may know that he has as surely saved the life of such a patient as if he had removed a cancer, but the patient may not appreciate it, and may be tempted to compare his last state with his former, even though he may be cured of his disease and have gained greatly in flesh and strength. Therefore it is always better to bring the upper end down to the site of the natural anus when it can be done without too much danger of sloughing.

This point having been decided and the gut having been fitted to the position it is to occupy, the toilet of the peri-

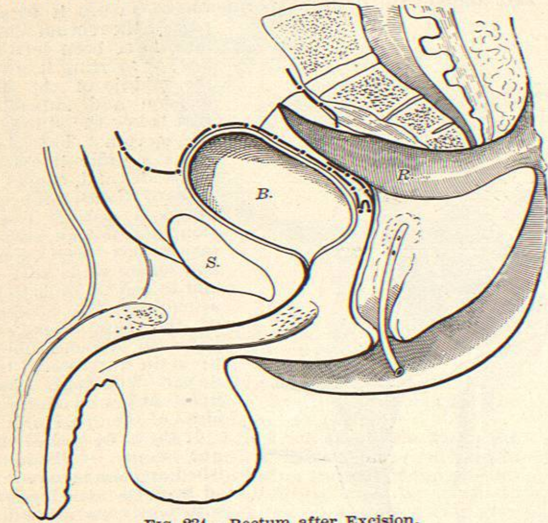

Fig. 234.—Rectum after Excision.

toneum may be attended to. This is much the same as in an ordinary laparotomy—hot douches with saline solution, or sponging till all fluids are removed from the deep portions of the wound.

Should the operator prefer to close the opening into the peritoneum by a separate catgut suture, this should next be done. It is not difficult to find the ragged margins of what is now left of the *cul-de-sac*, to run these margins together by a continuous suture from below upward, and finally to close the peritoneal cavity by stitching the edges of the torn peritoneum to the peritoneal layer of the bowel. I do not, however, consider this separate suture to be necessary.

Fig. 164.—Sacral Artificial Anus.

The end of the gut should next be stitched to the skin at the point decided upon, and all parts of the wound should be drawn together as carefully as possible by deep and superficial sutures. The cavity left by removal of the rectum is too large, however, for perfect apposition of the parts or for union to be expected by first intention, and a drain of aseptic gauze should be passed down to its deeper parts. Free oozing will always take place from the bed from which the anal portion of the gut has been removed, and this can best be stopped by a few deep sutures in the final closure of the wound. In fact, it often cannot be stopped in any other way.

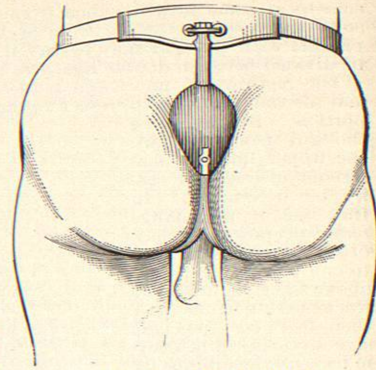

Fig. 236.—Truss for Sacral Anus.

Usually a sharp rise of temperature—to 102° or 102.5° F.—may be looked for, even in favorable cases, at the end of the second day, but in those that are to do well this will subside in a day or two spontaneously, and the patient will make an uninterrupted good recovery. A successful case may be sitting up at the end of two weeks, and several of my own have returned to their homes at the end of three.

The most careful end-to-end suturing of the gut after the removal of the disease should always be practised. If the anus has also been extirpated, then a very careful suturing of the end of the gut to the skin should be practised. The Murphy button is, generally speaking, not adapted to these cases for the reason that its successful use depends in great measure upon securing peritoneal approximation, and there is usually no peritoneum on the distal end of the gut after extirpation of the rectum. When the suturing fails the vast wound will be found after two or three days to be full of fetid gas, pus, and fecal matter, and if the patient is fortunate enough to recover it is with a fecal fistula in addition to the anus provided by the operation.

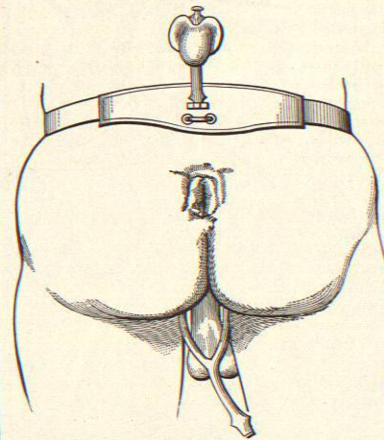

Fig. 237.—Truss for Sacral Anus.

In cases in which a fecal fistula has resulted at some point in the line of incision, secondary plastic operations are often successful. As a rule the gut itself must be dissected out and closed with Lembert's suture, and then the wound covered by suturing the skin and subcutaneous tissue. Closing the skin over the opening in the bowel without closing the opening in the bowel itself is seldom successful.

In avoiding fecal fistula trust must be placed entirely in a careful suturing of the cut ends, and the more carefully this suturing is done, and the more perfect the antiseptic precautions, the better chance there is of union without a large fecal abscess and subsequent fistula.

In amputation the upper end should be brought as near the site of the natural anus as possible; and if the sphincter has been left, the inside of the anus should be vivified in order to give some chance for union. Fecal fistula may, it is true, result in any case, but the main object of the operator should be to avoid this result, and the more thought he devotes to it, and the more perfect his antisepsis, the less likely it is to occur.

Sphincteric Action After Extirpation.—Many attempts have been made to secure this very desirable result, but most of them have proved ineffectual. As a rule there will be no sphincteric action after an amputation, and all hopes of sphincteric power after destruction of the muscle upon which alone it depends may as well be abandoned first as last. The twisting of the end of the gut before suturing it to the skin may do something, and so may an opening in the substance of the glutæus maximus muscle to which the end of the gut is sutured, but it is best not to hope for much from these expedients. The main thing to be hoped for is the avoidance of any contamination of the wound with fecal matter, and I can only say with regard to my own practice that I now generally expect a patient to recover from the operation of extirpation of the rectum, and that by careful attention to all the details of antisepsis and careful suturing of theend of the gut I generally manage to avoid the large suppurating cavities full of fecal matter which were formerly the chief cause of death after my own operations.

Many complications may arise during an operation for extirpation of the rectum. One of the most awkward I have ever personally encountered was to find a rectum absolutely devoid of mesentery and bound immovably to the hollow of the sacrum. All attempts to get it loose and bring it down resulted merely in stripping up one of the longitudinal bands of muscular fibres, and in the end I held in my hand six inches of stripped and injured gut which was entirely without any source of nutrition. As I was about to abandon the operation and turn the patient over for a left inguinal colostomy, it occurred to me to make use of a loop of large gut—probably the upper freely movable part of the sigmoid—which during a great part of the time had been hanging freely in the field and occasionally getting in the way. This was drawn into the incision and stitched to the edges in much the same manner as would be done in ordinary colostomy. It was then opened and the section between this opening and the end irrigated. Finally, the useless end of the gut was also stitched to the incision in the expectation that it would slough and come away, as it did. The man made a rapid and uneventful recovery.

Another complication, though not a frequent one, may be found in the consolidation of all the perirectal tissue by inflammatory changes, in cases of old, non-malignant ulceration and stricture. Under these circumstances the isolation of the rectum may be a matter of the greatest difficulty, and beyond the powers of the inexperienced operator.

Such in brief is the operation for extirpation of the cancerous or strictured and ulcerated rectum. The most casual reader will at once be struck by the fact that it is an operation of absolute precision, very different in character from the old one through the perineum, in which a more or less blind plunge was made into the pelvis for a piece of the rectum, and in which the loss of blood depended almost entirely on the speed with which the operator did his work.

The operation described may be done by an experienced man in about forty-five minutes, and the resulting mortality will depend much more on keeping fecal matter and other intestinal contents out of the wound, both during the operation and during the first days of healing, than upon the amount of shock.

My own first statistics showed the full death rate of thirty per cent., but by attention to the details given above this has gradually been reduced until, at this time of writing, I have had no death in the last seventeen cases.

A wound into the vagina, though always to be avoided when possible, may often be necessary in order fully to remove the disease. Such a fistula may be closed during the operation. A wound of the urethra in the male, when slight, is to be treated as though the patient had submitted to an external urethrotomy, viz., by the frequent passage of the sound to prevent contraction.

When a large piece has been taken from the urethral wall, a permanent recto-urethral fistula is the necessary result, and the danger of fatal inflammatory action is greatly increased from the presence of the urine in the rectal wound. Wounds of the peritoneum may or may not be sutured with catgut, as the operator prefers. As for the cases reported by Nussbaum and others, in which the whole neck of the bladder, the greater part of the prostate, and the seminal vesicles have been removed, and the patients have lived for years in comfort, they are merely curiosities of literature.

Fig. 238.—Soft Polypus. (Esmarch.)

In certain cases in which, from the extent of rectum removed, it is impossible to draw the ends together, or in which, from the tightness of the stricture, it has been found impossible to empty the bowel above of fæces, or in which the wound has become soiled with the same during operation, Kraske postpones the suturing of the ends of the gut at the posterior segment till a later period, and forms a provisional sacral artificial anus, as shown in Figs. 234, 235. For this a subsequent plastic operation is necessary. Hochenegg has devised and applied for use in these cases the truss shown in the cuts (Figs. 236 and 237).

Schede accomplishes the same end by a colostomy in the groin after the resection, and a subsequent closure of the artificial anus when the sacral wound has healed.

Non-malignant Growths.—Under this head may be included polypi, vegetations, condylomata and the rarer examples of benign fungus, gummata, fibromata, lipomata, and the various forms of cysts.

A polypus may be defined as a benign tumor composed of one or more of the normal elements of the rectal wall; an hypertrophy either of the mucous membrane or of the submucous connective tissue. The former is generally spoken of as soft or villous, and the latter as hard or fibrous. The former is shown in Fig 238, and is often spoken of as the polypus of childhood; the latter is known as the polypus of adults, though these distinctions are of little practical value.

Fig. 239.—Glandular Polypus. (Esmarch.)

A polypus of the soft variety may reach the size of a pigeon's egg, is soft to the touch, may break down under the finger with rough handling, and has a shaggy or cauliflower surface. A microscopic examination shows it to be composed of long, fine, bifurcated papillæ, covered with cylindrical epithelium. The glandular or adenomatous polypus (Fig. 239) is generally the size of a small plum, rarely that of a pear, and yet may reach a weight of four pounds. It is vascular, and therefore of reddish color; sometimes smooth on the surface, but often mammillated, like a strawberry; attached by a pedicle, generally to the posterior wall at a point within reach of the finger; and may be found anywhere between the ileo-cæcal valve and the anus. It is due to an hypertrophy of either the follicles of Lieberkühn or the closed follicles. There is another variety of polypus which is formed by an hypertrophy of both the villi and the follicles of Lieberkühn, and is known under the various names of villous polypus, villous tumor, granular papil-

loma, and "peculiar bleeding tumor." These tumors are very rare, have the feel of a large warty polypus, with cauliflower surface, are of red color, bleed easily when touched, and are of relatively slow growth. They adhere to the rectum by a pedicle, sometimes composed chiefly of mucous membrane, and at other times large, short, and fleshy. The pedicle may be absent and the growth will vary in structure according to the proportions of its different elements. It may reach the size of an orange, is found only in adults, and the symptoms are the same as those caused by other polypi.

The hard or fibrous polypus (sarcomatous polypus), which is composed primarily of the elements of the submucous connective tissue, is much rarer than the soft variety, and is most commonly found in adults, in whom it may be single or multiple. It is composed chiefly of fibrous tissue, and resembles the uterine fibroid; but it may contain both muscular and glandular elements. These polypi vary greatly in the degree of hardness to the touch, according to their composition and turgescence. They may creak under the knife on section and look very much like hypertrophied and œdematous skin; or they may resemble the better known nasal polypus in composition. When they are seen in the rectum before removal the surface is generally red from vascularity; but after removal they are pale and generally smooth, though sometimes uneven and irregular in surface and covered with hypertrophied papillæ. The mucous membrane is generally easily stripped off, unless there has been local inflammatory action, in which case it may be firmly attached and have lost its natural appearance. The vascular supply is abundant, both in the substance and on the surface of the tumor. The pedicle is generally slight, and is formed mechanically by the traction of the growth. The tumor is benign in character, and when once removed does not generally return, although cases of recurrence at or near the same point are not unknown.

A rectal polypus may exist many years and give no signs of its presence. The two chief symptoms which it is apt to excite are hemorrhage and discharge. The former may be of daily occurrence, or may be present only at long intervals, and it may vary in amount from a few drops to a quantity which shall cause grave disturbance and alarm. When the mucous membrane covering the tumor has once become ulcerated, the bleeding will be frequent and the discharge more or less fetid. When the tumor is so high and the pedicle so short as to be beyond the grasp of the sphincter, there will be little or no pain; but after prolapse once begins to occur, the suffering at each act of defecation may be extreme. The sphincter may become dilated and relaxed, or if it remain strong it may work a spontaneous cure by strangulating the pedicle. The discharge is sometimes profuse and constant, escaping not only at the times of defecation, but at frequent intervals between, and being of an exceedingly fetid character. This by its irritation may set up secondary troubles—congestion of the mucous membrane, erosions around the anus, vegetations, diarrhœa, and tenesmus; and joined with the loss of blood the condition may be mistaken for extensive ulceration or malignant disease.

The treatment is generally simple. When the pedicle is long and slender the tumor may as a rule be safely twisted off, but it is better to apply a ligature. There are two dangers to be considered: the first is that the pedicle may contain large vessels, and the other is that it may contain peritoneum. The extirpation of a polypus which came down from the sigmoid flexure and dragged the peritoneum with it has been followed by death. Should there be a large, fleshy pedicle it must be securely ligatured.

The anus and adjacent skin are often the seat of vegetations of a warty or papillomatous nature, due to a simple hypertrophy of the papillary layer of the skin. They are composed of the connective tissue, the epithelial covering, and the blood-vessels, which in their natural proportions and quantities make up the papillæ of the derma. These little tumors resemble ordinary warts. When one of them is isolated it is dry, but when several of them are united they become macerated in the secretion of the part; this secretion undergoing decomposition in the spaces between them, and then giving rise to inflammatory phenomena. The tumor then becomes moist and fetid, and all the adjacent parts become irritated. According to the number and size of the warts, the condition of the patient, the abundance of the secretions, and the irritation to which they are originally due, these vegetations take on various shapes, and hence have been described as cock's-combs, cauliflower excrescences, etc., but the fundamental structure of all of them is the same. They were formerly considered as proof positive of syphilis, and even of sodomy, and were so treated; but they have nothing to do with syphilis, and they owe their growth, in the first place, to a special predisposition to the formation of warts in the individual, and, in the second place, to the presence of some irritating cause acting on this particular part. Thus the discharge from any disease of the rectum or genitals may cause them to grow, and they may appear in persons apparently perfectly healthy and cleanly. Pregnancy has an undoubted influence on their production, and they may disappear spontaneously after delivery. They may appear at any age from infancy to adult life, though generally belonging to the latter. They may vary in size and quantity, from a single enlarged papilla to a mass weighing a pound. When they grow from one side of the intergluteal fold, and are large enough to press with their moistened surface upon the corresponding point on the opposite side, a second patch may be developed at the point of contact. Their development may be slow or rapid, and when they reach a large size the patient is troubled by the feeling of a foreign body, by a sanious and foul discharge, and by fresh erosions and superficial ulcers in adjacent parts. Great pain in defecation may be caused by a small wart just at the verge of the anus, and such a little tumor may cause all the symptoms characteristic of fissure. These warts may also spring entirely from the mucous membrane above the sphincter. There is little danger of mistaking a mass of such warts for a malignant growth, though they have been known to assume a semi malignant character, and to return frequently after removal. The most common error is to consider them as syphilitic condylomata, and indeed they may not always be easily distinguishable from the raised mucous patch or flat condyloma which is a manifestation of true syphilis. The two may exist simultaneously, the former caused by the irritation of the latter.

The surest, most rapid, and in every way most satisfactory method of curing these warts is simply to cut them off with the knife or scissors. The ligature is not always applicable, and cauterization is apt to do more than is necessary. The growths may, however, be induced to dry up and shrivel away by applications of powdered alum or tannin, and by washing with astringent lotions, such as Labarraque's solution.

The term condyloma has been applied to so many different growths around the anus that it has lost all definiteness. The variety of syphilitic mucous patch situated upon the skin near the anus, and known as condyloma lata, or vegetating condyloma, first manifests itself as a red spot, and by a slight effusion beneath the epidermis, which is soon rubbed off by friction, exposing a raw surface generally covered by a grayish pellicle. This surface is subsequently elevated by an upward growth, and by branching of the papillæ, with formation of connective tissue and dilatation of the blood-vessels. Where this process has reached a considerable extent, a cauliflower appearance is the result, and what was at first a simple mucous patch may become a large, pedunculated, warty growth surrounded by other vegetations which have sprung up around the original lesion, and which are due to the irritation of its presence.

The more general meaning of the word condyloma is, however, a non-syphilitic tumor composed of an hypertrophy of the skin around the anus, attached by a broad base, pinkish in color, soft, fleshy, glistening, moist,

irregular in shape, flattened where two are pressed together, and generally giving out a slight secretion. These tumors, as a rule, have one of the radiating folds of the anus as their point of departure, and they differ from the warty growths in the fact that they consist of an hypertrophy of the whole thickness of the skin and not alone of the papillæ. The epithelial element in them is not as marked as in the warts, and the blood-vessels also are less developed. They are merely the result of a localized chronic inflammation of the skin, and often result from an external hemorrhoid or any local irritation, such as has already been spoken of. They are a very common accompaniment of any ulcerative process within the rectum, and hence of stricture, and many a stricture has been unjustly stamped as syphilitic because the discharge from the anus has caused the development of these fleshy tags. Unless there is some special reason for interfering with them they may generally be left to themselves, as they are not likely to cause any amount of trouble unless they become ulcerated upon the surface. In this case they are easily removed by the scissors and ligature.

Pruritus Ani.—Itching at the anus is generally a symptom of some other disease, such as hemorrhoids or eczema, but it is often present in a marked degree when no cause for its existence can be discovered. It is at times an exceedingly painful and annoying affection, which seems to be dependent upon no particular general state, being found in all classes. The itching is more or less constant, but is generally worse after the patient has become warm in bed for the night. The scratching which is indulged in for relief, often unconsciously during sleep, aggravates the condition by lacerating the skin. The disease is sometimes, in old cases, attended by marked changes in the appearance of the parts. The skin becomes thickened and parchment-like, or else eczematous and moist from exudation, and there may be a very characteristic loss of pigment, in which case the skin becomes of a dull whitish color. This is particularly noticeable in cases of long standing. Associated with this condition it is not unusual to find one or several fissures.

The causes of pruritus are sometimes easily discoverable, and in such cases a cure rapidly follows their removal. It is often due to internal hemorrhoids, and will be effectually cured by their removal. It is often a symptom and complication of a fistula with a small external opening, which is easily overlooked and may be relieved by the cure of the latter and the cessation of the discharge. It is often dependent upon the presence of worms in the rectum, and in every case these should be carefully looked for. When they exist they may generally be seen like small pieces of fine, white thread lying between the radiating folds at the verge of the anus, especially at night after the itching has begun. Instead of the disease being due to a parasite within the rectum it is sometimes easily accounted for by the presence of pediculi. Again, pruritus of an intense kind may be due to *eczema marginatum*, or it may be a symptom of a chronic eczema, of herpes, or of erythema. When no local cause can be discovered, a careful inquiry must be made into the patient's general health and habits. If chronic constipation be present it must be overcome first of all. In women the condition of the generative organs must be looked after, and the urine should be examined for sugar.

In case none of these causes can be found to account for the symptom, errors of diet must be searched for and corrected. Anything like excess in smoking or in the use of alcohol will aggravate the disease, and these habits if indulged in at all must be carefully regulated. The disease will sometimes be encountered in stout, full-blooded persons who live well, and perhaps incline to gout. In such, active exercise and plainer living, with cold bathing of the part night and morning, and the use of a wash containing tar or carbolic acid, will often effect a speedy cure. On the other hand, the disease may be present in persons of exactly the opposite class, the overworked and worried professional or business man, and in this class of cases alone, where the itching seems to be a purely nervous affection, arsenic is indicated. It may be combined with quinine and cod-liver oil, and administered until its full physiological effects are manifested. If pin-worms are the cause, they may generally be removed by certain simple measures, the best known of which is an enema of lime water or carbolic acid, ʒ i.; glycerin, ℥ i.; and water, ℥ vij., injected after each passage. Turpentine and tincture of iron used in the same way are very effectual. The most useful remedy for eczema marginatum is a wash of equal parts of sulphurous acid and water, frequently applied with a soft cloth, and, when necessary, gradually increased in strength up to the pure acid, which is, however, a painful application and one which will readily blister. Strong tincture of iodine, thoroughly applied, is also an effectual application. If there be thickening of the skin from effusion, the application of very hot water freely with a sponge may give relief, and if a stronger application be necessary, the compound tincture of green soap, or a solution of caustic potash (gr. v. to ℥ i.), or liquor potassæ, may be resorted to. A good ointment is made of the ordinary oxide of zinc ointment made soft and applied gently; and one which is very effectual in temporarily allaying the itching is made of chloroform (ʒ i. to ℥ i.). Another effectual application is composed of carbolic acid, ℥ ss.; glycerin, ℥ i.; and water, ℥ iij. This may be applied at night, and its strength may be adapted to the case. There are many formulæ of this kind, all of which answer a good purpose, but the cure is to be undertaken in a broader spirit than by searching for any single ointment or lotion which shall allay the itching for a time. In every case the cause must be found and removed if a permanent cure is to be expected.

Spasm of the Sphincter.—This is an affection which has been much disputed about, but which undoubtedly sometimes exists alone, and without any complicating fissure. It is generally found in nervous and debilitated patients, and its symptoms are: more or less uneasiness about the anus, a sense of fulness in the perineum, often more or less difficulty in micturition, constipation, and pain and difficulty in defecation. A digital examination will often show a markedly contracted anus, and an attempt to introduce the finger will cause unbearable agony. The act of defecation may be exceedingly difficult to accomplish on account of the pain it causes; and any anxiety or distress of mind, and anything which tends to irritate the rectum or the parts around, will aggravate the difficulty. The treatment consists in attention to the general health, in allaying nervous excitement, in the administration of laxatives to relieve the bowels, and in anodyne injections, such as twenty drops of laudanum. The surgical treatment consists in etherization and thorough dilatation of the sphincter. If this cannot be done, the next best thing is the systematic use of bougies.

Neuralgia.—This is an affection which, like the last, is most often seen in nervous people, particularly women. The pain is apt to be paroxysmal but may be continuous, and, unlike spasm, is entirely independent of the act of defecation. It is much the same disease as neuralgia elsewhere in the body, and must be treated in the same general way. Where there is well-marked periodicity a malarial element must be looked for; and the disease is sometimes the only manifestation of the gouty diathesis. The first care should be for the general health, the second for the regularity of the bowels; and, after this, local applications of cold water and of an ointment of belladonna should be tried. Sometimes blisters applied over the sacrum afford relief. The disease must be carefully distinguished from coccygodynia and from spasm of the sphincter. *Charles B. Kelsey.*

ANUSOL.—A proprietary name for suppositories stated to contain bismuth iodo-resorcin sulfonic acid. A formula which has been published says that they contain balsam of Peru, zinc oxide, resorcin, bismuth oxyiodide, and cacao butter. They are used for catarrh of the rectum, tenesmus, anal fissure, pruritus, etc. *W. A. Bastedo.*

ANYTIN is a derivative of ichthyol introduced by Unna in dermatological practice. It is a thirty-three-per-cent.