Considering the type of case tackled, the results amply justify the treatment, but fortunately there is something more to be said. In the case of a patient with secondary disorders the results of the treatment are still better, for whether the catarrh is cured or only reduced, the general health is improved and the patient gains weight and strength. He ceases to fear chills and "fugs," is in better spirits, and loses the dread (so common in catarrhal subjects) of tuberculosis.

Preparation of Autogenous Vaccines.

I have no experience of stock vaccines, but to those who are interested in autogenous vaccines I should like to say that they will not find nasal catarrh easy at first, but that success will follow if they bear in mind the importance of:

1. A suitable form of nasal swab.
2. The use of good media.
3. The making of cultures *immediately* the swab is taken.
4. The dominating part played by the pneumococcus.
5. The part played by Pfeiffer's bacillus of influenza.
6. Treatment over a considerable period, however rapidly the patient may appear to be cured.

Some day we may know why nasal catarrh, so slight and transient an ailment with most of us, proves so obstinate and intractable in some; meanwhile nothing but good can come from further investigation and discussion.

The recent correspondence in this JOURNAL on infective catarrhs encouraged me to publish these data from my own practice.

THE TREATMENT OF CHRONIC URETHRITIS:

WITH A DESCRIPTION OF A NEW INSTRUMENT
FOR CAUTERIZING THE LACUNAE.

BY

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In the treatment of chronic urethritis, whether due to the gonococcus or some other microbe, local instrumental methods are more than ever in use, and for the present, at any rate, it is clearly recognised that medicines, injections, vaccines, etc., play only a subsidiary part, and are by themselves, in the majority of cases, of no value whatever unless accompanied by instrumental interference.

It will, I think, be agreed that of all instrumental proceedings dilatation, whether by means of sounds or the four-bladed dilator, is the most valuable, but is far too often neglected. If young surgeons would only thoroughly learn the possibilities connected with dilatation of the urethra under all conditions and stages of disease, it would be infinitely more profitable than experimenting with such doubtful proceedings as electrolysis, hot sounds, suction, etc. I have repeatedly seen cases in which the urethra, already narrowed to half its size by recent infiltration, had been subjected to electrolysis for the cure of a discharge without benefit, and not infrequently with positive harm, when a few simple dilatations would have effected a cure.

The treatment of gleet by means of bougies is very old. Benjamin Bell in 1785 was perfectly cognizant of the good effect of dilating the urethra in cases of gleet, and says "that the largest bougie that the urethra will take should be passed for its cure."

In my opinion every case of gonorrhoea—certainly every prolonged attack—should be subjected to a dilatation on recovery. The young practitioner will be surprised to find how frequently contractions will be present without signs or symptoms. He should not take too literally the patient's statement that the stream of urine is perfect. He may be an optimist or merely unobservant. Only a few days ago I performed urethroscopy on a man who complained of a slight urethritis of a week's duration. It was his first attack so he repeatedly assured me. Imagine my surprise on finding an advanced stricture in the bulbous urethra. On being pressed he confessed to a similar slight attack eighteen months before which was not worth bothering about or mentioning. His present non-gonococcal discharge was probably a relapse, after alcohol, of his previous urethritis.

Almost all inflammatory processes of the urethral mucous membrane throw out cellular deposit, of which part, should absorption be at all delayed, becomes

converted into young fibrous tissue. If the irritation be prolonged, sufficient material will be deposited to cause considerable narrowing of the urethra, which may or may not progress to form real stricture, and eventually interfere with the urinary stream. The mucous membrane may heal without instrumental assistance in any of these stages and the discharge cease.

J. D. First gonorrhoea ten months ago, cured in four months. Never had an instrument passed. Wishes to marry, and comes to make sure that he is well. No symptoms, no discharge, no threads. Says the stream is as good as ever. Urethroscopy: Strictures from one to three inches; admits No. 15 F. only. Could dilate only up to 17 F. at first sitting, which means a condition of dense induration. I have partially softened this with the electrolytic sound connected with the positive pole of the battery, after the method of Luys, using 10 milliamperes for ten minutes. The silver-plated sound which fits the urethra fairly firmly may be kept on the move or the current reversed for a few moments before withdrawal. This is the only condition in which general electrolysis of the urethra appears to be of any use.

Occasionally cases of persistent discharge are met with where no infiltration material has been thrown out, and these are among the worst cases one has to deal with. Fortunately they are not common.

E. T. Married recently. Gonorrhoea five years ago; many relapses. Says he has not been reinfected since. Discharge and heavy flakes crowded with gonococci. His wife also has a discharge containing the gonococcus. Urethroscopy: Mucous membrane very flabby, like perished rubber. Four-bladed dilator up to 80. No resistance. Vaccines may be tried. Lost sight of him.

On the other hand, extensive deposits may take place early during an attack, certainly at the end of one month, the result of bacterial activity, often reinforced by the chemical irritation of concentrated injections or strong irrigations.

M. T. First gonorrhoea two months ago. Mild attack with very little discharge. Had solution of argyrol sealed in the urethra for three hours on twelve different occasions; does not know the strength. Gonococci now abundant. Urethroscopy: Pronounced infiltration one to three inches; admits 21 F. with pressure and followed by slight bleeding. After a week 23 F. passed easily without pressure and with no bleeding, showing rapid absorption.

These deposits in themselves are of a beneficent nature, and represent the local effort to combat the disease. They are therefore the surgeon's friend if he recognizes the condition before much organization has taken place. Anyone who has carried out a dilatation or two under such circumstances will remember the astonishing rapidity with which the discharge disappeared. In this connexion it should be mentioned that recent deposits may become absorbed to a considerable extent without the assistance of an instrument if the irritation be removed.

G. B. Gonorrhoea ten months ago. Discharge ceased after two months. Two relapses since. Has used pretty regularly an injection of argyrol 5 per cent., holding it in for ten minutes, three times a day. Urethroscopy: Patchy infiltration stained black by the silver extending from 1 to 4 in.; admits a No. 24 F. cannula only. No dilatation done. To discontinue the injection, and to come for treatment in a week. His military duties prevented him from coming for eight months, when the canal was found to be wide and pale, and with only a trace of sclerosis. He had had no treatment. A 27 F. sound was passed easily, and a few days later a four-bladed dilator up to 68. Recovery was complete.

The commonest region to be affected with infiltration is what may be called the glandular and lacunar area, extending from the lacuna magna at three-quarters of an inch from the meatus for about three and a half inches. It affects in the first place the roof chiefly, but eventually extends around the canal. It is somewhat superficial at first, and if left untreated may heal, leaving behind slight general sclerosis or isolated strictures of large calibre. On the other hand, the infiltration may spread more deeply and the contracting process progress so as to interfere eventually with the urinary stream. It must be borne in mind, however, in connexion with the frequency of infiltration in this region that strong injections which cause, or assist in causing, these deposits are often used indifferently or are intentionally injected so as to reach only 3 or 4 in. of the urethra.

Much less frequently met with is an infiltration of the region of the bulb where severe stricture is commonest. This seems paradoxical, but the explanation is that an infiltration in this situation is of more serious import than elsewhere, owing to the laxity of the mucous membrane

and the quantity of cavernous or spongy tissue surrounding it, which favours extensive deposits of fibrous tissue and rapid contraction. The hypothesis that this region is more prone to inflammation and stricture than elsewhere owing to its dependent position favouring the collection of pus is not borne out by fact, as, urethroscopically, no more secretion is found there than elsewhere. As in the part anterior to it, infiltration of the bulbous urethra begins in the roof, and can be seen as fine white transverse bands on strong air distension. These can be distinguished from the muscular fibres found in this situation by the sharpness and whiteness of their free edges, and sometimes by their asymmetry. When they involve the floor of the urethra they are easily detected, as this part is otherwise smooth and free from ridges. Although the muscular fibres, both smooth and striped, which encroach on the bulb, chiefly on the roof, as an extension of the non-striped sphincter and compressor urethrae, have to be strongly expanded with air before the farthest stricture bands can be seen, I have never seen stricture definitely in the membranous urethra. Stricture has been described, however, in this situation but only as an extension backwards of a bulb stricture, and Bazy and Decloux describe and illustrate with four or five beautiful illustrations the normal and strictured membranous urethra in such a case.³

Infiltration of the prostatic urethra may lead to a certain amount of sclerosis, accompanied by an irregular thickening of the veru montanum, but it does not usually lead to the formation of a stricture, although a few isolated cases have been recorded. This immunity is due to the scantiness of the submucous cellular and cavernous tissue and the firm support provided by the dense fibro-muscular tissue of the prostate. It is significant that the urethra only becomes liable to stricture after it has entered the corpus cavernosum urethrae (corpus spongiosum) at the bulbo-membranous junction, and the rapidity and especially the degree of the narrowing, appears to depend on the quantity of cavernous tissue in its vicinity, which diminishes from behind forwards. On the other hand, the incidence of infiltration runs *pari passu* with the richness in gland elements and decreases from before backwards. The fossa navicularis, which has a smooth mucous membrane covered with pavement epithelium and sparsely supplied with glandular elements, is only occasionally affected with gonorrhoeal stricture.

When to Dilate.

No doubt considerable experience is necessary to decide at what period in the course of an attack it is safe or desirable to begin dilatations. If begun too soon the reaction which follows may develop into a veritable relapse, and this may spread, with its attendant possibilities, to the hitherto healthy posterior urethra. On the other hand, if unduly delayed, or if deferred until the gonococcus disappears, as is advised by some writers on this subject, the inflammatory deposits will be given time to organize into fibrous tissue and the most favourable opportunity for bringing about their absorption allowed to pass, to say nothing of the fact that these deposits shut in and shelter the microbes in the pockets and recesses of the mucous membrane—a most important factor in the prolongation of the disease.

Urethroscopy.

After a month the question of an anterior urethroscopic examination arises. Florid cases must be excluded from this category and their examination deferred. In mild first attacks urethroscopy may be undertaken after one month or sooner, especially if the patients have undergone irrigation treatment and a condition of tolerance attained, or, in other words, the chronic stage anticipated. Second and especially subsequent infections can often be examined after a couple of weeks, the discharge rapidly subsiding after a few good irrigations with a 1 in 5,000 solution of potassium permanganate. Examination with the air-inflation urethroscope is much less irritating than an exploration by means of a *bougie à boule*. If a smallish tube be used, no part of the urethra need be touched except the immediate neighbourhood of the meatus. As a rule—but there are many exceptions—when the posterior urethra is sufficiently affected to dull the urine, anterior urethroscopy, like other instrumentation, must be deferred, although it should be borne in mind that this condition is sometimes kept up by a stricture, due to a previous attack,

which may require dilatation before the urine has cleared or will clear up. The posterior urethra does not lend itself well to air distension, but may be examined by means of a six-inch straight or elbowed tube without air inflation. A better method is by means of a water circulation urethroscope, such as Wossidlo's or Geiringer's. Fortunately a urethroscopic examination of this part of the canal is only rarely necessary, and, as a rule, should not be undertaken until at least nine or twelve months have elapsed, and then only after a course of instrumentation by sounds.

Method of Using a Dilator.

When using a straight dilator one of the blades should be applied to the centre of the roof of the urethra to bring pressure to bear on the important area of the lacunae. The dilator is then closed and rotated just a little so as to bring the blades to a fresh section of the mucous membrane and dilate as before. This is to be repeated once or twice, rotating the instrument each time and taking only three or four minutes over the whole proceeding. The blades of a dilator should be as broad as possible. A good one is made in all nickel by Gentile of Paris. The operator should be familiar with the strength necessary to use under all circumstances, from the gentlest pressure in cases of early soft infiltration to the firm pressure necessary in advanced organization of the deposits.

Dilatation is carried out by means of sounds, so long as the meatus will accept them; afterwards, if it is necessary to go higher, the four-bladed dilator must be used. Straight six-inch sounds and straight dilators are used for the penile urethra and curved ones for the bulbous part. To decide whether a curved instrument should be used or not—and they are not so simple to use as the straight—aero-urethroscopy is invaluable. The bulbous part being a wide and dilatable section of the canal any narrowing is easily detected, except in the immediate neighbourhood of the bulbo-membranous junction, where muscular fibres close the canal and bother the diagnosis. For each time a curved dilator is required a straight one will be used perhaps fifty times. Air or water pressure does not affect the deposits; they only strain the unaffected parts.

Dilatation is carried out about every ten days in early cases of infiltration and every five days in advanced cases. There are, however, many exceptions to this rule. The effect of dilatation being physiological, time must be allowed for absorption of the deposits to take place. If dilatation be repeated too soon in a case of soft infiltration it will be found that the reactive congestion prevents so large a size being soon repeated without bleeding or excessive reaction. The good effect will continue for at least two or three weeks, and the amount of absorption that will follow one dilatation in suitable cases is astonishing. In follicular cases, where the disease is somewhat strictly confined to the follicles, care must be taken not to overstretch the urethra, or injury to the healthy fibrous, elastic and muscular elements of the mucous membrane will result, and a condition of flabbiness or paralysis set up, there being no general infiltration to resist the pressure.

Every instrumentation should be preceded by irrigation of the urethra with a solution of mercury oxycyanide 1 in 5,000, and followed by one of potassium permanganate of the same strength, or of silver nitrate 1 in 8,000. If these details are carried out effectively, a plain dilator is quite as good as an irrigating one. There is no particular degree to which a dilatation should be carried at each sitting. Every case is a law unto itself. The resistance is the guide. In a recent case where resistance is slight the dilator should be withdrawn once or twice and the urethra stripped, when a trace of blood will give warning that enough for the time has been done. The discharge may disappear long before all the deposit has been absorbed. Dilatations should, however, be continued and the urethra restored to, as near as possible, its original size.

The dilator is not often required for the prostatic urethra, large sounds being preferable and usually sufficient, if the meatus is large enough to take them. Silver nitrate irrigations are especially suitable for the posterior urethra in chronic cases, and may be used also either after an instrument or after a prostatic massage, in strengths varying from 1 in 10,000 to 1 in 5,000. In inveterate cases painting the prostatic urethra with a 1 in 8

solution of silver nitrate through a urethrosopic tube is an eminently satisfactory proceeding. Instillation of a solution of silver nitrate is a disappointing form of treatment, except perhaps in chronic inflammation of the vesical trigone, and should be given up in favour of the sound and irrigator.

Instrumentation should be temporarily suspended if gonorrhoeal rheumatism supervene. This applies to the anterior as well as to the posterior urethra. Vesical irrigation after a strong anterior dilatation must be made at a low pressure, not more than 4 ft., or haemorrhage may follow. The usual height of the reservoir is 5 ft. to 6 ft. above the urethra for an anterior and 4 ft. or 5 ft. for a vesical irrigation.

To facilitate the entry of fluid into the bladder if deep breathing and relaxation fail, the patient should endeavour to empty his urethra of the last few drops of urine. This brings the ejaculator urinae into action and the fluid in the anterior urethra will be pumped into the bladder, this being the path of least resistance. The same result may be obtained by the patient endeavouring to close the anus tightly a few times.

Personally I always use a little cocaine to facilitate the entry of fluid into the posterior urethra and bladder, and also for instrumentation. Five or ten drops of a 1 per cent. solution injected into the urethra with an eye dropper and massaged backwards into the posterior urethra is suitable for all purposes. The solution is made up with a 1 in 2,000 solution of mercury oxycyanide, which sterilizes it.

Cauterization of the Lacunae.

The point to which I wish particularly to draw the attention of genito-urinary surgeons is that in a certain number of cases dilatation fails to bring about recovery and the discharge continues, and the question then arises, What more can be done to effect a cure? On performing urethroscopy (and I may say in passing that my pattern aëro-urethroscope with magnifying telescope is the best for the purpose), one, two, or a series of small swellings may be seen along the roof of the urethra (occasionally one may be found situated on the side wall or floor), each with a small, swollen, often crateriform orifice pointing towards the meatus; they may or may not contain pus. These are the inflamed and suppurating lacunae of Morgagni, which may keep up a discharge long after the other parts of the urethra have recovered. Other sources of pus in the anterior urethra are minute abscesses connected with the submucous glands of Littre, which burst and continue to leak through a small sinus on to the surface of the mucous membrane or into a lacuna. The more superficially placed glands and the follicles, which are superficial immature glands of Littre, usually empty their inflammatory contents through their natural outlet.

It is obvious that if dilatations and irrigations fail to clear out these foci—and this often happens—something more has to be done to expedite recovery. In the BRITISH MEDICAL JOURNAL of September 26th, 1908, I described a new method of cauterizing these pockets in the air-distended urethra, which was a great advance on former methods, and this proceeding has been largely adopted by genito-urinary surgeons in this country, the destructive agent used being either silver nitrate or electrolysis. There is not much to choose between these two agents—the latter is the more precise and cleanly, while the former is the more readily available. As in ninety-nine cases out of a hundred nothing more is required than a caustic-covered probe-point for the destruction of these foci, it occurred to me that if a simpler method than the interposition of a collapsible mount, as in my operating urethroscope, could be devised, the treatment would be simplified and brought within the range of a much larger number of surgeons. With this end in view I have had made for me by Messrs. Down Brothers an ordinary four-inch urethral cannula with a small tube running along its inner wall. This inner tube, which is about a millimeter and a half in diameter, tracing it outwards, leaves the cannula obliquely near the flange, and terminates externally right away from the line of vision. A small screw cap fixing a rubber disc, through which the probe passes prevents the escape of air. This arrangement is superior to all devices which entail the passage of the probe through the window of the urethroscope. The distal end of the small tube terminates just within the end of the cannula, and is slightly elevated

to direct the probe a little towards the centre of the urethra. Should the end of the probe when projected not be well seen when looking down the cannula, it may be slightly bent to bring it clearly into view. (See illustration.)

An essential point in its practical use is that the cannula being *in situ* in the urethra, and the probe projected beyond it for three-quarters of an inch or so, the latter need not be touched again, but the probings done by grasping the urethroscope firmly and manipulating the cannula and probe together in the urethra. This leaves the left hand free to steady and make traction on the penis. The expert will often treat the lacunae before commencing dilatations.

Directions for Use.—After boiling the cannula remove the probe and thoroughly dry both. Replace the probe and project it beyond the end of the cannula for an inch. Heat the point in a spirit flame and melt on to the terminal quarter of an inch a minute film of silver nitrate and withdraw the probe into its sheath. This, besides protecting the caustic, ensures a thin film only being used. The oiled cannula is next introduced into the urethra to its full extent, keeping the side containing the probe in contact with the lacuna, the obturator is removed, and the excess of lubricant mopped out with stylet and cotton. The urethroscope is securely fixed into the cannula and air admitted under direct control of the eye. The probe is then projected into the middle of the inflated urethra for three-quarters of an inch or as much as may be necessary, and, as the cannula is being slowly withdrawn and the lacunae brought into view, it can be introduced into them while tilting the distal end of the cannula a little towards the affected wall. This proceeding may be compared with that of slipping the hand into the inside breast pocket of the coat, to which a normal lacuna in an inflated urethra may be compared in miniature. All the affected lacunae may be treated at one sitting, but the quantity of silver nitrate will be found sufficient only for three or four without renewal. A lacuna has a depth of only one-sixth to one-fourth of an inch (four to six millimetres), and is comparatively wide, so that the probe should be moved from side to side.

Subsequent treatment consists in the use of a mild antiseptic injection, such as zinc permanganate (one-eighth grain to an ounce of water), by means of a hand syringe, or, better still, a daily irrigation with a solution of potassium permanganate 1 in 5,000. The patient should be warned of some increase in discharge for a day or two, and that possibly it may be blood-stained. After a week or so dilatations are resumed. If a urethrosopic examination be undertaken at the end of a fortnight the cauterized lacunae may be found distended with the air used for inflating the urethra. This phenomenon occurs frequently also in lacunae that have recovered from prolonged inflammation without having been subjected to cauterization, and is due to the cicatrization and contraction of their free edge, which then acts like the taut string of a bow. This appearance occurs normally in a well developed lacuna magna, so that its interior can be viewed under aëro-urethroscopy.

This altered condition of the lacunae is one of the reasons why the urethra that has taken a long time to recover, or has been subjected to many attacks, recovers

from a new infection with such remarkable rapidity after a few irrigations with potassium permanganate, the solution freely entering the lacunae and flushing them out.

It is advisable to stock at least a couple of these tubes, and a 22 F. and a 26 F. are useful sizes, but any size can be obtained. Other uses may be made of these tubes: for instance, the small inner tube may be made longer than the cannula to form a syringe, or a capillary syringe may be passed instead of the probe. A silk covered wire is used for electrolysis. On one occasion I used it as an écraseur by passing a fine steel wire doubled from the

distal end, thus forming a loop. The base of a wart which has been shaved off with the thinned end of a cannula, or a warty area, can also be cauterized in the distended urethra.

I have used this method of treating the lacunae constantly for five or six years and can thoroughly recommend it as a practical, efficient, and expeditious substitute for the probe and collapsible mount.

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OBSERVATIONS ON THE ILEO-CAECAL VALVE IN MAN.

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A PATIENT has recently come under my care in whom the ileo-caecal valve was visible on the surface. Exceptional opportunity was therefore afforded for observations on its behaviour.

The patient, a well nourished, intelligent man, aged 39, suffered from dysentery in Salonica in December, 1916. In September, 1917, caecostomy was performed at another hospital on account of chronic dysentery. The whole of the caecum prolapsed through the wound and turned inside out, and this condition has remained ever since. The large intestine has been irrigated regularly, and there is little or no discharge from it now. An operation to remedy the condition is contemplated shortly, probably

FIG. 1.—The ileo-caecal sphincter at rest.

excision of the caecum and ascending colon with the termination of the ileum, and end-to-end anastomosis of the ileum and transverse colon.

PRESENT CONDITION.

A mass of prolapsed bowel, about the size of a large orange, is seen over the right iliac fossa. It is covered with mucous membrane, which is the mucosa of the caecum turned inside out. At the upper end the orifice leading to the ascending colon can be found beneath a fold. There is no thickening or inflammation or ulceration. The thin wall of the caecum is spread out over coils of ileum, which are not themselves visible, but through the covering of caecum it can be seen that these coils of ileum are in incessant peristalsis; fasting or feeding they are never still.

THE ILEO-CAECAL VALVE.

In the centre of the protuberant mass the ileo-caecal valve is plainly visible all the time. In the somewhat similar case described by A. H. Rutherford¹ the valve could only be seen by drawing aside a fold of mucosa. Through the orifice all the motions pass and are collected in a receptacle. Nothing passes on into the ascending colon.

It is clear at a glance that the ileo-caecal valve should rather be regarded as a sphincter than a valve. It is oval in shape. There is a well marked ring of muscle surrounding it, slightly raised above the surface. Three or four puckers are visible radiating from the slit-like orifice. When the sphincter is contracted it is about three-quarters of an inch long. No folds of ileal mucosa are then visible. It grips the inserted finger.

When the patient is lying quiet in bed the sphincter remains closed, and nothing comes through for hours at a time. Occasionally there may be a little passed, but I have not seen it myself. When the patient is up and about there is rather more activity.

The effectual factor in bringing about activity is the taking of food by mouth. This never fails. Fluids or solids have the same effect, but especially a proper meal of solids. I have timed the reflex on various occasions. It may take place in one and a half minutes, or may be delayed for four minutes.

When activity commences the sphincter relaxes, the orifice lies patent, and may measure $1\frac{1}{2}$ in. across. Folds of ileal mucosa are exposed to view. Having relaxed, it does not contract again until activity ceases, in this respect differing from the pylorus.

First there comes through a spit or two of gas and bubbles, then follows a gush of liquid orange or brown-coloured faecal matter. This continues to come through in

FIG. 2.—The ileo-caecal sphincter relaxed after taking food.

gushes of about $\frac{1}{2}$ oz. at a time at intervals of half a minute, more or less. This goes on whilst food is being taken, and for a variable time, usually about an hour afterwards, unless the food consisted only of a biscuit or glass of milk, in which case the orifice ceases to discharge after twenty minutes or so. Articles of undigested food, such as currants, take about six hours coming through from mouth to ileo-caecal valve.

SPECIAL OBSERVATIONS.

Secretion of Succus Entericus.—On one occasion, just after taking food, the first gush to come through was not faecal, but consisted of a drachm or two of clear watery fluid. It seemed as if the swallowing of food had provoked a reflex secretion of succus entericus, and that on this particular occasion there happened to be no faecal matter in the terminal inches of the ileum, so that the succus entericus came through in a pure state. In ordinary it would be mixed with faeces.

Acid and Alkali Reflexes.—It is well known that the pylorus is controlled by the acidity or alkalinity of the contents of the duodenum. I applied acid solutions, and on another occasion alkaline solutions, to the caecal mucosa near the orifice, both when it was active and when it was quiescent. Neither acid nor alkali had any obvious effect in hindering or stimulating the activity of the ileo-caecal sphincter. This point, as far as I know, has not been investigated before, but the result is not surprising. The conditions of activity of the pylorus and the ileo-caecal sphincter are quite different.