansed surgically under an anæsthetic, his skull was inspected and no fracture discovered and the wound was sutured loosely and rubber tissue drainage inserted.

His previous medical history was negative.

Two days after admission he became rational and complained of numbness in his right upper extremity but as this was dressed at his side at the time for his fractured acromion no great attention was paid to it. Throughout the day a severe cellulitis of his face, neck and scalp became apparent, with a temperature range of 100.6° F. to 103° F. His scalp wound was opened at once and December 24, 1928, counterdrainage was established. The scalp was further drained on January 4, 1929, and again on January 24, 1929. During this period the man was very sick. His scalp wounds were entirely covered with dry crusts on February 6, 1929.

When the dressings were removed from his shoulder January 28, 1929, it was found that the man had no useful function in his right upper extremity. A neurological consultant at this time gave the opinion that the man had suffered damage to his cervical nerve root.

He was discharged from the hospital to the Out-Patient Neurological Service February 9, 1929, where he was found to have reactions of

degeneration in many muscles of his right arm. He was treated in the Physiotherapy Department by galvanism and massage. An X-ray of his cervical spine April 2, 1929, showed a crushed fracture of the body of the sixth cervical vertebra with an old fracture of the fifth cervical spinous process.

He was referred to the Orthopædic Service for reconstruction of his arm, if possible, on June 4, 1929. It was found at this time that the man had complete and total paralysis with advanced atrophy of all muscles supplied by the fifth and sixth cervical roots of the brachial plexus, *e.g.*, supra and infraspinatus, subscapularis, teres major and minor, levator anguli scapulæ, rhomboideus major and minor, deltoid, biceps, brachialis anticus, brachioradialis, supinator brevis, pronator radii teres, flexor carpi radialis and palmaris longus.

The serratus magnus also was involved as evidenced by the winged scapula, showing that the damage had been done to the fifth and sixth roots close up to or in the vertebral foramina before the branches came off from these roots to help form, with a branch from the seventh cervical root, the long thoracic nerve.

The whole arm hung limp at the side with no power above the elbow except the triceps, and the humeral head was depressed at least one and one-quarter inch from the acromion. There was no power to externally or internally rotate the humerus except by means of the pectorals and latissimus dorsi. There was no power to abduct the shoulder, flex the elbow or supinate the forearm. Sensation was disturbed but not abolished anywhere. His neck motions were full and free. He had power to shrug his shoulder by means of the trapezius.

It was felt that since his injury to the brachial plexus was so centrally located, function for minor use was better than none at all, so accordingly, June 13, 1929, an arthrodesis of his right shoulder was done. The bones were found very soft and atrophic. After destroying the articulating surface of the humeral head, glenoid, and under surface of the acromion, the head was suspended and fastened to the acromion by an encircling suture of kangaroo tendon. The arm was put in plaster of Paris in 60° of abduction and 45° of external rotation and kept there until August 1, 1929, when the case was changed. The new one was kept on until September 17, 1929. His post-operative course was uneventful. When the case was finally removed his shoulder was in fair position and stiff but there was no bony union. He had power through the trapezius to actively abduct the arm 30°.

Even though he had no power in the supinator longus, the muscle usually used when transplanted up the humerus to act as a flexor of the elbow, it was felt that it was worth a trial to transplant the remaining extensor muscle group attached to the external humeral condyle higher up the humerus and thus make these muscles do double duty, as it were—elbow flexion and wrist extension. This was done October 9, 1929, by separating subperiosteally the muscle origins from the external condyle and fastening them subperiosteally one and one-half inch up the outer side of the humeral shaft by means of kangaroo tendon passed through drill holes in the shaft. The arm was then fixed in flexion 20° above a right angle in an internal angular plaster splint until December 6, 1929, but massage and guided active motion were begun November 1, 1929. When his splint was finally removed, the active motion of his elbow was from 100° to 60° and he could actively abduct his shoulder 70° from his side even though the shoulder arthrodesis did not show bony union.

At present he is able to fully flex his elbow with his shoulder abducted and easily gets his hand to his mouth. In so doing the flexors of his wrist must contract against the pull of the extensors to fix the wrist so that the extensor insertions may act as origins. By so doing his hand goes into radial deviation of 20°.

As measured now his active movements are: abduction of the whole shoulder girdle, 60°; flexion of elbow to 40°; extension of elbow to 160°; and external rotation 25°.

The patient is anxious to get more external rotation of the shoulder so it is proposed soon to try and give him complete bony ankylosis of his shoulder in a more advantageous amount of external rotation.

Neurological surgeons may say that suture of the divided roots should have been attempted first, since no serious irreparable damage has been done to the muscles supplied by the torn fifth and sixth cervical roots that still could be done, if feasible, and the man's permanent disability would be then only the fibrous ankylosis of the shoulder, which exists often enough as the result of disease or injury in patients now leading active, useful lives.

TRAUMATIC BRACHIAL PLEXUS PARALYSIS

Dr. Thomas Shallow read a paper with the above title for which see page 182.

THE CAUSE AND ELIMINATION OF REACTIONS AFTER INTRAVENOUS INFUSIONS

Dr. Lee A. Rademaker read, by invitation, a paper with the above title for which see page 195.

GASTRIC ULCER

Dr. Edward Watts Saunders, of New York City, read, by invitation, a paper entitled, "A Bacteriological and Clinical Study of Gastric Ulcer," for which see page 222.

Dr. J. Edwin Sweet, of New York City, said that Doctor Saunders did not start this work with the view of finding the cause of peptic ulcer. Sometimes it is most useful to try to solve some peculiar feature of a problem, rather than to tackle the whole thing. Doctor Saunders started from two clinical facts; ulcer is a human disease, it is a chronic disease. Just at that time Doctor Lambert and Doctor Weeks were working in the laboratory on the problem of lung abscess—another human disease, another chronic disease. They were able to show in sections a ring of spirochetes advancing into the lung tissue ahead of the pus producers, apparently the reason for their chronicity. So Doctor Saunders tried the same technic—Levadity staining of properly fixed material from ulcers. He did not find spirochetes, but did find what seemed to be longer and shorter chains of streptococci.

He was then particularly fortunate in having the advice of Doctor Torrey and Doctor Kahn, of the Department of Public Health, who suggested Humtoon's medium or hormone agar. The results of this work he has shown in this paper. Especially noteworthy is the fact that of nineteen cultural attempts, ten showed the same organism in pure culture; four more showed the addition of a yeast; the rest, different casual contaminations. One would

have expected to find the entire flora of the mouth in an ulcer of the stomach.

Doctor Saunders finds no relationship between these organisms and the organisms of the so-called foci of infection; the theory of the focus of infection in ulcer is very persistent even though it would not appear from the literature that the pursuit of this theory has led to any very remarkable clinical results.

Doctor Saunders, being a surgeon, would have been justified in throwing up his hands in holy horror when he found his work heading into the abstruse problem of modern bacteriology—mutation. It seems that herein may lie an explanation for the most remarkable facts concerning ulcer; the relation of ulcer to body type; the seasonal occurrence, or recurrence; the strict limitation to the pyloric area; the explanation of the results of surgery.

Perhaps all believe in the hydrochloric theory of ulcer. It has, however, never satisfied the speaker; the ejected stream, impinging on the duodenal wall sounds good for the post-pyloric location, but does not seem to explain the pre-pyloric location. Nor has anyone offered any evidence that more acid squirts harder in November than in July.

It seems a far more likely hypothesis, and one in closer conformity to the facts, to assume that the disturbance is of the regurgitation of bile, and the effects of bile or some contained factor in the bile, upon the growth and virulence of the organism.

If Doctor Saunders' findings are accepted, it must be assumed that this organism grows only in a medium of the right degree of acidity; therefore, in the body it can grow only in the skin, the mouth, the stomach, and in the stomach it finds the correct pH around the pylorus. But a further factor is needed to explain the seasonal peculiarity of ulcer and its adherence to the asthenic type. A working hypothesis is that this second factor is the bile and perhaps some particular factor in the bile which reacts to seasonal influences.

Possibly the situation is this: in the asthenic type the duodenum is so kinked that bile, with or without this supposititious second factor, does not get to the pyloric region at all.

Rest in bed cures by relieving this kink. Gastroenterostomy cures by permitting access of bile into the stomach, whence it flows out, through the pylorus, over the ulcer. The only sterile cultures in Doctor Saunders' work have been in cases in which a gastroenterostomy was present. Resection cures by removing that area where this organism can grow; it savors somewhat of the method of curing a bunion by amputation through the mid-thigh—doubtless effective, but somewhat strenuous. Pyloroplasty does not help because the bile factor misses the ulcer area entirely.

Ulcers do occur in the plethoric type but how often does this happen without concomitant gall-bladder disease? If the biliary tract is diseased, then this supposititious factor in the bile may be lacking.

CHRONIC ARTHRITIS SHOWING IMPROVEMENT FOLLOWING LUMBAR SYMPATHECTOMY

DR. CHARLES H. FRAZIER remarked that there are certain forms of arthritis, call them what you will, rheumatoid arthritis or arthritis deformans in which the patients often suffer from cold, clammy hands and feet. There are areas of pallor and cyanosis of the extremities, the tissues are puffy and often the surface is covered with a film of moisture. One might with propriety interpret these as signs of vasoconstriction; certainly there is a vascular disturbance involving the arterioles and capillaries. It is well known that there are certain forms of arthritis that are of neurogenic origin, as, for example, in Charcot's disease and syringomyelia.

Surgeons have been in the habit of speaking of these chronic forms of arthritis mostly from the infective point of view. The question now comes up, especially in view of the observations which have been made following gangliectomy, whether some of these forms of arthritis may not be due to imperfect nutrition, as the result of vasospasm.

So far as the speaker knows, the first observation as to the effect of sympathectomy was made by Rowntree and Adson (*Transactions Assoc. Amer. Physicians*, vol. xi: v, p. 221, 1929), and the results of their operation were so striking that Doctor Frazier ventured to apply this treatment to a case which was brought to his attention from the Medical Service of the University Hospital.

As a result of this observation Rowntree and Adson state that in certain types of arthritis the sympathetic nervous system of the extremities is hyperactive, producing marked vasomotor disturbance and profuse sweating, possibly contributing to the spasm and atrophy of the muscles with the resultant deformity. The clinical picture is characterized by coldness of the extremities, marked sweating, trophic changes of the muscles, skin and nails, tender, painful, and swollen joints. All these abnormal manifestations disappeared on release of the extremities from sympathetic control.

Certainly in times past we have been in the habit of expecting temporary relief at least from such measures as might increase the circulation and temperature of the joint, more particularly hot applications, physiotherapy, baking, diathemy.

REPORT OF A CASE.—W. P., aged twenty-five years (File No. 17921), was referred to the Neurosurgical Service of the University Hospital from the Medical Department October 29, 1929.

History.—The first attack of joint pain and swelling was in 1923, lasting three months and affecting many joints. A second attack occurred in February, 1926, which lasted until May, 1926, and a third attack began in December, 1926, the latter, however, of less severity than the two previous attacks.

May 18, 1927, to June 26, 1927, the patient was studied on the Medical Service of the University Hospital with the following findings: small buried tonsils; congenital deformity of right hand and chest; evidence of arthritis in right wrist, right elbow and both ankles. X-ray showed abscess of upper molar tooth, left wrist and ankles showed orthopædic changes.

Treatment.—Tonsillectomy and extraction of teeth.

Readmitted October 16, 1929. In the interim patient has had several similar attacks. In September, 1929, the bottom of his right foot became painful and slightly swollen, great toes of both feet began to swell and cause pain; the joints were neither hot or reddened in this attack. Pain next appeared in sacroiliac region.

Operations.—December 28, 1929: Left lumbar ganglionectomy L. 2, 3 and 4; January 2, 1930: paravertebral injection of the thoracic ganglion; January 27, 1930: right lumbar ganglionectomy, L. 2, 3 and 4.

The effect of the operations has been more than gratifying. The freedom with which the patient moves now is very much greater than before. Of course, certain structural changes had already prevented perfect freedom of motion in his knee-joints but those who observed him before the operation and afterwards, called attention especially to the greater freedom with which he walks, the erect station of the trunk which heretofore had been bent forward.

This case, Doctor Frazier thought, was an excellent one for demonstration because the process in the left upper extremity, especially the wrist-joint, had already reached the terminal stage; that is, there was complete ankylosis of the wrist-joint. The process in the lower extremities, as in the knees and ankles, was not nearly so far advanced so that here we have an opportunity to demonstrate whether or not the sympathectomy may arrest the process, whatever it may be, in these forms of chronic arthritis.