Gastrostomy, radical cure of hernia, and thyroidectomy : an address delivered at the opening of the Section on Surgery at the Annual Meeting of the British Medical Association, held in Belfast, July and August, 1884 / by Sir William Mac Cormac.

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SOME REMARKS ON

GASTROSTOMY: THE RADICAL CURE OF HERNIA: AND THYROID ENLARGEMENT.

GENTLEMEN,—My first duty is to express my very sincere thanks for the honour you have done me in electing me President of the Surgical Section. I appreciate the compliment in a two-fold sense, as well because of the distinction the office carries with it, as because that distinction has been conferred upon me by my old fellow-townsmen in the place in which I was born and bred. A good many years have passed since I left my native town; but I shall always retain for it, and for the Institution in which we now meet, where I received the earlier part of my education, feelings of very warm affection.

It has been the custom of the President to preface the work of his Section by an introductory address; and on the present occasion, this practice would seem the more appropriate, since no general address on surgery appears upon the programme of the meeting.

It is always difficult to select a subject; but if you will permit me, gentlemen, I should like to refer in my remarks to some of the questions which appear upon our list of *agenda;* and also to matters of very practical interest, which I have endeavoured to illustrate by cases occurring in my own practice. This has appeared to me preferable to any endeavour to make a general review of the progress of surgery at the present time. If one were merely to attempt to define the direction of that progress, it would be to say that modern surgery is the surgery of cavities. In respect of the surgical treatment of the contents of the skull, and the diagnosis of hidden lesions there, what strides have been made! How often, now, is surgical interference

demanded by the physician in affections of the chest, and what startling proposals have been made for their more efficacious treatment! The abdomen seems handed over almost without reserve to the surgeon, of whom it may now be said that he has dealt surgically, and with most surprising success, with almost every organ contained within it, I might, indeed, say every organ.

Among the subjects we have to discuss, there is, in the first place, the treatment of spinal curvature by the plaster-of-Paris jacket. I do not wish to speak of this now, further than to say with how much pleasure we anticipate hearing its merits advocated by the originator of the method, a man of much surgical enthusiasm and fertility of resource, who will not fail to delight us all by the energy and originality of his mind, as well as by his thorough goodness of heart. The principles of Dr. Sayre's treatment appear to me to be sound; and when his practice is adopted in suitable cases, unquestionable benefits are derived; one of the greatest, in my opinion, being the transference of the treatment from the hands of the instrument-maker to those of the surgeon.

GASTROSTOMY FOR STRICTURE OF THE ŒSOPHAGUS.

Gastrostomy for the relief of stricture of the œsophagus will be discussed by Mr. Macnamera and Mr. Fagan. The early history of this operation is very discouraging. In twenty-eight cases the subjects of the operation succumbed in succession before any successful result was obtained. Of forty-one cases recorded by Petit, thirty-one were for cancer, and of these thirty died. But I think an improved method of operating, with a better choice of time for performing it, will soon afford a very different record. That there is no thing fatal or even very dangerous in the operation itself, is sufficiently well established by the general success which attends it when it is performed for cicatricial stricture or the removal of a foreign body from the stomach. In the year 1872, I brought before the London Clinical Society notes of two cases of stricture of the œsophagus operated upon in

this way. In both, a fatal result shortly ensued—one in forty-five hours, the other in six days. At the same meeting Mr. Thomas Smith brought forward a similar case, which proved fatal on the eighth day. In all three cases the subjects were in a very feeble condition prior to operation; and, although some of the more distressing symptoms were materially relieved, the patients died very much as if no operation had been performed.

Nine other cases recorded by Mr. Durham also proved fatal. In six of them life was only prolonged for a short space, one living fifty-eight hours, while in the others death occurred at intervals of three, ten, and twelve days, peritonitis being found after death. Mr. Smith sums up his remarks by agreeing with Mr. Durham's statement, that it is doubtful whether life has been prolonged by the operation in any case of gastrostomy performed for disease. The conclusion of my own paper is to the effect that, "while the propriety of the operation may still be considered an open question, I would urge a further trial at an earlier stage of the disease." The general opinion as to gastrostomy has much changed since then; and Mr. Durham, in the last edition of Holmes's *Surgery*, admits it to be a justifiable operation. But surgeons are still far from unanimous as to the advantages which may be gained, or whether these are not counterbalanced by the risks incurred. I therefore would only trouble the meeting with the details as to two cases which seem to me to justify the conclusion which I had arrived at in 1872. They point out that a clear gain to length of life, and a very definite increase of physical comfort, is possible in an otherwise irremediable disease, provided the operation be carried out at a sufficiently early period.

Two Cases of Gastrostomy performed for Obstruction of the Œsophagus from Malignant Disease:—

CASE I.—J. H., aged 55, was first seen early in June, 1882 suffering from dysphagia, very marked on attempting to swallow anything solid. Did not notice any loss in weight. There was no history of malignant disease. The difficulty of swallowing was first observed on May 2nd by Dr. Daly, under whose care the patient was.

July 1st. The dysphagia was rapidly increasing. A tight nodular stricture of the œsophagus was readily detected opposite the cricoid cartilage, through which a small bougie could be passed with some difficulty. It was five and a half inches from the teeth, and involved two inches of the tube.

From June 27th to July 19th, the patient lost nine pounds in weight.

On July 10th, I failed to pass any œsophageal bougie. The dysphagia was urgent. Even a teaspoonful of fluid partially choked the patient, and excited severe spasmodic coughing. The distress caused by the sensations of hunger and thirst was very great, and the patient himself most anxious for relief by operation. Dr. Daly and myself concurred in advising it.

On July 21st, I performed gastrostomy. An incision was made through the abdominal wall, three inches in length, immediately below and parallel with the cartilages of the lower ribs. All bleeding points were secured before the peritoneum was divided. This having been incised for the full extent of the wound, the anterior surface of the stomach at once presented in the centre. All bleeding from the peritoneal edges having been arrested, four deep and six or eight superficial sutures were introduced, so as to draw up the stomach close to the margins of the central portion of the superficial wound. The deep sutures were passed from near the margins of the skin, so as to include about three-quarters of an inch of the parietal peritoneum, and were then made to travel for about half-an-inch between the serous and muscular coats of the anterior surface of the stomach, as shown in the woodcut. In this way, the stomach was firmly attached to the abdominal wall, and two broad surfaces of serous membrane were brought into contact. Two guide loops were next introduced into the exposed piece of stomach to facilitate the subsequent opening, a very practical suggestion of Mr. Bryant. All the steps of the operation were performed antiseptically, and antiseptic dressings applied. When these were afterwards removed, the wound was found to be soundly healed, and a

thick layer of lymph covered the exposed stomach. The operation was not followed by any sickness or constitutional disturbance. The temperature never rose above normal, and the pulse never exceeded 80. Nutrient suppositories of dried bullock's blood, as suggested by Dr. Daly, were administered, and found to be invaluable in supporting the strength of the patient. His strength, in truth, kept up so well that there appeared to be no urgency about opening the

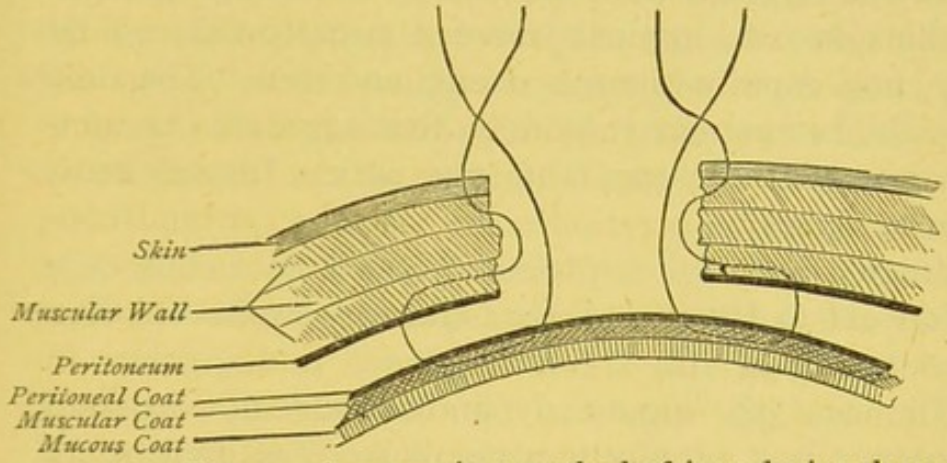

FIG 1.—A convenient method of introducing deep sutures in order to bring a broad surface of the serous membrane of the stomach and abdominal wall into contact.

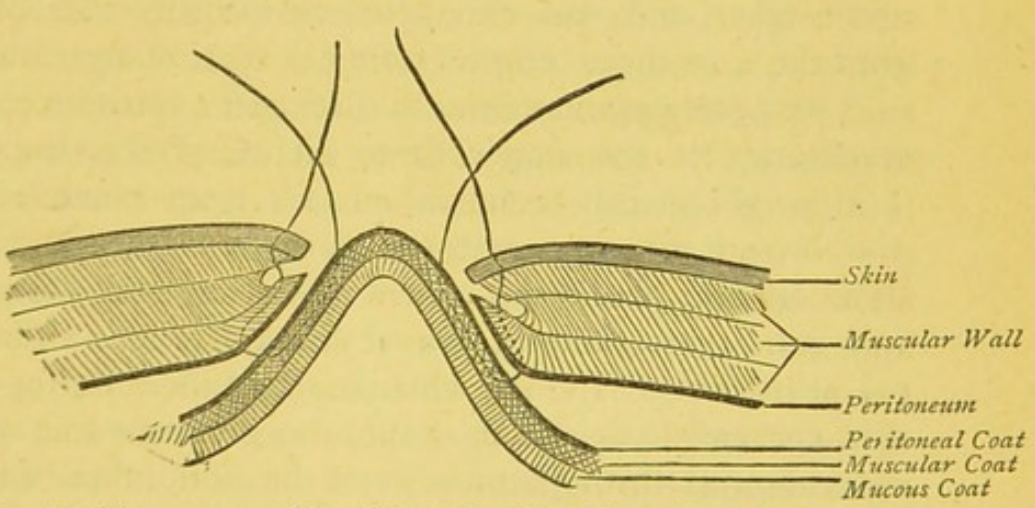

FIG. 2.—Position assumed by the parts when the sutures are drawn tight.

stomach, and the power of swallowing seemed to return so perfectly as almost to raise doubts as to the reality of the œsophageal contraction. Very little, however was given by the mouth during a whole fortnight, beyond some teaspoon-

fuls of iced milk, although the power of swallowing was restored to a surprising extent.

On August the 4th, fourteen days after the first operation, the stomach being very firmly united to the anterior abdominal wall, and the external wound completely healed, the operation was completed by making an opening into the stomach large enough to admit a No. 10 catheter; ten ounces of milk were at once given through the gastric aperture. It was digested well, and there was no regurgitation. From this date the patient was fed entirely through the opening, and rapidly became strong and well. The daily diet consisted of one quart of milk, four eggs, six ounces of whisky, one pint of soup, and one rusk. He smoked a good many cigars.

On August 24th he expressed himself as feeling quite well, and went to Hastings. He could now swallow nothing whatever by the mouth.

On October 5th, urgent dyspnœa suddenly occurred. Tracheotomy was promptly performed. The patient did well, and soon began to move about again. Towards the end of the month, however, he became gradually weaker and weaker, and sank exhausted on October 29th, one hundred days, or three months from the date of operation.

A *post mortem* examination disclosed extensive epithelial carcinoma of the upper three inches of the œsophagus. The neighbouring bronchial glands were much enlarged, and bound together with new growth. The stomach had been opened about the centre of its anterior surface, and was firmly attached to the abdominal wall. The medical attendant, Dr. Daly, who recommended the operation, and earnestly advised it should be performed at an early date, showed throughout a great interest in the case. "I may remark," he says, "as to the above case, that my patient was in the most intense distress before gastrostomy, and nothing could exceed the agony he suffered in attempting to swallow. All this was changed by the operation. He was quite free from suffering, enjoyed life, was most cheerful, and so it was until he died, except when the dyspnœa came on. If, therefore, gastrostomy had nothing

else to recommend it, the freedom from pain and distress which it gives entitles it to our warmest approval. We can also by this operation, when enemata fail, save our patient the horrors of death by starvation." (A preparation of the parts was exhibited.)

CASE II.—L. P., aged 42, with no family history of malignant disease, came under observation in March, 1882. He then complained of dysphagia, some uneasiness in the chest, and more or less pain in the epigastrium. In September, he experienced greatly increased difficulty in swallowing; even the smallest quantity of fluid causing great distress. The patient felt himself being gradually starved. On October 14th, he consulted me, and I was enabled to satisfy myself as to the presence of a stricture, at the lower part of the œsophagus, probably malignant in character, and with difficulty admitting the passage of a No. 10 bougie. The patient had the greatest difficulty in swallowing even a teaspoonful of water. Great emaciation had taken place, and much weakness from want of food, but the chief complaint was of intolerable thirst. The operation of gastrostomy was proposed and gladly accepted, the case being very urgent, and the patient desirous of relief at any cost.

October 15th. The first stage of the operation was performed, precisely as in the preceding case. The patient felt somewhat exhausted after the operation. Temperature 95.0°, pulse 64. Nutrient enemata of Brand's essence of beef and brandy were given, and repeated every six hours. The mouth and fauces were refreshed from time to time with pieces of ice. In the evening, he felt fairly comfortable; temperature 98.6°, pulse 72.

October 16th. Temperature 99.8°, pulse 76. He felt very comfortable, and did not complain of pain either in the wound or elsewhere. He was given a little milk, brandy, and egg, by the mouth, and felt he could swallow better than before. The food caused uneasiness in the stomach after a time, and was discontinued. Ice was given as before. Nutrient enemata of dried bullock's blood, half an ounce in four ounces of water, with half an ounce of brandy, were ordered to be given every four hours, alternately with

Brand's essence of beef. His strength was well maintained temperature 99.6°, pulse 76.

October 20th. Since the last report, he had been doing well; the temperature and pulse were normal. He had excellent nights, and was in good spirits. The wound was dressed under spray; its condition was perfectly satisfac-factory; there was only a very slight staining of the dressing. Firm adhesions had taken place between the serous layer of the stomach and the edges of the skin-wound. On the surface of the exposed portion of stomach was a layer of solidified lymph. All sutures were removed. He felt very comfortable after the dressing, and was allowed to sit up. During the next week, he continued to do well, was in good spirits, and gaining strength and flesh. The wound was again dressed on the 22nd; it was perfectly healthy. He took a cup of chocolate, and a thin slice of bread and butter on the 25th and 26th. He swallowed fairly well.

October 29th. He was able to take a lightly boiled egg, chocolate, with bread and butter for breakfast, finely minced meat and soup for dinner, claret and water, and arrowroot for supper. He swallowed fairly easily. Up to this date, the patient regarded himself as cured by the preliminary operation, and was unwilling that the stomach should be opened. The operation-wound was firmly cicatrised, but now the difficulty of swallowing returned, variable in degree, but always increasing. On November 8th, about three weeks after the preliminary operation, he was again unable to take anything by the mouth. The nutrient enemata were resumed. During the next few days, he was better, and could again take a little food by the mouth, but, on the 14th, was unable to swallow, and, on the 18th, could not even get a little water down. I urged that the stomach should be opened without further delay. His strength was rapidly diminishing, and he was losing weight fast, as much as six pounds during the week preceding the final operation.

Under these circumstances, on December 6th, seven weeks after the first operation, the operation being post-poned contrary to my strongly expressed opinion for five weeks, the stomach was opened without difficulty with a

tenotomy-knife, the loops of thread serving as a guide. A No. 8 silver tube was introduced, and three quarters of a pint of tepid milk at once injected; not a drop regurgitated, and the patient experienced a sensation of great comfort.

December 13th. Seven days after this operation, he had passed an excellent week. He slept well without opiates, had less pain, felt stronger and looked better; all food was assimilated, there was no regurgitation; no feeling of thirst, which was previously so distressing; hunger was appeased; he felt comfortable after food; he had gained 2 lbs. 12 ozs. in weight.

December 20th. Second week. He had been daily improving, able to sit up and walk about a little, with the exception of one day. Food had agreed well; there was scarcely any escape of food from the gastric opening. He had gained three pounds and three-quarters in weight. During the week he felt better, expressed himself as very thankful that the operation had been completed, and for the great relief it had afforded him during the fortnight. The patient felt excessively hungry for food, which, when taken, completely satisfied his craving.

December 30th. He was generally improving, but complained of pain across the front of the chest, increased by any effort of swallowing. He had been much troubled by uneasy sensations which he referred to the œsophagus, occasional retching, and vomiting of mucus, with traces of blood. He had further gained nearly 3 lbs. in weight.

January 31st. He had alternately lost and gained flesh during the past month, but had now a balance of gain in his favour to the amount of two and a half pounds. He suffered much from severe paroxysmal pain in the sternal, præcordial, and dorsal regions, increasing difficulty in swallowing, frequent ejection of collections of fœtid matter from the œsophagus. Food was injected regularly into the stomach without causing either pain or discomfort.

In February some pneumonia supervened, due, it was supposed, to invasion of the lung by extension of the disease.

During the months of March and April the patient suffered much from severe fits of coughing. He took his food

well through the opening in the stomach, and had even gained in weight.

May 21st. He died almost instantly at 11.15 in the evening, having suddenly, without antecedent strain or effort, thrown up between two and three pints of bright arterial blood. His last meal of farinaceous food with milk and a little brandy had just been injected, and he appeared quite as well and comfortable as usual up to the final moment.

The patient lived twenty-four weeks, or almost six months, after the completion of the operation of gastrostomy.

May 22nd. *Post Mortem* examination by Dr. Saville twenty-four hours after death. The body was not emaciated. Rigor mortis was well marked. There was an artificial opening in the centre of the left half of the epigastric region, communicating with the stomach. This opening appeared naturally closed, but was large enough to admit about a No. 12 catheter. On opening the abdomen, the orifice was seen to correspond exactly with the middle of the anterior wall of the stomach. There were a few adhesions between the extreme edge of the left lobe of the liver and parietal peritoneum, but nowhere else. In the thorax, the posterior margins of the lungs were bound down by firm adhesions. On removing the parts *en masse*, a fusiform swelling, about three inches long, was found to involve and surround the lower three inches of the œsophagus. All the structures around were infiltrated and matted together. Half an inch above the diaphragm, where the tumour was broadest, the growth had broken down in the interior into a cavity communicating above with the healthy portion of the œsophagus by a small channel, while another narrow channel, about No. 8 catheter in size, led through the lower portion of the growth into the stomach, the cardiac orifice of which was slightly invaded. The cavity was continuous with a smaller one, about the size of a filbert, in the base of the right lung. On the left side it communicated with a ragged opening, half an inch long, in the descending aorta, from which the fatal hæmorrhage

came. The bronchial glands were quite healthy. The kidneys were congested, the liver and spleen normal. The stomach-walls were very thin, but otherwise healthy, an atrophic condition which I have also observed in the great intestine below the seat of a cancerous stricture. No secondary deposits in any of the viscera were discovered. On microscopic examination, irregular-shaped cancer-cells were found scattered amidst small inflammatory cells, and dense trabeculæ of connective tissue. There were no birds' nests. The growth was, without doubt, malignant. (The morbid specimen was shown.)

Mr. May, under whose daily observation the patient subsequently was, writes that, "after the completion of the operation, and injection of food into the stomach, he began at once to improve, and had little or no difficulty in digesting the injected food. He suffered no pain from the opening in the stomach, and only such as was evidently due from the old disease. In about a fortnight, he was able to move about the house; and, in less than a month, the weather being previously unfavourable, took outdoor exercise. He thus lived in comparative comfort for five months and a half, and then died suddenly from extension of the old disease into the aorta. Considering the immediate relief afforded by the operation from impending starvation and general suffering, the great comparative comfort in which he lived for nearly six months, the ease with which suitable food was digested when injected direct into the stomach, and, to my mind, the moral certainty that his life was thereby prolonged for about five months, I should most certainly recommend a similar procedure were I again to meet with a similar case."

It will now be generally admitted, I think, that, in obstruction of the œsophagus dependent upon malignant disease, opening the stomach for the purpose of feeding is a legitimate procedure. In stricture from traumatic causes it is even more strongly indicated, and has proved permanently successful. Patients have lived, and been able to feed themselves through the artificial opening, for an indefinite period. But the operation to be successful must be

done comparatively early. We must not wait till the individual is all but starved to death, and incapable of recovering from the effects of the operation, or assimilating the food introduced into the stomach through the opening made. The history of the operation shows us case after case dying of pure debility, just as if the operation had not been performed at all. The food introduced into the stomach is not digested. In my opinion the earlier operations proved fatal, almost without exception, from this cause.

I regard œsophagotomy as a somewhat questionable procedure, when the obstruction is due to malignant disease. When the obstruction is low down it is inadmissible altogether, and when it is situated as high up as it can be, say nearly opposite the cricoid cartilage, the opening in the œsophagus must still be made very close to the disease. Œsophagotomy is the more difficult operation, and the subsequent benefit would appear to be no greater. The operation, therefore, being merely a palliative one in either case, the easier method of gastrostomy, which in my opinion is equally safe, is to be preferred.

For traumatic stricture, œsophagotomy is preferable whenever there is sufficient space in which to reach the tube below the contracted portion.

One great improvement in the mode of operating is dividing the operation into two stages. The first consists in exposing the stomach-wall, and attaching it by some convenient method to the abdominal parietes, leaving the completion of the operation to a subsequent date.

Great credit is due to Mr. Howse for having recalled attention to this method of operating, first, I believe, on the occasion of presenting a case on which he had thus operated to the Royal Medical and Chirurgical Society, in June 1879.

It should not be forgotten, however, that Volkmann urged a similar principle in operating for hydatids of the liver; his method of operating is described in the *Proceedings of the Congress of German Surgeons for* 1877. An incision four or five inches long having been first made be-

tween two lower ribs, or even a portion of rib excised, the liver-surface is freely exposed. The wound is then packed with antiseptic gauze; and when firm adhesions have occurred, the liver can be safely cut into, and the echinococcus-cyst evacuated. But, in the case of the stomach itself, Sédillot, who invented the term gastrostomy, and who was one of the very first to perform it, operated, in 1853, in a manner quite similar, I believe, to that suggested by Mr. Howse. He first attached the stomach to the abdominal wall by five or six points of suture, which included only the peritoneal and muscular coats of the stomach. The opening of the stomach being postponed for five clear days, "jusqu'à l'époque," Sédillot says, "où des adhérences se seront formées entre cet organe et les parois de l'abdomen." Nelaton (*Elémens de Pathologie Chirurgicale*, vol. iii, 1854) makes a similar proposition; so does Verneuil. Indeed, the advantages of this procedure are so apparent, that they appear to have occurred to more than one surgeon, and it would be somewhat strange if they had not done so.

When the stomach is opened by a small incision, after its parietes have become firmly glued to the abdominal wall, the risk of peritonitis is rendered very slight, and the small opening, while it permits the easy introduction of solid food, opposes regurgitation, with all its attendant inconveniences. I regard interrupted sutures, introduced through the serous and muscular coats of the stomach, and through the peritoneum and skin, as the best mode of fastening the stomach to the parietes. The sutures should be introduced so as to bring broad surfaces of peritoneum and stomach into contact. Great care should be taken while passing the needle to avoid wounding the mucous coat. It is very important not to open the stomach-cavity at the time of the first operation. No doubt, the stomach is generally empty, and there is but little chance of escape of anything save the natural secretion of the organ; but this alone is quite sufficient to interfere seriously with healing.

I think some objection applies to the practice of transfixing the projecting portion of stomach-wall with long

needles or acupressure pins. Schoenborn has tried this plan, and left the needles some days before withdrawal; but the pressure caused gangrenous action and abscesses in the neighbourhood of the wound. Langenbeck considers these consequences may be avoided by leaving the needles in only twenty-four hours, but this is scarcely long enough to admit of sound union taking place.

The period at which the stomach should be opened must vary in different circumstances. In some cases, the weakened condition of the patient renders it necessary to make an opening in twenty-four, or forty-eight hours, a necessity which may be avoided by operating before the patient has reached so extreme a degree of prostration. Injections of milk or nutritive fluids have even been made through a fine canula, like that of a hypodermic syringe. But it is clearly better to allow a week or ten days to elapse in order to allow the adhesions to become firm, and the external wound to heal, before the stomach is opened. The long interval which took place in my second case shows that the stomach-wall may become firmly attached to the abdominal parietes without causing interference with its ordinary function, or inconvenience to the patient. When the patient is relieved of all effort to swallow food, and nutriment has been exclusively administered for some time by the rectum, it is quite remarkable how generally the symptoms of œsophageal obstruction are relieved to a very complete extent. In both my cases this was a prominent feature, and so completely as even to give rise to a temporary suspicion that the operation had been unnecessary. A not unfair inference, however, is that the progress of the disease is in this way somewhat delayed.

The improvement is, in any case, but temporary; sooner or later symptoms of obstruction, as great as, or greater than, before, reappear. The disease extends to adjacent tissues and organs. Death may ensue from exhaustion, obstruction of the trachea, infiltration of the lungs or mediastinum, or hæmorrhage from perforation of one of the great vessels. Nevertheless, a greater or less interval of real relief from very severe suffering is obtained. The sensa-

tion of hunger, and, what is yet more hard to bear, of thirst, is diminished or disappears altogether, and the sufferer can, to a certain extent, resume his ordinary mode of life.

In fatal cases, we find that death is not rendered more painful or distressing; in fact, in most instances, it seemed as if life ebbed away uninfluenced either way by the operation. In very many cases, however, the operation has obviously done no good, because of the previously exhausted condition of the patient.

I regard gastrostomy as a very proper operation, the advantages of which, in cases of cancerous obstruction of the œsophagus, should be laid before the patient at a comparatively early period of his disorder. If the operation be done then, not only are the symptoms relieved, but, in all probability, the rate of growth in the tumour is for a time materially diminished, as it ceases to be irritated and disturbed by the constant efforts to swallow.

RADICAL TREATMENT OF HERNIA BY EXCISION OF THE SAC.

A subject of much practical interest is the so-called radical cure of hernia. I refer to the excision of the hernial sac either partially or completely, with subsequent suture of the pillars of the inguinal canal, or the closure after a similar fashion of the crural ring. Under new conditions, the method is of recent introduction, although it is in reality a very old method, and one which may yet be considered on its trial. This plan of operation has proved successful in many cases, but further statistics are required; and, although I cannot contribute any large number of cases, I should like to give my personal experience for what it may be considered worth. I have thus far the record of thirteen successful cases to offer you, and one case of recurrence of the hernia. Eleven were inguinal, including one double hernia, and three were femoral, twelve were males, two females. There were besides two fatal cases from causes altogether unconnected with the radical operation. The interval after operation, when the permanence of the cure was examined into, varies from a few weeks or months

in the two most recent, to four years and eight months in the oldest of the cases reported upon. Four had a duration of upwards of one year, and two of eleven months. Two were four years and upwards, one exceeded three, and one two years; so that, on the whole, a reasonable test-interval has been allowed. In one half of these cases no truss was worn after the operation; of the other half, some very shortly discarded it, in two the truss did not fit properly, and was worse than useless, while in two others a truss was worn, although there appeared no particular necessity for it.

CASE I.—*Double Inguinal Hernia. Operation for Radical Cure Performed on each side.*—T. B., aged 48, labourer at a grain warehouse, was admitted into St. Thomas's Hospital, and was sent into one of my surgical wards, November 13th 1883, and discharged cured, January 17th, 1884. The patient, a strong, healthy man, had a rupture on each side; that on the left had been in existence for nineteen, and that on the right for five years. He had worn a truss only during the preceding nine months, but had been unable to retain the herniæ by means of it. His occupation necessitated much severe exertion, and occasionally the pain in the herniæ was so severe as to compel him to lie down for a time. Six months before admission, the left hernia became temporarily irreducible; it went back after the use of hot fomentations. The patient had had two attacks of rheumatic fever, but otherwise enjoyed good health.

On examination a hernia was found, extending into the scrotum on each side, easily reducible on manipulation. After returning the herniæ, the internal ring was on each side found to be large, the inguinal canal straightened and almost direct. The man stated that no truss kept the rupture reduced, that it came down constantly while he was at work, and that, in short, he was incapable, in consequence of the pain and inconvenience he suffered, of earning his daily bread. An operation was therefore proposed and gladly assented to.

December 1st. The patient having been placed under ether, I began by making an incision as for strangulated inguinal hernia, on the right side, dividing the structures

carefully down to the sac, which was then dissected out. During the operation the hernia was kept reduced, and the neck of the sac was now tied as high up as possible with strong chromic acid catgut, and the part below the ligature cut off. The conjoined tendon and Poupart's ligament were then united by two ligatures of chromic acid catgut, and the external and internal pillars of the ring were similarly sutured. The wound was closed with interrupted sutures, after insertion of a drainage tube. Strict antiseptic precautions were used throughout, and the wound was covered with temporary dressing until a precisely similar operation had been completed on the left side, the sac being dissected up, ligatured at the neck, removed, and the ring closed with chromic acid catgut sutures. Both wounds were now covered by a large antiseptic dressing, which was retained in position by means of a flannel roller. The evening temperature was 98.8°

Next day, December 2nd, the patient was uncomfortable, because of inability to pass urine; this was drawn off by means of a catheter. The wounds were dressed, and found to be looking well. There was slight pain in the lower part of the abdomen, with considerable distension. A subcutaneous injection of morphine, one-fourth of a grain, was given, and repeated in the afternoon. Temperature, A.M., 98°; P.M., 99°. Pulse, A.M., 72°.

December 3rd. The patient was suffering from carboluria; the urine was somewhat scanty, black, ammoniacal, containing much mucus and crystals of triple phosphate. Eucalyptus dressing was substituted for the carbolic. Temperature, A.M., 98.6°; P.M., 99.4°.

December 4th. He had had a much better night, and felt comfortable. The tongue was coated with a thin light-coloured fur. He had had no vomiting since the operation; the bowels had not acted, but a good deal of flatus was passed. Slight distension of the abdomen still remained, but there was no tenderness. Pulse 76, strong. The urine was almost natural in colour, slightly acid; it contained mucus, was scanty, but could be passed voluntarily. Temperature, A.M., 99.4°; P.M., 99.6°. At 6 P.M. yesterday, he

was ordered one grain of pilula opii, and had a "stone' or camomile-fomentation applied to the abdomen.

December 6th. The wounds were again dressed, the sutures removed, and the drainage-tubes shortened. He had no pain. Tongue cleaning.

December 8th. The wounds were dressed and drainage-tubes removed. The opium was now discontinued.

December 10th. The wounds were almost healed. The bowels acted for the first time since the operation. No impulse over the abdominal ring on either side could be felt when the patient coughed.

December 13th. Boracic lotion was ordered instead of eucalyptol dressing.

After December 4th, with one exception (December 30th), when the patient was suffering from sore-throat, and the temperature rose to 101° in the evening, it did not exceed 99.8°, nor fall below 96.6°; and, with the exception of an epileptiform seizure, which came on after smoking, on January 14th, convalescence was uninterrupted, and the patient went to a convalescent home on January 17th, 1884.

He came to the hospital for examination on March 4th, three months after the operation. He was wearing a light double truss, was in good health, and had walked twenty miles the day before. The wounds were perfectly sound; there was not only no trace of hernia, but no impulse on coughing could be felt over the external rings, or by the finger, when passed within the scrotum towards the position of internal rings.

He again presented himself for examination on July 21st, nearly eight months after the operation, and then the result of the operation seemed perfect. He wore no truss, and said he felt ten years younger than he did before.

II.—W. C., aged 62, timber sawyer, was admitted June 13th, and left cured July 3rd, 1879. He had right inguinal hernia. Symptoms of strangulation had been present four days. The hernia had been in existence for twenty years. He had never worn a truss. The day after admission, an antiseptic operation was performed. The contents of the sac were the small intestine and omentum; some of the

latter was removed. The greater part of the sac was also removed, a collar of the sac was invaginated, and the edges were sutured together. The columns of the ring were not sutured. The wound was quite healed ten days after operation.

On April 3rd, 1884, four years and eight months after operation, some weakness existed at the internal ring, with marked impulse on coughing, and slight prominence, but no hernial protrusion. The truss he had been wearing was quite useless, its pressure being applied on the pubic spine.

III.—R. B., female, age 40, was admitted June 10th, and left cured July 13th, 1880. A femoral hernia had existed for six years; symptoms of strangulation for thirty-six hours. The operation was performed the day after admission, with antiseptic precautions. The sac was removed, and the cut edges sutured together. When this patient left, there was no tendency to hernia, and there appeared to be no necessity for a truss.

On July 20th, 1884, four years later, the patient was perfectly well. There was no coughing: no return of the hernia. She had not worn a truss. She works very hard in a butcher's shop. The result is, therefore, most satisfactory.

IV.—E. R., aged 46, female, was admitted October 4th, and left cured October 20th, 1880. She had suffered from right femoral hernia for fourteen years, and had worn a truss for thirteen years; symptoms of strangulation had been present for twenty-four hours. With antiseptic precautions, the sac was opened; and, after return of the contents, a radical cure was effected by invagination and suture of the neck of the sac. The evening temperature rose to 100° on two occasions, but there was no drawback, and she left the hospital in sixteen days.

On April 3rd, 1884, three years and six months afterwards, she had worn a truss since the operation, there was no appearance of rupture; no impulse to be felt in groin in coughing. She felt much better in every way.

V.—James S., aged 59, was admitted October 26th, left cured November 25th, 1881. He had suffered from inguinal

hernia for ten years, and had been wearing a truss; which however, of late became weak, letting down the rupture. Symptoms of strangulation had existed for four days. With antiseptic precautions, the extraperitoneal operation was performed, the liberated bowel being returned. The neck of the sac was then ligatured, and about half of it removed. There was no rise of temperature after the operation, and no reappearance of hernia. The patient was advised to wear a truss.

July 21st, 1884. The patient has worn an inefficient truss. The rupture has reappeared; but he considers himself in much better condition than before, and can properly attend to his work. He says that the day he left the hospital he had a severe fall, and the rupture then and there reappeared, and remained down ever since.

VI.—Stephen A., stonemason, age 45, was admitted August 7th, and left cured October 22nd, 1882. He had had inguinal hernia on the right side for ten years. It had been temporarily irreducible on two previous occasions, and there had been symptoms of strangulation; otherwise, until two hours before admission, it had always been possible to get it back. Symptoms of acute strangulation were present, and therefore I operated with full antiseptic precautions soon after admission. The hernia was reduced, and the sac removed after dissection from the cord, the veins of which were varicose. The neck of the sac was ligatured, as in the other cases. Carbolic acid dressing had to be discontinued in consequence of carboluria, and eucalyptus substituted. There was sloughing of tissues in the wound, and free suppuration, extending into the scrotum, where a counter-opening was made. He had orchitis and an attack of pneumonia, and, later on, a short attack of painless diarrhœa, causing him to remain in hospital seventy-six days. Stephen A. was suffering from carbuncle when admitted, and was in a very bad state of health.

April 7th, 1884, nearly eighteen months after operation, this patient was found, on inspection, to have obtained complete relief; no difference of impulse was perceptible on the two sides. He wore a truss for a few weeks, but then discontinued it.

VII.—George D., carpenter, age 49, was admitted January 20th, and left, cured, February 7th, 1882. He had had right scrotal hernia for nearly thirty-seven years (reducible), and kept up by means of a truss. Taxis failed to effect reduction; and I operated eight and a half hours after the commencement of strangulation. The sac was opened with antiseptic precautions, and then dissected up and removed, after ligature of the neck with catgut. The temperature rose to 100° the night after operation, but was otherwise normal throughout. There was no bad symptoms.

April 3rd, 1884, two years and two months after the operation, no impulse could be felt on coughing in either groin. There was considerable depression over the scar, caused by wearing a truss with too strong a spring. This was ordered to be discontinued.

VIII.—Andrew M., baker, aged 42, was admitted December 25th, 1882, and left cured, February 8th, 1883. He had suffered from left inguinal hernia for twenty years and worn a truss for two and a half years. He was not wearing the truss for three days before admission, and the rupture suddenly descended, producing symptoms of strangulation. Several attempts at reduction had been made before he came to the hospital, and it was not deemed expedient to repeat them. The sac was opened in the usual manner, under strict antiseptic precautions, and found to be filled with dark coloured omentum. This was ligatured in two portions; the parts below the ligature were removed, and the stump returned to the abdominal cavity. A circular portion of the sac-wall was now excised, a drainage-tube inserted, and the wound closed. The temperature rose on the evening of operation to 102.6°, continuing about 99.4° until five days afterwards, when it became normal, but, on four subsequent occasions, rose to 100° in the evening, without apparent cause, there being otherwise no unfavourable symptom.

He was seen and examined January 4th, 1884, eleven months later. There had been no return of the hernia although he had, as a baker, done heavy work, and had not worn his truss regularly. On April 7th, 1884, fifteen months

after the operation, the relief appeared complete. There was only a very slight bulging on coughing, equal in degree in both inguinal regions. He suffers from asthma.

IX.—John V., decorator, aged 54, was born with a scrotal hernia on the right side, and wore a truss until he was 16 years old. He went without a truss from 16 to 46, but had been obliged to wear one for the last eight years. The hernia had been irreducible, with symptoms of strangulation, for twenty-four hours. Under antiseptic precautions, the hernia was operated upon, the contents were returned, and a circular ring of the neck of the sac, which was very thick, removed. The patient was admitted on December 26th, 1882, and left, cured, on March 13th, 1883. He was a feeble man, prematurely old, and became delirious a few days after the operation ; the wound suppurated, and he suffered from general rheumatic pains, and had a very dry tongue ; the temperature rising to 104° on the 6th, the day after operation. Ten days after the operation, he had some diarrhœa, and more than a month after, tonsilitis. The operation-wound healed quickly. A large abscess formed over the right scapula, which was opened antiseptically. After the incision of this abscess, the temperature, which had been very irregular, became normal, and the patient left, having no appearance of any hernia when last seen.

April 3rd, 1884, eleven months after the operation, there was no trace of any reappearance of the rupture ; the impulse was quite equal, on coughing, in each groin, and only to a slight extent. He had not worn a truss since leaving hospital ; he was able to ascend a ladder, and work hard all day without inconvenience.

X.—Ernest B., aged 3, was admitted March 15, and left, cured, April 18th, 1883. For some months the child had had a hernia on the right side. The day before admission it became irreducible, after a fit of coughing ; symptoms of strangulation came on, and the hernia, which was congenital, was relieved by division of the fibres external to the sac, about twenty-four hours after the symptoms appeared. After the contents were apparently returned, the sac was

opened. Some adherent omentum was found. This was removed after ligature; the sac was then ligatured at its neck and removed. Careful dissection was required, as the cord was found in the anterior wall of the sac. Eucalyptus spray and solution were used instead of carbolic acid. The temperature rose, in the evenings of the 16th, 17th, 18th, and 19th, to 99.1°, 99.6°, 101.2°, and 101.6°, respectively, but became subnormal on the 20th, and did not again exceed 99.4°. There were, otherwise, no unfavourable symptoms. The child was fitted with a truss, as a matter of precaution, there being no appearance of any return of the hernia when he left. He was examined April 3rd, 1884, more than a year later, and was not wearing a truss. There was no impulse on crying, nor trace of hernia.

XI.—Isaac H. S., aged 28, painter, was admitted on April 11th, and left, cured, on May 13th, 1883. He had a rupture on the right side when a baby, and wore a truss for this until he was fourteen years of age. He then gave up wearing a truss, and had no trouble with rupture until twenty-four hours before admission, when a small strangulated inguinal hernia was found on the right side. Taxis being ineffectual, the hernia was cut down upon, under antiseptic precautions, the sac opened, a stricture at the internal ring divided, some omentum ligatured and removed, and the stump of this, with the liberated intestine, returned to the abdominal cavity. About one inch in width of the sac was removed near the neck, after a catgut ligature had been applied to it, as high up as possible. The operation was followed by retention of urine, and later by rise of temperature and symptoms of localised peritonitis; but the patient was quite well when he left, and also when he was seen, eleven months afterwards, on April 3rd, 1884. He was wearing the truss which had been ordered when he left the hospital; but as the pressure had been applied over the femoral vessels, instead of over the internal ring, it was worse than useless. There was no tendency to reappearance of the rupture.

XII.—S. M., aged 40, French professor, had no history of previous illness. On February 11th, 1884, he had slight

diarrhœa. In the early part of the ensuing night he experienced a pain like "fire inside," in the hypogastric region. Soon afterwards vomiting set in. From this time he passed nothing by the rectum, although he strained at stool much and frequently. The vomiting continued and from about the third day he noticed that the vomits were stercoraceous and offensive. Hiccough began to set in about this date. From the first he noticed a small lump in the inguinal region, to which he did not attach any importance; so that, when seen in the out-patients' room, he merely complained that for some days past he could not retain any food in the stomach.

February 19th. When admitted, he was so much exhausted that it was difficult to obtain any history. He complained of hypogastric pain and sense of constriction. He was greatly collapsed, with pinched features, sunken eyes, whispering voice, pulse very weak (120), temperature subnormal, almost constant hiccough; he vomited twice in hospital before the operation, the vomit being stercoraceous. In the left inguinal canal, a bulging of the size of a chestnut could be seen and felt, resonant on percussion, somewhat tender, and with a little redness over it; no impulse on coughing. It was situated in the canal, not having passed the external inguinal ring, into which the finger could be introduced. At the upper part it distinctly tapered, and could be traced to the position of the internal ring.

An operation was performed soon after admission. On February 19th, and more than seven days after strangulation, I cut down on the hernia under the spray, employing all the usual antiseptic precautions. On opening the sac, a flow of dark coloured serum took place; the sac was fully divided upon a director. A knuckle of dark, much congested, small intestine came into view. This was gently drawn down; the seat of constriction was ascertained to be at the internal ring, in the neck of the sac. The constriction was divided. Between the intestine and the sac there were some comparatively firm adhesions, which were torn through, and the hernia was then reduced. A broad cir-

cular portion of the sac close to the ring was then dissected off, the external wound closed with silver-sutures, and a small drainage-tube left in. The vomiting ceased completely and permanently. Four hours after the operation, some flatus was passed. The pulse the next morning was below 80, temperature 100°. Twenty-four hours after the operation, the pulse was 80, temperature 101°; it never rose higher, and, during the next and subsequent days, was almost normal. No pains were felt in the abdomen; no tenderness on pressure. He left the hospital quite well, wearing a truss, and apparently cured of the hernia.

July 15th, 1884. On examination to-day, five months after, there is no trace of any hernial return perceptible, nor is there any impulse at the seat of operation when the patient coughs. On passing the finger from the scrotum into the external ring, there is no impulse or perceptible difference between the two sides. So far, the cure is a complete one. The patient has left off his truss.

XIII.—May 11th, 1884. W. R., aged 34, a New York merchant, had complained for some years of a small lump in the right groin, of which he did not know the nature. It caused him great uneasiness, and at times actual pain. At first, it was difficult to make a diagnosis. The tumour was about the size of a small walnut, tense and very elastic; it suggested the idea of a cyst. A slight impulse, however could be felt on coughing, and the tumour could be partially emptied, and became less tense when the patient assumed the recumbent position. The position is that of femoral hernia. An exploratory operation was performed, antiseptic precautions being taken; the fascia propria was abundant, and within it a small hernial sac was found. This was removed after the neck had been ligatured with catgut as high up as possible. The patient made an excellent recovery, without a bad symptom of any kind.

October, 1883. The patient had worn a truss for a short time, but this was now discontinued. At the present date, fifteen months having elapsed since the operation, there is no trace of the rupture, nor any weakness at the femoral ring.

XIV.—Henry S., stereotyper, aged 39, was admitted June 6th, 1884; discharged cured June 28th. He said he had had a right inguinal hernia for two years, caused by straining at work. The day before admission, while getting into bed, the tumour suddenly increased from a pigeon's egg to an orange in size, and symptoms of strangulation came on immediately. On admission, the patient was in great pain, somewhat collapsed and vomiting. The operation was performed in the usual way, and when the sac was opened, the hernia was found to be of the congenital form, and consisted of altered omentum and a knuckle of dark congested intestine. The omentum was ligatured and removed, and the intestine returned, after freeing the stricture at the neck of the sac. A broad strip of serous membrane was excised, and the pillars of the ring and inguinal canal drawn together with four stout catgut sutures, and the external wound closed. Wood-wool pads were applied. The wound healed by first intention, without either local or constitutional disturbance. At the time he left hospital there was no impulse on coughing, nor perceptible difference between the two sides.

July 21st. Although this is a recent case, yet the absence of the slightest impulse at the seat of the former hernia is a favourable promise for a permanent cure. At the present time, six weeks after the operation, there is not a trace of weakness at the rings.

XV.—S. S., aged 50, female, was admitted December 26th, 1879, and died January 6th, 1880. She had suffered from femoral hernia on the right side for thirty years, and had worn a truss for two years. She had symptoms of incomplete strangulation for five days before operation, when, with antiseptic precautions, after reduction of the hernia, the sac and some surplus skin was removed. She lived six days afterwards, dying from œdema of lungs and slight incipient peritonitis.

XVI.—George M., aged 69, was admitted February 18th, and died February 21st, 1881. He had had a left inguinal hernia for fifteen or sixteen years, but four days before admission, in consequence of a sudden strain, a swelling

appeared in the right groin, and symptoms of strangulation came on immediately. This proved to be from a small femoral hernia, which was reduced after opening the sac, and incision of Gimbernat's ligament. The sac was ligatured at the neck with catgut and removed. Antiseptic precautions were taken during operation, and antiseptic dressing was afterwards applied, but discontinued. Vomiting and hiccough supervened, and continued until death of patient from peritonitis, three days later. A portion of the strangulated intestine was found to have sloughed. The bowel below was empty and collapsed.

I think we may now assume that those operations which have for a prime factor the plugging of the hernial orifice with a mass of scrotal tissue are wrong in principle, and very imperfect and inadequate in their results. The method to which I would advert consists in obtaining a firm cicatricial obstacle at the neck of the sac to all further protrusion, and, in addition, the obliteration of the sac itself.

I have said partial or complete excision of the hernial sac, because, in small inguinal herniæ and in all ordinary femoral herniæ, the whole sac may with advantage be removed; but, in large inguinal herniæ, and especially in those of the congenital form, the total extirpation of the sac is unnecessary, and it may prove difficult to dissect it off without injuring some of the constituents of the spermatic cord, and thus give rise to considerable hæmorrhage, difficult to check at the time, and prone to recurrence. It is quite sufficient in such cases to dissect a ring-like portion of serous membrane away from the neck of the sac. This leaves a broad, raw surface, which afterwards firmly unites in a cicatricial mass, leaving the testicle shut off below in normal and practically undisturbed connections.

It is desirable to suture or ligature the neck as high up as possible, so as to leave no pouch of serous membrane in which a hernia may again form. In the majority of the cases this was the plan of treatment I adopted. In two or three only were the pillars of the ring sutured in addition. I have not been able to observe that the final result was

much affected by suturing the pillars of the ring; and if this should prove to be correct, the operation will be much simplified by the omission of this step. Suturing may, however, be of immediate advantage in cases complicated by cough, and it probably increases the amount of plastic material thrown out, and consequently the strength of the subsequent cicatrix.

One very important practical effect must follow on this innovation in the treatment of hernia, namely, that early operation, so important in all cases of strangulation, will tend to become yet more early. We have seen that it is justifiable to operate for the radical cure of hernia by this method, in the absence of any symptoms of strangulation; a proposal which most of us would not regard as justifiable without antiseptic precautions.

So long as the radical cure proved more dangerous than the disease for which it was undertaken, it was not possible for a conscientious surgeon to attempt it; but since what may be called the Surgical Reformation has taken place, all that is altered. Charles Steele was the first to operate under the new conditions, then Nussbaum, then Czerny, and shortly afterwards many others. The hope of curing the rupture will induce us to interfere surgically in cases where the symptoms of strangulation or incarceration are very slight, or even where there may be a reasonable expectation of reduction being effected by the taxis or other means. Indeed, no nice question need now arise, as to how often or how long the taxis should be used. It will probably be seldom resorted to, except in connection with the ulterior object of a more radical operation. And this will prove no slight gain, as in hospital practice, at any rate, we often meet with very serious consequences arising from a too energetic resort to it. I cannot but regard it as a piece of good fortune to many of my patients that they came into hospital with their herniæ strangulated, were operated upon, and cured. Many of them were seriously hampered in the struggle for existence by their infirmity, of which, when they left the hospital they had been completely relieved; and the interval of several years,

which has elapsed in some cases, gives us a reasonable expectation that the cure may be permanent.

I would conclude, therefore, first, that in all cases of strangulated hernia, the usual operation for the division of the stricture having been performed, partial or complete abscission of the sac should likewise prove an ordinary part of the operation. Where the aperture is large, its margins should be drawn together by suture. Chromicised or green catgut admirably suffices for the purpose, or if preferred, a silver suture may be used instead. In many cases, the operation may be extraperitoneal from the beginning, and the ligature applied around the neck of the sac before it is opened or removed. To this detail, however, I attach no importance, as it possesses little advantage if antiseptic precautions be otherwise strictly observed. The proceeding, in fact, is in some cases disadvantageous by preventing drainage, and also because of the frequent presence of adhesions within the sac.

Second, I regard a similar operation justifiable in cases of hernia, either femoral or inguinal, which cause the patient pain and inconvenience, or which are not retained by a truss when the individual is going about his ordinary avocations. If the patient be in good general health it may be performed without serious risk, and with the result, probably, of permanently freeing the individual from the consequences of a debilitating infirmity.

I have presented to you, gentlemen, all the cases of this operation which I have been able to trace afterwards, always a difficult matter with hospital patients. I have mentioned also the two fatal cases which occurred during the period in which the attempts at radical cure have been made; but it does not appear that this in any way contributed to the fatal results in these cases.

I consider the record important, as tending to prove that in cases of strangulated hernia the risk of the operation is not increased by this method of attempting a radical cure; and, further, because in only one of the series did recurrence of the hernial protrusion take place. In the statistics of 188 cases of the operation performed for strangu-

lated hernia, collected by Leisrink, the percentage of mortality was 17⅔, while recurrence of the rupture took place in one-third of the cases. In Nussbaum's experience, the rupture reappeared in nearly one-half of the cases.

The operation which I have exemplified is perhaps not, strictly speaking, a radical cure at all. At the utmost, it but restores the patient to the condition he was in before the hernia occurred; and persons with weak rings and relaxed abdomen, presenting, in short, those conditions which predispose to the occurrence of hernia, may have hernia again. You cannot make the man sounder by operation than he is by birth. But even in these persons the hernia will, in all probability, be more easily retained afterwards, or its recurrence altogether prevented by wearing a light truss. In one class of cases, I think, we may often expect that the cure will be truly radical, namely, in cases of congenital inguinal hernia. Here a patent channel, of congenital origin, admits of the descent of a hernia in individuals otherwise perfectly sound. In them, the occlusion of this channel may well end in a perfect cure of the rupture.

Of course, gentlemen, I do not profess to have treated this subject in any sense exhaustively. The time at my disposal, as well as your patience, probably, do not admit of it. I have merely ventured to make a few remarks which have occurred to me on what I trust you will allow me to call a successful series of cases.

THYROIDECTOMY.

The manner in which the enlarged thyroid gland may be excised varies. It is essential, to provide for an aseptic condition of the wound, and so avoid septic infiltration of the cellular tissue in the neck, which is very sudden in appearance, often without any very marked external change, while the result is almost always fatal. It is not less important to control hæmorrhage as far as possible, and avoid injury to the recurrent nerve. The older method of slitting open the capsule, enucleating the mass as quickly as possible, without regard to bleedin g

and tying the pedicle *en masse*, with double or quadruple ligatures, is open to serious objections, both on account of the enormous hæmorrhage and the risk of including the laryngeal nerves. It is much better carefully to avoid injury to the capsule of the gland, to tie all bleeding points as they arise, to divide the enlarged veins between a double ligature, and only after they have been thoroughly exposed,

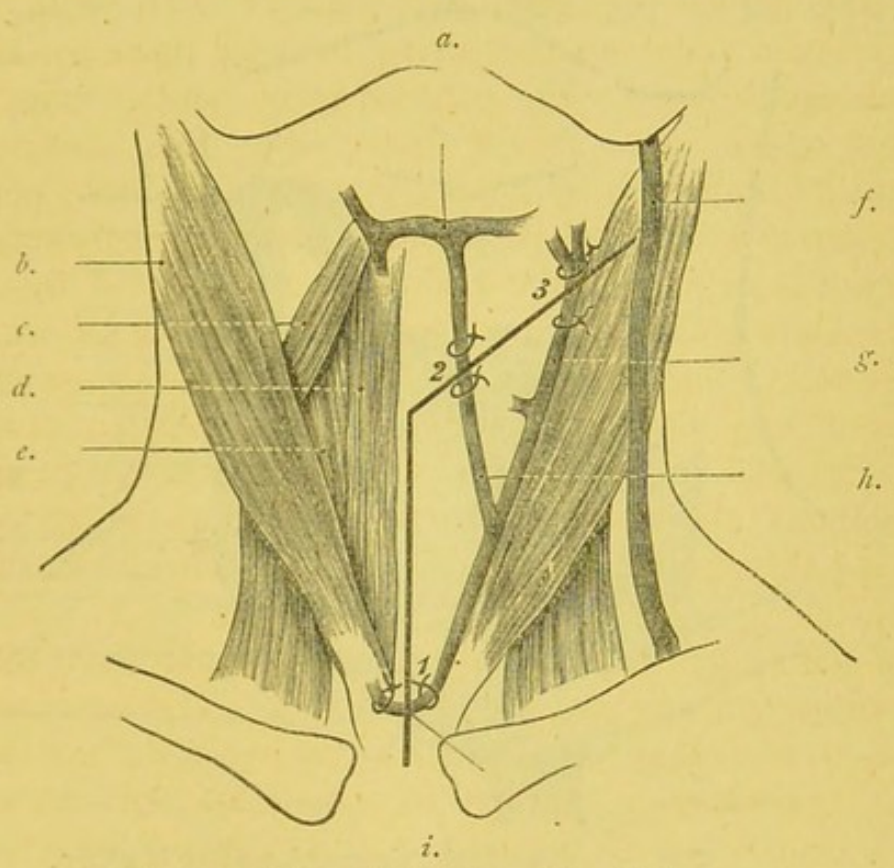

FIG. 2.—Lines of incision, after Kocher.

a. Superior communicating vein. *b.* Sterno-cleido-mastoid muscle. *c.* Omo-hyoid muscle. *d.* Sterno-hyoid muscle. *e.* Sterno-thyroid muscle. *f.* External jugular vein. *g.* Oblique jugular vein. *h.* Anterior jugular vein. *i.* Inferior communicating jugular vein.

to secure by immediate ligature the four principle arteries as well as, in some cases, an enlarged thyroidea ima. The superficial incision may be of two kinds, an angular and a Y-shaped. When the enlargement is chiefly confined to one side, a median incision should first be made from the upper margin of the tumour to the notch of the sternum. In this way only the transverse communicating branches of the veins shall be divided, and from the upper extremity of this in-

cision ample room can be obtained by making an oblique incision upwards and outwards, which should extend from the level of the cricoid cartilage to the anterior border of the sternomastoid muscle, or further, if necessary, in the direction of the mastoid process. The skin and platysma having been divided, the superficial veins will be cut

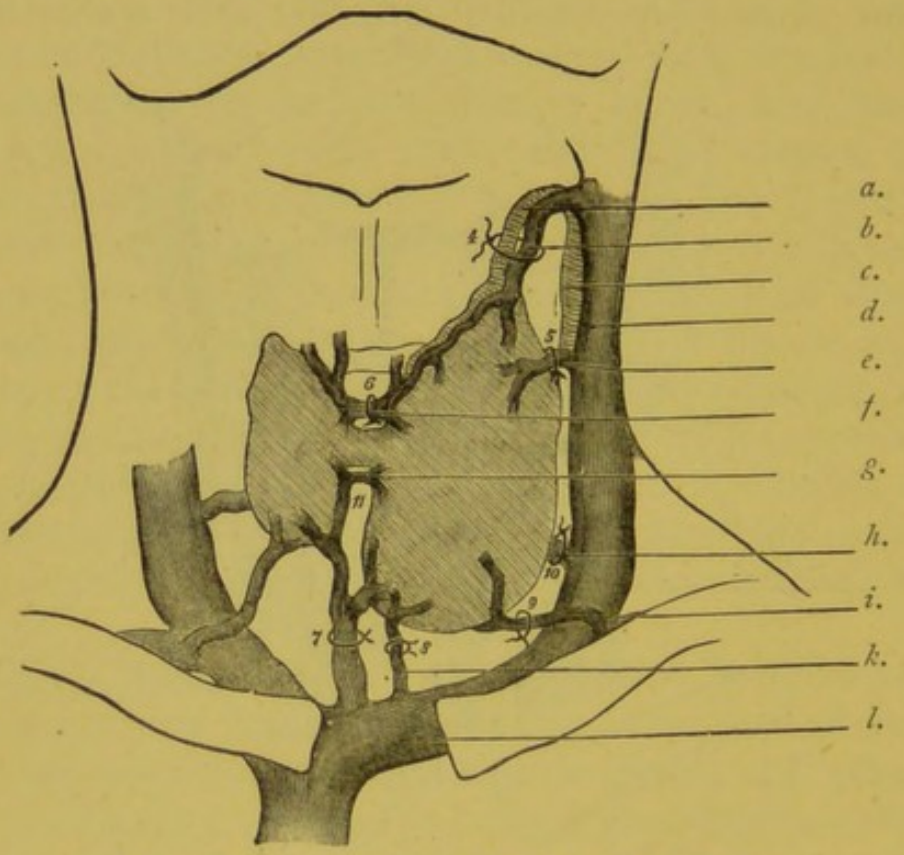

FIG. 3.—Principal vein-trunks, after Kocher.

a. Superior thyroid artery. *b.* Superior thyroid vein. *c.* Carotid artery. *d.* Internal jugular vein. *e.* Superior accessory vein. *f.* Superior communicating thyroid vein. *g.* Inferior communicating thyroid vein. *h.* Inferior accessory thyroid vein. *i.* Inferior thyroid vein. *k.* Thyroidea ima. *l.* Left innominate vein.

through at right angles, and may at once be tied with double ligatures. Where the thyroid enlargement is bilateral, a similar oblique incision may be made on the opposite side. After the platysma and superficial fascia have been divided, the sterno-hyoid, sterno-thyroid, and omo-hyoid muscles appear spread over the tumour. As a rule, especially if the tumour be large, these must be

divided, and, in some cases, part of the sterno-mastoid muscle as well; but this entails no serious after consequences. The tumour will now be very fully exposed with enormously dilated veins, covering, probably, its entire surface. These veins must be tied, one by one, with a double ligature before division.

The greatest care must be taken at this stage, for the veins are not only huge in size, but their walls are very

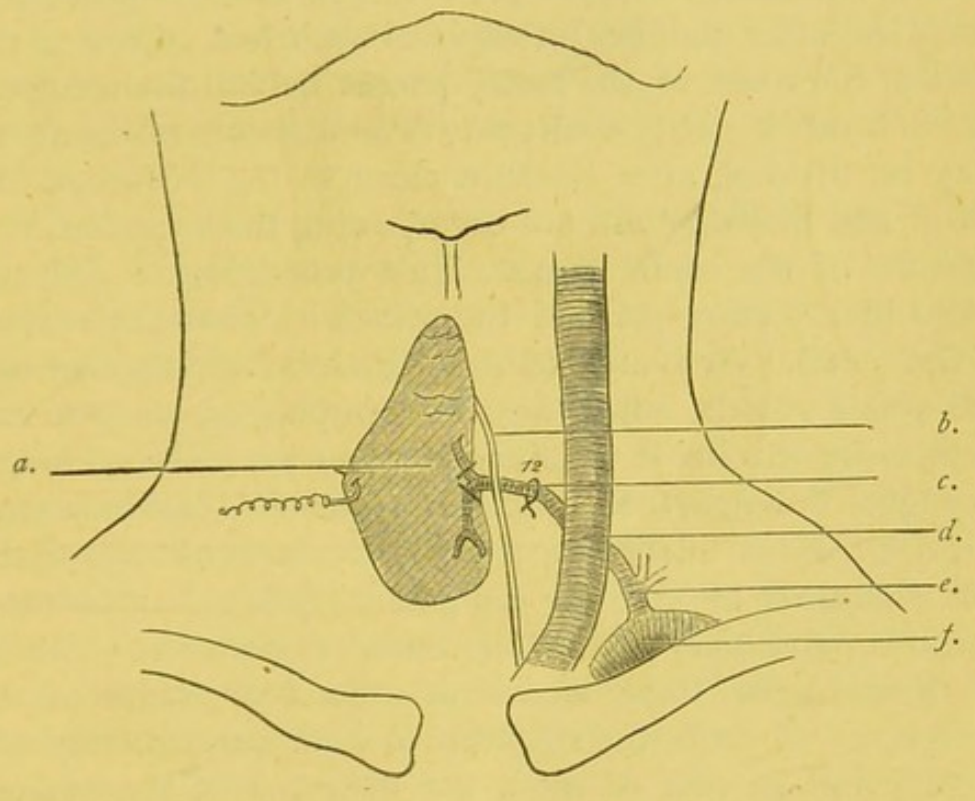

FIG. 4.—Relations of the inferior thyroid artery and recurrent laryngeal nerve to the enlarged lateral lobe.

a. Posterior surface of the left lobe of the thyroid. *b.* Recurrent laryngeal nerve. *c.* Inferior thyroid artery. *d.* Carotid artery. *e.* Thyroid axis. *f.* Subclavian artery.

thin and easily torn or cut through by the ligature. The tumour may now be carefully separated with the finger, or handle of the scalpel, until the position of the superior thyroid artery, at the superior lateral extremity of the thyroid body shall be reached. Here the superior thyroid artery will be found entering the tip of the thyroid tumour and either separately, or together with its vein, must be carefully

double ligatured and divided between. The artery is generally much enlarged, and its walls are very thin.

Search is now to be made for the inferior thyroid artery, which must be most carefully isolated previously to ligature. This may be applied as far as possible from its entrance into the tumour as Kocher recommends (see Fig. 3). In this way the recurrent nerve shall be well protected from injury. The inferior thyroid artery after leaving the thyroid axis passes transversely behind the outer border of the thyroid, and for some distance on its posterior surface, before it penetrates the gland, after dividing into several branches. Close to the trachea the trunk of the artery passes behind the recurrent nerve, which it partly encircles. The branches of the artery may be divided, after ligature, close to the surface of the gland, and bleeding will not occur, owing to the preliminary ligature of the main trunk. This proceeding I did not adopt in my case, but tied the vessels close to the surface of the gland. As Baumgärtner of Baden-Baden points out, the small vessels supplying the œsophagus, trachea and larynx, are less liable to injury in this way. The recurrent laryngeal Baumgärtner thinks, is safer, and cachexia strumipriva also less likely to occur. In his communication to the last Congress of German Surgeons (1884), Baumgärtner narrates particulars of nineteen cases of operation. Eleven of these were total excisions. In four some of the symptoms of cachexia strumipriva were subsequently observed, and in two of these the evidence of the malady had almost entirely disappeared after tracheotomy was performed. At the same meeting, Credé of Dresden reports twenty-two cases, with twenty-one recoveries. Fourteen of these were complete extirpations. Credé had never seen a case of Kocher's cachexia, not even in a boy of 16 on whom he operated. Credé likewise lays stress on dividing the branches of the inferior thyroid artery close to the surface of the tumour, for reasons similar to those of Baumgärtner. I feel sure it is the better plan. The tumour may now be turned towards the median line and lifted from the trachea. The further isolation should be conducted as carefully as possible until the isthmus is reached, which should be most

carefully divided, each bleeding point being secured as it appears. When the enlargement is bilateral, the same operative procedure must be conducted on the opposite side. It is very important, if possible, to avoid performing tracheotomy, as it enormously increases the subsequent risks. In forty-three of Billroth's cases, in which no tracheotomy was performed, all recovered. In five tracheotomy was necessary, and of these three died. Kocher has had a similar experience. When tracheotomy is necessary, as it fortunately seldom is, the wound becomes speedily septic. It is better, under these circumstances, to treat it as an open wound, with frequent irrigation, in the hope of preventing the fatal mediastinal infiltration which so often occurs.

To avoid immediate death by suffocation, it may prove needful to perform tracheotomy, but the operation is in itself extremely difficult, and to be avoided except in cases of the most extreme urgency. When the layers of cervical fascia and stretched muscles are divided, great relief to the oppressed breathing is generally obtained, the pressure being thus taken off the trachea. It is important to hold the head very steady during the whole of the operation, to prevent collapse of the trachea, and keep it so afterwards by sandbags. The case I am about to describe involved one of the most difficult and serious operations I ever had occasion to perform.

Large Goître successfully Excised.—M. A. B., aged 29, married and mother of five healthy children, was admitted November 22nd, 1883. There was no history of tumour in her family. When twelve years old, she was struck by a stone on the front of the neck. Three months later, she noticed a small tumour there; this gradually increased, in spite of continuous and varied treatment by iodine, galvanism, blistering, injection of perchloride of iron, and seton. Six months previous to admission, the tumour began to grow rapidly. Her general health became affected; she suffered from frequent dry cough, shortness of breath on exertion, frequent feeling of suffocation, and gasping, for breath. An attack of urgent dyspnœa, threatening

life, compelled her to apply at St. Thomas's Hospital for relief. On admission, a large tumour was seen in front of the neck, presenting a broad flattened surface, marked with some depressed scars, the effect of setons, and some greatly dilated veins. Crossing its centre, a large artery could be felt pulsating; the skin over the tumour was move-

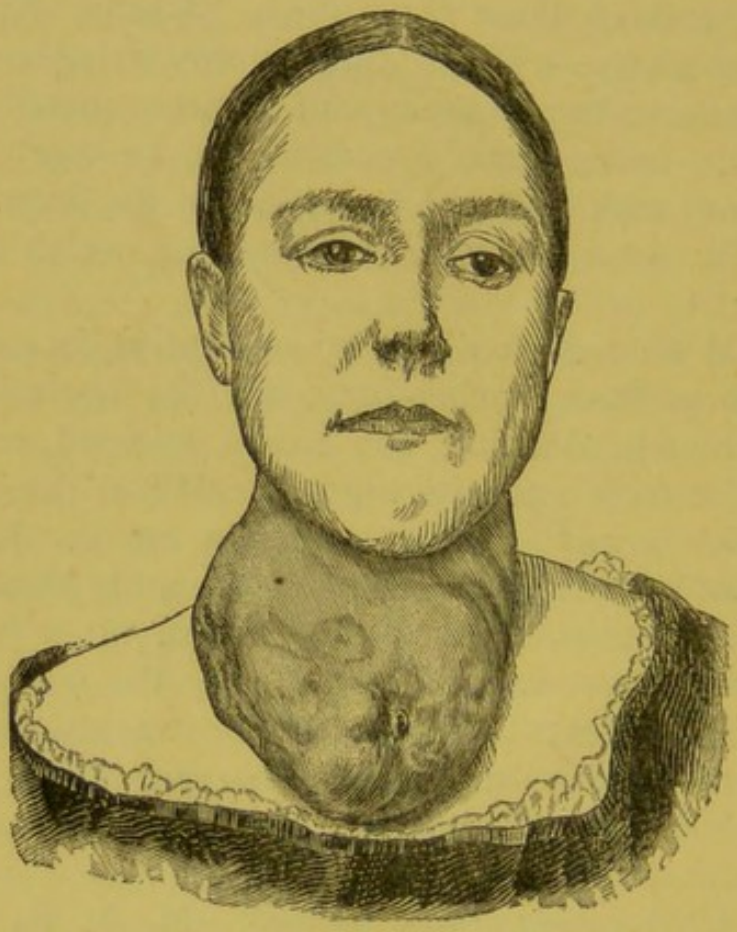

FIG. 5.—Front view of enlarged thyroid, from a photograph.

able above, but fixed below where the scars were situated. The surface was warmer than the surrounding parts. The tumour was firm, lobulated, and somewhat fixed. The thyroid cartilage could be felt above, and a firm band passing from this to the tumour. Below, it dipped behind the sternum, and extended outwards for half the length of the clavicle on each side. Above the right clavicle was a separate freely movable tumour, independent of the large one, about the size of a large walnut, whose nature could not be determined. The main tumour measured ten inches

vertically, nine inches horizontally, sixteen inches circumferentially. Laryngoscopic examination disclosed a very slight impairment of abduction of the left vocal cord during inspiration.

December 3rd. On this day I operated, removing the tumour by means of three semilunar incisions concave outwards made across its upper and lateral parts, enclosing a triangular

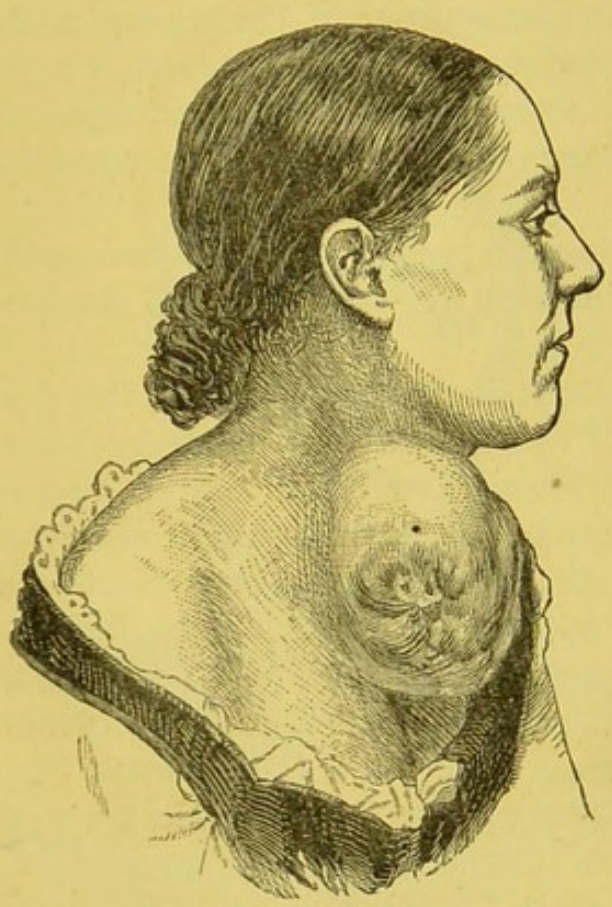

FIG. 6.—Lateral view of enlarged thyroid, from a photograph.

portion including the adherent skin and cicatrices. The skin above and below these incisions, together with the superficial tissues, was dissected upwards and outwards. There was considerable hæmorrhage from the superficial vessels, which were quickly clamped and tied as exposed. The capsule of the tumour was not opened. Towards its base much difficulty was experienced, owing to the number and intricate arrangement of the veins. A cone-like projection from the tumour passed four inches downwards, behind the

sternum, and required the most careful separation. The right and left superior thyroid and the right inferior thyroid arteries were ligatured when exposed. The left inferior thyroid was not seen. With a little further dissection the large mass was removed. Silk sutures were used, and three drainage tubes inserted at the angles of the wound. Iodoform powder was freely dusted over the exposed raw surface, and the whole covered over with iodoform gauze and wool. In consequence of the trachea being found extremely softened and laterally flattened, the patient's head was carefully fixed by means of sandbags. At least one hundred ligatures were applied. The operation took two hours.

The next day the patient had fully recovered from shock and the considerable loss of blood. All the symptoms were favourable.

On the second day after operation the drainage tubes were removed, and several of the sutures; the wound was perfectly healthy, with very slight serous discharge, and the condition of the patient satisfactory in every respect.

Next day the remaining sutures were removed; the wound now appearing comparatively limited in extent, contracting and healing rapidly. The cough, which had been very troublesome, and before had constantly produced sickness, is much better, and the sickness has quite gone. Five days after the operation the patient was allowed to sit up in bed.

December 16th. Just short of a fortnight after the operation, the patient was practically well. She got up, dressed, and moved about her room. Temperature since the operation has varied from 97° to 99.8°.

January 15th. The patient left the hospital cured, quite fat and strong, and looking extremely well. A small sinus persists near the notch of the sternum, from which issues a trifling discharge, and from time to time some of the numerous ligature-threads.

In March, the patient visited the hospital. Her general health is excellent. A small sinus still persists, through which knots of ligature-thread at intervals come away.

In June, she again visited the hospital. The condition as to the neck is the same. The sinus is still discharging ligature-threads; otherwise the patient is extremely well. My colleague, Dr. Ord, and others saw her, and were not able to discover any trace of myxædema or cachexia strumipriva.

The great point of interest at present in the treatment of goître by complete excision is the probability of the

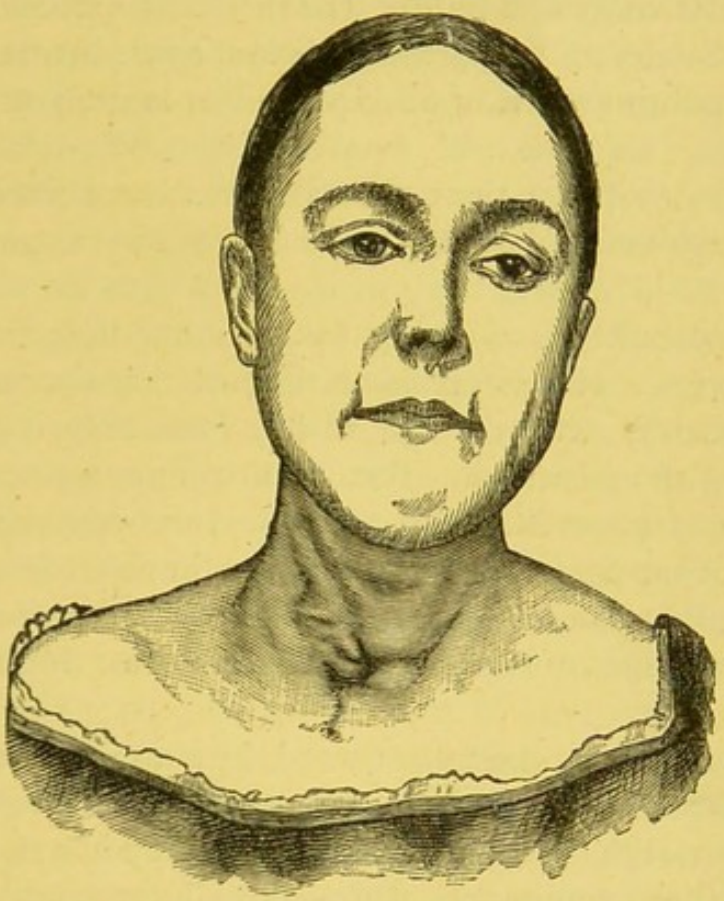

FIG. 7.—From photograph taken after patient's recovery

subsequent occurrence of symptoms resembling myxœdema, or, as Kocher terms it, cachexia strumipriva. In the preceding year, M. Reverdin of Geneva had independently described (*Journal de la Suisse Romande*, 1882, p. 539) results following complete ablation of the gland, which also much resemble myxœdema—two or three months after the operation, feebleness, pallor, anæmia, swelling of face and hands, without albuminuria, were observed. Kocher, at the

time of presenting his paper at the Congress of German Surgeons in 1883, had operated 101 times, with a fatal issue in thirteen of the cases, a mortality of 12.8 per cent.—a notable improvement on the death-rate up to 1850, of about 40 per cent. The total number of cases of non-malignant goître operated on since 1877 appears to be 240, with a mortality of 11.6 per cent. As a great operation, the rate of mortality is small enough to justify its performance, while there is almost no risk of any recurrence, even in cases where only one-half of the organ has been removed. In many instances of partial excision, some increase in size of the remaining portion took place, but never any cretinoid symptoms. In cases of total excision, the death-rate is about the same, 12.1 per cent. But Kocher points out very serious results as having followed in his experience in cases of total extirpation, in 24 of which he obtained a subsequent history, 18 being by personal observation and six by letter. He ascertained that of the six latter, four were perfectly well; the age varied from 22 to 15 years at the time of operation. The two others were in a bad condition of general health. In one, the body was swollen, and sensation impaired in the limbs; in the other, nervous pains and impaired sensation existed in hands and feet. Of the personally observed cases, only two were in good health.

The remaining sixteen showed, in a greater or less degree, symptoms consisting in sensations of fatigue, weakness and weight of limbs, pain in arms and legs, feeling of cold in the extremities, which in winter swell and become bluish-red in colour. The mental condition is duller, especially in children; their power of thinking and speech slower. This slowness of speech was strikingly characteristic of nearly all the cases. The face, hands, and feet showed swellings, lasting an hour or two, often most notable in the morning. The eyelids, more especially the lower eyelid, are swollen, and the face generally puffy. In short, without going into further detail, Professor Kocher gives a most striking picture, painted in fullest detail, of this disease, under the title cachexia strumipriva, without any knowledge

of what had been done in England in regard to myxœdema, more especially by Dr. F. Semon, by whom the apparent identity of this cachexia with the affection termed myxœdema was first pointed out at a meeting of the Clinical Society last December, of which a full report appears in the medical journals. This, Kocher further associates, in growing individuals, with the arrest of bodily and mental development, and a species of cretinism. I would refer for further details to his most interesting paper on the subject, in Langenbeck's *Archiv* for last year. These observations point to the thyroid as a blood-controlling gland, both in respect of the constitution of that fluid, and, according to Liebermeister and Schiff, as regulator of the blood supply to the brain. This view is supported by the fact that, in three of Kocher's cases, in which a small accessory thyroid was present, the otherwise total extirpation was not followed by any of these symptoms. It is possible that in my case the small tumour left behind is thyroid in nature; and this, according to Kocher's view, would explain the absence in this instance of any of the alleged characteristic symptoms.

Contradictory to these very explicit statements, is the great experience of Professor Billroth of Vienna, who has performed probably the largest number of extirpations of the thyroid gland. At the meeting of the Surgical Congress in Berlin in 1883, Dr. Wölfler speaks of sixty-eight cases of extirpation in Billroth's practice, with a mortality of only 7.3 per cent. He remarks that the total extirpation is not more dangerous than the partial removal of the gland; and that the cachexia strumipriva, described by Professor Kocher, has never been observed.

In a letter which I received from Dr. Wölfler, dated July 15th, 1884, he mentions that a cachexia strumipriva has not hitherto been observed in the Vienna clinic. "In young persons we only operate most exceptionally, while in older subjects the disease does not appear." In Berlin, at the discussion which took place after the reading of Professor Kocher's paper, Bardeleben expressed the belief that the cretinoid condition described by Kocher may very well have followed in his cases irrespective of the extirpation of

the gland, and that the enlarged thyroid was but a link in a chain of symptoms, dependent rather on the locality from which the patient came than on the circumstance that extirpation of the goître had been performed; an opinion which he supported by the results of a series of experiments he had made many years before on animals. In them neither removal of the spleen nor thyroid, nor even both organs, appeared to produce any influence on the general health if the creature survived the immediate consequences of the operation itself. Quite recently, Tauber (Virchow's *Archiv*, 1884) has performed similar experiments, which tend to support Bardeleben's views, and he asserts that no physiological affinity exists between the spleen and thyroid. One thing seems pretty clear from the discussion, that these changes, when they occur, are prone to do so in young persons before the age of twenty, and during the growing period of life, rather than after adolescence is reached. Indeed, in Kocher's series this fact is illustrated, for, amongst the sixteen cases in which the cachexia strumipriva was developed, nine were under twenty years of age, five between twenty and thirty, and only two above thirty. Eleven were young women, five were males. In two of these cases the disease is called hydroanæmia, and in another thick lips and nose are the only myxœdematous symptoms specified. In other cases, the cachexia strumipriva is stated to be commencing.

A remarkable circumstance is cited by Dr. Ranking (*Lancet*, May 17th, 1884), who was sometime resident at an Indian station where goître was endemic. He stated that among upwards of 2,000 cases of all kinds of goître, he did not find a single case of anæmia in a goîtrous subject. I submit, therefore, that although the observations of Kocher have thrown a new and most interesting light on the relations of myxœdema to the extirpation of goître, they are not as yet to be considered absolutely proven. Other observers have likewise failed to trace a sequence. The changes seem, at all events, much less likely to attack the adult than the adolescent, and affect females rather than males. The hands of the operating surgeon must not

yet be regarded as tied, at all events, until further and corroborative evidence shall be forthcoming. Partial extirpation may, in many instances, be sufficient to relieve the patient's symptoms, so also, most certainly, is excision or division of the isthmus. After this proceeding there need be no dread of subsequent myxœdemous change. But there will still remain other cases where complete removal of the enlarged gland is necessary. And if in adult persons, the opinion of some of those who have had the largest experience would seem to prove that the operation may be undertaken as safely as any of the other great surgical operations, and with results in every respect as thoroughly successful.

I should like to mention here a comparatively simple method of treatment, and easy of execution, which in suitable cases, promises excellent results. Without doubt, the most pressing indication for operation on the thyroid gland is the occurrence of attacks of severe dyspnœa. In some of these the division, or the partial or complete excision, of the isthmus of the gland, removes to a large extent the extreme lateral compression exercised by the lateral lobes on the trachea, and the power of breathing becomes restored. In the *Lancet* for 1875, p. 120, Sir Duncan Gibb makes the proposal to divide the enlarged isthmus, or, what is certainly better, remove a portion or the whole of it. He narrates the particulars of two cases in which, at his suggestion, this operation was very successfully accomplished by Mr. Holthouse, of the Westminster Hospital. In the first, the urgent attacks of recurrent dyspnœa were completely relieved. The trachea became quite free and exposed in the neck. The enlarged lateral lobes receded and became less prominent. In the second case the results were equally favourable. The prominence of the tumour in the neck diminished, the enlarged tortuous veins, previously visible on the surface, disappeared, as also the dyspnœa, dysphagia, and laryngeal cough, from which the patient had previously suffered.

I have not had an opportunity of trying this method myself, but my colleague, Mr. Sydney Jones, has performed

the operation four times. I have seen some of his cases, and he has been good enough to give me some particulars of them. They will shortly be published in full.

"In my first case," he writes, "the isthmus was well marked, and had a good depth between the two lateral lobes, so that by its removal alone the lateral lobes became widely separated. This case has done very well indeed. The second case was one where I operated for exophthalmic goître. Here, on removal of the isthmus—I think of this alone—great benefit resulted so far as shrinking of the lateral lobes; but the patient died, some time after recovering from the operation, owing to cerebral mischief in connection with the general disease. Two operations I have since had in which the isthmus was not so well marked, and the lateral lobes were so approximate that I removed, after transfixion with a double ligature, the inner portions of both lateral lobes. These cases both did well, with great relief to breathing and swallowing, and with shrinking of the lateral lobes. It seems to me the object is to create a gap between the lateral lobes, so as to prevent their approximation, a deep gutter being made in front of the trachea, from which free drainage is secured during the process of healing."

These results are very interesting, and will doubtless lead to further trial of this plan of dealing with certain forms of goître.

I should also like to record a striking result which my friend Professor Anthony H. Corley was good enough to communicate to me. Bridget H., aged 18, a native of Dublin felt her neck beginning to swell four months previous to date. At the same time, she complained of violent headaches, recurring every day at the same hour, accompanied by flushing of the face, throbbing sensations in the tumor, and increase in its size. For about three weeks, she had great difficulty of breathing and some dysphagia, and, during the exacerbations, felt herself choking. She sought admission to Jervis Street Hospital in order to obtain relief in some form, soon afterwards. Before any operation was attempted, Professor Purser chanced to see her, and, viewing the very periodic

nature of the attacks, suggested a trial of quinine. This Dr. Corley ordered in ten-grain doses. Almost immediately the patient began to improve. In less than a week, all unpleasant symptoms vanished, and when discharged from hospital, six weeks after her admission, the tumour had completely disappeared. The photograph taken on admission shows a very great enlargement of the gland, especially of its central portion, which is about as big as an orange. The second photograph, taken six months after she left the hospital, shows the complete disappearance of swelling. The case is most remarkable and important, and seems to justify the supposition of a possible malarial origin of some forms of acute enlargement of the thyroid, and the propriety of trying the effects of quinine whenever the exacerbations evince a periodic character.

And now, gentlemen, in concluding, I have only to thank you for having so kindly listened to me.

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