swelling. Stimulants will frequently be needed to counteract shock.

Technique.—Under the strictest asepsis the abdomen is opened and search made for the seat of obstruction, first in the right iliac fossa and with as little exposure of the intestines as is practicable. A needless exposure of the intestines will greatly increase shock and lessen the chances of recovery. The mass should be brought into the wound and protected by hot pads of gauze, while gentle efforts are made to relieve the invagination. If continuity is restored without damage to the bowel, recurrence can be prevented by suturing the mesentery to the abdominal wall. If reduction is impossible, if malignant disease is present, or if the intestine is gangrenous, colectomy should at once be performed, and resort to colostomy should be had only when the patient's condition prevents the operator from making the complete operation. The wall of the abdomen is to be closed as in other cases of abdominal section.

Volvulus.—Volvulus constitutes one of the most fatal forms of intestinal obstruction. The term is applied to a twisting of a segment of the intestine and its mesentery so that the circulation of the blood and also the passage of fæces are interrupted. Such a twist can occur only in cases in which the peritoneal attachment is sufficiently long to allow considerable mobility of the gut. The sigmoid flexure, therefore, is the part of the colon which is most subject to this accident. Sudden distention of the intestine with gas, or the presence of a fæcal mass, with or without an accompanying strain, may cause volvulus. When the torsion occurs, swelling of the twisted portion follows immediately, owing to interference with the return of venous blood. This swelling tends to accentuate the twist and to increase the obstruction to the blood supply. The adjacent portions of the intestine are distended with gas, which tends to prevent spontaneous restoration. Gangrene follows in a short time, and peritonitis is present if the patient lives long enough for its development. The prognosis is essentially grave. Spontaneous restoration rarely, if ever, occurs and no measures save operation offer any hope to the patient.

Symptoms.—The patient is suddenly seized with vomiting, which is not so severe in volvulus of the colon as it is in volvulus of the ileum. Severe paroxysmal pain radiating over the abdomen, with extreme tenderness, is always present. Sudden cessation of pain announces the development of gangrene. Pain returns with the development of peritonitis. Obstruction is complete. Early and circumscribed tympanites may precede general distention and rigidity. Rectal examination may reveal a mass in the pelvis in case a twist lies in that region. Marked restlessness and prostration are always present and the patient shows great anxiety. The surface shortly becomes cold and clammy and covered with perspiration. Hiccough soon appears and the circulatory and muscular systems become rapidly depressed.

Diagnosis.—Sudden onset of obstinate constipation (bowels regular before), vomiting, pain, tenderness, and localized tympanites without a tumor or a hernia will point strongly to volvulus. It is not always possible to make out the exact seat of the obstruction, but the symptoms described will call for exploration.

Treatment.—Palliative measures, purgatives, rectal injections, etc., are worse than useless. An early laparotomy offers the only hope for the sufferer. When this is performed early the result is very gratifying, but delay is dangerous. The mesentery should be sutured to the abdominal wall to prevent recurrence. When the bowel is gangrenous (which is shown by its dark color and the ease with which the peritoneum is separated from the muscularis), immediate resection with end-to-end or lateral anastomosis, or the formation of a fæcal fistula, is the proper surgical procedure to be adopted in a case of this nature.

Impaction.—Fæcal impactions are more likely to occur in the colon than in the small intestine, but less frequently perhaps than in the rectum. The right and left iliac fossæ are the most frequent sites. This condition develops in patients who have a tendency to constipation, and the accumulation occurs more or less slowly with intermittent attacks of diarrhœa until ulceration or complete obstruction occurs.

Symptoms.—Sometimes the first symptoms are diarrhœa with tenesmus, night sweats, loss of appetite, flesh, and strength, following a more or less constipated condition. In time constipation will take the place of the diarrhœa and there will be evidence of obstruction associated with pain, slight tenderness, and distention. Examination will reveal a tumor which is doughy to the feel, which can be indented, and which varies in size and shape.

Treatment.—Large enemata of salines, oil, soapsuds, etc., in Hegar's knee-chest position, with gentle kneading of the abdomen, will usually afford relief. If these means fail, the surgeon should resort to a laparotomy, which will render it possible to break up the mass by gentle manipulation of the intestine. Recurrence can be prevented by the administration of such remedies as belladonna, nux vomica, aloes, and cascara sagrada to tone up the intestine. Daily massage of the abdomen and proper diet are of marked benefit. When the mass is very large and danger of rupture of an ulcerated colon is present, a colotomy is justifiable.

Tumors.—Benign tumors rarely develop in the colon. Papillomata, adenomata, and fibromata sometimes form pedunculated tumors that project into the intestine and thus may give rise to intussusception by exciting efforts of expulsion. They may also grow to sufficient size to produce obstruction. As a rule these growths are single, but occasionally they are multiple. Lipomata sometimes appear as pedunculated growths upon the peritoneal surface of the intestine, where they have as a rule little pathological importance. These tumors also develop in the submucous tissue, extend into the intestine, and may even completely occlude the canal. Hofmokl[5] reports a case of this kind in which the tumor obstructed the lumen of the intestine for a distance of several inches and caused invagination of the colon. Annular benign growths are sometimes seen springing from the middle coat of the intestine; these are, as a rule, fibromyomata. Benign growths only demand attention when they cause intussusception or obstruction. Sarcoma attacks the colon very rarely indeed, even less frequently than it does the small intestine. Sarcomatous growths springing from adjacent organs may involve the colon and in the course of their growth produce obstruction. Clinically it is impossible to differentiate between sarcoma and carcinoma of this structure. Sarcoma possesses no tendency to spread through the lymphatics and may be expected to occur earlier in life than carcinoma. The final results are very similar in either instance. Owing to the amount of involvement which takes place before these tumors are recognized, removal rarely proves of benefit and an early recurrence is to be expected. Therefore entero-colostomy, or as it is sometimes called, short-circuiting of the intestine, will be the operation that offers the most to these patients. By this procedure the irritation of the fæces and the tendency to obstruction can be relieved. Senn has proven that a segment of intestine isolated in this way is able to rid itself of its secretions and of fæces which may enter it accidentally.

Carcinoma.—The large intestine is somewhat frequently attacked by this variety of neoplasm; about seven per cent. of all cancers have their origin in this organ. According to Sutton, ninety-eight out of every one hundred intestinal cancers have their origin in the large bowel and about seventy-five of these involve the rectum, ten the sigmoid flexure, and thirteen the cæcum and remainder of the colon. According to Leube, four-fifths of all cancers of the large intestine occur in the rectum and one-fifth in the colon and sigmoid. These growths spring from the mucous surface and from the glands of that structure and infiltrate, as they grow, into the deeper tissues of the intestinal wall. The histological structure resembles more or less closely that of the benign adenomata, yet this variety of new growth

shows a great tendency to infiltrate surrounding tissue. These tumors may project into the lumen of the intestine or spread through the submucous tissue until the entire circumference of the bowel is involved. In time ulceration occurs, and with it the contraction of the newly formed tissue until the canal is partially or completely occluded. Secondary involvement of the intestine by extension from carcinomata of neighboring organs not infrequently occurs, and as a rule such cases are inoperable owing to the wide dissemination of the disease. Cancer of the large intestine may exist for some time without giving rise to any distinct symptoms indicative of its presence. During this time some irregularity of the bowels may be present, but as a rule not of sufficient moment to demand attention. After a time there may be noted a sense of uneasiness or discomfort in the abdomen, and this is soon followed by more or less constant pain and tenderness. This pain is at times colicky in character. Loss of flesh and strength greatly out of proportion to the discomfort of the patient accompanies the foregoing symptoms. The appetite and digestion are at first unimpaired, but cachexia soon develops. When ulceration begins blood-stained mucus, shreds of broken-down tissue, and some pus are passed with the fæces. As the ulceration progresses diarrhœa and pain become constant and severe, and the slight septic intoxication which results causes loss of appetite and anæmia. Constipation becomes more and more marked until complete obstruction develops as the result of stricture. Intestinal obstruction may be the first symptom to appear. Ulceration often occurs above the stricture, and a number of fistulæ may form between the two portions of the intestine or between the proximal portion and the surface. The surrounding parts become involved finally and a peritonitis with ascites develops. Examination at this time will reveal the presence of a nodular tumor unless it is masked by the ascites. The positive *diagnosis* of carcinoma of that portion of the intestine which is beyond reach of the finger and rectal examination can usually be made only by an exploratory incision through the abdominal wall. Rapid emaciation and the history of irregularity of the bowels, uneasiness and pain in the abdomen, with a gradually increasing costiveness, will point strongly to cancer of the intestine.

Prognosis.—This is, as a rule, a fatal affection. The only chance offered for the patient is by an early and complete extirpation of the disease. In cases in which this is impossible and in which symptoms of obstruction or marked ulceration are present, either colostomy or lateral anastomosis will give temporary relief and perhaps extend the life of the patient. Colostomy is to be performed when the growth is in the lower portion of the intestine. Lateral anastomosis is indicated when the growth is situated high in the colon and extirpation is not feasible.

Operations upon the Colon.

Colotomy.—This term has for centuries been used to designate the formation of an artificial anus, but recent writers have limited its meaning to incision of the colon for the purpose of making a temporary opening; while the term colostomy is applied to the establishment, by operative measures, of a permanent opening into the colon. Therefore we shall in this connection make a distinction in accordance with the literal meaning of the terms. Colotomy is indicated for the removal of foreign bodies lodged in this part of the intestine, for the relief of fæcal impactions which cannot be otherwise removed, for the establishment of a temporary opening in a case of imperforate anus, or in one of ulceration of the rectum or lower part of the colon. The incision should be made over the swelling in the first two instances, or in the median line if the diagnosis is not made. When the operation is made for imperforate anus, the left inguinal region is best, as it also is for colostomy. When the intestine, which may be recognized by the longitudinal bands and fatty appendages, has been pulled into the wound, the diagnosis should be confirmed before proceeding with the operation. The peritoneum should be protected with gauze and an incision made longitudinally through the wall of the intestine. The foreign body or fæcal concretion should then be extracted and the part thoroughly flushed with saline solution. Closure of the intestinal wound is then accomplished by interrupted Lembert sutures of fine silk or of strong catgut. The needle should penetrate the submucosa which holds the stitch in place. It will usually be advisable to supplement with a second row of sutures. When one is satisfied that approximation is perfect, the colon should again be flushed and dropped into the abdominal cavity. The abdominal wall is closed in the usual manner without drainage. When the operation is performed for imperforate anus and for painful ulceration and inflammation of the rectum, the intestine should be brought only partially out of the wound and fixed with angulation so that excision will not be necessary when a cure of the fistula is indicated.

Artificial Anus or Colostomy is the operation of forming a more or less permanent opening from the colon to the surface. The indications for colostomy are:

1. Obstruction of the intestine below. (*a*) From inoperable tumor; (*b*) from stricture of the rectum or colon.
2. Congenital malformation of the rectum and anus.
3. To relieve the pain and irritation of intractable ulceration of the rectum, either simple, syphilitic, tuberculous, or cancerous, and to prevent the fæces passing over the diseased area.
4. To relieve incurable recto-vesical fistula.

Iliac Colostomy was first proposed by Littré in 1710 and frequently is known as Littré's operation, although it was not performed until 1776 by Pillore. It was employed at intervals after this time, but with a mortality so high that it was abandoned in favor of lumbar colostomy, proposed by Callisen in 1796 and successfully performed by Amussat in 1839. According to the statistics of Dr. Batt, the mortality of the lumbar method was 31 per cent. and of the iliac 53 per cent. Mr. Cripps performed 14 lumbar and 27 inguinal colostomies with one death. With the perfection of surgical technique, the objections to the inguinal method have disappeared, so that at the present time lumbar colostomy is rarely performed. Inguinal colostomy places the artificial anus in a position where the patient can properly care for it with ease. The colon is more readily accessible by this route than through the loin, and the operation is equally safe. The fæcal flow can scarcely be entirely cut off from the lower part of the intestine in the lumbar operation, thus failing to meet an important indication, and when a long meso-colon is present the lumbar route is useless. Objections have been urged to the establishment of a fæcal fistula in any case, but patients can pass a very comfortable existence for a number of years after its formation. Those patients are most comfortable who have means and leisure to take care of themselves, but even the working class can follow their usual vocations with comparative comfort. Some operators recommend excision of the rectum, as the operation of choice, but the majority of the profession prefer colostomy. When the obstruction lies higher in the colon, the opening can be made in the transverse portion or in the cæcum, but the usual site is in the left iliac fossa. An incision about three inches in length should be made parallel to Poupart's ligament and about one inch and a half internal to the anterior superior spine of the ilium. This incision at its middle should cross an imaginary line drawn from the anterior superior spine to the umbilicus. If each layer of muscular fibres is separated by blunt dissection and the retractor used to keep the wound open, considerable control over the orifice can be obtained for the patient after repair has occurred. The finger introduced into the wound and carried deeply outward toward the anterior spine will catch and bring the colon into the wound where it can readily be recognized. The intestine should be pulled down until the meso-colon is on the stretch to prevent prolapse through the artificial opening. The whole thickness of the gut should be brought out of the wound to make a strong

flexure, and it should be held there by a glass rod, through the meso-colon as advised by Maydl, or by a silkworm-gut suture as advised by Kelsey.

The skin, the peritoneum of the parietes, and the wall of the intestine should be united by eight or ten sutures of catgut or silk, thus closing the peritoneal cavity from chance of infection when the intestine is opened. Before these sutures are inserted, one or two silkworm-gut stitches should be passed through skin, muscles, and fascia at the upper and lower angles of the incision to bring the tissues snugly about the bowel. The wound can be hermetically sealed by a thin layer of sterilized cotton and collodion, leaving the intestine exposed for immediate opening if desired. When the wall of the intestine is pared away some hemorrhage may require attention. In cases in which the symptoms of obstruction are not urgent it is quite proper to wait three or four days before incising the intestine, as the mortality heretofore has been greatly decreased by such delay. General anæsthesia is usually unnecessary for opening the intestine after such postponement.

Lumbar Colostomy.—This, often known as Amussat's operation, can be more readily performed if the colon is distended as in stricture with obstruction. Under anæsthesia the patient should be placed on his right side upon a firm pillow to arch the left loin as much as possible. A perpendicular line drawn from the middle of the crest of the ilium, or, according to Allingham, from a point a half-inch behind the middle, will mark the situation of the colon. An incision four inches long should be made parallel to the last rib and half-way between it and the crest of the ilium with its centre in the line just mentioned. The muscular tissue and fascia for the whole length of the wound must be carefully divided until the transversalis fascia and the edge of the quadratus lumborum are exposed. When this fascia is cut through, the colon will present itself. Unless it is collapsed it can easily be recognized by its color, by the thickness of its walls, and by the scybalous masses which it usually contains. Care should be exercised to avoid opening the peritoneum. The colon should be drawn into the wound and sutured to each margin. The wound should be closed with silk-worm gut, an opening being left at one point for drainage; and when obstructive symptoms are not urgent several days may elapse before the intestine is opened.

Colectomy.—Excision of part of the colon has been performed with considerable frequency during the past ten years. The ileo-cæcal coil appears from the reported cases to be the part most often removed (ileo-colectomy). Magill in 1894[6] collected one hundred and four cases of resection of this portion of the bowel, with a mortality of thirty per cent. The first resection of the ileo-cæcal fold was performed by Krausshold, 1879, with a fatal result. Maydl, in 1882, operated successfully. Since that time the operation has become a recognized surgical procedure. The following conditions may demand resection of the colon: 1, malignant disease (carcinoma and sarcoma); 2, tuberculosis; 3, invagination, acute and chronic; 4, fæcal fistula; 5, gangrene from volvulus or bands; 6, gangrene from hernia; 7, wounds with considerable loss of substance; 8, inflammatory strictures; 9, irreducible cæcum in hernia.[7]

The feasibility of resection can be determined only after exploration and inspection of the diseased intestine. The most frequent indication for the operation will be a removable malignant growth; the other conditions mentioned are also frequently best treated by colectomy. The larger number of fatalities appear to be due to faulty technique, and improvement along this line will materially lessen the death rate. The mortality differs materially in the different conditions that call for the operation, being 16.6 per cent. in tuberculous disease and as high as 40 per cent. in invagination. Cancerous cases show a mortality of 33⅓ per cent. This appears to show that the peritoneum will prove more resistant to infection in tuberculous cases than in any others, and can then be handled with a greater degree of safety.

The preparation of the patient should be the same as that carried out for any abdominal operation and should receive the most careful attention. In cases of obstruction purgatives cannot be used, but in other instances the canal should be thoroughly emptied of its contents. The line of incision will depend upon the part of the colon involved. Any portion can be reached by a median incision, but the operations upon the cæcum or sigmoid flexure will prove very difficult through such an incision. One case is recorded in which an incision from the ensiform to the pubes was found necessary in order to complete the operation. For the two regions mentioned an incision in the respective iliac region four inches long, parallel with and about one inch and a half internal to Poupart's ligament, with its centre on a leval with the iliac spine, will prove satisfactory. This can be extended directly upward if desired after digital exploration of the region. All bleeding from the wound should be arrested before the peritoneum is opened. The diseased portion of the intestine should be well isolated by gauze pads to prevent contamination of the peritoneal cavity. The mesentery of the segment to be removed should be tied off in sections or clamped and ligatured after the bowel is removed. The first is perhaps the better method. These ligatures should be of strong catgut and the included mesentery should not extend beyond the point at which the intestine is to be divided. The bowel above and below the portion to be removed is emptied as nearly as possible of its contents and held firmly closed by the fingers of an assistant, by rubber-covered clamps, or by gauze tapes. In competent hands the first plan is the best, as there is less danger from pressure exerted in this manner. The intestine is then divided by sharp scissors and dissected carefully away from the surrounding parts. Watch must be kept for the ureter, which may be wounded in resection of either end of the colon. The continuity of the intestine can then be restored (1) by end-to-end sutures, (2) by lateral anastomosis accomplished by means of absorbable plates, (3) by lateral or end-to-end anastomosis with the aid of Murphy's buttons, (4) by lateral implantation in ileo-colectomy, or (5) by lateral anastomosis with the aid of clamps of H. H. Grant or La Place. In cases in which the patient's condition will not permit the completion of any of these steps a fæcal fistula can be formed. It should be remembered, however, that this entails the danger of a later operation and therefore should be avoided if possible. The end-to-end suture may be accomplished by the method of Czerny-Lembert (modified by Woelffler), which calls for two rows of sutures, the first penetrating the mucous and muscular coats, but not the serous. Avoid infection of the peritoneum, which is inverted by the second row of sutures inserted after the method of Lembert. The following method is more often employed: The cut ends of the intestine are held together by an assistant while four or six interrupted Lembert sutures are inserted at intervals around the bowel to approximate the segments. These sutures should invert less than one-eighth of an inch of the open wall of the intestine, thus bringing the serous surfaces into apposition. Another row of Lembert sutures, interrupted or continued, should be applied over the approximation sutures to render the closure efficient. The greatest difficulty in preventing leakage will be experienced at the mesenteric border; therefore especial care must be given to suturing at that point. Too great inversion of the cut edges may produce

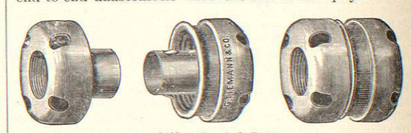

FIG. 1468.—Murphy's Buttons.

obstruction when repair is accomplished. The operator should be perfectly sure that the walls of the intestine are impervious and that its lumen has been restored before he completes the other steps of the operation. This can be determined by forcing the contents from above through the point of anastomosis, while the intestine is occluded below by pressure of the hand. The exposed parts should be thoroughly flushed, the redundant mesentery folded and sutured in such a manner that it cannot possibly produce strangulation, and the intestine dropped into the abdomen. When the suturing is perfect there need be no fear of extravasation, and gauze wicks are therefore unnecessary and often productive of harm. The omentum is drawn down in front of the intestines and the abdomen closed without any provision being made for drainage. It has been claimed that anastomosis by suturing, either end-to-end or laterally, requires considerably more time than when absorbable plates or buttons are employed, that leakage is more likely, and therefore that it is not as useful as one of the latter methods. The same amount of preparation for this operation in the dead-house or upon animals will make an operator about equally expert in the use of either plan. Leakage is no more likely from direct suturing than when some appliance is used, and perhaps less so, owing to the sloughing which sometimes follows the use of either the button or the absorbable plate. The Murphy button will undoubtedly prove the most rapid method for anastomosis, and in the colon will cause little inconvenience from its presence as a foreign body. The different forms of clamps proposed for anastomosis require more skill in manipulation than the other methods, save nothing in time, and will scarcely be generally adopted. The Murphy button is the best of the mechanical aids to intestinal suturing, and is equally suitable for end-to-end or lateral anastomosis. One section of the button is held in the open intestine by a running stitch, known as a purse-string suture, which is pulled tightly around the button as it is tied. The sections of the button are then pushed together and locked. A few stitches can be inserted to reinforce the line of coaptation. The mesentery should be cared for as in the direct suture and the operation completed in the same way.

LATERAL ANASTOMOSIS BY PLATES.—The open ends of the intestine should be closed by two layers of fine silk sutures passing deeply enough to catch the submucosa, then an incision is made in each bowel opposite its mesentery about one inch and a half from the closed end and long enough to admit the narrow diameter of the absorbable plate. The plates proposed by Senn are made of compact tissue of a large beef bone which has been decalcified by immersion in ten-per-cent. solution of hydrochloric acid. Oval plates, 7 cm. long, 3 cm. wide, and 5 mm. thick, are then cut out of the bone. An elliptical opening is made in the centre of the plate 3 cm. long and 7.5 mm. wide. At each end and at the middle of each side a hole is punched in the bone near the margin of the opening. Through these holes double threads are carried, leaving a needle at each lateral hole and a knotted thread at each end. When the plates are placed longitudinally in the intestine the needles penetrate its wall and the corresponding threads are tied snugly to those of the opposite plate. In this way the two intestines are approximated. A continuous Lembert suture completes the anastomosis. The only objection to this method is the danger of infection through the stitch wounds in the intestinal wall. Von Baracz' vegetable plates are cut of the same size and shape as Senn's bone plates and the operation is performed in the same manner. Many other mechanical appliances have been proposed, but the ones mentioned are the best.

LATERAL IMPLANTATION is the method of suturing the cut end of the small bowel into an incision in the colon. The incision in the colon is made longitudinally and is not quite so long as the diameter of the ileum. The end of the ileum is fastened into the side of the colon by four sutures, one at each end of the longitudinal incision and one at either side. As each knot is tied the suture is carried inside the colon and is left long enough to draw the line of suture out at the open extremity. The suturing is then completed inside the gut. After replacement, the serous surfaces are sutured together outside the intestine for reinforcement. The end of the colon is then closed by interrupted Lembert sutures.

After excision of the intestine the patient should have no solid food for about four days. The diet should consist of liquid easily assimilable food. On the third day a laxative can be administered, and, after the bowels move, feeding can be commenced. *J. Garland Sherrill.*

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COLONIAL SPRINGS.—Suffolk County, New York.

POST-OFFICE.—West Deer Park. Hotel (Colonial House) new.

ACCESS.—Viâ Long Island Railroad, 34 miles east of New York.

These springs are situated near the base of a bluff that stands about one hundred feet above the great plain of Long Island, the water rising up through a large deposit of clay in which are found considerable quantities of iron and other minerals. The location is about two hundred feet above the sea level and near the middle of the island, being 5 miles from Babylon, on the Great South Bay, and 7 miles from Huntington, on the Sound. It is said that the atmospheric temperature during the winter months will average four degrees warmer than at Lakewood, N. J. There are two springs in use, known as the "Colonial" and the "Mo-Mo-ne" Spring. The former has been known and used for many years by people in the vicinity suffering from kidney troubles. While excavating to make a reservoir for the "Mo-Mo-ne" several years since, four Indian wells were discovered two or three feet below the present surface. These were made from the trunks of the swamp aspen, or poplar—a tree of the Southern States. The trunks had been burnt out in the centre with hot stones, in the same way that the Indians employed in constructing their canoes. The smallest of the wells was left in position, while the others are on exhibition at the Colonial House. This discovery seems to prove beyond a doubt that the waters here were known to and used by the aborigines before the advent of Europeans.

The waters of the two springs were analyzed in 1894 by Professors Chandler and Pellew, of Columbia College, New York:

ONE UNITED STATES GALLON CONTAINS:

Solids.	Colonial Spring. Grains.	Mo-Mo-ne Spring. Grains.
Potassium sulphate	0.19	0.12
Potassium chloride	.43	.06
Sodium chloride	.80	.48
Sodium carbonate	...	.06
Calcium carbonate	.36	.09
Magnesium carbonate	.17	.13
Oxide of iron and aluminum	.02	.02
Silica	.44	.47
Organic and volatile matter	.09	.19
Total	2.50	1.62

These waters are very pure, the analysis showing but a minute proportion of organic matter. They are well qualified for domestic use. The Colonial Spring is similar to the Poland Spring of Maine. The water has a mild diuretic and tonic action. It has been found useful in kidney and bladder troubles, and may be taken in large quantities. *James K. Crook.*

COLOPHONY. See *Rosin.*