as they are only needed for a few days and they are rapidly absorbed. It may be stated as a general rule that catgut should be used in sizes as small as will do the work required in any given case.

In conclusion I wish to emphasize certain points which seem to me of importance: (1) In order to get the best results from catgut, care must be taken to select the size and preparation best suited for each occasion; (2) the use of too large sizes is one cause of unsatisfactory results; (3) care in tying and cutting catgut ligatures is essential to safety.

NEGLECTED METHODS FOR THE STERILIZATION OF "GUM-ELASTIC" CATHETERS.¹

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IN regard to the methods to which I am to call your attention, I would say that they are in no sense original methods of my own. They were new to me when first found and have proved new to a number of men to whom I have spoken of them. These methods I have tested rather carefully and, believing that they deserve to be used, call attention to them.

The first method, that of Herman of Rydygier's clinic, was published early in 1901.² He had found that gum-elastic catheters and bougies could be boiled in a saturated solution of ammoniac sulphate without damage, not only for a few minutes, but for several hours.

Somewhat later Claudius of Copenhagen published an article,³ the original of which I have not seen, stating that "silk" catheters could safely be boiled in concentrated salt solution. A reasonably extended search in textbooks and periodicals, for mention of these or like processes, resulted only in the finding of a passing notice by Alexander, in Morrow's "System," to the effect that gum-elastic instruments could be washed, then boiled in salt solution one drachm to the ounce, dried and dipped in boiling water before using. These three methods seemed worth testing, and have accordingly, especially the first two, been pretty thoroughly tested.

First, as to the ammoniac sulphate method. This salt, $(\text{NH}_4)_2\text{SO}_4$, may be gotten of the wholesale drug and chemical dealers at twenty-five cents or less the pound. It is evidently a by-product and very dirty. It can, however, be cleared by filtering the solution, or, still better, by letting it stand and decanting. The salt is soluble in one and three-tenths parts of water. This saturated solution boils in the open dish at 227° F. For actual use a slightly weaker solution was used. An ordinary open pan was used, over a rose-burner. (a) In the first experiment an ordinary cheap gum-elastic catheter was boiled in this solution two

hours at a time for a total of eight hours. It showed no change of surface or flexibility, though slightly darkened in color. (b) Next, three catheters were boiled for a half-hour, and let lie in the solution for two days without damage. (c) A mixed assortment of seven catheters, bougies and filiforms of various grades⁴ were boiled for ten to twenty minute periods for a total of five hours. They were washed and dried between boilings. Only one—a bougie by no means new—showed a little cracking and roughening. (d) Next, two catheters and an old bougie were boiled three-quarters of an hour and let lie in the solution for twenty hours. The old bougie was a good deal roughened, the catheters intact. (e) A mixed set of catheters and bougies—all new—were boiled for fifteen minutes, absolutely without damage.

Like experiments were made with concentrated salt solution. Salt is less soluble than the ammoniac sulphate, but a saturated solution proved to boil at nearly the same temperature, 227½° F. None of the fifteen assorted instruments subjected to long boiling in saturated salt solution showed any damage, save one cheap black bougie, which blistered slightly.

The method of using 12% salt solution (1 dr. to 1 oz.) was tried only twice, but on these trials boiling for fifteen minutes failed to show any damage to the instruments used.

Most of these experiments were carried out over six months ago, and most of the instruments used were kept, to watch for any late effects. There were none, except that instruments which were cracked before the experiments showed a recurring deposit of feathery crystals at the crack. This, however, like the crystals that form at the eye of catheters so boiled, is readily washed off and leaves no defect behind.

As a result of these tests, I am ready to claim that all the gum-elastic catheters, bougies, and filiform bougies ordinarily sold may be boiled repeatedly and for long periods in saturated (or something less than saturated) solutions of ammoniac sulphate or sodic chlorid without essential damage. New instruments show no damage whatever, used instruments only a deterioration that is of no great consequence. As to a choice between the two, I feel a little surer of the ammoniac sulphate, perhaps, but would choose it not so much because of this as because it is easier to handle and spatters less when it boils down than does the common salt.

As to the weaker solutions of common salt, they seem to be all right, but the tests made are too few as yet to be conclusive. At all events, the use of these more dilute solutions has no obvious advantage and has the disadvantage of lowering the boiling point.

It will be generally admitted that the use of gum-elastic instruments has been limited by the inefficiency of methods of sterilization, and that

¹ Read before the Surgical Section of the Suffolk District Medical Society, Jan. 8, 1902.

² Centrbl. f. Chir., 1901, H. 3.

³ Hospitaltidende, 1901, vol. 4, p. 515, Nos. 13-16.

⁴ It seems impracticable to ascertain the ultimate source of many of these instruments. Suffice it to say that all obtainable sorts were tried.

an easy and reliable method is desirable. It is to be feared that wiping with corrosive has not gone out of fashion entirely. Boiling in water almost instantly destroys the resinous coat of these catheters, as does steam. Formaline sterilization does no great damage, but is unreliable, as various experiments, notably those of Katzenstein,⁶ reported in 1900, have shown. Formaline, here as elsewhere, gives only a surface sterilization at best, and leaves the lumen of hollow instruments almost untouched.

The methods here presented have not been tested bacteriologically, because it seems superfluous. Here is a choice of methods whereby this class of instruments can be subjected to boiling for indefinite periods without damage, and at a temperature, not of 212°, but of fourteen or fifteen degrees higher. The salts used, though not poisonous or essentially irritant, are soluble, and readily rinsed off in boiling or in sterile water.

It would seem that these methods are fitted to remove the reproach of gum-elastic instruments, that they "are not sterile," and to place their sterilization on as firm a basis as that of the metal instruments, with which we rest content.

TWO NEW METHODS OF OPERATING FOR RETRODISPLACEMENT OF THE UTERUS.¹

BY FREDERIO COGGESHALL, M.D., BOSTON.

THE number of operations for the cure of retroversion of the uterus which are now in use is in itself a proof that none of them have afforded perfect satisfaction. I do not think we are any of us quite content, in all cases, with the operations that have been most commonly employed. These are my reasons for drawing the attention of the members of this society to two new operations which have been devised and successfully employed in the West, but which, as far as I can learn, are very little known in New England. Each of them has its special indications, and I have used both in the last few years with highly satisfactory results. The length of time which has elapsed since the earliest of my own operations may not be sufficient to give absolute certainty as to the permanence of the results, if one is to judge only by experience, but the method of securing the uterus is such that I think we can predict with a great deal of confidence that it will prove efficient, without waiting for many years to elapse in order to test its permanency.

The two operations to which I allude are those of Goldspohn of Chicago, which is a modification, or rather extension, of the Alexander operation; and that of Gilliam of Columbus, Ohio, which seems to me very much superior to ventral suspension or fixation in cases where those operations are commonly thought to be indicated. Much of the dissatisfaction with the ordinary

Alexander is due undoubtedly to the lack of knowledge of its technique, so that many men experience a great deal of difficulty in finding the ligaments, and complain that they are liable to break when they are being drawn out. I feel convinced, as a result of my own experience, that the operation is always a short and easy one if properly performed. This is not the place to enter into a discussion of the technique of the operation; I only speak of it, as the first part of the Goldspohn is the same as the Alexander operation. The other objection to Alexander's operation is founded on the assertion that after it has been performed it often fails to give satisfactory results. This, I believe, is due, as I have pointed out elsewhere,² to lack of care in selecting cases. Large numbers of cases of retrodisplacement of the uterus are complicated by more or less disease of the ovaries or tubes, and, in the bad cases of long standing, are almost sure to be complicated by adhesions tending to hold the uterus in its abnormal position. It is in meeting these difficulties that Goldspohn's operation is so much superior for complicated cases of retroversion to the ordinary Alexander. One ordinarily sees unsuccessful Alexander operations in which the uterus has been left to be pulled both ways, forward by the shortened ligaments, backward by the old adhesions, or shortened uterosacral ligaments which the operation afforded no means of breaking up. Again, one sees Alexander operations where the uterus has remained in good position, but the dysmenorrhea and backache has not been relieved because of the presence of sclero-cystic ovaries which the operation has left untouched. It is so common to find a retroversion of long standing complicated by adhesions, shortened uterosacral ligaments, and diseased tubes and ovaries, that an operation which, without adding materially to the seriousness of an ordinary Alexander, will enable us to correct the common complications of retrodisplacement, seems to me to fill a very important place. I assume that it will be granted that the ordinary incision into the abdominal cavity adds sufficiently to the gravity of the operation and lengthens and complicates the convalescence enough to be avoided if possible, provided these conditions can be equally thoroughly treated without it.

Goldspohn's operation, as I have performed it during the last three years, is as follows: The common Alexander incision having been made through the skin, the fat is separated with the fingers to avoid hemorrhage, down to the superficial fascia; this is cut, and the fat again separated with the fingers down to the deep fascia, which is thoroughly cleaned off before any attempt is made to find the ligaments. This makes the ring perfectly obvious, the two pillars being laid bare and standing out distinctly, the fat of the ring can be seen bulging up between them and we know that the ligament lies somewhere below it. The operator then proceeds to find the ligaments. The superficial fat of the ring being

¹ Read before the Suffolk District Medical Society, Section for Obstetrics and Diseases of Women, Oct. 23, 1901.

⁶ Centrbl. f. Chir., 1900, Vereinsbeilage, p. 105.

² American Gynecological and Obstetrical Journal, June, 1901.