3. The so-called prodromata of acute glaucoma are slight exacerbations, and are evidence that glaucoma has been present for a considerable period.

4. Glaucoma may exist for many years without producing any symptoms whatever and without producing any field changes.

5. The period between the beginning of the glaucomatous process and the development of field changes may be called the pre-perimetric stage.

6. The earliest field change produced is "baring of the blind spot."

7. "Enlargement of the blind spot" or a tuft-like or flame-shaped scotoma is not an initial field change. The arcuate scotoma is a relatively late field change and does not begin as an outgrowth from the blind spot.

8. There are three stages in early glaucoma. (1) The initial stage, without symptoms—the stage of the glaucoma patient. (2) The pre-perimetric stage, without field changes. (3) The stage presenting early field changes. The early diagnosis of glaucoma cannot be made in the first stage, but should usually be made in the second stage.

9. Glaucoma is to be diagnosed by the clinical picture as a whole, not by any one sign. The only pathognomonic sign is increased tension, and this is not always easily elicited.

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A meeting of the Tuberculosis Association will be held at 26, Portland Place, W., on Friday, November 22nd, at 5.15 p.m., when addresses will be given by Sir StClair Thomson on "Tuberculosis of the Upper Respiratory Tract" and Mr. H. R. Bickerton on "Tuberculosis of the Eye." At 8.30 p.m. Dr. E. L. Middleton and Dr. P. Heffernan will speak on "Industrialism and Tuberculosis." Further meetings of the association have been provisionally arranged as follows: In London, January 17th, 1936, Dr. Noel Bardswell, Dr. J. G. Johnstone, and Miss Marx, "After-care of the Tuberculous in London"; Dr. James Maxwell, "Intestinal Tuberculosis"; February 21st, Dr. H. H. Scott and Dr. C. H. C. Toussaint, "Primary Tuberculosis in Children and its Relation to Meningitis"; Sir Henry Gauvain and Mr. G. R. Girdlestone, "Treatment of Tuberculous Lesions of Bones and Joints"; May 15th, Sir Leonard Rogers and Dr. Andrew Morland, "Climate and its Relationship to Tuberculosis"; Mr. J. E. H. Roberts and Dr. F. G. Chandler, "Recent Advances in Thoracoscopy and Adhesion Section." Cambridge meetings: April 2nd, Dr. Hagius van den Berg (Amsterdam), Dr. R. H. Hazemann (Paris), and Dr. N. Tattersall, "Dispensary Organization"; Dr. Russell Reynolds, "Cinematography of the Chest"; annual dinner at St. John's College. April 3rd, Professor Sayé (Barcelona), "Chronic Miliary Tuberculosis"; Dr. Maurice Davidson and Dr. L. B. Stott, "Capacity for Work in Pulmonary Tuberculosis"; visit to Papworth Settlement. April 4th, cases for discussion; annual meeting.

OIL-SOLUBLE ANAESTHETICS IN
RECTAL SURGERY

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It is the purpose of this communication to introduce an improved formula of anaesthetics in oil, having a prolonged action, and being painless on injection, for the treatment of painful conditions particularly in and around the anus.

Since 1927, when Yeomans, Gorsch, and Mathesheimer introduced benacol for the treatment of pruritus ani, much attention has been given to local anaesthetics having a prolonged action. These workers used a solution consisting of equal parts of para-amino-benzoate and phenomethylol in ninety parts of rectified sweet almond oil. Oil was the solvent because, owing to the slow rate of diffusion from it of the dissolved anaesthetic substances, anaesthesia and relaxation of the musculature is prolonged. In this country Gabriel in 1929 employed A.B.A. (3 per cent. ethyl-para-aminobenzoate, 5 per cent. benzyl alcohol, and 10 per cent. ether in almond oil); an alternative solution being 0.5 per cent. procaine, 10 per cent. benzyl alcohol, and 1 per cent. phenol in almond oil. These solutions often gave rise to pain on injection and very often to severe pain several hours afterwards. The anaesthetic effect and the relaxation of the anal musculature were good but rather uncertain.

During the past two and a half years trial has been given to many and varying combinations of oil-soluble anaesthetics at St. Mark's Hospital, in the search for a solution which does not produce immediate or delayed pain after injection. Details of these experiments are given at the end of this article. The following formula has proved in a large number of cases to be the best: procaine base 1.5 per cent., butyl-para-aminobenzoate 6 per cent., benzyl alcohol 5 per cent., in sterilized almond oil. This solution owes its painlessness on injection to the adequate concentration of procaine base and to the elimination of ether. Its prolonged anaesthetic property is due partly to the slow rate of diffusion from the oil and partly to the prolonged action of the butyl-para-aminobenzoate. If this solution be sufficiently warmed and injected slowly it appears clinically that anaesthesia is almost immediate.

The advantages of this solution over those that have been previously tried are: (1) Its effect is almost certain. (2) The injection is painless, if given slowly. (3) In no case has there been any severe after-pain. (4) Anaesthesia or hypo-aesthesia is produced for periods varying from seven to twenty-eight days or longer. (5) Relaxation of the anal musculature is much greater and more prolonged. (6) The preparation is comparatively non-toxic; 20 to 30 c.cm. may be injected without any general ill effect. (7) Even when a large quantity (30 c.cm.) is given on one occasion, no local reaction is observed if the injection is skilfully performed.

General Technique of Injection

Though the technique of injection has been admirably described by Gorsch, Gabriel, and others, there are certain modifications and improvements, as well as an extension of the uses of oil-soluble anaesthetics, that justify a full description of the method of injection. The large branches of the motor and sensory nerve supply of the perianal region, mainly the inferior haemorrhoidal nerves and the perineal branches of the fourth sacral nerves,

approach the anus from the postero-lateral aspect. They lie deeply in the subcutaneous fat, even at the anal verge, and pass inwards through the external sphincter muscles. The solution must therefore be injected into the deeper tissues at the inner boundary of the ischio-rectal fossae as well as into the more subcutaneous plane.

The ampoule of the anaesthetic solution is placed in hot water at a temperature of about 110° F. for a few minutes, and the contents drawn directly into a warm and dry 10 c.cm. syringe. The skin in the region of the injection is cleansed with spirit and iodine, and the injection is made with due care for asepsis. In nervous subjects an intradermal wheal is raised, using a small hypodermic needle (No. 20) and 1 per cent. procaine. Through this wheal the solution is injected into the deeper subcutaneous tissues, using a No. 8/10 needle. The injection is given very slowly and evenly, and the oil is placed ahead of the advancing needle; no pooling of the solution should be allowed, and in no circumstances should it be injected into the skin or through the anal wall. If any swelling is seen the injection is not deep enough and sloughing may occur.

When the required amount has been injected, massage of the parts ensures an even distribution of the anaesthetic. On no account should an injection be given in the presence of acute sepsis. When there are excoriations the needle must be inserted through clean normal skin.

Fissure-in-Ano

In the cure of recent fissures with associated anal spasm this solution has been found most effective. It is also useful in the palliative treatment of more chronic indurated fissures before operation or in cases in which, for any reason, operation must be postponed or is contra-indicated.

A patient who was bed-ridden with advanced pulmonary tuberculosis and asthma suffered from severe pain and discomfort due to a chronic dorsal fissure. All local methods of treatment had failed. The injection of 10 c.cm. of the oily anaesthetic solution completely relieved his symptoms, and made him comfortable for several weeks.

Method of Injection

The patient is placed in the right or left lateral position. If there is extreme pain or spasm it is desirable to paint the fissure with a little aqueous solution of 2 per cent. percaine on a small pledget of cotton-wool wound round a probe before inserting the finger into the anus. The well-lubricated forefinger, its flexor surface toward the fissure, is gently inserted into the rectum, and the terminal joint slightly flexed so that the prominent muscle ring (ano-rectal ring) is gently hooked down towards the operator. It is important to keep this guiding finger quite still. The needle is then introduced in the midline posteriorly about one inch from the anal verge and the solution injected deeply into the sphincter muscles on one side of the anus. The direction and depth of injection is shown in Figs. 1 and 2. The anaesthetic is distributed in a fan-like manner as far forwards as the anterior edge of the anus and as deeply as the structures about 1/4 inch from the pulp of the inserted finger.

It will be noted that the injection is also placed at the outer aspect of the surrounding muscle—that is, the inner boundary of the ischio-rectal fossa. The opposite side is infiltrated in a similar manner without withdrawing the needle. Finally, the subjacent tissues about 1/4 inch on either side of the fissure are treated. From 5 to 10 c.cm. of the solution is necessary for a satisfactory result. Relaxation is usually immediate, and full anaesthesia occurs in a few minutes. The fissure is now treated by any of the many stimulating applications available, or the anus is gently dilated.

Recent fissures can almost always be cured by this method. The injection may be repeated at the end of ten or fourteen days if improvement has not followed the first injection. Failure is due to faulty technique, mainly to superficial or uneven injection. The muscle ring is much deeper than is usually thought, but it can be located with accuracy by the finger in the anal canal.

FIG. 1.—Direction of the injection for fissure.

FIG. 2.—Showing depth of injection for fissure; also infiltration for excision of anal haematoma.

Pruritus Ani

Varying success has followed the subcutaneous and deep injection of many different substances, including 1 in 3,000 hydrochloric acid, 40 per cent. alcohol, and meat broth, etc., for this distressing condition. Injection should only be carried out after thorough examination and elimination of any cause for the pruritus. I believe that failure to improve this condition in suitable cases has been due both to the use of too small quantities and to inaccurate infiltration. It is not claimed that this solution has any specific effect in the treatment of pruritus ani. All that it does is to cut off impulses from the irritable region for long periods. Rest is secured both for the patient and for the traumatized area; the general health and mental stability of the patient are improved, and the damaged skin can now be adequately treated. Repeated small injections of 5 or 10 c.cm. on several occasions are undesirable; no striking effect is produced, and, further, it has been observed that hyperaesthesia may occur where the treated and untreated areas join. Thirty c.cm. of this solution evenly distributed may be injected at one time.

Method of Injection

It is essential that the patient should be put to bed and should be under the supervision of a nurse, because diligent attention must be given to the skin after anaesthetization. A preliminary injection of hyoscine and morphine should be given three-quarters of an hour beforehand, and the injection should be carried out in

the lithotomy position. The skin round the anus is anaesthetized by injection of the oily solution, not only into the subcutaneous fat but also deeply into the ischio-rectal fossa along its inner wall. The injection is made in a fan-like manner through as few skin punctures as will enable accurate infiltration to be carried out; usually four or five punctures are necessary (Fig. 3).

FIG. 3.—Injection for pruritus ani.

FIG. 4.—Details of deeper injection for pruritus ani.

It is important that the subcutaneous fat well up to the anal verge should be infiltrated (Fig. 4). It is here that care must be taken to keep the solution deeply under the skin. The lowest inch of the anal canal is the site of origin of many of the afferent nervous impulses. This fact is shown by the failure of Ball's operation if the nerve fibres passing inwards through the sphincter muscles to the lining of the anal canal are not divided by dissecting up the anal canal inside the muscle ring. For this reason a further injection should be made deeply on the inner side of the anal muscles. This is done by inserting the forefinger into the anal canal, and with the needle introduced about a quarter of an inch from the anal verge and parallel with the guiding finger, $2\frac{1}{2}$ c.cm. of the solution is placed on each side of the canal, again in a fan-like manner, for the depth of one inch from the anal skin (Fig. 4). The solution must not be placed immediately under the lining of the anal canal.

It is important that the skin be kept scrupulously clean by removal of debris, etc., from between the thickened folds. This should be done twice daily and after defaecation, using warm water and white curd soap. It has been found that cauterization of the skin with silver nitrate stick immediately after the injection, followed by the daily application of 5 per cent. silver nitrate in spirit of nitrous ether for four or five days, is most effective for removing

the superficial thickened skin layers. The rugae are flattened out and thorough cleansing in the future will be possible. When the skin has completely healed the application of the following lotion will harden the skin and so prevent further excoriation: solution of lead subacetate $7\frac{1}{2}$ minims, industrial methylated spirits 120 minims, distilled water (recently boiled and cooled) to one fluid ounce.

CASE REPORT

A male, aged 48, had pruritus for years. For the past year he had been very much worse, and during this period had not slept properly. He had undergone all manner of treatments, including two courses of x rays. On examination he was a tired-looking man, miserable and hopeless. The perianal skin was thickened, pale, and sodden, with large hypertrophied rugae, presenting the appearance of old pigskin. Simple hygienic remedies failed to give any relief. He was therefore admitted into a nursing home, and under the influence of morphine and hyoscine the diseased area was thoroughly treated by the method to be described, using 30 c.cm. of the solution. Three small hypertrophied papillae were excised under this anaesthesia, and the skin cauterized with silver stick. The skin was cleaned with soap and water and spirit daily, and silver nitrate in spirit of nitrous ether was applied; this was carried out for six days; after this period simple calamine lotion containing glycerin was used. The patient had a slight degree of incontinence for two days following the injection, and complete numbness was noted for thirteen days. Six weeks afterwards there was hypo-aesthesia of the skin, which was now smooth, healed, and of normal appearance. The patient has improved in general health and has slept well since the treatment, and in a communication recently received—more than six months after the injection—he says that he only has an occasional itch after defaecation which lasts a few moments. He is well and sleeps throughout the night.

The duration of the effect of the injection is variable, but once the local symptoms have been relieved and the patient's general condition and mental outlook have improved simple attention to the skin in this region will prevent recurrence of severe pruritus. It has been observed that after the injection of 30 c.cm. of this solution hypo-aesthesia may remain for months. Should any area become sensitive after fourteen days a further small injection may be given in the affected region.

Minor Rectal Operations

Using this solution, ambulatory treatment of many minor conditions in and about the anus is possible. Anal haematomata (thrombosed external haemorrhoids), hypertrophied anal papillae, small fibrous polypi, etc., may be excised. From 5 to 10 c.cm. is usually sufficient for excision of a large anal haematoma, the injection being given into the subcutaneous tissues around it and also more deeply into the subjacent half of the sphincter. The mass and the skin covering it are excised, and any smaller and deeper clots sought for and also removed. A small dressing is applied and its corner tucked into the anus (Fig. 2).

Anal Spasm

This painful condition may be present without obvious cause, especially in the elderly and in patients who have had fluid stools for years. There appears to be in some cases fibrosis in the external sphincter, especially in its subcutaneous portion. The pain and symptoms can be relieved by injection, and the anus may be stretched daily by the passage of a graduated dilator. The subcutaneous sphincter, if definitely fibrosed, may be divided without using any further anaesthetic. Anal pain may be present, especially in women, without any obvious cause. Injection has completely relieved such patients of their symptoms.

Haemorrhoidectomy by Ligature and Excision

A radical operation for haemorrhoids can be performed after the injection of the subcutaneous tissues around the anus and also of the external sphincter. The technique of injection is similar to that recommended when aqueous procaine hydrochloride is used, but the oily solution must not be injected too superficially. The use of this solution as the sole anaesthetic for the operative treatment of haemorrhoids is not recommended except in certain instances. The chief indications are cases with complicating urinary diseases, old age, and other factors making the use of a general anaesthetic or the eminently satisfactory method of low spinal anaesthesia undesirable.

A man, aged 80, had very large, continually prolapsed internal haemorrhoids. The condition prevented him from getting about in his garden, and his life was unhappy. He was a frail old man, who certainly would not have stood a general anaesthetic and would undoubtedly have had trouble with micturition after a low spinal anaesthetic. A radical operation was performed after injecting 25 c.cm. of proctocaine. He had no post-operative pain whatsoever, and sat up in the ward daily after the first twenty-four hours.

Control of Post-operative Pain

A good deal of attention has been given to methods of minimizing post-operative pain, and various substances have been used to diminish pain after rectal operations. Wheeler and Hertzler have pointed out the value of certain anaesthetics in reducing pain, and the latter used diothane, which is a derivative of phenyl-urethane, with success. Since this substance must be injected into the skin its limitations and objections are obvious. Hayes and Stone have used anaesthetics in a similar manner, and Best recommends the use of carbolyzed vaseline containing percaine.

The injection of 10 or 15 c.cm. of the solution, distributed in a fan-like manner through a single puncture about one and a half inches behind the anus, before the operation has commenced, undoubtedly has reduced post-operative pain and especially the pain on defaecation. It has been found that the insertion of dressings into the anal canal is attended with much less pain and discomfort.

This combination of anaesthetics in oil is effective and without danger when used in suitable cases and when the technique of injection is rigidly followed. Oil-soluble local anaesthetics have earned a permanent and useful position in rectal surgery. It is likely that in the future, with further pharmacological advances, their use will extend into other branches of surgery.

Details of Solutions Used

Solutions containing ether or phenol should be used with care, for the irritating effect of these substances in the tissues may be severe if used in quantity. Ether was included in the original formula to increase the solubility of the ethyl-para-aminobenzoate and to diminish the viscosity of the solution. It was found that ether was unnecessary, and its elimination from the solutions considerably reduced both the pain of injection and the after-pain.

Benzyl alcohol is said to be non-toxic and non-irritating; it possesses considerable anaesthetizing powers, and, in addition, is a valuable solvent, being itself soluble both in water and in oil. It facilitates the gradual diffusion of the other drugs from the oily vehicle to the tissues, and produces a uniform and prolonged anaesthesia. Benzyl salts (benzyl succinate 15 per cent. and benzyl benzoate) were tried as substitutes for the alcohol, but they did not reduce the pain and were not as effective in producing relaxation. It was concluded, therefore, that benzyl alcohol is an essential ingredient in the solution. The addition of chlorbutol (2 per cent.) did not enhance the efficiency of the solution. The vehicle also came under review, but almond oil was found to be the least viscid of the vegetable oils.

In order to overcome the pain on injection and possibly to increase the duration of the anaesthesia, it was decided, in 1932, to add procaine to the formula. Procaine salts are insoluble in oil, but procaine base is soluble in oil, 1 part in 33. Procaine base was therefore added to the solution, first in a concentration of 0.25 per cent., but this was soon increased to 0.5 per cent. This concentration certainly reduced the pain of injection and also the frequency of after-pain, and the anaesthetic effect appeared to be increased.

Concentrations of ethyl-para-aminobenzoate up to 4 per cent. were used; it was impossible to increase this amount owing to its limited solubility. In 1934 Gorsch introduced a solution called anucaine, containing 5 parts of ethyl-para-aminobenzoate, 1 part butyl-para-aminobenzoate, 5 parts benzyl alcohol, and 1/8 part procaine, in sweet oil. He found this solution more efficient than the others he had tried, and he has used it extensively without any ill effects either local or general. For pruritus ani he recommends using 15 c.cm. in two separate injections, followed by a further 5 c.cm. on a third occasion, if necessary. After using Gorsch's solution, butyl-para-aminobenzoate was substituted for the ethyl salt, since it was found possible to dissolve it in oil up to 8 per cent. Furthermore, it has greater anaesthetic properties, and is probably less irritating than the ethyl derivative. It acts both on the nerve endings and on the nerve trunks, and induces a prolonged anaesthesia.

The following solution was tried in thirty-six cases: procaine base 0.5 per cent., butyl-para-aminobenzoate 6 per cent., and benzyl alcohol 5 per cent., in sterilized almond oil.

Seventeen cases of anal fissure, ten of anal haematoma (excision), four of spastic anus, two of polypi and hypertrophied skin tags (excision), one of hypertrophied anal papilla, one of a torn anal crypt, and one of severe pruritus were treated. Except in the case of pruritus, where 15 c.cm. was injected, the amount of the solution used varied from 5 to 10 c.cm. Pain on injection was noted in one case. The immediate anaesthetic effect was good except in one case of fissure. After-pain was reported in three cases. The duration of the anaesthesia was variable—as long as a fortnight in several cases, but the average duration was eight to ten days.

The results so far were satisfactory, but it was sought to improve this solution with a view to increasing its certainty and rapidity of action. The amount of procaine base was therefore increased. Procaine (diethylamino-ethyl-para-aminobenzoate) has a similar physiological action to butyl-para-aminobenzoate; it acts more promptly, but the anaesthesia is less prolonged. The balance of evidence goes to prove that the toxicity of procaine base is no greater and is probably less than the hydrochloride.

When the base is administered in oil its toxicity must be extremely low owing to its very gradual liberation from the solvent. Since more than 30 c.cm. of 2 per cent. aqueous solution of the salt of procaine may be injected without ill effect, the use of 30 c.cm. of a solution containing 1.5 per cent. procaine base in oil must be quite safe. Increasing the amount of procaine in the solutions under trial rendered them more certain in their immediate action. Varying concentrations both of procaine and of butyl-para-aminobenzoate were tried. The following is the formula of the solution found to be the most effective: procaine base 1.5 per cent., butyl-para-aminobenzoate 6 per cent., benzyl alcohol 5 per cent., in sterilized almond oil.

Toxicity of Constituents

Regarding the toxicity of the various constituents of this solution it was found difficult to obtain references to experimental work on animals. It was therefore thought advisable to carry out toxicity tests, and these have been performed in the pharmacological laboratories of the Pharmaceutical Society. I think it may be assumed that if there is a direct relation between the average lethal dose for a mouse and for a man, then the average lethal dose of the solution for a man weighing 10 st. (60 kg.) is of the order of 900 to 1,000 mls. The maximum dose recommended, 30 c.cm., should be quite free from toxicity.

The solutions were injected subcutaneously into groups of mice, each averaging about 20 grams in weight, in three or four different doses, using at least ten mice on each dose. The

solutions were: A, 6 per cent. of butyl-para-aminobenzoate in oil; B, 1.5 per cent. of procaine in oil; and C, proctocaine. The mice after injection were kept under observation throughout thirty-six hours and the final mortalities recorded. Results are shown in Tables I, II, and III, from which the average lethal dose of each solution was calculated—that is, the dose calculated to kill 50 per cent. of a group of mice. The average lethal doses of the Solutions A, B, and C are shown in Table IV.

TABLE I.—Toxicity of Solution A on Mice

Dose of Solution per Mouse (Subcutaneously)	Number of Deaths	Percentage Mortality
mil. 0.25	0 out of 12	0
0.5	7 " 20	35
0.7	5 " 14	36
1.0	11 " 15	73

TABLE II.—Toxicity of Solution B on Mice

Dose of Solution per Mouse (Subcutaneously)	Number of Deaths	Percentage Mortality
mil. 0.25	0 out of 10	0
0.5	8 " 20	40
0.7	11 " 16	79

TABLE III.—Toxicity of Solution C on Mice

Dose of Solution per Mouse (Subcutaneously)	Number of Deaths	Percentage Mortality
mil. 0.25	6 out of 20	30
0.4	15 " 19	80
0.5	9 " 10	90

TABLE IV

Solution	Composition	Approximate Average Lethal Dose in Mils per 20-gram Mouse
A	Butyl-para-aminobenzoate	0.76
B	Procaine	0.55
C	Proctocaine	0.31

It will be seen from these results that proctocaine is toxic towards mice in a dose of 0.31 mg. per 20 grams body weight of mouse.

Results Obtained

Fissure-in-Ano.—Of forty-one cases of fissure-in-ano, thirteen were quite recent fissures and healed after the injection. In three cases the anaesthesia produced was sufficient to allow the subcutaneous external sphincter to be divided without pain either during the operation or afterwards. In only one case was no anaesthetic effect observed. In this case, with a deeply indurated fissure, it is believed that insufficient solution was injected. In five cases a very slight soreness followed the injection, but all the patients could work after treatment. No severe pain was encountered except in one case of multiple fissures, where there was severe pain two days afterwards; this was undoubtedly due to inadequate injection. The length of the anaesthesia varied from seven to twenty-eight days, the average being about fourteen days. In one case the injection was repeated in twenty-one days, after which the fissure healed. The average amount injected was 5 to 10 c.cm.

Anal Haematomata.—In nineteen cases anal haematomata were excised, and in only one was the anaesthesia poor and of short duration. Five c.cm. of the solution was the average amount used.

Haemorrhoidectomy.—Eight cases were operated on for internal haemorrhoids using this solution only. Anaesthesia was good, except in one case, where the hypo-aesthesia necessitated a supporting injection of aqueous procaine hydrochloride. There was little or no post-operative pain in these cases, and at the most there was slight soreness on defaecation. Relaxation of the sphincter usually lasted for five to seven days, but in one case it lasted for sixteen days after operation. In two cases there was marked relaxation for nine and fourteen days. There was some feeling of uncertainty during defaecation in two cases, but true incontinence did not occur. Normal sensation and muscle power returned in all cases. From 15 to 25 c.cm. of the solution was injected.

Control of Post-operative Pain.—Preliminary injection of proctocaine before operation was tried in eleven cases, and great reduction in incidence and severity of post-operative pain was noted. In one case severe spasm after an operation for fissure performed under a low spinal anaesthetic was completely relieved by an injection of the anaesthetic solution several days after the operation. Since this communication the solution has been used as a routine in many more cases before operation, and there has been quite definite diminution of post-operative pain. The amount used has been about 10 c.cm. in each case.

Spastic Anus.—Four cases were treated; all were relieved and allowed the passage of a large rectal dilator without pain. In one case in which, before injection, even digital examination was very difficult, it was possible to inject internal haemorrhoids without discomfort.

External Tags and Polypt.—Nine cases were treated, and the external tags and/or polypt were excised satisfactorily.

Pruritus Ani.—Seven cases of previously unrelieved pruritus were treated successfully. In two very severe cases there was anaesthesia or hypo-aesthesia six weeks after the injection, with relief from irritation. From 15 to 30 c.cm. of this solution was injected on an occasion.

Anal Pain.—One case of pain in the anal canal without an obvious cause was treated by an injection of 10 c.cm. around the anus. The pain was instantly and permanently relieved.

In a hundred cases reported there has been little or no pain on injection when this has been slowly and carefully carried out and no severe after-pain has been encountered. The length of the anaesthesia varied from seven days to six weeks. Relaxation lasted from five to sixteen days. The length of the anaesthesia and relaxation was proportional to the amount injected. There was no delay in healing of the wounds. In no case was there any severe reaction in the tissue and no general toxic effects occurred.

My thanks are due to H. J. R. Bussey, research assistant at St. Mark's, for preparation of the line drawings. I am indebted to Messrs. Allen and Hanburys for their help and co-operation in the production of this formula. It is supplied by them in 5 c.cm. and 10 c.cm. ampoules under the name of proctocaine.

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