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SOME COMMON DISEASES OF THE RECTUM AND ANAL CANAL*

BY

A. LAWRENCE ABEL, M.S.Lond., F.R.C.S.

Surgeon to the Gordon Hospital for Rectal Diseases, the Princess Beatrice Hospital, and the Woolwich Memorial Hospital; Senior Assistant Surgeon, Royal Cancer Hospital

The rectum is the terminal portion of the large intestine, and its opening and closing are guarded by a special sense organ which is peculiar to man. Examination of the anal canal shows a change from the normal skin of the exterior—which extends upwards for about half an inch—into a more shiny, smooth area, terminating about an inch from the surface in a series of small papillae which together make a wavy or dentate line. These papillae consist chiefly of nerve fibres and ganglion cells, and are the nerve endings of the cerebro-spinal nerves which supply this portion of the anal canal. The whole of this area is therefore very sensitive to pain, and any irritation or inflammation leads not only to painful impulses but also to the irregular functioning of the subjacent sphincters. This region of the anal canal is called "the pecten," because the appearance created by the papillae and intervening Morgagnian sinuses resembles the teeth of a comb. Above this level the rectum is lined by columnar epithelium, beneath which lies a large plexus of veins—the superior haemorrhoidal plexus. Enlargements of these veins with their accompanying arteries form internal haemorrhoids. This area of the anal canal, together with the rest of the bowel, is supplied by autonomic nerves, which do not carry ordinary pain impulses. Beneath the skin of the anal orifice lies another extensive network of veins—the superficial haemorrhoidal plexus, which less frequently becomes the seat of varicosities. Rupture of a vein, however, is common and causes a painful subcutaneous haematoma.

Beside the papillae small pockets or crypts, named after Morgagni, form little sacculi, in which bacteria or small foreign bodies may lodge. Irritation of these, or of the mouths of the submucous glands which open into them, may cause tenesmus or neuralgia of the rectum, and set up disturbances of reflexes, which call the patient's attention to his rectum and lead to a perverted function of the intestine. Proximal to this area diseases which are peculiar to mucous membrane occur, while diseases peculiar to skin are found on the distal side.

Examination of the Rectum

Digital examination of the rectum is best carried out with the patient lying in the *right* lateral position, and with the examiner using his left index finger, for the following reasons:

The pelvic colon runs from the left iliac fossa, downwards and to the right, to become the rectum, and, with the patient lying in the right lateral position, this portion

of the bowel falls towards the examining finger, and does not tend to drop away from the latter, as is the case in the more usual left lateral or Sims's position. This leads to a more easy digital examination of a very important segment of the large intestine, not necessarily through the lumen of the rectum, but certainly through its wall. In addition the superior haemorrhoidal veins, which drain the blood away from the pile-bearing area, tend to be more compressed as they cross the brim of the pelvis, and enlargements of the internal haemorrhoidal plexus are readily palpable in the right lateral position, whereas they may be quite impalpable in the left lateral position.

If the examining finger is only passed into and out of the rectum little can be learned. The well-lubricated finger should be inserted slowly into the anal canal, and then rotated until the whole circumference has been carefully felt with the pad of the finger.

Digital examination should always be followed by inspection. The author's proctoscope† which carries its illumination in the handle, has a fenestrum which occupies one-third of the circumference of the distal third of the instrument, and allows a clear view of one-quarter of the anal canal at each insertion, while at the same time the remaining three-quarters are kept free from the field under inspection. For the inspection of the rectum beyond the anal canal a longer proctoscope or sigmoidoscope should be employed, preferably after careful cleansing of the lower bowel with lavage. When pus or blood-stained discharge is present in the rectum a specimen of this should always be removed for microscopical and bacteriological examination.

X-ray examination of the rectum itself is scarcely ever of any value, and is often grossly misleading. Cases of inoperable growth in the ampulla of the rectum are frequently seen in which a negative x-ray examination had been carried out some months before. For a suspected lesion at and above the junction of the rectum with the sigmoid colon x-ray examination should never be omitted, and is of the utmost value. It must, however, always be accompanied by digital and visual examination.

Pathological Conditions

As the anal canal is so well supplied with nerve endings and subject to frequent irritation by infected material, attacks of spasm of the sphincters are common. Straining, with or without constipation, leads to an engorgement of the local veins. These two factors give rise to an impairment of the free return of venous blood and consequent

* The substance of a British Medical Association Lecture to the North Staffordshire Division at Stoke-on-Trent, on March 4, 1937.

† A description of this instrument is given on page 1317 of this issue.

round-cell infiltration in the neighbourhood of the pecten and the deposition of fibrous tissue. This pathological deposition of fibrous tissue, which is also commonly found in other parts of the alimentary canal wherever sphincteric action occurs (especially when under the control of the will) was first described in the anal region by Mr. Ernest Miles, and named by him "the pecten band," because, in established cases of internal haemorrhoids, or in patients who have had a greater or lesser degree of anal spasm, this band of fibrous tissue is formed immediately beneath the mucous membrane of the region described above as the pecten. Its presence leads to a malnutrition of the mucosa in this region, and, depending on its severity, to a degree of dysfunction in the act of defaecation, an increased straining, and further enlargement of the varicosities.

Fissure

The main force of the faecal mass during evacuation of the bowel is exerted on the midline of the anal canal posteriorly, and if, as a result of fibrous tissue lying beneath the mucosa in this position, free movement of the mucosa on the underlying tissue is prevented, then the mucous membrane becomes split and torn. Thus tearing down of one of the anal papillae occurs—in 99 per cent. of cases in the midline posteriorly—and a small oedematous blob of mucous membrane may be seen at the lower end of the crack. Severe pain, coming on immediately the bowels have moved, and lasting sometimes for many hours, is the common symptom. By carefully drawing the anal orifice open the lower end of the crack can be seen, together with the small tag of mucous membrane erroneously called for many years "sentinel pile." As time goes on the edges of this crack assume the appearance of a chronic ulcer, in the base of which the fibres of the tissue forming the pecten band can often be seen. In its early stages fibrous tissue can be caused to be reabsorbed by the application of mercury. The most efficacious ointment for this purpose is one part of unguentum hydrarg. subchlor., *B.P.*, combined with three parts of vaseline. This alone will often effect a cure, provided the bowels are attended to and any piles which have caused the pecten band are dealt with. Combined with this ointment an analgesic should also be employed, in order to relieve the patient's chief symptom and to allay spasm. Either percainal or nestosyl may be used, in addition to or in combination with the mercury ointment. In more chronic cases incision of the fissure, together with the fibres of the underlying pecten band, will be found to be necessary. With much induration the edges of the fissure may have to be excised. Concomitant spasm of the anal sphincters may be alleviated by the intrasphincteric injection of 10 c.cm. of B.A.B.A., with 1 per cent. percaine. Uncomplicated cases may often be treated as ambulatory patients. If large internal haemorrhoids accompany the condition, then the patient should be put to bed and the whole condition radically dealt with by operation.

Piles

External.—The plexus of veins lying immediately around the anal orifice seldom form external haemorrhoids by themselves. One or two small veins, however, frequently rupture, especially in young muscular men, and then form a small haematoma beneath the skin, which presents itself as a painful purple swelling immediately at the anal margin. For many years this has been known as a ruptured or thrombosed external pile. This description is quite incorrect, as the condition is really a haematoma ani. Patients are often seen in whom much discomfort has been caused by frequent attempts to push the haematoma

upwards into the anal canal, under the erroneous impression that the condition is a pile arising from within. All that is required is a small injection of a local anaesthetic, a radial incision, and a pressing out of the clot. The pain is relieved immediately by the operation, and careful cleansing for a few days, together with the application of an astringent antiseptic and analgesic ointment, as detailed above, effects a complete cure.

Internal.—Internal piles are produced by dilatation of the branches of the superior haemorrhoidal artery and their accompanying venae comites. They occupy constant positions in their relation to the circumference of the anal canal, and correspond to the branches of the superior haemorrhoidal artery. Of these, two occur on the right and one on the left, in the positions which may be described respectively as the right anterior, right posterior, and left lateral quadrants of the anal canal. These, together with their accompanying veins, form the three primary piles which, if present, may be found in these constant positions. Smaller branches, from the right posterior and left lateral vessels, which seldom become enlarged before the age of 40, form secondary piles. From the right posterior vessels a pile may arise in the right lateral and the posterior aspects respectively of the anal canal. From the left lateral vessels piles may arise in the left posterior, the left anterior, and the anterior aspects. Careful digital and proctoscopic examination will reveal the exact number, degree, and position of any piles that may be present.

In their early stages the only symptom of piles may be a little blood with the action of the bowels. The dilatation of the veins produces a thinning of the overlying mucous membrane, which readily becomes eroded and allows small haemorrhages to occur. Sometimes a little sense of fullness in the anal canal is experienced. They are difficult to feel on palpation, but are easily seen on proctoscopy. As the vessels dilate the mucosa becomes thickened, fibrosis occurs beneath its surface, and the piles become big enough to be extruded from the anal canal. In this, the second stage, they are troublesome, lead to irregularity of the action of the bowels, come down with the straining of defaecation, but, on account of the changes of their surface, do not tend to bleed. They usually go back by themselves, and, apart from a sense of discomfort, do not produce a great deal of disability. Both these stages of piles respond well to the injection treatment. At the Gordon Hospital for Rectal Diseases we have found that a large injection of 10 c.cm. of 5 per cent. phenol in almond oil into the upper part of the pile gives the best results. Only one pile is treated at a time, the remainder at weekly intervals, and then a period of four to six weeks is allowed to elapse before the case is reviewed to ascertain if further injection is necessary. Two points of technique are important. The dentate or pectinate line of nerve endings must be recognized, and the injection given well above it, otherwise such severe pain will be experienced that the patient will never return for further treatment. Secondly, the needle must be inserted obliquely and for not more than one centimetre, and if this is observed carefully no bad effects will follow.

The third stage of piles is when they have enlarged so much that even the thickened mucous membrane has again become thinned and multiple erosions occur on its surface. The piles themselves have become so large that they come down with each action of the bowels, and even with slight exertion. They do not return of their own accord, and have to be pushed back, and even then cannot with ease be retained inside the anal canal. Through the

eroded surface of the mucous membrane infection among the veins and into the peri-anal lymphatics occurs, and any form of treatment other than operative is fraught with a definite degree of risk. Although it is true that large numbers of patients are much relieved by the injection treatment, even in the third stage, yet there is no doubt that the modern operation carries no risk and has the most satisfactory and lasting results.

Contrary to general opinion the modern ligature operation, carried out with careful pre-operative and post-operative medication, under intravenous anaesthesia and accompanied by the technique of division of the pecten band (pectenotomy), may be rendered so free of discomfort that it is surprising that a horror exists still to such a marked degree in the minds of so many of the public. One extremely valuable recent addition in the post-operative care of these cases is with reference to the frequently accompanying retention of urine. This is of course purely spasmodic in nature, and the spasm is readily overcome in the vast majority of cases by the subcutaneous injection of 1 c.cm. of esmodil, which has often worked like a charm.

Abscess and Fistula

An abscess in the region of the rectum or anus is usually produced by an infection reaching beneath the wall of the canal in the region of the pecten, as detailed above. The pain which accompanies the condition may of course be soothed by the application of heat, but an incision, too soon rather than too late, should be made, as a track is almost invariably present, leading from the abscess cavity into the anal canal, either superficial to, or between the fibres of, or deep to the external sphincter. This can often be laid open freely at the time of the original incision. If such a track is not laid open the abscess is frequently converted into a fistula, and then a subsequent operation is necessary in order to cure the latter. Many workers in this field of surgery have felt and still feel reluctant to endeavour to cure the condition in one operation. We have employed a one-stage operation on several hundred cases, and while no untoward sequelae have ever been noted, a complete cure has been attained, except in a small minority of cases. If a fistula has been allowed to develop it must be laid open freely into the anal canal, provided the iris-like diaphragm action of the levatores ani is not interfered with. Complete division of the external sphincter alone is of no consequence, produces no disability, and is frequently necessary.

Pruritus Ani

Irritation of the mucous membrane of the pile-bearing area of the anal canal and rectum, from whatever cause and whether accompanied by internal haemorrhoids or not, produces an excess of mucus, which, leaking out in minute quantities, irritates the peri-anal skin and causes the itching and soggy skin which is known as pruritus ani.

A peculiar highly strung mentality is common in these patients, and worry is a factor both before and after the development of the condition. Some general factors must always be borne in mind and inquired for: excess of alcohol and too rich a diet frequently accompany it. Constipation or, alternatively, excessive purging are often found. The presence of worms accounts for a small proportion of cases. The urine should always be tested for sugar. External irritants should be eliminated. Those of us who have had the privilege of seeing a large number of our fellow-countrymen's nether garments are aware

that the British housewife loves to do her most thorough darning in the area which is the seat of pruritus ani; these patients often improve considerably if their underclothes are made of pure silk, or at any rate artificial silk. Local pathological conditions, especially piles and cryptitis, with a greater or lesser degree of pectenosis, account for the vast majority of cases. If these pathological conditions are radically dealt with the pruritus usually disappears. Palliative treatment, however, will effect a cure in an early case. Mercury ointment applied well inside the anal canal will have an astringent effect upon the mucous membrane of the pile-bearing area. The skin may be treated for a few seconds with 20 per cent. carbolic acid in glycerin, followed by the application of an ointment. The following is a valuable prescription:

Powdered zinc oxide...	...	...	3 drachms
Liniment of camphor...	...	...	2 drachms
Sterile white vaseline...	...	...	to 2 ounces

If more analgesia is required 10 grains of percaïne hydrochloride may be added. Nestosyl ointment is also often efficacious. Careful attention to the bowels is important. The drug which appears to have the most satisfactory stimulating effect upon the last few inches of the large intestine is senna, and perhaps the most popular and satisfactory method of administering this is as follows:

R Pulv. fol. sennae	...	...	} āā 3 grains
Pulv. rad. jalapi	...	...	
Pulv. sulph. sublim....	...	...	
Theriacae nigrae	...	...	ad 1 drachm

This, taken regularly at night-time in smaller or larger doses according to how it suits the patient, gives a regular, solitary, and adequate evacuation of the bowels each morning. Still more advanced and intractable cases, however, always show physical signs of definite functional or hysteroid tendencies—for example, exaggerated kneejerks, loss of corneal reflex, and areas of patchy anaesthesia. In addition to a radical cure of the local underlying causes by operative intervention, careful treatment with nerve sedatives, and helpful suggestion, may be accompanied by small doses of x rays (half an erythema dose) together with the local application of a bland, oily substance.

Rectal Tumour

(a) *In the Child*.—The commonest tumour in the child is a small adenoma about the size of a cherry, which causes the occasional appearance of blood in the stool and the still more occasional appearance of a small lump outside the anal orifice. This is frequently seen by the mother, seldom by the doctor, and its detection on digital examination of the rectum is most difficult. The simplest method of diagnosis and treatment is as follows: present the mother with a stout piece of thread and tell her that the next time the "cherry" appears at the anus to tie the thread around the base of it—that is, around the "stalk"—and, leaving the thread long, bring the child to see the doctor again. On this occasion, although the cherry cannot be seen, the thread is projecting from the anal orifice. A little traction upon it produces the adenoma again, outside the anus. A fresh piece of thread is then taken and tied very tightly around the stalk. Both threads are then cut short, leaving about an inch. The threads and the adenoma come away in about a week's time, and the child is cured.

(b) *In the Adult*.—The commonest non-malignant tumour occurring in the adult rectum is the adenoma. Seldom single, frequently multiple, they may be present either locally in the rectum alone or throughout the whole

length of the large intestine. If they are not treated malignant changes almost invariably supervene after a period of years. Careful x-ray and sigmoidoscopic examinations are essential in order to ascertain exactly the state of the whole of the large intestine. No barium enema radiograph is complete without draining off the barium and taking a further picture after air-replacement. A localized adenoma may be successfully treated with diathermy, provided that microscopical examinations of portions of it have shown that it is not malignant, and frequent subsequent examinations are made over a period of years to ascertain that there is no recurrence.

Cancer of the Rectum

Cancer of the rectum is almost always a carcinoma, rarely a sarcoma, and this disease constitutes more than one-third of all the cancers of the alimentary canal, including even the mouth. It occurs in three positions: (1) at the anus; (2) in the ampulla of the rectum; (3) at the recto-sigmoid junction.

Carcinoma of the Anus.—This is usually seen at an early stage, as it is accompanied by pain and the presence of a typical ulcer which bleeds easily, and the inguinal glands of the affected side are soon involved. The most satisfactory treatment consists in removal not only of the ulcer but of a large margin of apparently healthy surrounding tissue on each side and deeply, together with extirpation of the inguinal glands. In this situation, and in this situation only in dealing with rectal neoplasms, radium or radiation therapy may be made to play an important part.

Carcinoma of the Ampulla of the Rectum.—A long latent period exists between the commencement of a carcinoma of the ampulla and the onset of symptoms. This may extend to several months, and often the first symptom is nothing more than a sense of fullness of the rectum after the bowels have moved. When this has been present for some time there may be a sudden attack of either diarrhoea or constipation, and ultimately the frequency of the bowel action becomes definitely increased. Diarrhoea occurs, accompanied by the passage of blood and mucus, the sense of fullness gives place to a definite aching, and the patient begins to lose both weight and appetite. The diagnosis is easy, provided a careful digital examination is made.

Carcinoma of the Recto-sigmoid Junction.—Here again the onset of symptoms may be delayed long after the growth has made its appearance. The first symptom is usually a definite attack of *altered bowel action*. For example, a patient who has been perfectly regular in his habits suddenly gets an attack of obstinate constipation, which may continue for several days or weeks in spite of a large variety of aperients. Another patient, who has been habitually constipated, is suddenly delighted to find his bowels acting freely. Not until definite stenosis occurs and the condition has become considerably advanced do the well-known symptoms of alternating diarrhoea and constipation make their appearance, together with the passage of blood and mucus. The diagnosis is not by any means easy. Examination with the right index finger with the patient lying in the left lateral position seldom enables the examiner to detect the growth. If, however, the patient is examined with the *left* index finger with the patient lying in the *right* lateral position, the recto-sigmoid region is usually brought within reach of the finger and an early diagnosis can be established. Every suspicious case should, in addition to a digital examination, have a sigmoidoscopic examination, and this should be done before, and not delayed till months after, a barium enema.

Operability of Cancer of Rectum

The vast majority of cases of cancer of the rectum are alleged to be inoperable when they are first seen. First, because a large number of medical practitioners still believe that every cancer of the rectum is inoperable. Secondly, because in many of these cases there is a mass of impacted faeces due to the obstruction and to the powerful peristaltic action of the large intestine, and when the rectum is examined the whole mass is mistaken as being fixed, immovable, and quite inoperable. If the examination is repeated after seven or ten days of careful aperientization and wash-outs, it is often found that a large proportion of the mass has disappeared, and the condition obviously is now freely movable and easily operable. Thirdly, with modern technique many patients who were thought to be inoperable a mere ten years ago are now found to survive the operation without any undue anxiety, and operability has risen in our hands from 30 per cent. to over 50 per cent.

Palliative Treatment

Colostomy.—A well-established colostomy in the left iliac fossa, consisting of the exteriorization of a complete loop of the sigmoid colon, subsequently treated with one daily wash-out, is a most satisfactory operation. In the inoperable case it should be performed early rather than late. Owing to careless management a colostomy was for a long time regarded as producing more distress than otherwise, but in recent years its regulation is so satisfactory that its advantages are considerable in the majority of cases.

Diathermy.—In patients whose general condition prohibits the employment of radical treatment diathermy has a definite and most useful place, and in cases in which the growth is inoperable a painful and discharging growth may be kept almost symptomless, sometimes for many years.

Radium.—Except at the anus, cancer of the rectum is markedly radio-resistant, and my experience has led me to believe that its use in this position as a general rule does more harm than good.

Radical Treatment for Cancer of Rectum

The cure of cancer of the rectum depends upon three main factors: (1) the knowledge of the pathological paths along which the growth tends to spread; (2) the planning of an operation to include as much as possible of the fields of spread; (3) careful pre-operative, operative, and post-operative attention.

1. PATHOLOGICAL PATHS OF SPREAD

The way in which cancer of the rectum spreads was clearly and accurately demonstrated by Mr. Ernest Miles over a quarter of a century ago, and the present position of the treatment of cancer of the rectum throughout the civilized world has been built upon his well-laid foundations. Cancer of the rectum spreads by lymphatic channels in three directions: (a) downwards towards the ischio-rectal fossae; (b) laterally, on the levatores ani muscles; and (c), most important of all, in an upward direction along the course of the inferior mesenteric artery, and thence laterally towards the wall of the pelvic colon.

2. PLANNING OF AN OPERATION

The earliest possible removal of the widest possible field gives the largest percentage of cures in cancer of any organ. Cancer of the rectum is no exception. In fact,

radical extirpation by the abdomino-perineal method produces the highest percentage of cures compared with those in any other situation. It is believed that anything short of a radical operation is literally playing with a patient's life; and while isolated instances of operations that have preserved the sphincters (though not always preserved control) are recorded, it must always be recognized that anything short of an operation which includes all possible fields of lymphatic spread, though frequently proving a brilliant success for a year or two, is a gamble in which the patient's life often ultimately becomes forfeit.

When operating for cancer of the rectum three main surgical principles should be borne in mind:

(a) As indicated above, not only the growth but also all removable fields of lymphatic spread must be extirpated as widely as possible. As the upward spread demands the most careful attention, extirpation should be effected up to the point where the left colic artery arises from the inferior mesenteric artery.

(b) Before a primary growth is tampered with or manipulated in any way, the majority of the blood and lymph vessels which are liable to transmit metastatic cells to the venous and lymphatic circulation should be ligated when possible. This is easily done in the abdomino-perineal operation, in which the first step is to tie a ligature around the inferior mesenteric artery and vein and the accompanying lymphatics, opposite the bifurcation of the abdominal aorta. Primary dissection is therefore carried out as far as possible from the original growth, as is also all subsequent dissection.

(c) Where an operation involves two different fields, one of which is relatively less infected than the other, the less infected should be dealt with first and closed off, and the more infected second, so that the former may not be infected from it. The only operation which fulfils these fundamental principles is the radical abdomino-perineal operation, introduced in 1907 by Mr. Ernest Miles. Its performance is easy and quick, seldom taking an hour for the whole operation. It is tiring to neither patient nor surgeon, and more than a minimum of shock is conspicuous by its absence. It has a low immediate mortality and, as will be shown, a high cure rate. Five years ago I reported seventy-six consecutive cases with six deaths—a mortality of just under 8 per cent. These included seven patients of 75 years of age and one of 76, of whom only one died. With a bolder attack upon more advanced cases the rate has risen slightly since.

3. PRE-OPERATIVE, OPERATIVE, AND POST-OPERATIVE TREATMENT

In the *pre-operative treatment* of the patient care should be taken to restore and build up his vital functions as much as possible. Close attention should be paid to the state of the intestines, and if in spite of careful use of aperients and lavage any suspicion of obstruction remains, as shown either by a clinical examination of the colon or by a raising of the patient's blood urea, a preliminary caecostomy or colostomy should be established some days before the radical operation. All treatment likely to produce dehydration should be stopped for a full forty-eight hours before operation, and any lack of haemoglobin or red cells combated by a preliminary blood transfusion. Careful premedication with a safe dose of omnopon and scopolamine, followed by the induction of anaesthesia by the intravenous route before the patient leaves his bed, do much to combat psychic shock.

In the *operative treatment*, during operation I find the best results follow the use of a spinal injection of 1 in 1,500 percaine, which cuts off all noxious impulses, lasts

for several hours, and is followed by less fall in blood pressure than with other types of spinal injection and by no untoward sequelae. Ether and chloroform are rigorously excluded, and general anaesthesia is continued by nitrous oxide oxygen.

Details of operative technique are too many to outline here, but two important points should be mentioned:

(i) *Absolute Aseptic Intestinal Division*.—This is carried out by Mr. Zachary Cope's modification of De Martell's three-bladed clamp. When the bowel is to be divided the three blades are applied and the centre one removed. Division is then carried out between the two clamps, which are left *in situ*, by means of the actual cautery, and an absolutely aseptic division of the intestine thereby takes place. This ingenious instrument would not appear to have received the recognition it deserves.

(ii) *Presacral Neurectomy*.—As it is impossible to carry out a radical removal of the rectum without damaging the parasympathetic nerves it is advisable to relieve the bladder of a tonic contraction of its sphincter by removing the presacral nerve as a routine. The effect of this has been to abolish the need for a catheter, except in the small minority of cases, thereby preventing urinary infection and making the post-operative period much easier. At the same time the path of deep pain impulses is removed.

Post-operative Treatment

Over thirteen years ago I began to give a blood transfusion as a routine post-operative practice for all cases of major abdominal work. For over five years it has been my practice to follow this with continuous intravenous saline-glucose infusions for at least twenty-four hours, and preferably longer. By far the most satisfactory apparatus for this is the Baxter vacoliter, using 5 per cent. dextrose in normal saline at the rate of 3,000 c.cm. in twenty-four hours, or one litre every eight hours. This solution is never followed by reaction; it is apyrogenic; when it has been continued for four or five days it has caused no venous thrombosis; and it does not need warming. During this time nothing whatever is allowed to be taken by mouth. These measures have had a beneficial influence upon the mortality of all major abdominal cases, including the abdomino-perineal operation.

In October, 1935, I reported to the American College of Surgeons upon 164 survivals of this operation, performed by members of the staff of the Royal Cancer Hospital during the ten-year period 1920–9 inclusive. Of these cases 104 were alive and well five years or more after operation, and fourteen were untraced. Out of all survivals 63.4 per cent. were known to be alive and free from signs of the disease five years after operation. If the untraced patients are ignored (and search at Somerset House failed to find evidence of their death) 104 out of the 150 cases traced represents a five-year cure rate of 69.3 per cent.

In a recent communication to the French Academy of Medicine the statistician M. Marcel Moine calculated that if, since 1846, the French death rate had remained unchanged while the birth rate declined as it has the present population of France of about forty-two millions would have fallen to twenty-eight millions. But if the birth rate of 1846 had not changed and the country had benefited from the actual decline in the death rate since 1846, then the population of France would to-day be eighty-nine millions.