If the nasal discharge is associated with the formation of multiple nasal polypi, recurring high up in the nose after removal, and the x rays show orbital prolongation of the ethmoid, the question of an external approach to this area is to be considered.

If any further operative treatment is thought desirable, I am strongly of the opinion that this should be carried out by external measures, for in this way one can determine the condition of the frontal mucosa and can remove under direct vision all the higher ethmoidal prolongations with little risk to the patient. It is not, however, free from danger, for I have had one fatality, when a very slight leaking of cerebro-spinal fluid was followed, even ten days later, by meningitis. Probably when the ethmoid has been operated upon a number of times, and a mass of polypoid and scar tissue is left, through which purulent material trickles, and all recognizable landmarks have been removed, the surgeon is faced with very considerable responsibility. He must assure himself as to the condition of the other nasal air cells and their probable influence on the present ethmoidal condition. If the sinuses have been to a large degree eliminated and another attempt to clear up the ethmoid area is to be carried out, certain preliminary proceedings are desirable. The more room gained in the approach to the upper and posterior regions of the nasal meatuses, the greater the chance of success, for the surgeon sees and knows better what is being done. Even a moderately deflected septum may be resected with advantage; Skillern points out the benefit obtained by removal of the uncinat process from its insertion to its end. By this measure a gain of one-quarter to three-eighths of an inch in width is obtained—quite enough to make the difference between success and failure. When so much of intranasal mucous membrane as follows extensive ethmoidal operations has been removed, it is surprising how little crusting ensues.

THIRTY YEARS OF STOMACH SURGERY*

BY

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In 1898 Osler published a volume of clinical lectures on abdominal tumours, fully one-third of which was devoted to tumours of the stomach. He described eighteen cases. Of these three were operated on by Mr. Halsted; all of them were of the "forlorn hope" variety. Thus of one patient Osler says: "As the case was a desperate one and the man's condition hopeless, the election of operation was left to the patient." Mr. Halsted resected a pyloric growth, but the emaciated patient died two days later.

Early in the new century there was a boom in abdominal surgery. Gastro-enterostomy and other forms of operation on the stomach began to be performed quite regularly, so that in 1905 Moynihan had gathered sufficient material to enable him to publish his first book on the surgical treatment of gastric and duodenal ulcer.

PATHOLOGY OF STRUCTURE AND FUNCTION

There is little difference between the gastro-enterostomy performed twenty years ago and that of to-day, but our ideas of pathology have undergone radical change. In the early days attention was paid chiefly to mechanical difficulties; to-day we put stress on disorders of function. Then the surgeon was concerning himself with anatomical pathology; now physiological pathology is believed to

be of greatest importance. For example, the condition known as "hour-glass stomach" has practically disappeared as a clinical entity. The radiographer of thirty years ago would develop, from time to time, an x -ray photograph of a stomach showing a constriction dividing it into two compartments. It was presumed that an organic stenosis was present, which made it difficult for stomach contents to pass from the proximal pocket into the distal pocket. And gastro-gastrostomy—the construction of a large opening between the two compartments—was the operation usually performed in such cases. We now know that the stenosis is only apparent, and that the narrowing was essentially due to localized spasm of the stomach muscles at a point corresponding to an ulcer on the lesser curvature. The radiographer has ceased to report cases of hour-glass stomach, and the operation of gastro-gastrostomy has fallen into disuse.

Similarly, if an x -ray examination revealed the stomach dilated and dropped, it was presumed that the dropped stomach must find it difficult to empty its contents uphill over the held-up arch of the duodenum, and various ingenious operations were devised to overcome this mechanical difficulty. Gastroplication was a method of taking tucks in the big stomach in order to reduce its size. In gastropexy a series of stitches was used to shorten the gastro-hepatic omentum, and so to raise the stomach to a higher level in the abdomen. The great omentum was sometimes stitched to the anterior abdominal wall above the level of the navel in order to make a shelf on which the stomach should rest. In many cases gastro-enterostomy was performed on patients who suffered from gastropnoxis in order that a large stoma should be made at the most dependent part of the big stomach through which, it was presumed, the stomach contents would drop by force of gravity into the jejunum. Indeed, that splendid surgeon Mayo Robson, in his book on diseases of the stomach, suggested gastro-enterostomy as the rational treatment for acute paralytic dilatation of the stomach. We have learned by bitter experience that the pathology of the dilated stomach is functional and not mechanical, and that the onward progress of food from stomach to bowel is always the result of peristaltic muscular action, and never due to the force of gravity. A dropped atonic stomach remained flabby, and failed to function normally, even when a large opening had been made in the most dependent part of its greater curvature. Surgeons discovered to their dismay that an occasional complication of gastro-enterostomy, the very operation which Robson had suggested as treatment for this condition, was paralytic dilatation of the stomach.

ACUTE PARALYTIC GASTRIC DILATATION

Over twenty years ago I had my first experience of acute dilatation of the stomach.

A youth had been at a football match on a very cold Saturday afternoon. He came home feeling famished with cold and hunger, and bolted a big, indigestible meal, along with a large quantity of tea. He became ill in the night, with abdominal pain and vomiting. The doctor who was called to see him on Sunday morning found him looking gravely ill, and sent him to the infirmary with a diagnosis of fulminating appendicitis. When I saw him I thought the case was more probably one of duodenal perforation. On opening the abdomen I found the cavity almost entirely filled by an extraordinarily dilated stomach. A stomach tube was passed and an attempt to empty the stomach by siphonage and manipulation was imperfectly successful. I followed this by injections of strychnine, but the stomach showed no sign of contracting. After the patient had been put back to bed I remembered how in my student days the "Saturday-night drunks" had been given apomorphine, and how this drug had made the drunken man vomit "as if,"

* A paper read at a meeting of the Bradford Medico-Chirurgical Society.

in the words of an irreverent fellow student, "he was going to bring up his immortal soul"; so apomorphine was given to my poor patient, but without avail. Toxic secretions were poured out into his paralysed stomach, and in a few hours he died, cold and blue and pulseless.

Long ago I realized that I had treated this young man on quite wrong lines. His was a very extreme case, and, in my opinion, the patient would have died whatever treatment he received. Less severe cases, however, can be saved when treated on rational lines.

For example, a man, enfeebled by suppurating gunshot wounds, shared with his ward mates a supper of bacon and beans provided by a good-hearted orderly medical officer. A few hours later I was asked to see him. He was complaining of severe abdominal pain, and had vomited undigested food. When the emaciated abdomen was exposed the outline of the greatly distended stomach, bulging forward in the upper part, was at once apparent. The stomach was immediately washed out, the process being repeated every few hours in order to get rid of the highly toxic materials which were being secreted into the paralysed organ. No food was given by the mouth for some few days, but several pints of saline fluid were injected daily into the cellular tissues of the armpits. After five or six days the stomach regained its power to contract and the patient recovered.

The condition may be likened to the paralysis of the bladder following childbirth or operations about the perineum, of which we have probably all had experience. The method of treatment should be similar in both conditions. When a puerperal woman develops retention of urine we neither make a dependent opening in her bladder nor do we expect to make her bladder contract by giving her strychnine or pituitrin. We arrange for the periodical emptying of the bladder by the catheter, and hopefully await the natural restoration of contractile function.

STOMACH PARALYSIS COMPLICATING GASTRO-ENTEROSTOMY

As I have already mentioned, some degree of gastric paralysis may follow the performance of a gastro-enterostomy, and it may become a most alarming complication. The patient may have made quite satisfactory progress for a few days; then loss of appetite occurs, and either a copious vomit of dark green fluid, or, more commonly, constant nausea and frequent vomiting of small quantities. Sometimes, but by no means always, a succussion splash is obtainable. Recently treatment of this alarming complication has been facilitated by the introduction of Jutte's tube. This is a 4-foot-long rubber tube of less than 1/4 inch diameter; it is passed through the nose into the stomach, which is thus emptied by continuous siphonage. The tube causes the minimum of discomfort, and can if necessary be left in position for several days. It has the enormous advantage over the stomach tube that the thirsty patient may drink water as freely as he likes. The water siphons back through the tube, so that the patient at the same time as he is satisfying his thirst is also effectively washing his stomach.

ACUTE DROPPED STOMACH

In 1922 Barclay published the results of a series of x-ray experiments on patients whose stomachs were presumably normal. These investigations demonstrated how rapidly the position and state of the stomach could be made to alter by nervous and mental stimuli. He cited a number of cases. While a woman was being screened in the dark, a noise was made by dropping a heavy weight behind her, and with the fright her stomach was seen quite suddenly to drop from a normal position to that of pronounced dropped stomach. Conversely, he observed the stomach of a brewer's drayman contract

when the man was informed that he was going to have a bottle of beer. Barclay made the suggestion that the sinking sensation felt in the epigastrium, say, by a medical student going in for an examination, is probably due to actual physical sagging of the stomach, and later observers have found that the stomachs of examinees were lying lower and were more dilated than when they were again screened after the examination.

EFFECT OF GASTRO-ENTEROSTOMY IN PEPTIC ULCER

With the exception of the rare case in which a cancer or an oedematous ulcer is producing extreme mechanical stenosis of the pylorus, we no longer regard the beneficial result of a gastro-enterostomy as being due to the construction of a dependent opening which permits food to leave the stomach easily. In some way, by no means fully understood, the flooding of the stomach with alkaline jejunal contents appears to be the all-important factor in producing the healing of a peptic ulcer. In common with many other surgeons, I have more than once performed a preliminary gastro-enterostomy for a condition which looked like a pyloric cancer, and on opening the abdomen a second time, perhaps only ten days later, with the intention of resecting the growth, have been pleasantly surprised to find the induration gone and little or no evidence of what must have been an active ulcer surrounded by inflammatory oedema. Those of us who have been operating for a good many years have learned that the local removal of a gastric ulcer is likely to be followed by recurrence unless by gastro-enterostomy or some other method the stomach contents are kept alkaline after the excision operation, whereas we have cases of gastric ulcer which have been cured and have remained healed when a gastro-enterostomy only has been done, the ulcer being left untouched. In view of the possibility of cancer developing on the site of a gastric ulcer it must always be desirable to get rid of the ulcer—by the cautery, by local excision, by sleeve resection, or by partial gastrectomy—whenever this can be done without grave risk to the patient; but I have followed up cases of gastric ulcer which I treated twenty years ago, or more, by gastro-enterostomy alone, and I know that the patients remain quite well.

THE ATTACKS ON GASTRO-ENTEROSTOMY

During the past few years gastro-enterostomy has been subjected to attacks from opposite camps. On one side, some surgeons have claimed that the operation is not sufficiently radical, and, on the other side, some physicians have been teaching that medical treatment has practically done away with the need of operation for ulcer. A number of keen surgeons, almost all of them in the junior ranks, have insisted that the ulcer-bearing area should be excised in every case of either gastric or duodenal ulcer. As I have said, I agree that where its position and condition make it safe to do so, a gastric ulcer is better excised, not because it is unlikely to heal after a simple gastro-enterostomy, but because the ulcer base may contain cells which are liable to become cancerous. No such liability has been found to exist in duodenal ulcers, and gastro-enterostomy results in the cure of these in so high a percentage of cases that I agree with the late Mr. Basil Hall, who said that to advise duodenectomy for the cure of a duodenal ulcer was rather like advising amputation of the limb for the cure of a varicose ulcer of the leg. The attack from the physicians' side is much more plausible. If you cure an ulcer, they say, by an operation which keeps the stomach contents alkaline, why operate? Why not give alkalis by the mouth? Frankly, however appealing and logical this argument may be, it can only be accepted with many limitations.

In the first place, it is not only the making of the gastric contents alkaline which apparently is essential for the curing of an ulcer, but the keeping of the contents alkaline—a very difficult matter. For the patient of leisure who can get specially prepared meals at short intervals, and who has the means and the mind to persevere with alkalis taken persistently over a period which may extend for a year or even longer, I am prepared to believe that medical treatment is likely to result in a cure. One pitfall is that, even without treatment, symptoms in a case of duodenal ulcer may clear up for months on end, only to return when the patient has begun to congratulate himself that he is permanently cured. Similar remission of symptoms following alkaline treatment must not be regarded as necessarily meaning that the ulcer is cured finally and for ever. I wonder what proportion of patients possess the temperament which will allow them to bend their minds continuously to give anxious attention to their health, to refrain from eating or drinking anything forbidden, to give up smoking, to take medicine (alkalis, olive oil, etc.), and to go on doing all these things, day in and day out, over a period of at least many months. We all know that, however willing a patient may be to do this, the working-class man or woman, and those in many other walks of life, must find it quite impossible to carry out such a regime satisfactorily.

For example, I was asked to operate on a patient last year. I found an unhealthy appendix, a gall-bladder containing stones, and a small ulcer on the front of the first part of the duodenum. I removed the appendix and gall-bladder and gladly agreed to the physician's suggestion that medical treatment should be tried for the small ulcer. This was carried out for six weeks in hospital, and for a time after the patient went home; but when he went back to work, he found it impossible to continue the treatment rigidly. He was an intelligent man, doing a foreman's work, and he assured me that he did the best he could. While at work one day he had a big melaena, and about six months after the first operation, I operated again, and successfully did a gastro-enterostomy. The ulcer was found active at this second operation.

STATISTICS OF STOMACH OPERATIONS

I have prepared the statistics of all my stomach operations performed at the Bingley Hospital during the years 1920–29. I have chosen the Bingley figures rather than those of the Bradford Royal Infirmary because I have myself done all the operations at Bingley and taken the notes, and chiefly because it has been possible to follow up every case.

There were in all 87 patients operated on. Of these 53 had gastro-enterostomy performed (3 for inoperable cancer, 6 for gastric ulcer, and 44 for duodenal ulcer). In the same period, however, 22 operations were performed for perforations of ulcers—20 duodenal and 2 gastric. In other words, 25 per cent. of all the stomach operations were for perforations. Most of the patients who "perforated" were known to have ulcers, were taking alkaline medicines, and had been advised to take a modified diet.

ALKALINE TREATMENT AND THE ARTISAN

However ideal medical treatment of chronic peptic ulcer may be in theory, it is practically impossible for the man who has to earn his living in the open market to carry out effectively the regime laid down by the advocates of medical treatment; circumstances make it a sheer impossibility for him to do it, however sincerely he may wish to treat himself correctly. By contrast, of the 38 patients who were treated by gastro-enterostomy

and who are still alive, and residing in the neighbourhood of Bingley, I am told by their doctors that every one is able to do his or her work; 7 still require occasional treatment, the other 31 are reported to be "well" or "very well."

A further point with regard to the claim for surgical treatment in cases of peptic ulcer is illustrated by the following:

I operated six weeks ago on a man who had a dyspeptic history lasting many years. Recently symptoms had become more persistent and rather more severe, and so at last he was driven to submit to operation. We found not only a very obvious duodenal ulcer, but also a very unhealthy appendix. This is a very frequent coincidence.

The point I wish to emphasize is that whatever may be done by medicine to cure a duodenal ulcer, even the most enthusiastic advocate of medical treatment of ulcer will not claim that alkaline medication will make a diseased appendix healthy. Diet and drug the patient as you may, the little vermiform test tube goes on manufacturing its toxins and pouring them into the patient's tissues.

Last year I operated on a man who had had a gastro-enterostomy performed a dozen years ago by another surgeon. Symptoms and x-ray examination suggested the presence of a jejunal ulcer. I opened the abdomen and found the gastro-enterostomy opening in splendid condition. I removed the appendix; the dyspeptic trouble disappeared soon after and has not recurred.

GASTRIC CANCER

There are two quite distinct types of gastric growth—the cancer which develops at the site of a chronic peptic ulcer, and the cancer which arises *de novo* in the stomach. The symptoms of gastric ulcer are not nearly so characteristic as those of duodenal ulcer. I am sure that many a patient, usually female, who has been treated, perhaps for a number of years, by her doctor for chronic dyspepsia, and because of the indefiniteness and variation of her symptoms has very possibly come to be regarded as a "hopeless neurotic," would, if x-rayed, be found to have a chronic gastric ulcer. When a gastric ulcer has been diagnosed, the possibility of malignancy supervening should be an additional reason for suggesting operation.

The *ab initio* cancer symptoms are quite different. Rather sudden loss of appetite is the commonest. When a patient comes complaining that he has no relish for his food, and is losing weight and strength, an x-ray examination should be advised without delay. If cancer is present, a "filling defect" in the stomach outline will be found, more often than not, to make the diagnosis clear. In only a small proportion of these cases is radical removal of the growth possible; in the majority of the operated cases, metastases will kill the patient in less than two years. All the cases are not fatal, however, and I know of quite a number of patients who are alive and well years after a gastrectomy for cancer confirmed by the microscope. These "cures," however infrequent, encourage the surgeon to attempt radical operations for these otherwise hopeless cases.

SUMMARY

To summarize very briefly the lessons learned from thirty years' experience of stomach surgery:

1. The pathology which is important in most stomach lesions is functional and not mechanical—a disorder not of anatomy but of physiology.

2. A stomach whose vagus and sympathetic nerve supply is normal will empty itself whether the patient is lying or sitting or standing, or even standing on his head;

gravity plays a negligible part in the emptying of the organ.

3. Acute dilatation of the stomach is a paralytic condition analogous to retention of urine and requiring treatment on similar lines.

4. Acute paralytic dilatation may come on idiosyncratically, but more usually as a post-operative complication—at times of gastro-enterostomy or partial gastrectomy.

5. There is reason to believe that the cure of peptic ulcer after gastro-enterostomy is due to the continuous neutralization of the gastric acidity which the operation ensures.

6. In many cases treatment of ulcer by diet and alkalis is likely to fail because the patient either cannot or will not submit to a sufficiently prolonged and thorough course of treatment.

7. Of a hospital series of stomach operations, 25 per cent. were for ulcer perforations; most of these patients had had medical treatment.

8. If a diseased appendix is present along with an ulcer there is little likelihood of the ulcer being cured by medical treatment alone.

9. Many cases of chronic gastric ulcer fail to be diagnosed because the symptoms are apt to be both variable and ill defined; *x-ray* examination is desirable in most cases of chronic dyspepsia.

10. Sudden loss of appetite in a patient whose digestion has previously been normal is highly suggestive of stomach growth; an *x-ray* examination should be advised without delay in such cases.

MUSCLE EXTRACT TREATMENT OF SOME GRAVE VASCULAR DISEASES

BY

M. S. SCHWARTZMAN, M.B.

A suggestion was made by me in two previous papers^{1,2} to apply in "intermittent claudication" a new method of treatment with injections of muscle extract, the therapeutic value of which in angina pectoris was discovered by Professor J. S. Schwartzman (Odessa)^{3,4} and confirmed by a number of authors on the Continent.⁵ The object of the present paper is to give a short account of the results obtained in a larger number of cases of vascular diseases of various types. On account of space I shall confine myself to a brief description of three illustrative cases and a summary of the results obtained in forty-two other cases, reserving the details for future publication. The two cases first described were demonstrated before the Clinical Section of the Royal Society of Medicine on February 13th, 1931.

THROMBO-ANGIITIS OBLITERANS WITH ADVANCED GANGRENE

History.—A mechanic, aged 42, with no history of venereal disease, but who had been smoking ten cigarettes a day, complained that since 1924 he had felt pain in his calves on walking. Trophic disorders appeared on the toes and dorsum of the right foot in 1926. Gangrene developed in 1929, when his right leg was amputated, first below the knee (Mr. C. Price Thomas at Westminster Hospital), and soon after above the knee (Mr. Tudor Edwards). At the operation the right popliteal artery was found to be thrombosed. In December, 1929, gangrenous changes appeared on the left big toe. In January, 1930, a periarterial sympathectomy of both left femoral and anterior tibial arteries was performed (Mr. E. Rock Carling). After a short period of

relief the condition became gradually worse, and the patient was readmitted to the Westminster Hospital in July, 1930.

Examination.—The left leg, foot, and toes were stone cold, deeply blue, and oedematous. The soft tissues of the big toe were black, sloughing, and hanging in shreds. There was a very offensive discharge from underneath the slough. A black area extended alongside the bases of the toes; no inflammatory reaction was noticeable. The patient suffered such excruciating pain that he threatened to commit suicide. The dorsalis pedis and posterior tibial arteries were pulseless. The angle of circulatory sufficiency was about 70 degrees. The amputation stump of the right thigh ulcerated over a large area. The Wassermann reaction was negative; blood pressure was 135/90.

Treatment.—Treatment with daily injections of muscle extract was started by me on July 5th, and continued till August 9th at the Westminster Hospital (under Mr. E. Rock Carling), and later at the London Jewish Hospital (under Mr. S. I. Levy) till the middle of October. At first the soft tissues of the big toe and at a later date the distal 1½ phalanges separated. The pain and swelling disappeared, the discharge stopped, the leg and foot became normally warm, and the wounds healed up. Neither elevation nor dependent position caused any pain. Return of colour was prompt at horizontal position. Blood pressure fell to 125/70. The arteries were pulseless as before treatment, and no change in oscillometric index could be detected.

The case terminated in spontaneous amputation of a part of the big toe, instead of a high amputation above the knee, which was thought to be indicated before the commencement of this treatment.

COMBINED THROMBO-ANGIITIS OBLITERANS AND RAYNAUD'S DISEASE

History.—A miner, aged 43, with no history of venereal disease, complained that for nine years he had had pain in his legs after walking a distance of about a hundred yards. A few months later he developed attacks of blanching of all his fingers and toes, followed each time by an intensely blue colour and associated with a severe burning sensation. The affected parts became persistently swollen, cold, and cyanotic, and within a few months the tips of eight fingers, and all the toes except one, fell off. The burning sensation became unbearable in December, 1929, when black offensive discharging ulcers appeared on the stumps of the self-amputated parts. The patient slept badly and was almost cachectic in appearance. He was admitted to the Guest Hospital at Dudley on June 11th, 1930 (Dr. G. Walker).

Examination.—The posterior tibial and dorsalis pedis arteries were imperceptible on both sides. The right radial artery could be felt, but not the left. Postural colour changes were very slight. The blood pressure was 130/100. *X-ray* examination revealed necrotic changes at the terminal phalanges of fingers and toes. No calcification of arteries was seen.

Treatment.—Treatment with muscle extract was begun on June 15th. Four days later the patient stated that the pain was less severe, and that he could sleep better. After twenty injections the patient slept without hypnotics. A second course was started on July 5th, and continued daily for a month.

The following is an abstract from the hospital notes sent to me by the house-surgeon, Dr. Browne, on August 10th: "All pain is gone except occasional spasms at the bases of the great toes, which are not quite healed. The feet and hands are normal in colour and sensation. The face is rosy and fattened, and the patient is better than he has been for years."

The patient is under my observation at present at the London Jewish Hospital. The pain has never recurred, the gangrenous patches have been replaced by healthy granulations, there is no discharge, and skin is growing over the wounds from the edges. The blood pressure fell to 110/60.

Of two other cases of thrombo-angiitis obliterans with advanced gangrene, the treatment in one resulted