

for five weeks. As this caused no diminution in the size of the swelling she was recommended to return home, as the case was deemed incurable. Since leaving the hospital, 22 years ago, the sinus made by the seton had been continually discharging, and she had been subject to what she describes as "shivering fits." These always came on in the morning, the patient feeling at first very cold and shivering, followed in about an hour by a profuse sweating stage with vomiting lasting a further hour and then by 48 hours of extreme prostration. She stated that she had had as many as two of these attacks in a fortnight, and they were worse just before her menstrual periods. She noted that the attacks always came on when the discharge from the goitre ceased and were followed and relieved by a discharge of blood and pus from the sinus.

On admission there was a large swelling in the neck extending from the level of the upper border of the thyroid cartilage above to the top of the sternum below; it was very fixed and apparently adherent to the cervical tissues. In the middle line, about the centre of the swelling, there was a sinus, into which a probe passed for about two and a half inches and from which there was a constant purulent secretion. The skin around was red and oedematous. There was no dyspnoea when the patient was at rest in bed, but it became evident when she walked about. The various organs of the body were healthy. The patient was treated with hot boric fomentations, and as a soft fluctuating area formed just below the old sinus an incision was made and a few drachms of pus were evacuated.

Operation.—On June 25th the following operation was performed. A horseshoe-shaped incision was made through the skin, commencing at the anterior edge of the right sternomastoid muscle at the level of the hyoid bone, carried forward to the middle line and then downwards, terminating on the right clavicle two inches external to the sterno-clavicular articulation. The skin flap thus marked out was dissected back with difficulty owing to its being adherent to the goitre. The thyroid tissue was very vascular and was firmly adherent to the trachea throughout its course, and it was only separated with great difficulty by dissection. The pedicles containing the superior and inferior thyroid arteries were secured and ligatured with cat-gut before division. The trachea was found to be much flattened from before backwards. After removal of the infected skin around the sinuses the wound was closed with silkworm-gut sutures, a drainage-tube being inserted at the lower part and the wound packed with iodoform gauze very lightly. With the exception of two stitch abscesses, the wound healed by first intention, and on July 24th the patient was discharged. When last seen on Nov. 6th the wound was soundly healed, the patient seemed in excellent health, and she reported that she had had no shivering fits since the operation.

Examination of the tumour.—In the middle of the thyroid tissue there was a cyst of the size of a hen's egg with thickened walls and calcareous lining, the contents of the cyst being purulent.

Pathological report by Mr. FRANK BARNES, Visiting Clinical Pathologist.—Macroscopically the whole gland is apparently composed, firstly, of a very much thickened capsule, varying in thickness from a tenth to a quarter of an inch; secondly, of the gland substance which is hollowed out into a cyst having two openings on the anterior surface, one at the lower pole and one about the middle. The gland substance itself is placed mainly on the posterior wall of the cyst and is hard in consistence and traversed by yellowish bands of calcareous substance and having small yellowish areas of a similar nature, but in places softer. Much fibrous tissue runs through the gland substance, rendering it almost cartilaginous in consistence. Microscopically the specimen is for the most part composed of a thick-walled cyst. The wall of the cyst is in places composed of the thickened capsule of the gland, but in the deeper portion glandular substance showing much fibrosis and considerable small-celled infiltration projects into the lumen of the cyst, while here and there calcareous degeneration has set in. A portion of the wall of the cyst shows well-marked tubercles, the giant cell system being particularly well marked.

Remarks by Sir THOMAS CHAVASSE.—The case presents several points of interest. In the first place the method of treating bronchoceles by using a seton does not appear to have been quite extinct 22 years ago. In this instance it induced a chronic septic condition, with acute exacerbations

at frequent intervals, and it is somewhat remarkable that the patient's general health did not suffer more, but during the greater portion of the 22 years she admitted that existence had hardly been endurable. Examination after removal showed that at no time could the drainage of the contained cyst have been efficient, the opening in its lower part being made after admission to the hospital, and that nothing but complete extirpation could bring about a radical cure. Probably operative measures would have been sought for at a much earlier date, but several medical opinions were expressed that the thickness and the induration of the cervical tissues, the apparent hardness of the goitre, together with the age of the patient, were suggestive that a malignant neoplasm, involving the trachea, had to be dealt with, and that excision could not be safely accomplished. The operation was admittedly much more difficult than an ordinary thyroidectomy, mainly owing to the firm adhesions to the rings of the trachea which existed throughout. The microscopic report bears evidence that degenerative changes of a mixed type were taking place in the tumour, the precise clinical significance of which will only be evident in the future.

Birmingham.

A MODIFIED PLAN FOR THE PREPARATION OF CHROMIC CATGUT.

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So many different methods have appeared within the last few years for the efficient preparation of catgut as a surgical ligature, most of which for various reasons have been discarded, that I trust I may be excused for adding yet another to the already long list of methods.

The claims of catgut as a surgical ligature were ardently supported by Lord Lister, to whom in the main its present-day popularity is due. The fact that it is absorbable by the living animal tissues is another factor in its favour, for having fulfilled its duty it disappears; and so the danger of subsequent irritation and infection due to the presence of a non-absorbable ligature which acts as a foreign body is eliminated. But catgut itself as it appears on the market in the raw state is a somewhat dangerous material if due precautions are not taken to render it sterile. Even when it is rendered sterile it may in itself induce suppuration when buried in healthy tissues. Many methods have been employed for sterilising catgut, but each of them has some disadvantages. The fact that catgut is rendered *sterile* does not necessarily make it a perfectly safe material for ligature. It has been noticed that absolutely *aseptic* catgut, when introduced into a wound, has the power of exciting suppuration. According to Ewald, this is due to some unknown toxic substance.

It appears rational to incorporate with the catgut some substance which acts as an antiseptic in itself, but such substance, exercising its antiseptic action, must have no deleterious effect on living tissue. If, for example, a ligature is prepared with corrosive sublimate its introduction is followed by coagulation of the albumin, and finally, necrosis of the tissue, which forms an excellent pabulum for micro-organisms, in the event of their being present. Though this local necrosis is only microscopic, it occurs, and as we never can be certain that organisms are not introduced into the wound during the course of an operation, the fact is obvious that its use should be discarded. The same applies to all the different antiseptics which are used in the preparation of catgut, such as formalin, carbolic acid, the different salts of mercury, &c.

The above-mentioned remarks do not apply so much to such materials as silk, silkworm gut, linen thread, and celluloid hemp. These ligatures are easily rendered sterile by boiling, and their subsequent sterility depends on their being kept immersed in an antiseptic fluid. Once they are *in situ*, providing due aseptic precautions are taken, they give rise to no further trouble. Not so with catgut. Besides its property of exciting suppuration as mentioned above, during the process of absorption, it may, if not sterile, liberate pathogenic microbes. Too much stress cannot, therefore, be placed upon the desirability of using an antiseptic catgut, as has been especially urged by Professor C. Yelverton Pearson of Cork and the late Nicholas Senn of Chicago.

What antiseptic then can we incorporate with catgut which will be non-injurious to the tissues, will not interfere with its strength or pliability, and yet is of such penetrating power as to destroy any micro-organisms which may lie on the surface, or may be embedded in the interior of the gut? Such a substance we have in thymol. Thymol is a most powerful antiseptic and resists putrefactive processes to a remarkable degree; one grain in two ounces of water stops putrefaction. It is non-irritating to the tissues when incorporated with catgut in the way mentioned below. Thymol ($C_6H_3 \cdot OH \cdot CH_3 \cdot C_3H_7$) is a crystalline phenol obtained from the volatile oils of *Thymus vulgaris*, Linn., *Monarda punctata*, Linn., *Carum copticum*, Benth. and Hook, and other plants. It resembles carbolic acid, has greater germicidal power, and is less irritating to wounds.

Author's method.—Ordinary glass tubing two-fifths of an inch in diameter and of good thickness is cut into three-inch lengths with a file and the edges rounded off in the flame of a Bunsen burner. A piece of tubing this size easily holds a thread of catgut ten feet long as commonly sold. The gut is wound in a single layer on the tubes, not too tightly, taking care not to twist or unravel it, and secured at both ends by the "first stage" of a "surgeon's knot." A piece of fine silk or cotton thread is then run through the tube and knotted outside. This facilitates the subsequent handling of the catgut in transferring it from one solution to another. It is then placed in a 1 in 1000 solution of chromic acid for 48 hours, when it becomes a rich brown colour. It is then transferred without washing to a jar containing ordinary sulphurous acid. The catgut lies in this for a further period of 24 hours, when it assumes a greenish hue. From the acid the gut is finally placed in methylated spirit made up to 1 per cent. with thymol (approximately $4\frac{1}{2}$ grains of thymol to the ounce of spirit). For the whole process I used three 12-ounce bottles, such as are commonly used for the dispensing of tablets in bulk. The mouths are wide and stoppered with cork. The threads, each fastened to a tube of catgut, are left hanging out of the mouth of the bottle, which is then stoppered with its cork. Extensive bacteriological examination of catgut prepared in this way shows it to be free from organisms. Experiments were made as follows. Catgut was cut into two-inch lengths, soaked in normal saline solution, and when soft gently unravelled. A virulent culture of anthrax bacilli and spores was rubbed into the substance of the gut, which was then allowed to dry. The infected catgut was placed in the chromic acid solution and then transferred to a gelatin Petri dish. Colonies grew with great profusion. Some gut was placed in chromic acid solution, then in sulphurous acid, and then into gelatin. This killed most of the bacilli, but did not seem to have much effect on the spores. Catgut was then put through the entire process, with the result that Petri dishes remained sterile. Other organisms experimented with—*staphylococcus pyogenes aureus*, *staphylococcus pyogenes albus*, *streptococcus pyogenes*, and *pneumococci*, the last two from virulent cases of peritonitis—gave like results. The catgut so prepared is sterile, antiseptic, very strong and pliable, and its tensile strength may be relied upon for at least three weeks. Another point in its favour is the cheapness and ease of preparation.

In conclusion, I wish to thank Professor Pearson for permission to use extracts from his readable little book, "Modern Surgical Technique."

References.—(1) Operative Gynaecology, Kelly, vol. i., p. 14; and (2) Operative Surgery, Binnie, p. 621; (3) Modern Surgical Technique, Pearson.

Reviews and Notices of Books.

Surgery, its Principles and Practice. By Various Authors. Edited by WILLIAM WILLIAMS KEEN, M.D., LL.D., Emeritus Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia; and JOHN CHALMERS DA COSTA, M.D., Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia. Volume IV. With 582 illustrations, 22 of them in colours. London and Philadelphia: W. B. Saunders Company. 1908. Pp. 1194. Price 30s. net.

WE are glad to see another volume of this valuable System of Surgery. The first chapter deals with hernia, and it is from the pen of Dr. W. B. Coley of New York. He tells us that he has met with only 39 cases of direct inguinal hernia out of 1950 operations, and that he considers it probable that in the vast majority of inguinal hernias in the male, and practically all in the female, the sac is preformed, and there is no doubt that surgical opinion is inclining very much in this direction. Direct hernias are much rarer than used to be thought. For the radical cure of femoral hernia Dr. Coley prefers a purse-string suture which brings into apposition the roof and floor of the crural canal, and the femoral opening is thus completely obliterated. The article is good and is very rich in illustrations. Dr. R. Abbe of New York is responsible for the chapter on the surgery of the rectum and anus. It begins with a useful account of the anatomy of these parts, but we must protest against the statement that "the fetal development of the rectal structure is from the external epithelial layer of the ovum." The treatment of hæmorrhoids is well described, but the illustration representing Whitehead's operation could convey no definite idea of the operation to anyone not acquainted with it. A good account is given of the various methods of removing rectal growths, but, curiously, nothing is said of the abdomino-perineal operation.

The importance of a thorough examination of the urine before operation in many cases is recognised in this work by the devotion of a special chapter to this subject, written by Dr. D. L. Edsall of Philadelphia, and it is very carefully written, not too much being claimed for urine analysis, but a just appreciation of its importance being shown. Dr. J. Ransohoff of Cincinnati commences his account of the surgery of the kidney and the suprarenal gland by a description of the anatomy, and then he describes the means and methods of examination. He considers that urinary segregation is to be preferred as a routine practice to ureteral catheterisation, for it requires less experience and can do less harm; but he thinks that it is less accurate. As to the value of operation in chronic Bright's disease Dr. Ransohoff says that if the operation is ever justified it should be limited to cases in which pain is a marked symptom or in which profuse hæmaturia or anuria threatens life, and the operation should be limited to capsulotomy.

Dr. Bransford Lewis of St. Louis has supplied the section on the surgery of the bladder. In vesical tuberculosis the local treatment which he considers to be of most value is the injection of iodoform emulsion in liquid vaseline, but he has found that the use of air for cystoscopy in tuberculous bladders has been followed by steady improvement, and though iodoform injections were being employed at the same time he is inclined to think that the admission of air exerted a beneficial influence akin to that seen in cases of tuberculous peritonitis, where simply opening the peritoneal cavity is followed by amelioration. Stone in the bladder forms the subject of a separate chapter, written by Dr. A. T. Cabot of Boston. An excellent description is given of the various methods of removing stone. The author says, speaking of

LEPERS IN INDIA AND THE EAST.—The thirty-fourth annual report of the Mission to Lepers, which has just been issued, shows that during the year 1908, 7295 lepers came under the immediate notice of the society, which has 73 stations in different parts of the East. Some 600 children of leprous parents are being educated in the homes of the society, and as these children as yet show no symptoms of the disease the society is doing really beneficent work in looking after them and keeping them from possible contamination. The expenditure of the society for the year was £28,882, of which £8638 were received abroad mainly in grants from the Indian Governments. Donations should be forwarded to the secretary, 38, Henrietta-street, London, W.C.