

of the prostate is in the same unenviable position, being diagnosed late and being inaccessible.

Sometimes a carcinoma in its primary form readily reacts to radium, but the glands when infected may not react at all; block dissection of the glands still seems the best treatment in carcinoma of the tongue. Some carcinomata, such as that of the body of the uterus, are resistant and not apparently affected by radium. Accuracy of dose in all cases is essential, and that is the great difficulty at the present moment.

Cure is a term we hardly like to use in connexion with carcinoma, for though a round-celled sarcoma may disappear in a few weeks, the patient will probably die from secondary infection in the lungs, just as after an amputation. Delay, however, is less likely with radium, for there should be less shrinking from radium treatment than from amputation. If it can be impressed upon the public that early diagnosis will remove the disease without a mutilating operation a bigger step forward will result than has ever been made in the history of this disease.

#### THE FUTURE OF RADIUM TREATMENT.

It must be clearly understood that the treatment of carcinoma by radium requires the knowledge and the experience of a specialist. Haphazard administration must involve disappointment and bring the method into contempt. It is a regrettable thing to have to say that radium treatment in this country has survived in spite of, rather than because of, institutions which have loaned radium to people totally ignorant of the subject; the indiscriminate

distribution of radon about the country must cease, and radium centres are now being established to supply the needs of different areas. France has already formed a large number of such areas; an expert visits the centres and even subcentres at regular intervals.

Post-graduate teaching is now available at the Mount Vernon Hospital, which, it is hoped, will become the cancer centre of the Empire, and attract research students to it from all parts. This institution has linked itself with the Radium Institute, and a school will be opened in the autumn for the instruction of post-graduates in radium treatment. Very close co-operation is needed between the different branches of the profession, including surgeons, laboratory workers, biologists, and physicists; this has been brought to a high state of efficiency in Paris, Brussels, and Stockholm, and the results there are correspondingly good.

No carcinoma investigation is worth anything unless a really good follow-up department is in use. A patient may be relieved for a time, and a secondary mass appear, which can be dealt with efficiently if seen and recognized at once; patients must therefore be examined at all centres periodically. It is hoped that special travelling facilities by rail may be arranged so that they can come for examination at the London centre of the hospital at a reduced fee. In Sweden all carcinoma patients can travel to the centres free of charge. Results cannot be expected until five years have elapsed, so patience is needed, but it is hoped that organization will soon place London in the forefront of the battle against malignant disease.

## THE TREATMENT OF PRURITUS ANI AND ANAL FISSURE.

BY

W. B. GABRIEL, M.S.,

SENIOR ASSISTANT SURGEON, ST. MARK'S HOSPITAL.

RECENT communications to the *British Medical Journal* by J. P. Scatchard (June 28th, p. 1203) and by A. S. Morley (July 12th, p. 79) indicate that the treatment of anal pruritus and fissure by the method which I described a year ago<sup>1</sup> is proving successful. The method recommended was the subcutaneous injection of a solution composed of anaesthesin 3 per cent., benzyl alcohol 5 per cent., and ether 10 per cent., in sterilized oil, and termed "A.B.A." Since the publication of that paper I have had a large experience of this method, and the present time seems favourable for the elaboration of certain points in the indications and technique which I have found of value.

#### Pruritus Ani.

In pruritus ani it is only the intractable cases which need treatment by injection of A.B.A.; the majority of cases will clear up by simple attention to cleanliness, by the use of lotions and powders rather than ointments, and by careful search for and treatment of any local cause of the pruritus. The attention which has recently been drawn

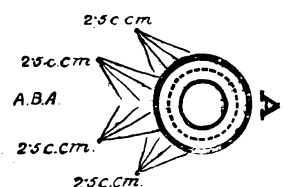


FIG. 1.—Showing injection of 10 c.c.m. of A.B.A. into the two posterior quadrants at the first treatment.

by Colonel W. P. MacArthur (*Journal*, June 28th, p. 1195) to the importance of thread-worms in this connexion is very opportune. In cases of pruritus ani of long standing in which no local cause can be found, I believe the injection of A.B.A. to be the method of choice, and superior in every way to under-cutting operations. With increasing confidence in the use of this solution, I have found that 10 c.c.m. may safely be employed at the first treatment. This amount is injected in relation to the posterior half of the perianal region through four punctures, 2½ c.c.m. being injected at each point indicated in the accompanying diagram (Fig. 1). The reason for selecting this part for the first injection is an anatomical one. The sensory nerve supply to the anus and anal canal is supplied by the

inferior haemorrhoidal nerve, and by the perineal branch of the fourth sacral nerve; these nerves approach from the posterior and postero-lateral aspects of the anus. An injection of 10 c.c.m. of A.B.A. as described above gives the pruritus, so to speak, an immediate knock-out blow, and very little more has to be done. A week later 5 c.c.m. of A.B.A. are injected by two punctures into the right anterior anal quadrant (Fig. 2), and the left anterior anal quadrant is dealt with similarly during the following week. Perianal dermatitis is treated on the accepted lines: cracks and fissures are swabbed with silver nitrate solution, iodine, or friar's balsam, and the patient applies a simple lead or magnesia lotion. Relief of irritation is experienced within a few hours after the first injection. A feeling of numbness develops and lasts for many weeks, so that ample time is afforded for treatment of the dermatitis, and for the patient to forget his anal troubles.

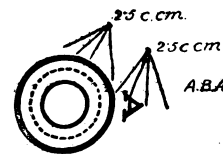


FIG. 2.—Showing injection of the right anterior quadrant at the second treatment. At the third session the left anterior quadrant is injected in a similar way.

In the average case, therefore, I find that the injection of three doses—10, 5, and 5 c.c.m.—of A.B.A. is sufficient for cure. I have given this large dose many times and have had no complications. The solution must be injected deeply in a fan-like manner as described in my original paper, with strict attention to asepsis, and the injection should be made so deeply that no superficial swelling is noticeable afterwards. I might add that A.B.A. is now dispensed by Messrs. Allen and Hanburys in 5 c.c.m. ampoules, which is a more effective amount for use than the original 2 c.c.m. ampoules.

As an alternative to A.B.A., I have for some months been trying a solution of percaine in oil; the remarkable anaesthetic properties of this substance in regard to duration of anaesthesia are well known. The new solution has been prepared for me by Allen and Hanburys, and is composed as follows: percaine 0.5 per cent., benzyl alcohol 10 per cent., phenol 1 per cent., in 5 c.c.m. of sterilized oil. The phenol was added in order to assist the solution of percaine, alkalis having to be avoided, and also on account of its antiseptic effect. Goldbacher<sup>2</sup> has shown that 5 per cent. phenol in oil can safely be injected subcutaneously in pruritus cases. This new solution produces a more rapid effect than A.B.A., and the duration of the

hypo-aesthesia in cases of pruritus is very satisfactory. The percaïne content in 10 c.cm. of this solution (0.05 gram) is well within the limits of safety for adults, and I have only once had any general reaction: this was in the case of a man with pruritus, who, on a hot summer's day recently, became slightly pale and faint after the injection, but quickly recovered.

#### Anal Fissures.

In the case of anal fissures, A.B.A., or the percaïne in oil solution, can be trusted to produce sphincteric relaxation, 5 c.cm. being the usual amount which I now inject into the sphincter. A superficial fissure will heal readily: a fissure with a sentinel tag will heal when the tag has been snipped off, but it is not possible to secure healing of a deeply undermined fissure without a drainage operation. A fissure of this last type is really a submucous pocket or a blind internal fistula, and must be drained back by a surgical operation. Injection of A.B.A. in such a case may relieve the symptoms, and will permit a thorough examination to be made, but it will not cure the condition.

The operation for drainage of a deep undermined fissure is best performed under a low spinal anaesthesia by the technique described by my colleague at St. Mark's Hospital, Mr. J. K. Hasler.<sup>3</sup> With the patient in a sitting position 0.4 or 0.5 c.cm. of stovaine billon in saline solution is injected intradurally through any convenient lumbar interspace. The patient remains sitting for a few minutes before being placed in the lithotomy position; he is then found to have a saddle-shaped area of anaesthesia in the perineum corresponding to the distribution to the skin of the fifth, fourth, third, and sometimes the second sacral nerves. The operation is performed as follows. The sphincter is gradually stretched until five or six fingers can be admitted readily. The undermined pocket is then drained posteriorly, and the sentinel tag is excised. Instead of the usual "lozenge" or diamond-shaped incision which has hitherto been recommended, I now make an incision with square ends, which has great advantages; it gives better drainage, and renders healing of the wound in the anal canal quite inevitable (Fig. 3).



FIG. 3.—Indicating incision with square ends, recommended by the author for drainage of a deeply undermined fissure.

#### REFERENCES.

- <sup>1</sup> Gabriel, W. B.: *British Medical Journal*, June 15th, 1929, p. 1070.  
<sup>2</sup> Goldbacher, L.: *Hemorrhoids, the Injection Treatment, and Pruritus Ani*. F. A. Davis Company, Philadelphia.  
<sup>3</sup> Hasler, J. K.: *Proc. Roy. Soc. Med.*, Section of Anaesthetics, February, 1930, p. 419.

## ANAESTHETIC EXPLOSIONS.

BY

K. B. PINSON, M.B., CH.B., M.R.C.S., L.R.C.P.,  
A.I.MECH.E.,

ANAESTHETIST, MANCHESTER ROYAL INFIRMARY.

Two cases of alleged explosion of chloroform vapour have recently come to my notice. Chloroform is not inflammable; in fact, it cannot be made to burn by itself. A mixture of 2 parts of chloroform with 1 part of ether, or a mixture of chloroform, alcohol, and ether will, however, burn, giving off strong acrid fumes containing chlorine.

I have tried to discover whether in favourable circumstances the vapour of chloroform can be caused to ignite, for in one case there was an explosion when an electric cautery (Cameron's "cauterodyne") was being used in the mouth. I first passed a stream of oxygen through chloroform in a Junker's bottle, and failed to ignite the vapour issuing from it. I thought that the extremely high temperature of the electric spark might in some way render the oxygenated vapour combustible, so I prepared an experiment in which chloroform was boiled in a tin canister with a stream of oxygen bubbling through. The flame of

an oxy-acetylene blowpipe was applied to the vapour, and, subsequently, a fragment of steel was kindled in the vapour with the aid of a jet of oxygen. This procedure resulted in such brilliant scintillations being given off that the heat must have been well over 4,000° C.—the temperature of the flame—and at least as high as the sparks from the electric cautery.

In both cases the chloroform vapour decomposed at once into billows of pungent and acrid black fumes; these did not catch fire, and the decomposition did not continue when the flame was removed, indicating that it was not the chloroform vapour that became ignited in the two cases. Since there is no doubt at all about the facts in the two cases of explosions at operations, I can only say that the occurrences must have been caused either by the inadvertent addition of ether, or by the burning of combustible gases arising from hot and charred tissues in such a confined space as the mouth. This is a probable explanation in the second case, and accounts, of course, for the flickering always seen when using such cauteries.

At least a hundred explosions probably occur every year with ether in this country, causing trifling or severe burns of the eyebrows, lips, and pharynx, but not extending into the lungs, because the mixture is too weak to burn there. The explosions are caused by the ignition of the richer mixture introduced into the mouth by a tube or occurring in the immediate proximity of the soaked coverings of the mask. I feel sure that two or three minutes after stopping the administration of ether the expired air contains too little of the gas to ignite.

For several years I have continually used the ether bomb apparatus, often within two or six feet of an open fire, and frequently much nearer a cautery, without any ignition taking place. The quantity of ether is too small, or too quickly diluted, although, where there is an electric radiator in the room, the pungent fumes of slow combustion can always be smelt above it within a few minutes of the vaporization of even a small quantity. An explosion was reported to have occurred from the introduction of the apparently sound lamp of an oesophagoscope into the pharynx; it must be concluded that the connexion in the lamp socket was sufficiently imperfect to cause minute sparkings, because I have found that a needle introduced into an air-ether mixture has to be at least red-hot to ignite it.

The ordinary optimum mixture of petrol vapour and air in a motor car engine is 1 in 13; in the case of alcohol it is, I believe, 1 in 14, and in that of ether the proportion is probably the same. A weaker mixture would, however, ignite, and so would a stronger, but the limits (without compression) are not wide and the ignition point is considerably raised. When a combustible gaseous mixture is raised to a certain temperature it "fires"; this is its "ignition point." The term "flash point" refers to a liquid, being that temperature at which it gives off inflammable vapour. The temperature at which a hot body introduced into an inflammable mixture will cause ignition depends partly upon the nature of the body.

In this connexion a case was recorded in the *British Medical Journal* of October 17th, 1925, where a dental warm air syringe set fire to ether vapour in the mouth of a patient and resulted in fatal haemorrhage. The nearest flame was said to have been six feet away, and the nozzle of the syringe was certainly not red-hot. In the correspondence which followed this report the possibility of catalytic action, similar to that induced by spongy platinum, was mooted, and also the chance of burning spirit being carried on to the nozzle from the lamp employed to heat it. I can find very few references to explosions.

By far the most serious fires with ether have been caused by bottles being dropped in rooms with open fires or electric radiators. Ethyl chloride will not ignite in air, but it burns with an apple-green flame on the addition of a little extra heat, and more freely with oxygen; curiously enough, however, the condensed substance burns freely with a luminous and smoky flame, which is coloured green near the liquid surface. The explanation of this may be that the jet of gas becomes too rapidly diluted with air, partly owing to the velocity at which it passes out of the nozzle.