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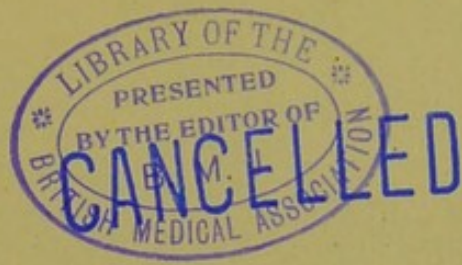




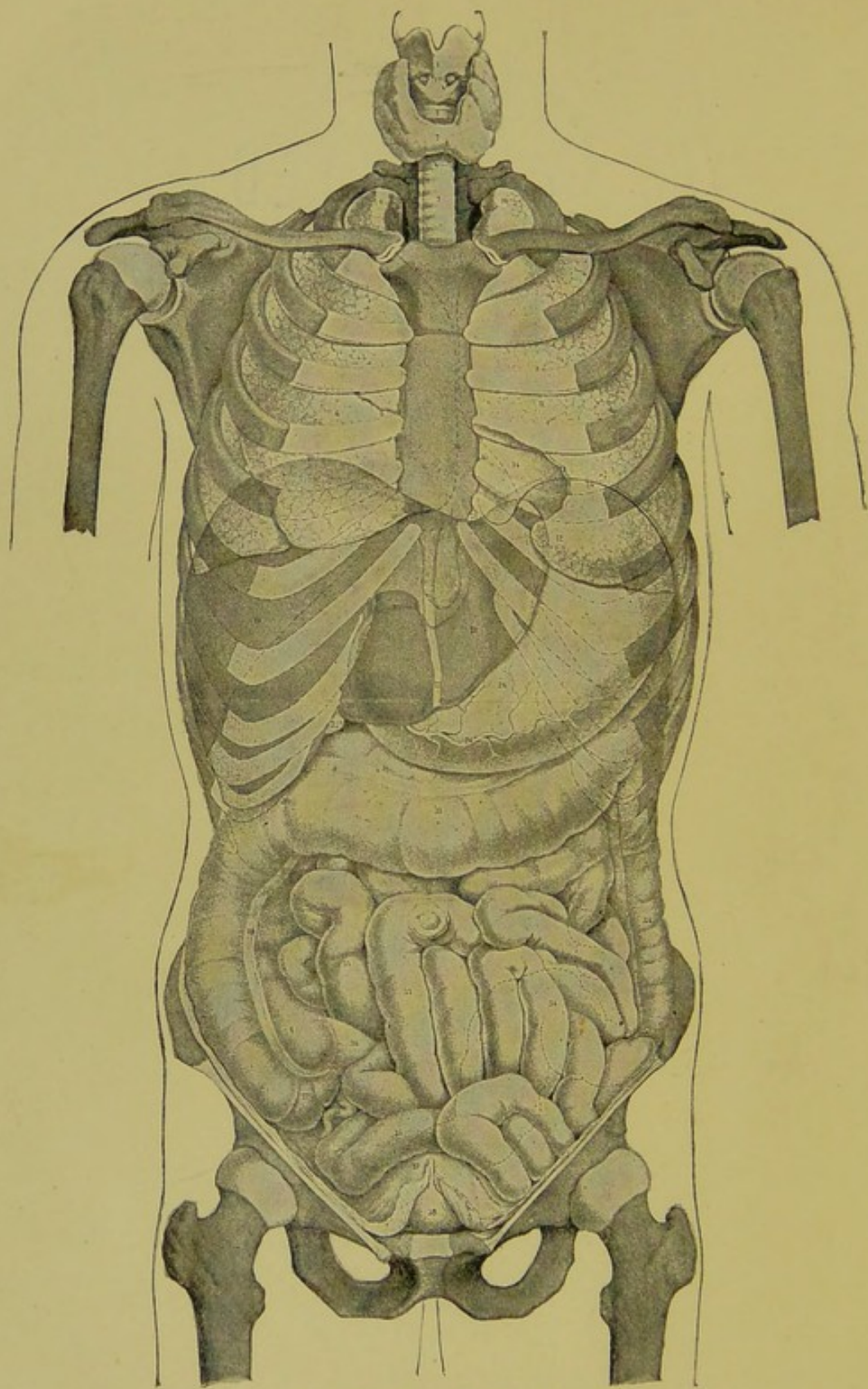
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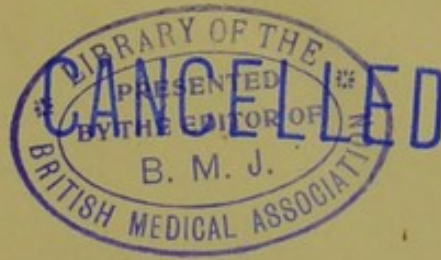


CONSTIPATION
IN ADULTS AND CHILDREN



(From Luschka, "Die Lage der Bauchorgane," etc.)

Frontispiece.



19, Right lobe of the liver; 20, Quadrate lobe; 21, Left lobe of the liver; 22, The suspensory (broad) ligament of the liver, cut off; 22*, Fundus of the gall-bladder; 23, Oesophageal (upper) orifice of the stomach; 24, Cul-de-sac of the stomach, partly overlaid by the left lung; 25, Pyloric end of the stomach; 26, Section of the stomach which lies in the epigastrium, and is partly covered by the liver; 26*, Arteria gastro-epiploica dextra, corresponding to the course of the greater curvature of the stomach; 27, Cæcum; 28, Appendix Vermiformis; 29, Ascending colon; 30, Right colic flexure; 31, Transverse colon; 32, Left colic flexure; 33, Descending colon; 34, *Dotted lines*, showing position of sigmoid flexure underneath the small intestines; 35, Small intestines in the arrangement most commonly found; 36, Obliquely ascending end of small intestines; 37, Summit (apex) of bladder covered by peritoneum; 38, Anterior and lower portion of bladder (in a state of moderate distention and reaching beyond upper border of pelvis) free from peritoneum.

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CONSTIPATION

IN ADULTS AND CHILDREN

WITH SPECIAL REFERENCE TO
HABITUAL CONSTIPATION AND ITS MOST
SUCCESSFUL TREATMENT BY THE
MECHANICAL METHODS

BY

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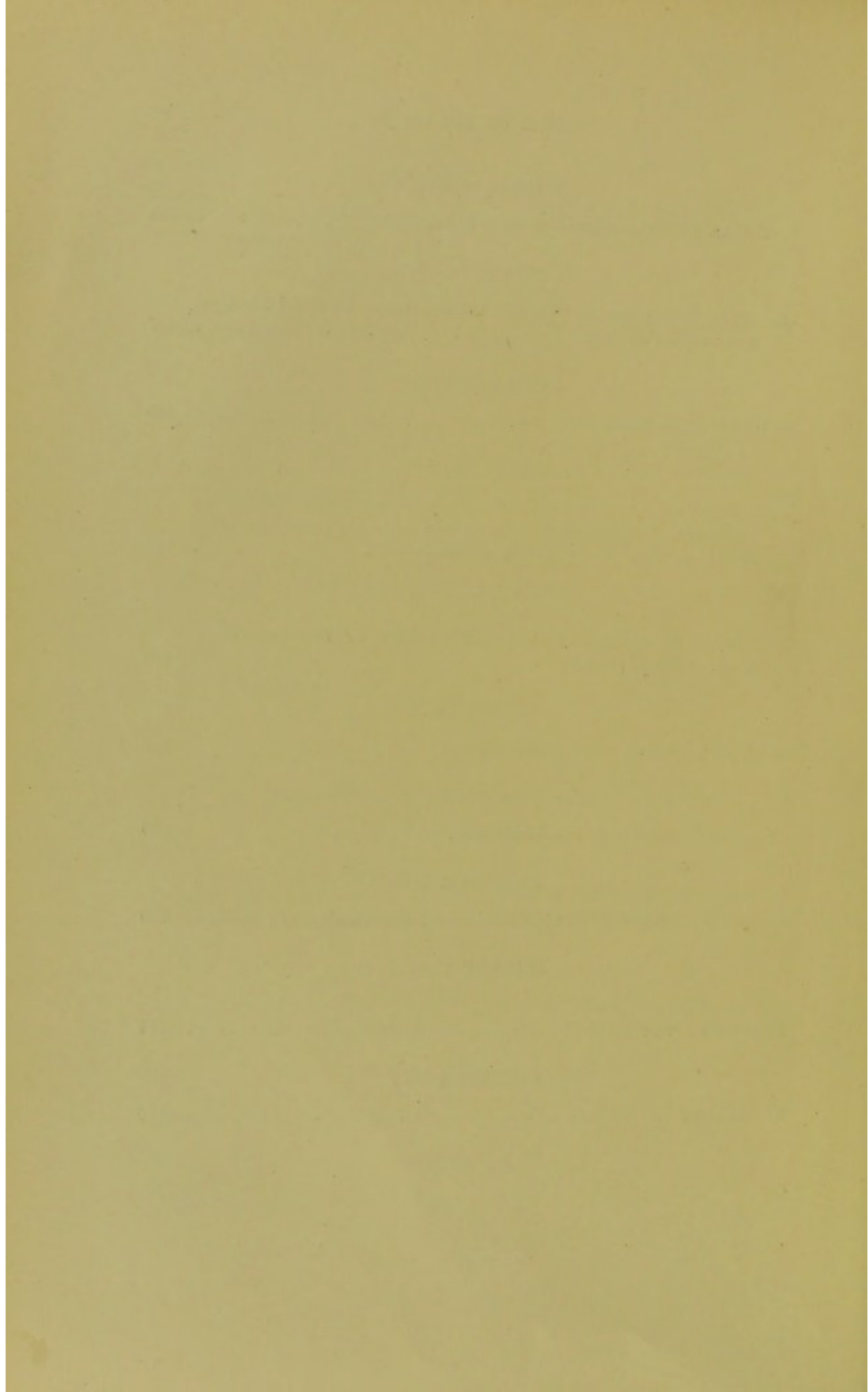
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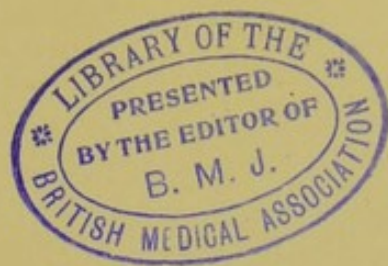
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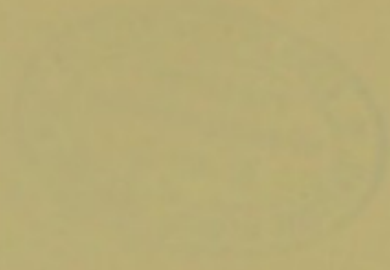
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PART I

CONSTIPATION IN ADULTS



CONSTIPATION IN ADULTS



SECTION I

CHAPTER I

ANATOMY OF THE INTESTINES

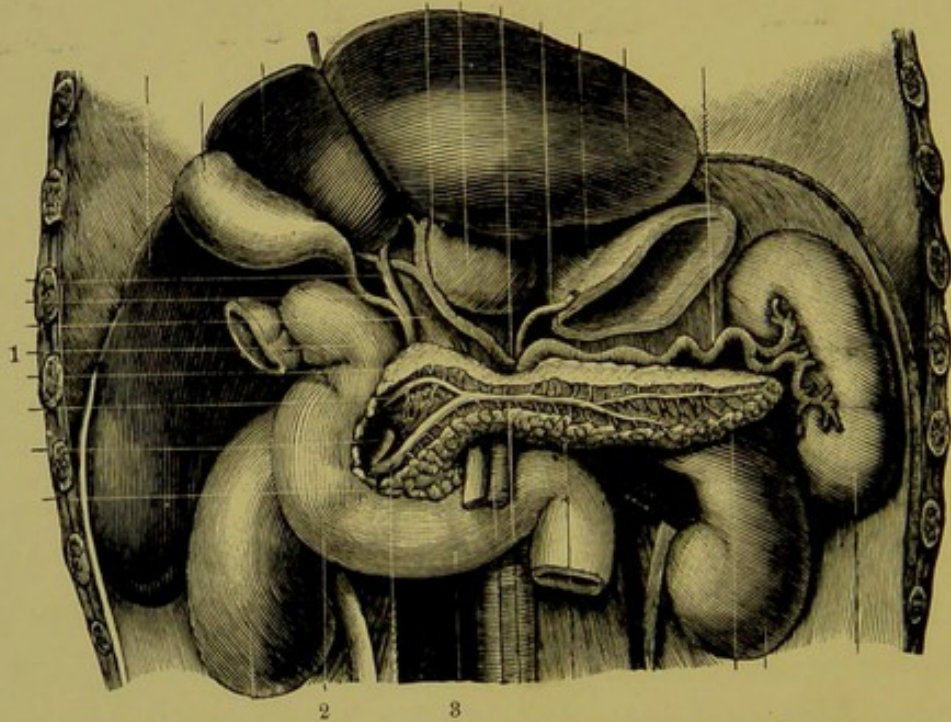
THE part of the human body that principally concerns us here is the intestinal canal, consisting of two distinct and characteristic parts,—the small intestines and the large bowel.

The small intestines constitute by far the major part of the intestinal tract. The average length in the adult male (between the ages of twenty and fifty) is twenty-two feet, six inches; in the female it is twenty-two feet, four inches. Exceptionally it is found, both in the male and female, longer or shorter by some feet.

The intestinal tract proper begins at the stomach, from which it is separated by the sulcus pyloricus, with that portion known as the duodenum. Ever since the days of Herophilus the small intestines have been divided into three parts,—the *duodenum* (twelve fingers, eight to ten inches), the *jejunum*, and the *ileum*. There is, however, no line of demarcation that separates the duodenum from the jejunum, or any distinctive feature by which to

recognize the one from the other. Luschka has therefore proposed that the duodenum and jejunum be grouped together as one part and be called the pancreatico-bilious intestine (*intestinum pancreatico-biliosum*).

The **duodenum** takes its origin at the pyloric extremity of the stomach, on the right side of the epigastrium, about the level of the last dorsal vertebra, and ends on



THE DUODENUM AND SURROUNDING STRUCTURES. (*Sappey.*)

1, *Pars horizontalis superior*, thrown back to the right; 2, *Pars descendens* or *verticalis*; 3, *Pars horizontalis inferior*.

the left of the spinal column, about the level of the third lumbar vertebra, in the jejunum. Between the points here described it changes its course three times and is therefore divided into three segments, — some have it four, — the *pars horizontalis superior*, the *pars descendens* or *verticalis*, and the *pars horizontalis inferior*. The fourth part described by some is the *pars ascendens*.

The *pars horizontalis superior*. Beginning at the stomach, as already described, it runs outward and somewhat upward to the right in a horizontal direction, with a tendency to obliqueness. The position varies, of course, considerably with the movements of the stomach, becoming more transverse when the longitudinal fibres of that organ are contracted, and more oblique when the stomach is dilated. The position undergoes change in gastrop-tosis, whether this be partial, as when the pyloric portion alone is dislocated, or complete. This portion of the duodenum is the widest of this section of the small intestine and is about two or three inches in length. It is somewhat bottle-shaped, dilated more at its upper extremity to form the antrum duodenale. It is covered by the lobus quadratus and the right lobe of the liver. This segment is freely movable and is almost completely invested by the peritoneum. The *pars verticalis* (descending segment) runs down in front of the right kidney as far as the third lumbar vertebra. It does not descend in a straight line, but makes a gentle curve and merges almost imperceptibly into the inferior transverse portion. Joined to this latter part it gives to the duodenum the configuration of a horseshoe with the convexity looking to the right and the concavity to the left. In the concavity is received the head of the pancreas. On the inner surface of the vertical segment just below its middle is the orifice of the ductus communis choledochus, and just a little above this the separate orifice for the duct of the pancreas. It is covered by peritoneum on its anterior surface only. The *pars horizontalis inferior*, the longest and narrowest part of the duodenum, passes over trans-

versely from the right side to the left and at the left border of the spinal column ends in the jejunum. That which by some is described as a fourth change in direction, or fourth segment, is the ascent made by the terminal extremity of the duodenum from the third to the second lumbar vertebra, at which point the jejunum may be said to begin. It has a partial investment of peritoneum on its anterior surface. It is covered in front by the transverse mesocolon and crossed by the superior mesenteric vessels; it lies upon the aorta, vena cava, and the crura of the diaphragm. Above it is the lower border of the pancreas.

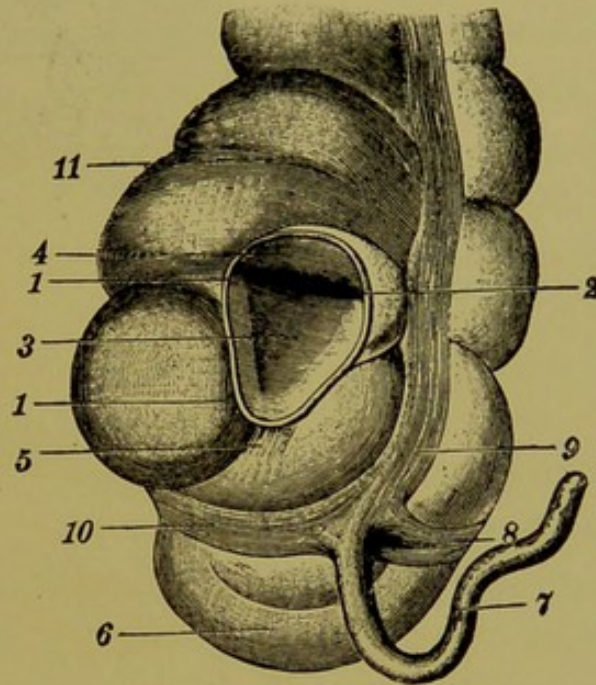
Jejunum and Ileum.—The jejunum is two-fifths of the residue of the small intestine. It begins at the point already described, descends, makes numerous convolutions, and merges into the ileum. The ileum is the residue of the small intestine, and is the narrowest portion of it. The gyri or ansæ, which these two segments form, are very numerous, and they lie closely packed together. They are arranged in a very irregular form, from left to right. Leaving the duodenum, they fill the contiguous left epigastric and umbilical regions, then the left hypochondriac and left lumbar regions, descend into the pelvis, reascend into the left iliac, pass over the hypogastric into the lower umbilical, right hypochondriac, and right lumbar regions. The ileum terminates here in that portion of the large bowel known as the cæcum. This terminal extremity is rather funnel-shaped, the wide portion of the funnel directed toward the ileum.

By means of the mesentery, which is a fold from the

peritoneum, and which with its two layers, the ascending and descending, forms the peritoneal covering of these two segments of the small intestine, they are hung up, as it were, on the spinal column.

The capacity of the small intestine is equal to six litres (about twelve pints).

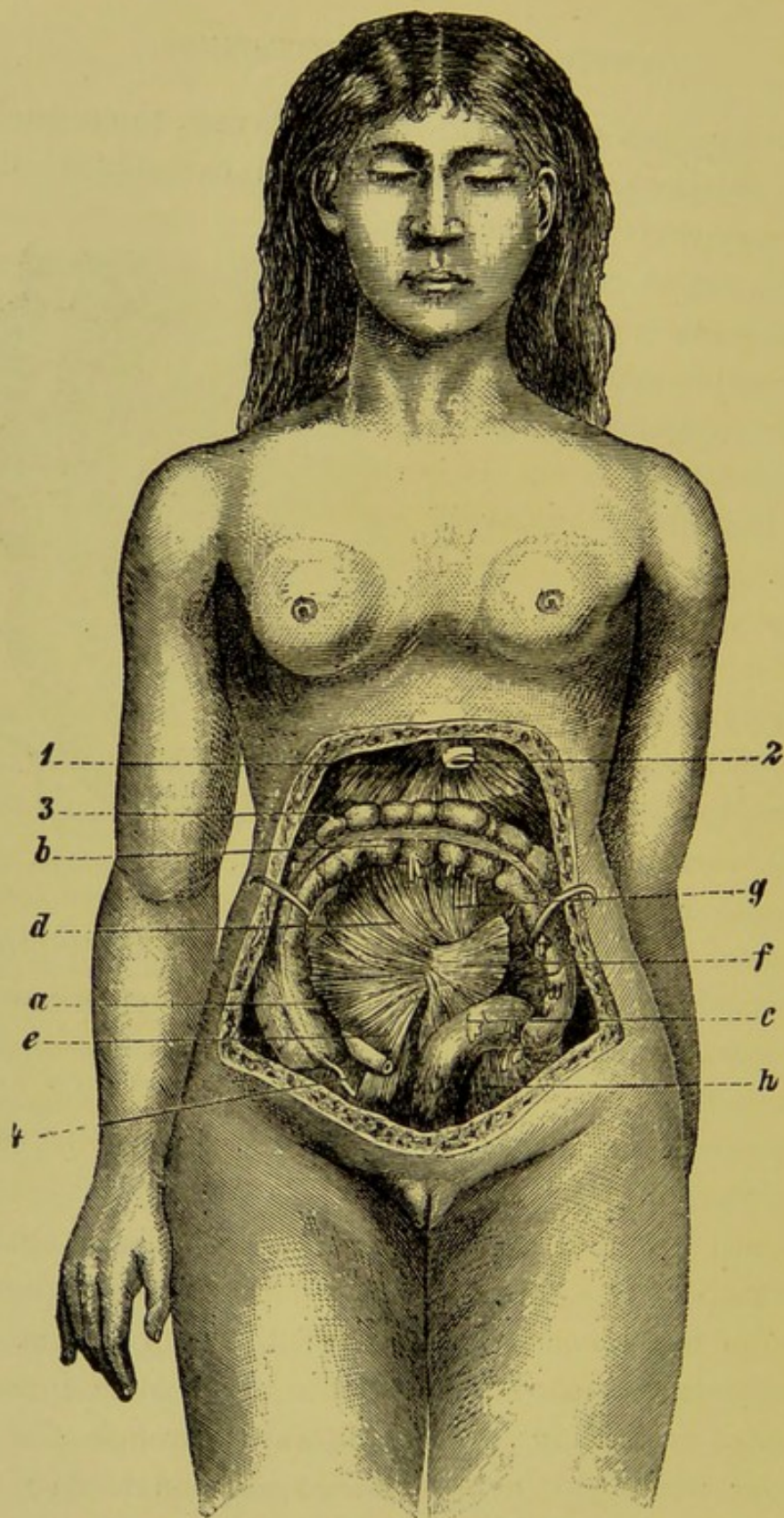
The Large Bowel. — The large bowel, *intestinum crassum seu amplum*, is about five feet in length, with occasional variations as in the case of the small intestine. It begins at the termination of the ileum and ends at the anus. It is largest at the cæcum and gradually diminishes in cali-



SHOWING CÆCUM AND FUNNEL-SHAPED TERMINAL EXTREMITY OF THE ILEUM. (*Sappey.*)

1, Line of division of the small intestine; 2, Opening of the small intestine into the large bowel; 3, Lower section of ileo-cæcal valve; 4, Upper section of ileo-cæcal valve; 5, Bundles of muscle-fibre passing over from the small on to the large bowel; 6, Lower section of cæcum; 7, Appendix vermiformis; 8, Posterior outer tænia; 9, Posterior inner tænia; 10, Anterior tænia; 11, Haustra (*Sacculi*).

bre until the rectum is reached, where there is again an increase in size. The large bowel in its course describes an arch in the concavity of which the loops of the small intestine are located. From the right iliac fossa, the point of beginning, it runs upward through the right lumbar and right hypochondriac regions to the under surface of the liver, where it makes a curve, which is covered by the overlying liver; passes then trans-



THE LARGE BOWEL IN POSITION. (Hartmann.)

a, Ascending colon; *b*, Transverse colon; *c*, Sigmoid flexure; *d*, *e*, *g*, Mesocolon and mesentery; *h*, Fascia covering inner pelvic muscles. 1, Central tendon (of diaphragm); 2, Opening for the oesophagus; 3, Bundles of muscle-fibre of the under surface of the diaphragm; 4, Appendix vermiformis.

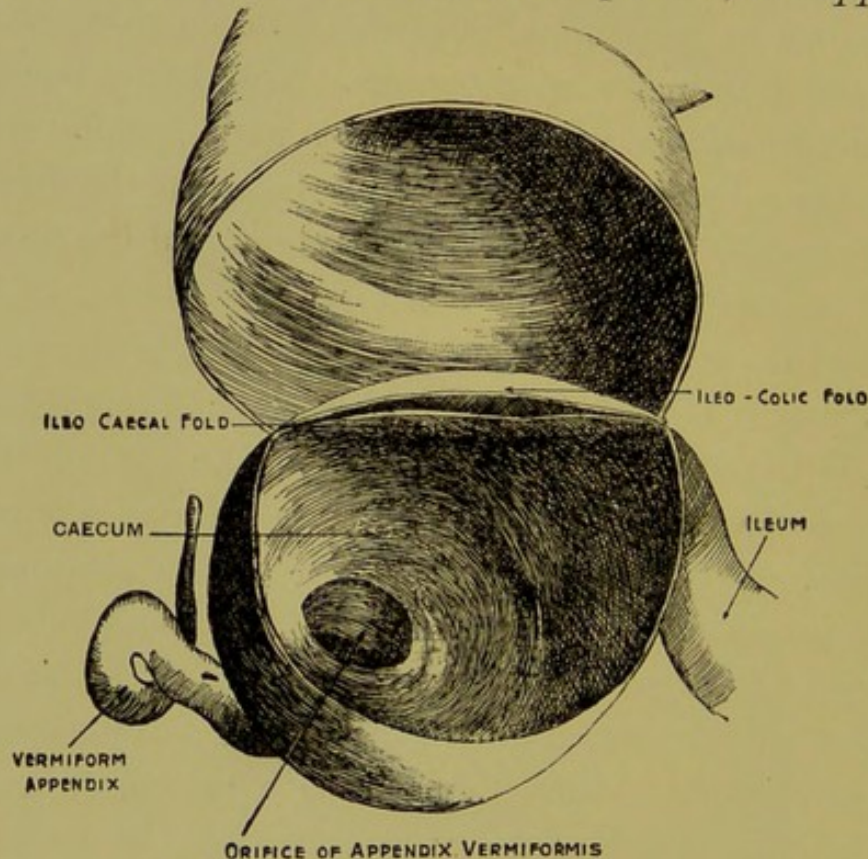
versely, with a somewhat upward tendency, onward between the borders of the epigastric and umbilical regions into the left hypochondriac region,—near the spleen, about two vertebra higher than to the right,—where it again makes a curve and descends through the left lumbar region and left iliac fossa, where it makes a sort of fold known as the sigmoid flexure; it then passes downward and terminates at the anus. The large bowel is divided into various parts: the *cæcum* and *appendix vermiformis*, the *ascending colon*, the *transverse colon*, the *descending colon*, the *sigmoid flexure*, the *rectum*, and the *anus*.

The **cæcum** (*blind pouch*) is the largest segment of this section of the intestinal tract. It measures about two and a half inches both in its vertical and transverse diameters. It lies in the right iliac fossa on the right internal iliac muscle, with its end about the middle of Poupart's ligament. It is retained in position by the peritoneum, which passes over its anterior surface and sides, and posteriorly it is connected by loose areolar tissue with the iliac fossa. Occasionally it is almost surrounded with peritoneum, which then forms a mesocæcum.

About the junction of the cæcum and the ascending colon the ileum opens into the large bowel by a narrow, elongated, slit-like, aperture at right angles to the axis of the bowel. The mucous membrane forms here two semilunar valvular folds which project into the bowel and constitute the ileo-cæcal valve, the *valvula Bauhini*. At each end of the orifice the valves coalesce, and are continued as a narrow membranous ridge around the canal of the bowel for a little way, forming the fræna or retinacula of the valve. At the left extremity of the

slit the aperture is rounded; at the right end it is narrow and pointed. When the cæcum is distended, the borders of the valvular folds are closely approximated and any reflux prevented.

At the lower and posterior portion of the cæcum, there is found attached a small worm-like process, the *appendix*



(From Harrison Allen's Human Anatomy.)

vermiformis. It is from three to six inches in length; exceptionally it may be found longer; thus Luschka saw one that had a length of twenty-three centimetres (about eighteen inches). Its diameter is about the size of a goose-quill. It opens into the cæcum by a minute orifice at which an incomplete valve-like projection of the mucous membrane is sometimes found.

The Ascending Colon: that part of the large intestine

lying on the right side of the abdomen between the crest of the ilium and the diaphragm. Continuous with the cæcum and smaller than it, it mounts upward and somewhat outward, to the right hypochondrium, passing in front of the lower half of the right kidney. Here it makes a turn, the *flexura coli dextra seu hepatica*, runs horizontally and to the left, and terminates in the transverse colon.

The *right colic flexure* is in contact with the lower border of the right lobe of the liver and partly also with the gall bladder.

The ascending colon is covered anteriorly and on its sides with peritoneum and sometimes is completely invested by it, so that a narrow mesocolon is formed; posteriorly it is usually covered by loose areolar tissue which connects it with the quadratus lumborum muscle and the kidney. It is thus retained in position.

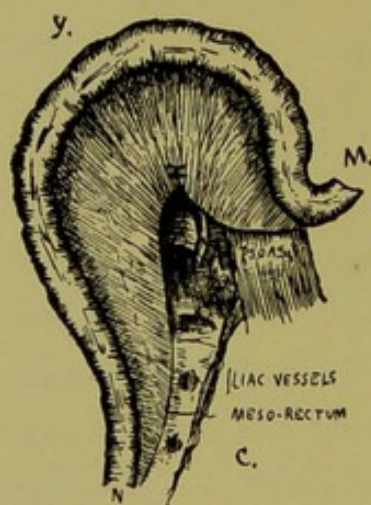
The Transverse Colon: the longest part of the large bowel passes transversely across the abdomen between the lower boundary of the epigastric and the upper boundary of the umbilical region to the left hypochondrium, where it makes a turn, the *flexura coli sinistra seu linealis*, and passes downward to terminate in the descending colon. In its passage across the abdomen it describes somewhat of an arch, the concavity being directed backward toward the vertebral column. This is known as the *transverse arch* of the colon.

This is the most movable part of the colon; it is almost completely invested with peritoneum and is attached to the vertebral column by a large and wide duplicature of this membrane, the *transverse mesocolon*.

It is in relation by its upper surface with the lower border of the right lobe of the liver, with the gall bladder, with the greater curvature of the stomach, and with the lower border of the spleen; by its under surface with the small intestines; by its anterior surface with the great omentum and the other constituent parts of the abdominal parietes.

The Descending Colon passes downward through the left hypochondrium and the left lumbar region to the upper part of the left iliac fossa where it enters into the sigmoid flexure.

The Sigmoid Flexure. — This is normally the narrowest portion of the large bowel and lies in the left iliac fossa.



(From Treves' Anatomy of the Intestinal Canal, etc.)

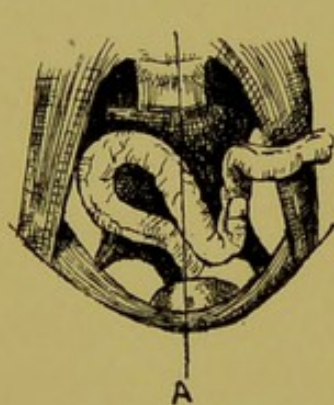
C, Usual shape of the unfolded loop (adult); *M*, Termination of descending colon; *N*, at the point of ending of the mesorectum.

As usually described, the gut makes a double turn upon itself; beginning at the termination of the descending colon it curves upward, then descends and again makes an upward curve, the whole having

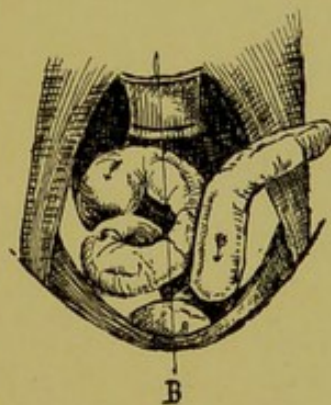
the shape of the figure "S" — whence the name — and terminates in the rectum. According to Treves, however, this description, though classic, is erroneous; the flexure does not resemble the "S" Romanum; it has rather the figure of an omega — "Ω." He describes it as

follows: "The descending colon ends just at the outer border of the psoas. The gut here suddenly changes its direction; it crosses the muscle at right angles and about

midway between the lumbo-sacral eminence and Poupart's ligament. It now descends vertically along the left pelvic wall and may at once reach the pelvic floor. It then passes more or less horizontally and transversely across the pelvis from left to right and commonly comes into contact with the right pelvic wall. At this point it is bent upon itself, and, passing once more to the left, reaches the middle line and descends to the anus." Treves includes in his description of the flexure what is usually denominated the first segment of the rectum. The aver-



A, Most usual arrangement of the loop when *in situ*.



B, Rarer form of arrangement.

age length of this portion of the bowel in the adult is about $17\frac{1}{2}$ inches. It is kept in place by a fold of peritoneum,—the sigmoid mesocolon. The fold, however, is ample and permits of extensive movement on the part of this segment of the large bowel.

The Rectum. — This is the terminal portion of the large bowel. It is narrower at its upper part than the sigmoid flexure, but dilates as it descends and, just before the anus, forms an ampulla, which may reach great size. The rectum, which varies in length from six to eight inches, is usually divided into three parts,—the upper,

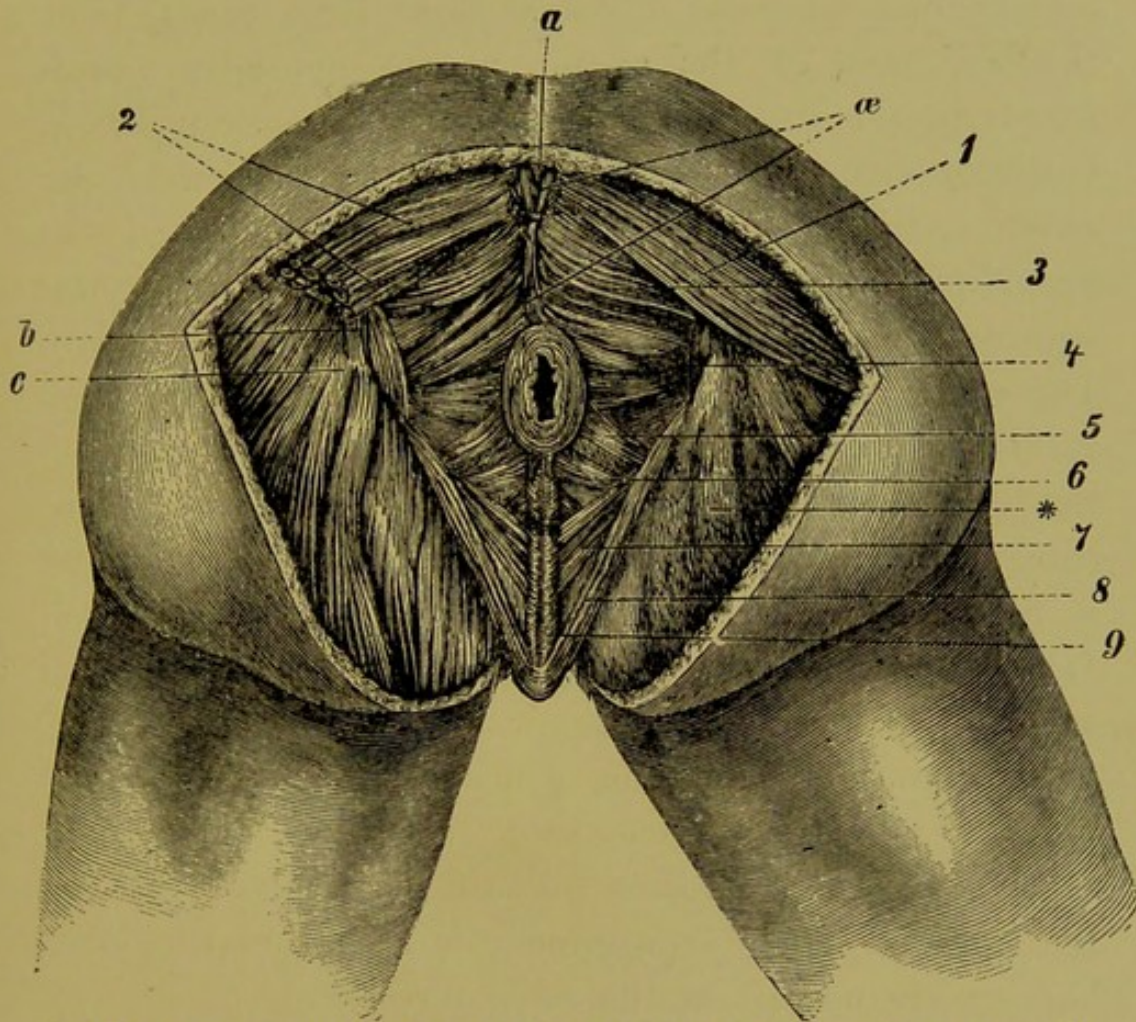
the middle, and the lower portion. (As already stated, Treves recognizes but two segments, counting the first as part of the sigmoid flexure.) It begins at the left sacroiliac symphysis, passes obliquely downward from left to right to the middle of the sacrum, making a gentle curve to the right. It regains the middle at this point and descends to the lower part of the sacrum and coccyx; near the extremity of the latter bone it inclines backward to terminate at the anus, a buttonhole orifice, situated a little in front of the coccyx. The upper part of the rectum is completely surrounded by peritoneum and connected with the sacrum behind by a fold of this membrane, which is known as the *mesorectum*. In front it is separated, in the male from the posterior surface of the bladder, and in the female from the posterior surface of the uterus and its appendages, by some convolutions of the small intestines. The middle portion is closely connected with the sacrum; it is covered by peritoneum on its upper and anterior portions only.

The Sphincters of the Anus. *The external sphincter.*— Like all sphincters, its purpose is to keep an orifice, that of the anus, closed. It consists of planes of muscular fibre which surround the anus. It is elliptical in shape and intimately adherent to the integument about the margin of the anus. It arises from the tip of the coccyx, and is inserted into the tendinous centre of the perineum, merging with the transverse perinei muscle. It has both voluntary and involuntary muscular fibres.

The *internal sphincter* is a plane of involuntary muscular fibres about one-half an inch in length, which

surrounds the lower part of the rectum about an inch above the margin of the anus.

A third sphincter does not exist.¹



THE EXTERNAL SPHINCTER OF THE ANUS (AND THE PERINEAL MUSCLES IN THE ADULT MALE). (*Hartmann.*)

1, The glutæus maximus; 2, Same, divided; 3, Deeper fasciculi of the same; 4, Levator ani; 5, 6, 7, Transversus perinei; 8, Ischio-cavernosus; 9, Bulbo-cavernosus; 10, External sphincter of the anus. *a*, Sacrum covered by its connective tissue; *b*, Fascia; *c*, Point of origin of the muscles of the thigh. *, The latter shown to the right covered with fascia. *æ*, Ligam. anococcygeum.

Certain points in the structure of the large intestine are deserving of consideration.

It strikes the eye of the beholder at once that the

¹ See Kelsey, Diseases of the Rectum and Anus.

large bowel does not present the smooth, even surfaces noted in the small intestine, but has a sacculated appearance. This is due to the arrangement of the longitudinal muscular fibres in three large bands, from the beginning of the cæcum at the appendix vermiformis to the rectum. One of these bands, or tæniæ, is posterior along the attached border of the bowel; the anterior, the largest, is on the forward surface of the ascending and descending colon and sigmoid flexure, and on the under surface of the arch of the colon. The third, or inferior lateral band, is found on the inner surface of the descending and ascending colon, and on the under surface of the transverse section. These bands, being shorter than the rest of the intestine, draw it together, and so produce the appearance described. When they are dissected off, the bowel can be drawn out and its sacculations disappear.

The mucous membrane, which is quite smooth and without villi, is thrown into crescentic folds, *Plicæ Sigmoidæ*, which project forward like valves between the sacculi. Their arrangement is such that their free borders are not all in the same direction.¹

The rectum is not sacculated, but smooth and cylindrical, the tæniæ being wanting here. The mucous membrane of the rectum is thicker, more vascular, of darker color, and but loosely connected with the muscular coat. When the rectum is collapsed, its mucous membrane is thrown into folds which are in apposition with each other, and obliterate, as it were, the lumen of the bowel. When the rectum is distended, the folds disappear.

¹ See chapter "Physiology of Peristalsis."

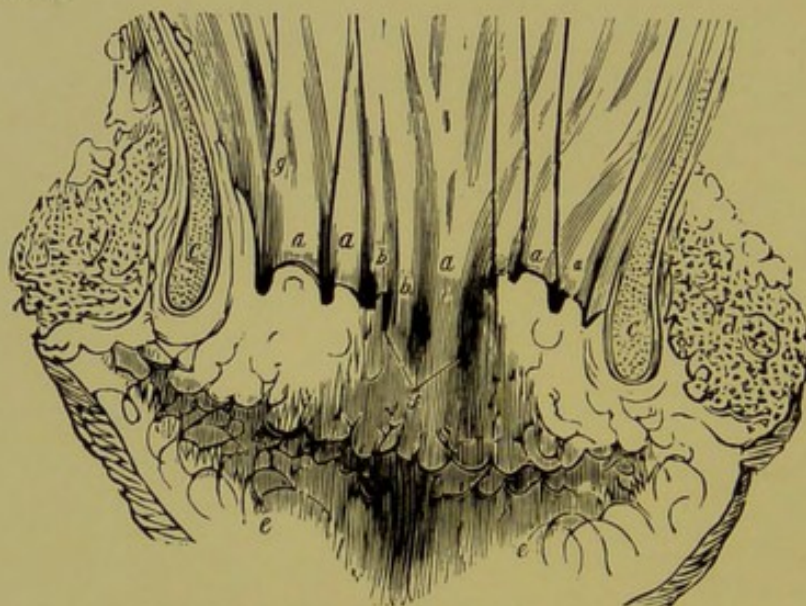
Houston described as valves of the rectum folds of the mucous membrane found protruding into it, and ascribed to them the function of holding up the fæces, *i.e.* preventing its constant descent, and consequently constant irritation of the sphincter. They were said to be present in all persons, but to vary in number and location. It has, however, been disputed, and the weight of authority is against their existence, as a rule. This much, however, is positive, that even where such protruding folds do exist they have no valvular function; the rectum has no need of valves. Occasionally a large fold of mucous membrane is found, extending into the lumen of the tube; Kohlrausch described such a fold, which he calls *plica transversalis recti*, and it has been seen by others.

About the level of the internal sphincter five or six little semilunar valves are noted, with their concavities directed upward toward the colon.¹ They form an irregular line around the canal. They are thus described by Dr. Horner: "The mucous coat of the rectum is thick, red, and fungous, and abounds in mucous lacunæ and glands. It is laid smoothly above, and below it is thrown into superficial longitudinal folds called columns. At the lower end of the wrinkles between the columns are small pouches from two to four lines in depth, the orifices of which point upward; they are occasionally the seat of disease, and produce, when they are enlarged, a painful itching."²

¹ Handy, W. R., Text-book of Human Anatomy, Philadelphia, 1854.

² Special Anatomy and Histology. Eighth Edition, Vol. II. Phila. 1857. Bodenhammer, "Observations on the Normal Sacculi of the Anal Canal," etc., *Medical Record*, May 26, 1888.

The function of these little pouches, *Sacculi Horneri*, is apparently to collect mucus which may be required to lubricate the moving fæces, and thus facilitate its expulsion.



(From Handy, Text-book of Human Anatomy.)

Represents a section of the anus and rectum, showing the rectal pouches. *aa*, Columns of the rectum; *bb*, Rudiments of columns; *c*, Internal sphincter divided; *d*, External sphincter divided; *ee*, Folds of skin on the nates; *f*, Pouches; *g*, Bristles in the pouches.

Arteries.

- I. PANCREATICO-DUODENALIS, branch of the gastroduodenalis, branch of the hepatic, branch of the cœliac axis, supplies the first part of the duodenum.
- II. SUPERIOR MESENTERIC ARTERY: a large vessel arising from the abdominal aorta a little below the cœliac axis. It passes forward between the pancreas and transverse portion of the duodenum and descends between the layers of the mesentery to the right iliac fossa, where it terminates, considerably diminished in size. It supplies the

whole length of the small intestine except the first part of the duodenum. It also supplies the cæcum, ascending and transverse colon.

Branches: *Vasa intestini tenuis*, fifteen or twenty branches, arising from the convex side of the artery. They anastomose with each other in a series of arches which become smaller and more numerous as they approach the small intestines, to which they are finally distributed.

Inferior pancreatico-duodenal is distributed to the transverse and descending portion of the duodenum; it anastomoses with the pancreatico-duodenalis.

Ileo-colic, distributed to the lower portion of the ileum, cæcum, and vermiform appendix. Anastomoses with branches from the inferior mesenteric artery.

Colica dextra to the ascending colon.

Colica media to the transverse colon.

The artery is accompanied in its course by the superior mesenteric vein, and is surrounded by the superior mesenteric plexus of the sympathetic nervous system.

III. INFERIOR MESENTERIC ARTERY arises from the left side of the abdominal aorta just before the point of bifurcation. It is not so large a vessel as the superior mesenteric artery. It supplies the descending colon, the sigmoid flexure, and the greater part of the rectum.

Branches: *Colica sinistra* to the descending colon.

Arteria sigmoidea to the sigmoid flexure.

IV. **HÆMORRHOIDALIS SUPERIOR** is the continuation of the inferior mesenteric artery from the iliac fossa downward. It descends between the mesorectum to the rectum, and at about its middle divides into two branches which descend on either side of the rectum, where they divide into several smaller branches, which are distributed to the muscular and mucous coat of this section of the bowel near its lower end. These anastomose with each other, with the middle hæmorrhoidal and inferior hæmorrhoidal arteries, and with branches from the internal iliac and internal pudic arteries.

This artery is accompanied by the inferior mesenteric vein, and is surrounded by the inferior mesenteric plexus of the sympathetic nervous system.

V. **MIDDLE HÆMORRHOIDAL ARTERIES.** Branches of the internal iliac, distributed to the anterior part of the rectum.

VI. **EXTERNAL HÆMORRHOIDAL ARTERIES.** Two or three small arteries — branches of the internal pudic, distributed to the muscles and integument about the anus.

Veins. — Superior mesenteric vein,

Inferior mesenteric vein, unite with others to form the *portal* vein.

Nerves of the Intestinal Tract. — The nervous system of the intestinal tract is almost altogether part of the great sympathetic system. The nerve filaments and

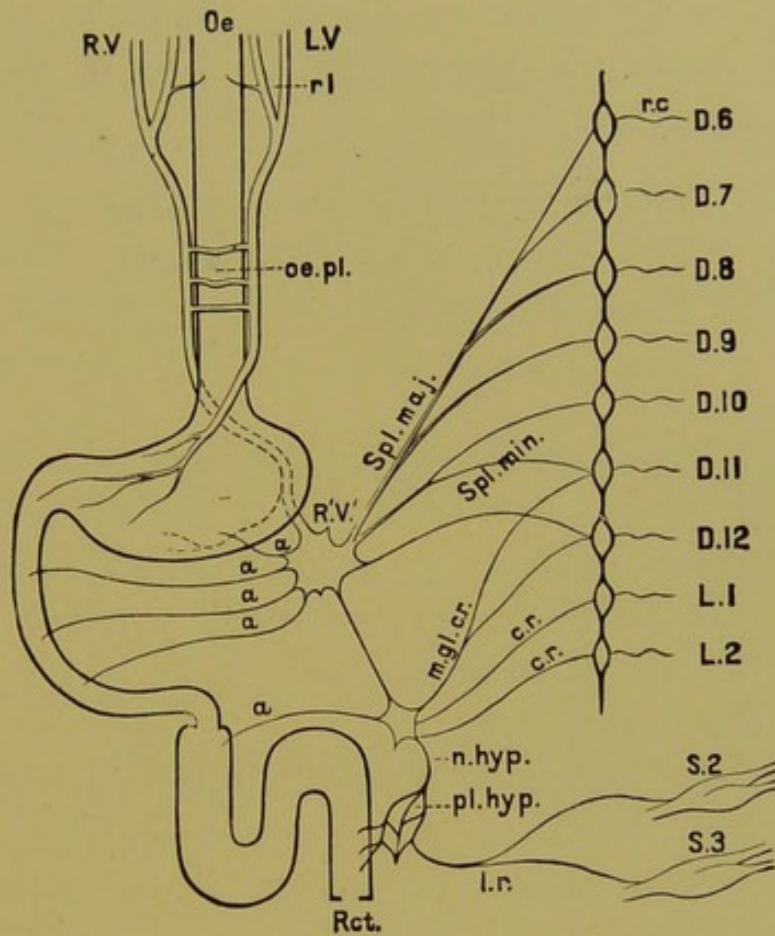


DIAGRAM TO ILLUSTRATE THE NERVES OF THE ALIMENTARY CANAL IN THE DOG.
 Foster, Human Physiology.

The figure is for the sake of simplicity made as diagrammatic as possible, and does not represent the anatomical relations.

Oe to *Rct.* — The alimentary canal, œsophagus, stomach, small intestine, large intestine, rectum.

L.V. Left vagus nerve ending on front of stomach. *r.l.* recurrent laryngeal nerve supplying upper part of œsophagus. *R.V.* right vagus, joining left vagus in œsophageal plexus, *oe.pl.*, supplying the posterior part of stomach and continued as *R'.V'* to join the solar plexus, here represented by a single ganglion and connected with the inferior mesenteric ganglion (or plexus) *m.gl.* — *a.* branches from the solar plexus to stomach and small intestine, and from the mesenteric ganglion to the large intestine.

Spl.maj. Large splanchnic nerve arising from the thoracic ganglia and rami communicantes *r.c.* belonging to dorsal nerves from the 6th to the 9th (or 10th).

Spl.min. Small splanchnic nerve similarly arising from 10th and 11th dorsal nerves. These both join the solar plexus and thence make their way to the alimentary canal.

C.r. Nerves from the ganglia, etc., belonging to 11th and 12th dorsal and 1st and 2nd lumbar nerves, proceeding to the inferior mesenteric ganglia (or plexus) *m.gl.* and thence by the hypogastric nerve *n.hyp.* and the hypogastric plexus *pl.hyp.* to the circular muscles of the rectum.

l.r. Nerves from the 2nd and 3rd sacral nerves, *S.2*, *S.3* (*nervi erigentes*), proceeding by the hypogastric plexus to the longissimus recti muscles of the rectum.

plexuses are derived more directly from the following plexuses, which are themselves but part of the great *solar*, or epigastric, plexus:

The superior mesenteric plexus,
The inferior mesenteric plexus,
The aortic plexus,
The hypogastric plexus.

The *superior mesenteric plexus* accompanies the superior mesenteric artery into the mesentery, and there divides into a number of plexuses which follow the branches of the artery to the parts supplied by it; namely, the *small intestines*, the *cæcum*, the *ascending* and the *transverse colon*.

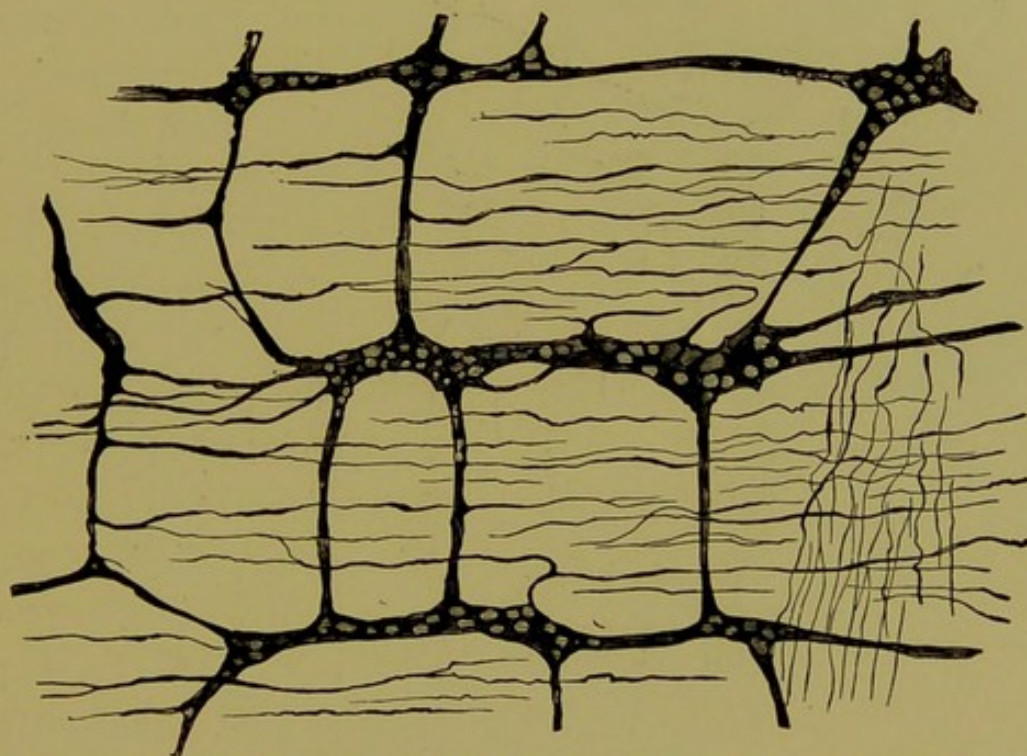
The *inferior mesenteric plexus* (which originates more directly from the aortic plexus) accompanies the ramifications of the inferior mesenteric artery to the parts supplied by it,—the descending colon and the sigmoid flexure.

The *superior hæmorrhoidal plexus* (which also is part of the aortic plexus) supplies with nerve filaments the upper part of the rectum.

The *inferior hæmorrhoidal plexus*, part of the hypogastric plexus, distributes itself over the inferior portion of the rectum and there unites with the ramifications of the superior hæmorrhoidal plexus.

These plexuses, after they have entered into the intestinal structure, divide into two distinct layers, which surround the intestinal tissues in every direction. The first layer is located between the longitudinal and the circular layers of muscular fibres, and constitutes the

plexus myentericus of Auerbach. The second layer is found between the mucous membrane and the submucous tissue, and is the *plexus of Meissner*. These plexuses are formed by a network of fine non-medullated nerve fibres, with ganglia and ganglionic cells located at various points in the network. There are communicating branches between the two layers.



PLEXUS OF AUERBACH, BETWEEN THE TWO LAYERS OF THE MUSCULAR COAT OF THE INTESTINE. (*Cadiat.*)

The bowels have no direct connection with the cerebro-spinal system; indirectly, however, they have such connection. As has been said, all the various plexuses above recounted are more or less part of the great solar plexus, and this receives the terminal extremity of the right pneumogastric nerve.

Through the solar plexus the intestines are in communication with the various organs of the body; for,

besides the terminal portion of the right vagus nerve, this plexus receives also the ends of the splanchnic nerves, the greater and the lesser, which are derived from the thoracic sympathetic ganglia.



PLEXUS OF MEISSNER FROM THE SUBMUCOUS COAT OF THE INTESTINE. (*Cadiat.*)

a, Cavity of tubular glands or crypts; *b*, one of the lining epithelial cells; *c*, Interglandular tissue; *d*, Lymphatics.

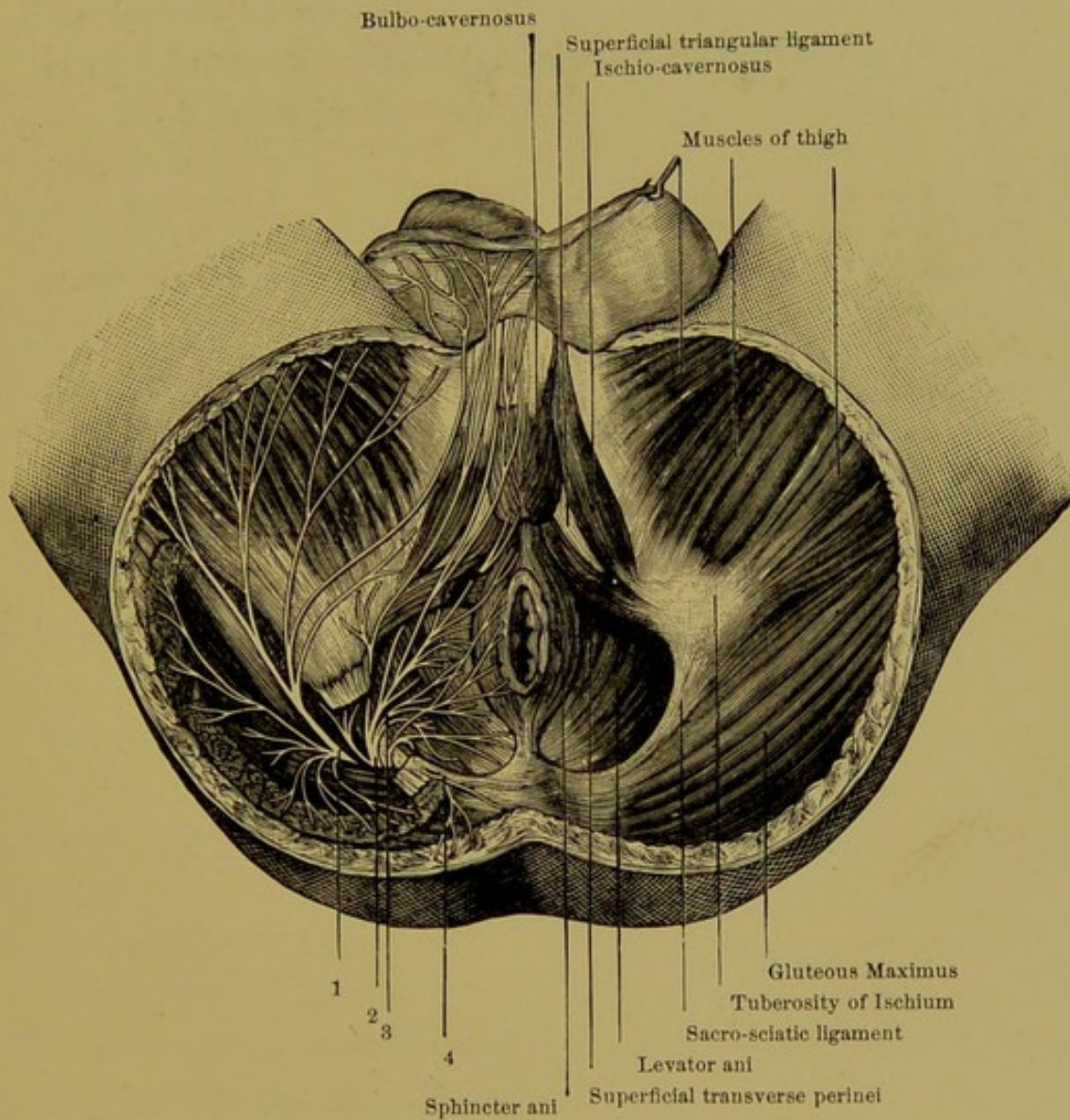
Only the rectum and the anus are in direct communication with the cerebrospinal system. Besides the branches of the great sympathetic system already named, these parts receive nerve filaments from the sacral plexus of the spinal cord. The part, however, that is most abundantly supplied with nerves from the cerebrospinal system, is the external sphincter.

1. The *inferior hæmorrhoidal nerve* (usually a branch of the pudic) is distributed to the external sphincter and to the integument around the anus.

2. The *posterior branch* of the *superficial perineal nerve* passes to the back part of the ischio-rectal fossa and distributes filaments to the sphincter ani and the integu-

ment around the anus: these unite with the inferior hæmorrhoidal nerve.

Moreover, the integument around the anus with which



THE MALE PERINEUM. (From Morris' Text-book of Human Anatomy.)

1, Inferior pudendal nerve; 2, Superficial perineal nerve; 3, Inferior hæmorrhoidal nerve; 4, Cutaneous branch of fourth sacral.

the sphincter is in intimate relation, and the accessory muscles of the latter, receive filaments from various branches of the great sacral plexus, the *cutaneous* from

the fourth sacral, the *inferior pudendal*, and the anterior branches of the superficial perineal.

The bowels hang rather loosely attached to various parts in the abdominal cavity. They are supported and kept in place by the muscles and other structures forming the anterior and the posterior abdominal walls.

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1854.

CHAPTER II

FLATUS (ΠΝΕΥΣΙΣ, WIND, GAS)

IN the course of the process of digestion in the intestinal tract, by reason of the breaking up of the various alimentary matters ingested and their elaboration into assimilable material, gases are developed in the stomach and in the intestines. They were primitively divided by Van Helmont¹ into two groups, — the inflammable and the non-inflammable, the gases of the large bowel constituting the former, those of the stomach and the small intestines the latter group. This same subdivision was adopted by Priestley.

The flatus thus formed is constituted by various gases : carbonic acid gas (CO_2 , *carbon dioxide*); carburetted hydrogen (CH_4 , *methane, marsh gas*); nitrogen (N); hydrogen (H); sulphuretted hydrogen (H_2S [HS_2], *hydrogen sulphide*). The last is found normally in the intestines only.² There is some difference of opinion in regard to carburetted hydrogen, whether it is a normal constituent of the flatus or not.³

¹ Tract. de Flatibus, 27.

² In pathological conditions of the stomach, in dilatation with decided stagnation, it is also found in the stomach and readily recognized in the withdrawn stomach contents by the well-known test.

³ Planer, *Sitzungsberichte d. Akadem. d. Wissenschaften zu Wien*, Vol. XLII. Ruge, *Ibid.* Vol. XLIV. 734. *Chemisch. Centralblatt*, 1862, 347. Nowack und Brautigam, *Muenchener Mediz. Wochenschr.* 1890.

The gases vary of course in volume, depending much upon the character of the food that is taken. Thus it is well known that the leguminous seeds, as peas and beans, give rise to a greater proportion of flatus, especially of carburetted hydrogen, than do other articles of food.

In addition to the gases thus developed, a certain amount of the volume of the flatus is derived from extraneous sources; a certain amount of air is swallowed with the food in the act of deglutition and a quantity of carbonic acid gas (perhaps the greater part) is diffused into the intestines from the blood-vessels.¹

The following table of Planer gives the volumes of the various gases as found by him in the stomach, in the small intestines, and in the large bowel:

GASES, IN VOLUME, PER CENT.	STOMACH.		SMALL INTESTINES.		LARGE BOWEL.	
CO ₂	20.79	38.83	16.23	32.27	30.64	34.80
H	6.71	27.58	4.04	35.55		
CH ₄						12.88
N	75.50	38.22	79.73	31.63	69.36	50.20
O		0.37		0.05		
SH ₂				Trace		Trace ²

Ruge³ found the flatus of the large bowel collected per anum, regard having been had to the influence of diet, constituted as follows:

¹ Foster, Physiology. Landois and Sterling, Physiology. Charles, S. J., *British Medical Journal*, 1885, February, "The Sources, etc., of Carbonic Acid."

² Loc. cit.

³ Loc. cit. Foster, Physiology.

	MIXED DIET.	LEGUMINOUS DIET.	MEAT DIET.
CO ₂	40.54	21.05	8.45
N	17.50	18.96	64.41
CH ₄	19.77	55.94	26.45
H	22.22	5.03	0.69
SH ₂	Trace only		

The flatus is an *important factor* in the proper functioning of the bowels; *it stimulates peristalsis, tends to keep the intestines distended*, and contributes much to the looseness of the ingesta and of the fæcal matter.¹

Under normal conditions the flatus is removed from the intestines by reabsorption by the blood-vessels, and by discharge through the rectum.

When from any reason this disposition of the flatus is interfered with, it accumulates, augments in volume, distends the belly, and not infrequently is the cause of spasmodic pains, more or less severe, therein.

Its presence in larger volume is recognized by the characteristic tympanitic sound given forth by the abdomen upon percussion. The accumulation of flatus in habitual constipation, where it is mainly confined to the large bowel, is never so great as in the acute forms of constipation,² where both accumulation and exaggerated formation with greater distension of volume are favored. Occasionally the flatus may itself become the cause of a constipation.

When fæcal vomiting occurs, the abnormal accumulation and production of flatus is the chief factor thereof.

¹ Nowack and Brautigam, loc. cit.

² The conditions favoring the free development and action of the pathogenic bacteria.

CHAPTER III

INTESTINAL PERISTALSIS

JUST as they differ in anatomical appearance, so do the two sections of the intestinal tract differ in function. Whilst it is the province of the small intestines to elaborate the chyme coming from the stomach and such other parts of the food taken as have as yet undergone but little change into substances that can be readily assimilated by the system, and to absorb these from the moving mass of matter as it progresses on its downward journey, the large bowel collects the indigestible residue, and after extracting what little of nutritive material remained therein, propels it onward and downward and expels it from the body.

In the performance of its functions the intestinal tract makes a series of movements, known as peristalsis (*περιστελλω*, to send around, to surround), by which the food materials are carried onward and downward. These movements are vermicular in character, and are produced by the contractions of the several layers of muscular fibres clothing the intestines. There is a contraction of the circular muscular coat which travels lengthwise and downward; following it, a contraction of the longitudinal muscular fibres, which also travels lengthwise and downward. The circular layer of muscu-

lar fibres being the largest, its contractions are the most powerful and the most effective. By them the lumen of the tube is constricted at that particular point and an upward escape of the contents prevented; at the same time a pushing downward force is exerted. The contraction of the longitudinal fibres shortens the special section of the intestine, and thus materially aids the forward and downward transport.

Small Intestines. — The peristaltic action of the small intestines begins at the duodenum. It is not a continuous movement, *i.e.* that, beginning at the duodenum, it continues onward in regular course without interruption until it has reached the ileo-cæcal valve. It continues for a short distance, and beyond that for another distance everything is quiescent; beyond that again, activity. Frequently several distinct sections or loops, lying side by side, are contemporaneously in action, with perfectly quiescent portions or loops intervening between them. All at once the active sections will become quiescent, whilst the previously immobile parts will become active.¹

The peristaltic movements of the small intestines can, according to Nothnagel,² be divided into two groups: the first, already described, the vermicular action, alternate contraction and dilatation and lengthening and shortening of the tube. With this a change of position of the active loop or loops may occur, making a sort of rolling motion. The second, observed in the small intestines only, is a to-and-fro, pendulum-like movement. It is thought that by this motion the various constituents

¹ Nothnagel, Beiträge zur Physiologie u. Pathologie des Darmes.

² Ibid.

of the chymus are more thoroughly shaken together, and, furthermore, the chyme, which is acid,¹ is brought into more immediate contact with the secretions of the intestinal parietes, which are alkaline.²

This is the more plausible, as during this special movement there is no carrying forward of intestinal contents, they remaining in the parts in motion even though this continue for quite a length of time.

This oscillatory movement is produced more particularly by the action of the longitudinal muscular fibres.³

The movements of the small intestines are slow.

Large Intestines. — Almost all that is convertible into assimilable material having been properly prepared and almost altogether absorbed, the indigestible residue is discharged into the large bowel, into the cæcum. Here putrefactive changes, brought about by apparently a specific microbe,⁴ take hold of the residue of the albuminous matter that has passed over and it is broken up into its ultimate products, — indol, skatol, etc. Here also what little of assimilable material has been carried over is absorbed. Then by peristaltic action, which is the same as in the small intestines, the residuum is pushed gradually onward from sacculus to sacculus, assuming more and more the color, form, and consistence of normal fæces, until, when it arrives at the sigmoid flexure, it is the fæces ready for expulsion.

¹ Macfadyen, Nencki, and Sieber, *Archiv f. experiment. Pathologie u. Pharmacologie*, Vol. 28, Heft 1 and 2.

² *Ibid.*

³ Foster, *Physiology*.

⁴ Bienstock, *Zeitschrift f. klin. Medizin*, 1884. Macfadyen, Nencki, and Sieber, *loc. cit.*

The peristaltic movements in the large bowel are much slower than in the small intestines.

The time occupied in the passage of the small intestines is three to four hours; of the large bowel, from ileo-cæcal valve to rectum, it is twelve hours.

As to the causes producing these movements, this much can be said: An impulse to movement is undoubtedly communicated by the pyloric portion of the stomach, and by the chyme projected into it, to the duodenum. That the chyme does *per se* excite peristaltic action has been established by Nothnagel.¹ The discharge of the bile adds to the impulse. Then the acid chyme coming in contact with the alkaline secretions of the intestinal walls and with the various other secretions poured into the intestinal canal, chemical changes are instituted and gases developed, which also, as has been experimentally observed, have a stimulating effect on the bowel. In addition to all this, we have the influence of the coarse particles in the chyme. In the large bowel, though undoubtedly a certain amount of impulse or stimulus is received from the smaller intestine, still the principal factor of the peristalsis here are the *coarse particles of the indigestible residue*.

It has been a question with physiologists, and one that is not yet definitely settled: Is the peristalsis due to nervous action or is it the result of muscular irritation? It is possible that the peristalsis is entirely due to muscular irritability, *i.e.* that the irritation of the mucous membrane is communicated to the underlying cell of the muscular coat, and thence passed from one cell to

¹ Loc. cit.

another; experimental study and clinical observation, however, indicate clearly that it is the result of nervous action.¹

This view is certainly more in harmony with physiological processes in other parts of the body, and is more than confirmed by the abundant nerve supply furnished the intestines by the great sympathetic system as already described.

The cerebrospinal system is ordinarily not interested in this peristalsis. It always proceeds without any perception thereof on the part of the cerebrum; only when it becomes abnormal, when it becomes spasmodic, either from excess of local irritation or by reason of an irritant impulse that has been sent down from the cerebrum through the vagus, do we become conscious, painfully so, of the movements going on within us.

Upon the basis here set forth there are no contradictions, and the rather varied clinical phenomena observed, such as the production of diarrhoea by sudden mental shock or impression, are readily explained.

From the results of various experimental observations it has been assumed that the sudden stoppage of the circulation would produce increased peristaltic action, and that this was directly due to the carbonic acid which accumulated in the blood. However, the investigations of Van Braam Houckgeest² and of Nasse³ have shown that just the reverse is true; venous stasis and accumulation of CO₂ have an inhibitory influence, arrest peristalsis,

¹ Nothnagel, loc. cit.

² Pflueger's *Archiv*, Vol. VI., 1872.

³ Beiträge z. Physiolog. d. Darmbewegungen, 1866. Foster, Physiology.

whilst *increased oxygenation* makes the *movements more powerful*.

The gases developed in the intestinal tract, by keeping the bowels moderately distended, greatly facilitate the passage through them, from pylorus to rectum, of the chyme and residuary bolus.¹

Defecation.—As can be seen from the configuration of the sigmoid flexure, whether it be of the form described by anatomists generally or it have the shape noted by Treves (upon careful reading of his description and attentive inspection of his drawings, it does not require a great stretch of the imagination to see an “S” romanum [rather a sigma] in the omega), it is evidently intended for the accumulation of fæces; and this is truly its purpose. The fully formed fæces accumulate in the flexure and are held there ready to be discharged. According to the description of O’Beirne,² there is a narrowing at the point of junction of the sigmoid flexure and the rectum—O’Beirne’s sphincter. But even if this be disputed, it is nevertheless readily understood how the fæces can collect therein. As already stated, the movements of the large bowel are very slow, and there is but little *vis a tergo*. The sigmoid flexure is of large capacity; moreover, lying as it does on the sacrum and bladder, it is supported, held up, and the fæces kept from falling down. The *rectum* is always free from fæces, as was stated by O’Beirne, and as I have amply convinced myself. Its walls lie ordinarily in apposition and it thus forms an additional support for the fæcal masses gathered

¹ See Chapter II.

² *New Views on the Process of Defecation, etc.*, 1834.

in the flexure. The pouch frequently forms an exception to the rest of the rectum, in that it may contain some fæces, whilst the balance of the "straight tube" is empty.

The *anus*, the terminal extremity of the intestinal tract, is guarded by the external sphincter, which is habitually in a state of tonic contraction, which can be increased or diminished by a stimulus applied to it, either internally or externally.

This contraction is perhaps altogether due to the action of a special nerve centre, situated in the spinal cord. Experimental investigation has shown that this centre is not situated higher than the lumbar region of the cord. Increased irritability or diminution of the same in this centre is followed by increased or diminished contraction of the sphincter. This centre is again under the control of the higher centres in the brain. By the action of the will, by emotions, the centre may be inhibited and a relaxation of the sphincter result, or its irritability may be heightened and the sphincter become more firmly contracted. The sphincter can be acted upon directly by the cerebrum and a strong contraction thereof effected. However, under circumstances, the energetic peristalsis may overcome all efforts of the will. Irritation of the *pedunculus cerebri* and downward along the spinal cord produces a contraction of the external sphincter.¹

As long as the fæces remain above the rectum, no perceptible sensations are conveyed to our mind. As soon, however, as the fæces pass into the rectum and reach about the middle thereof, an irritation of the nerve

¹ Landois, Lehrbuch der Physiologie des Menschen, 1880.

filaments traversing the mucous membrane is set up, — a notification, as it were, is sent to us; we become conscious of its presence whilst at the same time the sphincter is more firmly contracted.

The process of defecation would therefore be about as follows: The peristalsis in the large bowel becomes more energetic, a quantity of fæces descends into the rectum pushed onward by the *vis a tergo* of the moving masses, a notification is at once sent in, whilst the sphincter becomes firmly contracted. Ready for the evacuation, by the command of the will (automatically, according to some), the sphincter centre in the cord is inhibited and a relaxation of the muscle results. The sudden emptying of the rectum creates a vacuum, the air rushes in, the rectum is kept open, and fæces from the flexure follow.

There is a further and more powerful factor concerned in this process; namely, the voluntary, forcible drawing in of the wall of the abdomen, — the abdominal pressure (*Bauchpresse*) which we call in to aid the involuntary mechanism hitherto considered. An inspiratory act is begun, the lungs are moderately filled, then the glottis is closed; the diaphragm is in the inspiratory position, *i.e.* descended, and the abdominal walls are strongly drawn in. By this means we exert a powerful pressure upon all the abdominal organs, upon all parts of the colon; its contents are pressed out, as it were, pushed into the flexure, and that which had been previously stored there made to descend into the rectum. Even if we are inclined to hold that the sigmoid flexure is removed from the influence of the pressure exercised by the abdominal walls (which I doubt very much), the

expression of the other parts of the colon, the increased peristalsis naturally excited, and the dilatation of the rectum by the inrushing air are amply sufficient to effect a further descent of the fæces.

This pressure with the abdominal walls can be exercised with greater or less force, according to the needs of the hour. Greater force is, of course, demanded if the peristalsis be slow, feeble ; if the tonicity of the intestine be impaired ; if the fæces be hard and dry, either from over inspissation or from a lack of sufficient mucous secretion ; much less force, when all things are normal.

By the movements described the perineum is pressed out, the anus is dilated, and the sharp bend in the lower part of the rectum somewhat straightened, and this part brought more into line with the rest of the canal. The levator ani muscle, which forms a support for the pelvic organs during the act of straining, assists also in the act of defecation ; by its contraction it draws the anus and the marginal extremity of the rectum upward, strips it, as it were, over the descending column of fæces, and thus hastens its discharge. It also aids in retracting the soft parts that have been pushed out in straining.¹

¹ Flint, A Text-book of Human Physiology, 1888. Landois, Lehrbuch der Physiologie des Menschen. Carpenter, Human Physiology. Foster, M., A Text-book of Human Physiology, 1891.

CHAPTER IV

FÆCES

A NORMAL omnivorous individual discharges from four to six ounces of fæces in the twenty-four hours. The quantity varies with the quantity of food that is taken, being larger in gross eaters. It varies also with the character of the food that is taken. A diet of which vegetables form the major part will, naturally, give a larger quantity of fæces than one which is almost entirely made up of nitrogenous substances. These latter are taken up almost altogether into the system, leaving but little detritus.

Of the quantity thus discharged, seventy-four per cent is water, and twenty-six per cent solid constituents. This proportion is requisite for the natural and easy discharge of the excrement. When the proportion of water falls below fifty per cent, then the matter is moved with greater difficulty, and consequently much more slowly, to the outlet; whilst should it fall below twenty per cent it cannot be moved at all, even with the muscular power of the intestine at the normal, and accumulation results.

Ordinarily the fæces are a homogeneous mass of fair consistence and of sausage-like shape. The consistency, like the quantity, depends upon the food that is taken; it is firmer with an abundant meat diet, whilst it is

more like pap when vegetables form the main article of sustenance.

The color is usually a yellowish or dark brown, and is due chiefly to biliary pigment. This also varies somewhat with the character of the diet. A milk diet gives a light yellow stool. Certain articles of food, rich in coloring matters, may give it an unusual coloration.

The odor is characteristic, and is the result of the putrefactive processes that go on normally in the large bowel as described.

The reaction, though generally alkaline, varies also with the diet. With vegetarians, or with those who live mainly on vegetable food, it is acid; with a meat diet, or with the average admixture of nutritive material, it is alkaline.

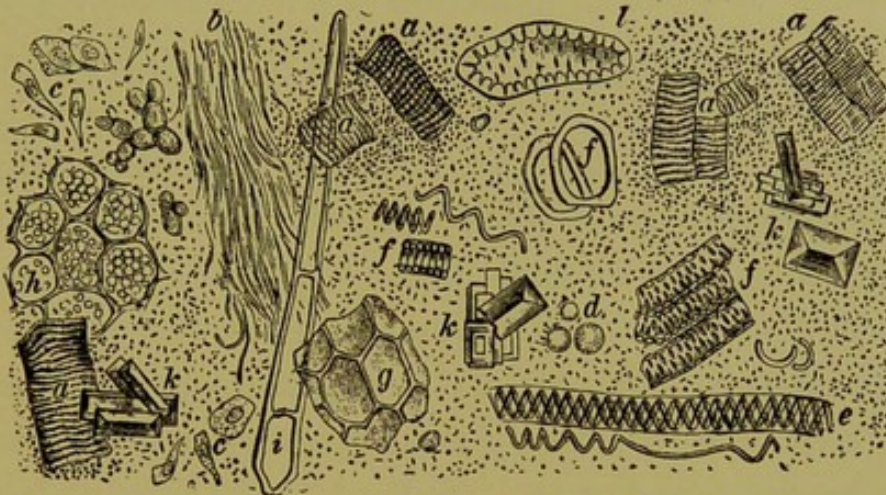
The fæces consist of residuary indigestible matters, of the products of destructive cell metamorphosis and of chemical change, and of substances gathered up in the intestinal tract. The *extraneous matters* are plant cells, vegetable fibre, starch grains, muscle fibre, connective tissue, and fat. From the intestinal tract there are gathered up epithelium, round cells, mucus, and bacteria; bile salts and bile pigment. In addition, they contain crystalline salts, the products of the digestive process: the ammonia-magnesium phosphate, neutral phosphate of lime, lime salts colored yellow by bile pigment, and oxalate of lime.

Mucine is a regular constituent of the fæces.

Albumen is never found.

A *microscopical* examination of the fæces is always advantageous and is readily made. A minute quantity

of fæces is rubbed up on a slide, — if it be too dry a drop of water can be added, — covered with a cover glass and put under the microscope. Normal fæces from the ordinary mixed diet will present a picture like this :



NORMAL FÆCES. (From Jaksch, Klinische Diagnostik.)

a, Muscle fibres; *b*, Connective tissue; *c*, Epithelium; *d*, White blood-corpuscles; *e*, Spiral cell (vegetable cell); *f-i* (inclusive) vegetable cells of diverse forms; *k*, Triple-phosphate crystal; between these various elements an enormous mass of micro-organisms; *l*, Diatoms.

In the stools of persons living almost exclusively upon a meat diet but very little or no vegetable residue, as plant cells or vegetable fibre, will be found.

Such an examination will disclose to us any foreign bodies that may be present as helminthes or the products of pathological processes going on in the intestine.¹

¹ Flint, Text-book of Human Physiology. Von Jaksch, Klinische Diagnostik. Landois, Lehrbuch der Physiologie des Menschen. Rosenheim, Pathologie u. Therapie der Verdauungskrankheiten, Theil II.

CHAPTER V

DEFINITION; ETIOLOGY; CLASSIFICATION

CONSTIPATION — delayed evacuation of the bowels — is said by many to be but a comparative term, and what might be considered constipation in the one is normal habit in the other.¹ They hold this for the reason that we see persons who have a stool but once in three or four days, a week, or even longer, in the enjoyment of good health, and I myself saw a woman who had but a limited evacuation once a month — every thirty days a midwife came to her house and scooped out the accumulated and hardened fæcal masses from the rectum — and still she did not, apparently, suffer much from this retention. Retarded evacuation can therefore, according to these authorities, be called constipation only when morbid symptoms manifest themselves concomitantly with it. I am, however, of a different opinion. It is the consensus of physiologists that every normal person should have an evacuation once in twenty-four hours, or, taking into consideration that our food at the present day is freer from coarse particles, and that therefore peristalsis is slower, at least once every other day.² I, therefore, regard every person who does not have a full, free evacu-

¹ Chambers, *Digestion and its Derangements*. Henoeh, *Unterleibskrankh. Nouveau Dictionnaire de Médecine et de Chirurgie pratique*.

² Flint, Landois, Foster (*Physiology*).

ation *once in three days* at the furthest, without, of course, the aid of extraneous measures, as constipated, even though he present no disturbances of normal function. It is possible that certain of the fluid or solid constituents of the body have suffered a change in some of their constituent elements, either by the addition of a foreign element or by the subtraction therefrom by chemical metamorphosis of a native one; a change, however, which escapes our observation because our knowledge of the intimate normal constitution of these bodies is still far from complete, and our methods of examination and the mechanical aids thereto are still defective. Moreover, it cannot be maintained that in case of sickness from other causes in such a person, that the constipation will not make itself felt to the detriment of the patient. It cannot be maintained that the constipation does not render the person particularly prone to a certain category of ailments, or even predisposed to all the ailments that flesh is heir to. Even if the foregoing be disputed (which it cannot), it can only be said that a tolerance has been established; that the system has become habituated to this state even as the mountaineers of Styria have become accustomed to arsenic, and such an individual can eat with gusto an amount of the drug that would, with us, suffice to send a regiment of soldiers to the bourne whence no traveller has as yet returned.

What is constipation? Constipation means that *although a sufficient quantity of food is taken and digested fully, there is, nevertheless, a want of normal discharge of the indigestible residual matters and the other matters therein gathered up from the bowel.*

This definition excludes, and what I regard as very properly, the long-delayed defecation resembling constipation, which we find as one of the symptoms of

Stricture of the œsophagus, or obstruction of the same by tumors from without; of

Ulcer of the stomach; of

Cancerous disease of the stomach about the pylorus; of

Non-malignant stricture of the pylorus; of

Ulcer of the duodenum.

In all these morbid states very little food is usually taken, or rather can be taken; what is taken is of concentrated nutritive form, with little or no residual matter, and even of that little which is ingested, a considerable portion is usually vomited. If much or coarse food is taken, it is certainly almost altogether rejected. It is very evident, therefore, that the condition is not one of constipation, but rather an absence of material to be discharged. For the same reason, I exclude the absence of alvine discharges in *starvation*, *inanition*, although some authors class it and describe it under the head of constipation.¹

All classes and conditions of life are liable thereto. It is found in both sexes, and at all ages. It is a matter of common observation that females are much more prone to this derangement than males, for the reason that besides the causes common to both sexes, there are a number of etiological factors, special to them, as ailments, acute or chronic, of their generative organs, relaxation of their

¹ Nouveau Dictionnaire de Médecine et de Chirurgie pratique, Jaccoud. Article "Constipation."

abdominal muscles, and the more stringent rules of modern society.

It is not an uncommon condition in infants, and is frequently a source of more or less inconvenience to the aged.

The causes that lead to this condition are many; they can be well grouped under the following four heads:

1. Pathological conditions, within or without the intestinal tract.
2. Abnormalities of form, congenital or acquired, or dislocations of sections of the large bowel.
3. Foreign bodies in some portion of the bowel.
4. Defective performance of normal physiological function.

Although various divisions of the subject have been already made, I believe that for clinical purposes, constipation, in whatever way produced, is best divided into two great groups:

- I. Acute Constipation.
- II. Chronic Constipation.

By *acute constipation* I understand that form which, coming on suddenly, is but one of a group of symptoms of a special, well-defined, and acute pathological process; where, in the treatment of the case, our attention is not specially directed to the relief of the constipation, even though we may resort to laxative medication; where with the cure of the pathological process the constipation disappears.

Chronic constipation embraces that form which is of slow and gradual development, and which does not present any acute morbid phenomena.

CHAPTER VI

ACUTE CONSTIPATION

ACUTE constipation is produced in various ways :

A. *By direct obstruction of the lumen of the intestinal tube.* This occurs,

In Intussusception.

In Volvulus (twisting or torsion) of the rectum or sigmoid flexure (the parts where it more commonly occurs).

In Twisting or inversion of the cæcum.

In Strangulation by the edges of some orifice, natural or artificial, into which a section of the small intestine may have dropped. Such orifices are the foramen of Winslow,¹ perforations in the mesentery, mesocolon, great omentum, or other duplicatures of the peritoneum.

In Strangulated hernia.

In Obstruction by foreign bodies.

The foreign bodies found in the intestinal tract can be divided, according to their derivation, into two groups :

- (a) Those introduced from without,
- (b) Those formed within the body.

¹ Rokitanski, Patholog. Anatomy.

(a) The group (a) can be again divided, according to the mode of introduction, into two subgroups :

1. Foreign bodies introduced by the mouth,
2. Foreign bodies introduced by the rectum.

1. The first of these subgroups is very well known to physicians, who are all more or less frequently consulted as regards thereto, especially in the cases of children, who seem to delight in the swallowing of extraneous matters. The bodies so introduced are varied in their nature : copper coins, pieces of silver, buttons, bones, pieces of glass, large pins, forks, and even open penknives have at one time or another found their way into the bowels. Though many of these bodies are of a formidable and rather dangerous character, it is nevertheless a fact, singular as it may be, that in a great many instances, perhaps in the greater number, they have passed through the bowels without inflicting any injury. Though not properly pertaining to the subject under consideration, the following cases are recopied here for the great interest that attaches to them, and the important lessons they inculcate.

CASE 1. *Swallowing of open penknife.* C. B. Hutchings, M.D. (Pacific Medical and Surgical Journal, 1886, XXIV. 35).

On the afternoon of Thursday, 19th, a young man twenty years of age, while fooling with some boys and girls, swallowed an open penknife, *handle first*. On telephoning the neighboring doctor, he was ordered to drink nothing but milk, and to take a dose of castor oil. Fortunately, this advice was not followed, and he came immediately to the city, where he arrived at 7.30 P.M. The castor oil was not given, but instead he was instructed to eat a hearty meal of mush and buckwheat cakes, and on going to bed directed to lie on his right side to facilitate the passage of the knife into the duodenum. The next day he was directed to spend most of the day on his right side with the hips elevated, and to eat freely of any food he desired, but particularly of buckwheat cakes. He claimed that he felt the passage of the knife through the ileo-cæcal valve,

from the very considerable pain it caused. The bowels moved on Friday. On Saturday and Sunday the same food was prescribed, but on neither day did the bowels move. He claimed, however, that he felt the knife in the transverse colon, and on Monday in the sigmoid flexure, and late Monday he felt it sticking him in the neighborhood of the anus. The bowels did not move on Monday, but on Tuesday morning about 11 o'clock there was an immense movement, which brought away the knife, point first.¹

CASE 2. *Swallowing a plate with four teeth.* M. L. Bates, M.D. (Transactions of the Medical Society of the State of New York, Vol. for 1886).

C. E. W., aged thirty-eight, came to my house about 1 o'clock in the morning of October 9, 1885, and after arousing me from my slumbers, stated that about an hour before he was awakened from his sleep by a strangling sensation, accompanied by cough and choking. When sufficiently aroused from his sleep to know what was going on about him, he found that he had swallowed his teeth—artificial plate with four teeth attached; he experienced also pain and a sense of oppression in the chest in the median line, directly over the sternum, and felt that the foreign body had lodged at some point in the œsophagus. As he was obliged to travel about a mile to reach my office, when he arrived there the pain and oppression had ceased, and he then experienced an uneasy sensation in the stomach. On examination I found that the foreign body had probably passed into the stomach and that we must deal with the case from that standpoint. After obtaining a description of the plate, as to its size, etc., I informed the patient that it might possibly pass through the alimentary canal, but that if, in the course of six days, it should not pass, then the operation of gastrotomy should not be delayed. From the description of the foreign body given by the patient himself, I thought it impossible for

¹ A diet of potato mush, *i.e.* mashed potatoes, has been highly recommended for the purpose of enveloping, and thus rendering innocuous, sharp or pointed articles that may have been swallowed.

it to pass the pyloric orifice of the stomach. After giving him some directions he went away. On the morning of the sixth day he came to my office and informed me that the plate with all the teeth intact and encased in a pultaceous mass of faecal matter passed his rectum that morning. He said that during the six days, no pain or even discomfort in any portion of his bowels was experienced.

2. Foreign bodies are introduced into the rectum for diverse and many reasons, and are likewise very varied in their character: spools, pieces of wool, tumblers, bottles, candles, pieces of iron bar, etc.

CASE 3. *Glass syringe broken in the rectum.* N. M. Baskett, M.D. (St. Louis Courier of Medicine, 1891, IV. 76).

Mrs. B, a widow, aged somewhere between fifty and sixty, is lying at the point of death with phthisis pulmonalis and will probably not live more than a few weeks. I was called upon by one of her relatives last week, who wished to consult me concerning the constipated condition of Mrs. B's bowels. She had had no passage for six or seven days. . . . I wrote for glycerine to be administered in two-drachm doses with a small syringe by injection. She stated that she had a small glass syringe, and I told her she could use that. She administered the glycerine successfully. . . . The bowels began to act frequently and exhaustingly, and during the night it became necessary to use means to check them, and the lady concluded to try the injection of ten drops of laudanum by the rectum. In introducing the syringe the cylinder of the instrument was broken in an oblique manner, and two-thirds of it drawn into the rectum. The piston and the other portion of the syringe remained in the operator's hands.

I was hurriedly sent for and the accident explained. I felt dubious concerning the matter, and I knew the danger of further fractures ensuing in any attempt to remove it. However, it was no time for speculation. I greased my index finger, introduced it, and was so fortunate as to find the oblique fractured portion lying in such a position that I could

slip the end of my index finger into the tube without cutting the finger. I then forced my thumb up until I could seize it between my thumb and index finger, and luckily removed it without fractures. This was indeed fortunate as the glass was scarcely thicker than a good quality of writing paper.

CASE 4. *A piece of wood driven into the rectum.* W. C. Jones, M.D. (*Occidental Medical Times*, 1891, V. 375).

On June 5, 1891, a Chinaman, sixty years of age, while mining in a ravine about two and a half miles from town, was approached by three men who demanded his money. They searched him and took all he had, — about three dollars in gold-dust, — but, thinking that by torture they could obtain more money, they sawed off six inches from the end of a hoe handle and forced it up the victim's rectum, wholly beyond the sphincter ani, and left him in this condition. This occurred at noon Friday. The following day, 10 A.M., he had walked to town and presented himself at my office. After some trouble, with a long pair of forceps, I grasped the foreign body, and as the not very carefully sawn end of the handle was downward, it required much force, and I presume pain, to deliver it through a strongly resisting sphincter. . . . The piece of wood was in the rectum twenty-two hours.

Bodies so introduced, if they be of sufficient size to be retained in the rectum, will set up, by the pressure and irritation exercised upon the mucous membrane, an acute proctitis, an ulceration of the mucous membrane, which may go on to perforation, and the formation of fistulous openings, or, if the condition present be recognized in time and the ulceration healed, may result in stricture of the rectum.

Again, bodies so introduced are, if they be not so large as to exert an inhibiting pressure upon the tissues of the rectum, transported upward by an antiperistalsis into various portions of the large bowel. Foreign bodies so introduced have been found in the sigmoid flexure, in the descending and in the transverse colon.¹ In their upward passage they are arrested

¹ Most convincing demonstration of an anti-peristalsis, which has been questioned by some.

at one point or another, and an *acute obstruction* of the bowels, an *acute constipation*, is set up.¹

(b) The foreign bodies formed in the intestinal tract are themselves the result of a greater or lesser degree of constipation, and will be considered under another head.

B. *By pathological changes in one or more of the tissues of the intestinal tract, impairing their capacity for normal performance of their physiological function.* This we find

In the acute inflammation of the various sections of the large or small bowel.

In the various forms of peritonitis. (It is the muscular coat of the intestine that is most frequently involved here; it is infiltrated, tumefied; and this, with the tying up of the intestinal tract by bands, the result of the inflammation, produces the constipation.)

In some cases of typhoid fever. (Here also the muscular layer has been found tumefied, and the mucous membrane very much infiltrated, so much so as to project into the lumen of the canal.)

C. *By direct inhibition of peristaltic function through the nerve centres.* This occurs

In acute cerebral meningitis.

In tubercular meningitis of acute form.

In apoplexy.

In acute mania.

¹ For further information upon this topic the reader is referred to Poulet, *Corps Étrangers en Chirurgie* (an English translation extant), Paris, 1879. Gerard, Camille, *Des Corps Étrangers du Rectum, leurs migrations dans l'intestin, etc.*, Paris, 1878.

In various acute diseases of the spinal cord and its envelopes.

In acute infectious diseases.

In hysteria.

CASE 5. Adler reports a very interesting case: A young man, *æ*t. seventeen, of German parentage, but educated in France; neurotic tendency manifested since earliest childhood; neurotic taint in family. Claims to have suffered rather frequently in the last few years from attacks of colic, with constipation, distension of the abdomen, and great pain. These attacks were accounted for sometimes by dietary indiscretion, at other times no cause for their coming on could be discovered. Laxatives and belladonna were said to have relieved him in the course of a few days, provoking free discharge of gas and faecal matter. The young man is organically sound, appears well nourished, has an excellent appetite, his digestion is good and his bowels are regular. All at once, without any known reason or cause therefor, he is seized with pain in his belly, with rumbling and gurgling therein, and distention. The belly grows rapidly in size, and in twenty-four hours has reached enormous dimensions. The diaphragm is pushed high up, the abdominal walls are tense to bursting, and the whole abdomen is very sensitive to pressure. No fever, pulse quiet, and but little more frequent; tongue clean; vomiting rare, — only after certain articles of diet. Urine normal, but rich in phosphates. Urination rather difficult, probably in consequence of the great meteorism, so that the catheter must be resorted to several times. It is impossible to obtain an evacuation or to effect the discharge of even a little flatus. Laxatives administered are vomited; those retained prove ineffective. As for rectal injections, but small quantities are tolerated, and these are again at once discharged, having had no effect. Digital examination of the rectum discloses a strongly dilated ampulla and so far drawn up that the internal sphincter cannot be reached with the finger; otherwise nothing abnormal. This condition continues for five or six days. The

diverse remedies, both internal and external, prove ineffective. Atropine is not tolerated at all; not even in minimal doses. Suddenly, after a few doses of the extract of Calabar bean and of nux vomica, fæcal evacuations with abundant discharge of flatus follow, and the patient is well. He remained well for a few months, and then had another and much severer attack. The belly became distended, assumed in a few hours incredible dimensions. Respiration was very much embarrassed; patient could lie only on his side, and then suffered greatly. This time the Calabar bean and nux vomica were without effect, and he remained in the state described for nearly a week. Then, upon a rectal injection of warm water to which a few drops of valerian had been added, fæcal and gaseous discharges followed, and the patient was well. The attacks recurred in the course of the following month. The patient returned to France, and was thus lost sight of.¹

Adler believes that the acute constipation was the result of a spasmodic stricture suddenly developed; there is, however, nothing in the history or in the examination to show that such was the case.

If it is true that hysteria may be the cause of a spasmodic stricture, and that it may so act upon muscle is well demonstrated, it is likewise undoubted that it may act in a manner directly the opposite, *i.e.* inhibiting the normal nerve tonus and producing a paretic condition.² The acute cases, as the one described, are undoubtedly due to the latter mode of action, for reasons readily apparent.

D. *By absence of, or impairment of the quality of, the bile.*

In the various acute diseases of the liver.

In cholelithiasis during the passage of the gall stone through the common duct.

¹ *New Yorker medicinische Monatschrift*, 1892.

² See Rosenthal, *Diseas. of the Nerv. Syst.* Charcot, *Leç. sur les Malad. du Syst. Nerv.* Gowers, *Dis. of the Brain and Spin. Cord.*

E. *By inhibition of the aid of the diaphragm and abdominal muscles.*

In acute diseases of the lungs and pleura.

In rheumatic diseases of the abdominal muscles.

In hyperæsthesia of the abdominal parietes.

In paralysis of the diaphragm and abdominal muscles.

In acute diseases of the female genital tract.

F. *Reflexly.*

In the inflammations of retained testicle.

In some of the acute diseases of the female genital tract.

In acute diseases of the bladder and prostate.

G. *By a combination of these various ways.*

In acute inflammations of the stomach.

In attacks of gout.

In all the various forms of constipation here considered, with the exception of groups "A" and "C," there are other circumstances, additional to the principal ones already named, that tend to produce the constipation. These are: The abstemious diet to which the patient confines himself already in the prodromic stage by reason of the loss of appetite; the sudden change in the character of the food, which in the invalid state consists altogether of bland, non-irritating articles; the small quantity of food taken; the recumbent position; the want of the usual exercise; frequently, also, the medication.

The pathology of the various morbid states referred to in this category as well as the treatment thereof are found *in extenso* in the numerous text-books, and the more pretentious works both on medicine and surgery, and in special treatises.

This category of constipation, as has already been indicated, does not concern us. It is not the constipation that requires our attention here, but the pathological process of which it is but one of the symptoms.

However, there are a few points relating to group "A" to which I would briefly call attention:

1. The Bauhinian valve can be passed by fluids injected with some force into the rectum.¹

2. Injections of large quantities of water with the powerful pump described in my paper on Intestinal Obstruction² are of the greatest value both as to the restoration of the normal status where such is possible, as in the various forms of intussusception and of volvulus, and as to the clear and distinct indication for operative interference where such restoration to the normal does not at once result.³ The long delay which greatly diminishes the chances of the operative procedure, and is therefore fatal to the patient, is done away with.

3. The value of the alternate use at brief intervals of hot and cold water, or hot and cooler water, according to the indications. I believe I can claim for myself priority in the use of hot water for rectal injections in the treatment of the conditions referred to, and in the use of hot water of a temperature of 106° F., for rectal injections, as, previous to the publication of my article, no such injections were described, at least not to my knowledge.

¹ See my article "Intestinal Obstruction," *American Journal of the Medical Sciences*, January, 1886. Senn, *Experimental Surgery*, Chicago, 1889, p. 479.

² *Ibid.*

³ See the casuistry in the article "Intestinal Obstruction," *American Journal of the Medical Sciences*, loc. cit.

CHAPTER VII

CHRONIC CONSTIPATION

CONSIDERING the varied nature of the etiological factors that give rise to it, chronic constipation is best studied subdivided, according to the mode of its production, into the following four groups :

A. Chronic constipation produced by well-defined morbid processes.

B. Chronic constipation by obstruction from foreign bodies.

C. Chronic constipation produced by congenital malformation of a section of the large bowel, or by defective development of the intestinal tract, or by dislocation of any part thereof.

D. Chronic constipation from impairment of physiological functioning alone.

SECTION I. CHRONIC CONSTIPATION FROM DISEASE

The morbid processes which cause chronic constipation do so in various ways :

1. *By obstructing the lumen of the tube :*

Cicatricial narrowing of any portion of the intestinal tract (as the result of the healing of an ulcer, or after dysentery).

Constriction of a section of the intestinal tract by bands (after peritoneal inflammation).

Constriction of the cæcum and of the jejunum (after typhlitis or perityphlitis).

Cancerous disease of the large bowel (the rectum is the part most frequently affected).

Tumors in the abdominal cavity pressing upon the bowel and occluding it.¹

Massive exudations of blood (hæmatocele), or of serum, into the cellular tissue of the pelvis.

Obstruction of the rectum by a retroverted uterus.

Tumors within the rectum.

Folds of mucous membrane.

Kesley,² in a clinical lecture, refers to a patient long afflicted with constipation, in whom, on downward pressure at stool, large and abundant folds of mucous membrane came down which completely cut off the orificium ani from the rest of the rectum. As he says, it is "a prolapse which does not protrude."

2. *By impairment of the secretions poured into the intestines :*

In chronic diseases of the liver, when the secretion of the bile is deficient, or perhaps almost altogether wanting; or when the bile secreted is not of normal character.

In diseases of the pancreas. Constipation is rather frequent in the diseases of this organ, and adds greatly to the severity of the suffering.³

¹ Rosenblatt (*Centralblatt f. Chirurgie*, 1882, No. 29, p. 64) reports a case of complete intestinal occlusion produced by a cyst of the pancreas.

² *New York Medical Journal*, May 16, 1896.

³ Hinrichs, "Beitrag zur Lehre v. d. Erkrankungen des Pancreas." Inaug. Dissertation, Berlin, May, 1889.

3. *By inhibition of peristalsis through the nerve centres :*

In chronic diseases of the brain.

In chronic affections of the spinal cord and its envelopes.

In chronic forms of insanity.

In saturnine intoxication (lead paralysis; saturnine encephalopathy).

In tabes dorsalis (locomotor ataxia) most obstinate constipation is frequently observed. Henrot reports an instance in which a constipation so obstinate supervened that the original nervous affection was lost sight of, and an intestinal obstruction presumed. An autopsy showed the tube free from all lesion or obstruction, and revealed marked atrophy of the cord, both of the anterior and posterior spinal roots.¹

In the paralysis after diphtheria.

4. *By chronic venous congestion of the intestinal circulation :*

In organic disease of the heart.

In some chronic pulmonary affections, as asthma, emphysema, etc.

5. *By voluntary abstention from stool on account of the pain it causes by reason of a diseased condition of the rectum :*

In hæmorrhoids.

In ulcers of the rectum.

In fissure of the anus.

¹ Henrot, *Des Pseudo-Etranglements*, Paris, 1865.

In chronic inflammation of the rectum (chronic proctitis).
In abnormal irritability of the rectum, — “*irritable rectum, hysterical rectum.*”

6. *By changes in the mucous membrane* which impair its irritability, and if they involve a more or less extensive portion of it, render it incapable of performing its physiological function in the process of digestion:

In saturnine intoxication.¹

In chronic catarrh of the small intestines.²

In membranous enteritis.

In the two latter diseases there are several other factors that can be regarded as assisting in the development of the constipation and its persistence, viz., change of diet (as most patients so afflicted confine themselves to bland, unirritating food, of a concentrated nature, having but little residue), restriction in quantity, etc.

In atrophy of a section or sections of the intestinal mucous membrane (after catarrhs).³

7. *By atony of the intestinal muscles produced by morbid conditions of the stomach or of the bowels:*

In atony of the stomach.

In some of the cases coming under my observation, I was inclined to believe that the atony of the stomach was secondary to the atony of the intestines.

In dilatation of the stomach.

¹ Where the lead has as yet acted locally only.

² It is almost an aphorism that catarrhal disease of the small intestines is attended by constipation, whilst diarrhoea is a prominent feature of catarrh of the large bowel.

³ Nothnagel, Beiträge z. Physiol. u. Pathol. d. Darmes.

The solids and fluids ingested are retained for an undue length of time in the stomach, and pass out but very slowly and in very small quantities. In fact, stagnation is its characteristic feature. No doubt that the intestinal muscles, also, are in an atonic condition. It is not unlikely that some of the intestinal structures, the mucous membrane most probably, are in a morbid state.

Gastric and intestinal dyspepsia (so-called) are said to cause constipation. I have not considered them among the etiological factors for the reason that I hold, without going here into the question what is *dyspepsia*, that constipation is not at all one of their symptoms, and when it is present, it is not the result of the morbid state of the stomach or bowels. It is due to the fact that these patients reduce their diet greatly both in quantity and quality, confining themselves, almost exclusively, to bland, concentrated material. Not infrequently the dyspepsia is the result of the constipation.

As a sequence of prolonged catarrh of the large bowel.

SECTION II. CHRONIC CONSTIPATION FROM FOREIGN BODIES

The foreign bodies that give rise to chronic constipation are such as are of gradual growth, whether the materials of which they are formed are excretions or abnormal formations of the body, or are introduced from without.

CASE 6. *Intestinal obstruction by a mass of hair.* Dr. Tefft.

A young girl, *æt.* seventeen, of sickly aspect, has long had the habit of swallowing all sorts of things. About her fifteenth year she menstruated at two periods, but never after that. She sickened; complained of cardialgia and of head-

ache; vomiting and diarrhœa¹ supervened; she emaciated markedly and lost greatly in strength. The vomiting was so incessant that all nutrition was inhibited. Gradually the belly became painful to the touch, the presence of a tumor, not depressible, indolent, hard, cylindrical, without fluctuation and occupying all the region between the anterior border of the ninth rib and the anterior superior spinous process of the ileum, was noted. On percussion, the region occupied by the tumor gave a dull, flat sound, whilst the other portions of the abdomen resounded rather sonorously. The vomiting soon became fœcal, the constipation absolute, and death soon closed the scene. At the autopsy it was found that the tumor was formed by the cœcum and ascending colon, which were filled with a foreign voluminous mass. This mass, which tapered off at its upper extremity, where it penetrated into the ileum through the ileo-cœcal orifice, was fifteen centimeters long and composed at its base of a mass of hair mixed with excrementitious material; the upper portion was a mass of cotton, and that part of it which penetrated into the ileum consisted of threads of flax and pieces of packthread.²

CASE 7. *Voluminous intestinal concretions.* Pupier. Z.

M. Pupier presented to the Medical Society of Lyons a calculus still greater than the one presented by M. Andry (which weighed forty grammes), weighing fifty-eight grammes, composed of almost pure cholesterine, and discharged only after a labor very much like that of an accouchement. The patient, a colleague, had never suffered from frank hepatic colic, though he frequently had pain on going to stool (before the evacuation), or felt some embarrassment about the level of the cœcum; the stools were colorless. By means of purgatives the calculus was dislodged, but not until after an anal drama, to use the picturesque phrase of the patient, which lasted over forty-eight hours. According to the victim of this accident, it is probable

¹ This form of diarrhœa will be referred to again further on.

² Schmidt's *Jahrbücher*, 135, p. 74. Also Poulet, *Corps Étrangers en Chirurgie*.

that the powder of cholesterine accumulated for a long time in the cæcum and there formed a mass.¹

It has already been said, and it is, I think, rather clearly demonstrated by the above histories, that such accumulations, especially as the one in case seven, are really themselves the result of a previously existing constipation or insufficient activity of the bowels; for with a normal activity of the intestinal tract and a normal cleansing thereof, no such accumulation could occur; certainly not very easily. Undoubtedly, when the mass has attained a sufficient size, it tends to aggravate the already existing constipation.

SECTION III. A. MALFORMATIONS OF THE INTESTINES

The malformations of the intestines are most varied in their nature, and may involve any and all parts thereof. Greig² describes a case in which the major part of the small intestines was entirely wanting. Atkins³ reports the history of an infant in whom the large bowel was found in a rudimentary state, and seemed, at first glance, impervious. On removal, however, of the whole alimentary tract, it was discovered that by the exercise of considerable pressure, a little meconium could be squeezed out. Other and more frequently occurring abnormalities will be referred to more in detail in the section treating of the constipation of infants. All these forms produce a constipation that belongs in the category of the acute, and are either altogether incompatible

¹ *Lyon Medical*, 1887, LIV. 546.

² *Canadian Practitioner*, February 16, 1893. *Sajou's Annual*, 1893, Vol. V.

³ *Lancet*, London, 1885, Vol. II.

with life, or require prompt surgical interference for their relief.

The malformations that are compatible with a more or less prolonged existence and that give rise to a state of chronic constipation, to a retardation of fæcal discharges, are, so far as hitherto reported:

1. Abnormally developed colon.
2. Undue length or size of sigmoid flexure.
3. Diverticula of the large bowel.

The *true* diverticulum of the small intestine (*diverticulum ilei*, *Meckel's diverticulum*), if it prove an obstacle to defecation, does so by constricting or strangulating a segment of the intestine, and the constipation thus resulting is consequently of the acute variety.¹

The *false* diverticula of the small intestines are, in so far as their influence on the movements of the bowels is concerned, harmless.²

4. Diaphragms in the large bowel.

From what has already been said in the chapter on "Intestinal Peristalsis," it can be at once understood how the conditions just named should give rise to a state of chronic constipation. For better illustration, a few of the cases coming under the various heads have been excerpted.

1. Abnormally Developed Colon.

CASE 8. Chicago Medical Journal, 1867. Dr. William Lewitt.

A young man, *æt.* twenty-one, was constipated; had not had an evacuation for three weeks. The patient was found suffering

¹ Osler, *Annals of Anat. a. Surg.*, Brooklyn, 1881. Treves, *Intestinal Obstruction*.

² Treves, *loc. cit.*

intense pain in the abdomen, with frequent desire to expel flatus from the rectum, which he could accomplish only by standing upon his head and hands in a perpendicular position. The abdomen was enormously distended, and so tense that it was impossible to feel the outlines of any abdominal organ. He had had a similar attack when he was about twelve years of age, and has ever since then been suffering from torpor of the bowels, having an evacuation only once in eight or ten days. Upon examination per rectum, there was found what appeared to be an enormous tumor filling up the entire pelvic cavity. The rectum appeared to be normal. . . . About a week after the first visit, the patient was seized one day with excruciating pain in the abdomen, and, after a few hours, expired.

Post mortem examination, six hours after death. The peritoneal cavity was enormously distended with gas, and a large quantity of faecal matter of battery consistence was extravasated into it, showing that perforation had taken place, and was the immediate cause of death. Perforation had taken place at several points in the colon. The ascending and descending colon (for there was no transverse) appeared like two immense cylinders, lying side by side, and extending from the epigastrium to the pelvis, and filled with soft faecal matter, and each was about five and one-half inches in diameter. The caput coli was not much enlarged; the transverse colon was entirely obliterated, and the two cylinders of the ascending and descending colon were folded upon themselves, filling up the entire abdominal cavity. The sigmoid flexure was about the same diameter, and what was supposed to be the tumor filling up the pelvic cavity was the sigmoid flexure enormously distended with faecal matter, and folded down upon itself, giving it the firm and rounded shape of a tumor that was supposed to exist, and pressed so firmly down upon the upper portion of the rectum as to prevent all passage of faecal matter into it. The colon was very much thickened, and completely filled with faecal matter of a battery consistence, containing over a large wooden pailful, besides what had extravasated through the perforation into the peritoneal cavity.

The reason for his adopting that peculiar and unnatural position to enable him to expel the flatus from his bowels was, that by that position the weight of the distended sigmoid flexure was taken off the upper portion of the rectum, and allowed a small quantity of flatus to escape, which afforded him some relief.

I have no doubt that the change of position and the enlargement of the colon were congenital. The youth of the patient, the early age at which his trouble began, seem to clearly demonstrate this, and, although we have no history of constipation to his twelfth year, it is more from ignorance or inadvertence.

CASE 9. *Enormous congenital development of the colon.* Dr. Formad (University Medical Magazine, June, 1892).

I. W., *æt.* twenty-nine years, white, single; was found dead in the water-closet of the society to which he belonged. . . . His mother tells that up to the age of one and one-half years, the subject under consideration was a normal infant, with the exception of a rather large abdomen, frequent irregularity of the bowels, and attacks of constipation; but no other deformity of the body had been noticed up to that time. Subsequently, and especially noticeable at the age of two years, the abdomen began to swell and the disturbance in defecation to be more marked, so that constipation would last from two to four days as a rule. His appearance was said to have been that of a marasmic child, lean and emaciated, and until five years of age he was unable to rise without assistance. Subsequently the bodily development was progressive, although he was rather spare. At the age of twelve years he was able to go to school, and, although the history of his intellectual success as a school-boy is uncertain, he appeared to have had the normal intelligence of lads of his age. At the age of sixteen, he earned his living at a foundry for eighteen months at continuous work. Subsequently he worked for several years as a laborer at an oil refinery, and while his work was uninterrupted during this period, his parents say that he was subject to habitual constipation, said to last as long as a whole month at a time, although

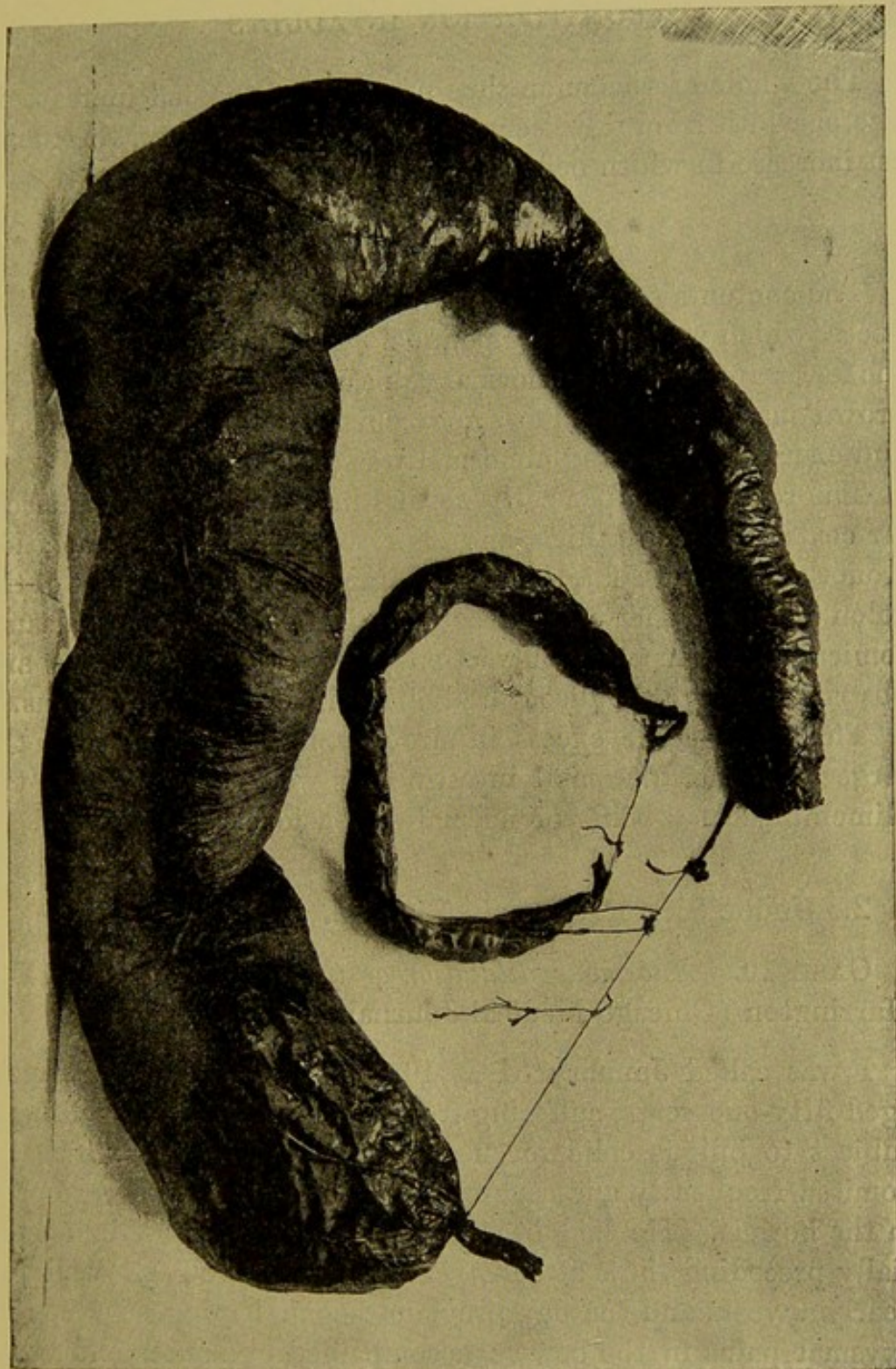
no correct clinical data covering this period of his life could be obtained. Yet it was obvious that his abdomen continued to grow in size. At this period of his life, while not feeling distressed by any painful ailment, he is said to have visited the dispensaries of various hospitals of this city. At twenty years of age his abdomen had reached very large dimensions, and the figure of his body became so peculiar that the manager of the Ninth and Arch Streets Museum saw fit to put him on exhibition as a freak, and for eight or ten years he was known as the "Windbag or balloon man." . . . The whole history of his life and habits does not present anything peculiar, except that he had an enormous appetite, and was generally a good feeder. He was known to relish a few heavy meals a day. He was occasionally of intemperate habits.

Autopsy twenty-four hours after death.

* * * * *

Abdomen. — No excess of the peritoneal fluid, although the surfaces of the peritoneum had an unusual degree of moisture. The color of the surfaces was normal, no evidence of any hyperæmia or inflammatory conditions in any part. A most striking appearance was presented by the colon. It was distended by fæcal contents and gas, and, although occupying a normal direction in the abdomen, it was of huge dimensions, and occupied a large portion of the thoracic region of the body. By a rough estimate it had the appearance of being at least ten times wider than normal, the exact measurements being as follows: total length of colon, 2.52 metres (about 8 feet 4 inches). The rest of the figures relate to the circumference of the bowels. Cæcum, 26 cm. (10 inches); colon, ascending part, 37 cm. (15 inches); colon, transverse part, gradually increasing from 38 cm. to 76 cm. (15 inches to 30 inches); colon, descending part, 60 to 62 cm. (24 to 25 inches); sigmoid flexure, 62 to 69 cm. (25 to 27 inches).

The mesocolon was abnormally large and thick, which, however, was perfectly consistent with the enormous hypertrophy of the colon.



Human colon, congenital giant growth and coprostasis. The more distended end is the sigmoid flexure. The narrow part taking exit from it represents the greater part of the rectum, which was normal. The narrow distal end of the preparation represents the head of the colon with the string attached to a fragment of the small intestine. The arched part of the specimen represents the transverse portion of the colon. — The figure within represents a normal human colon photographed simultaneously for comparison of dimensions. Dried preparations.

The whole of the colon thus presented a gradual increase in size or width from the cæcum to the sigmoid flexure, the greatest increase in width being in the transverse portion.

* * * * *

The contents of the colon was represented by two pailfuls of fæces, which weighed forty pounds. The physical character of the fæces appeared to be normal, appearing as a semi-fluid, dark-brown mass, with, perhaps, a greenish tinge; microscopically and chemically nothing abnormal was discovered.

The rectum was perfectly normal in dimensions; its muscular coats were quite thick, and it presented a striking transition from the extreme dilatation of the sigmoid flexure and rest of the colon above, to that of contraction, although no abnormal anatomical appearance of contraction that could have led to any obstruction could be discovered either in the rectum or anus.

This remarkable excess in size was, however, limited to the large intestine, the small intestines as well as the rest of the alimentary canal being of normal dimensions.

2. Undue Size of Sigmoid Flexure.

CASE 10. *Enormous dilatation of the sigmoid flexure.* Dr. Harrington (Chicago Medical Journal and Examiner).¹

I was called January 31 at 10 A.M. to see J. B. Farmer, aged fifty-one years, suffering from intense pain. He had been subject to bilious colic for nearly ten years, during which he vomited frequently and severely and suffered from severe pain in the bowels. He had been troubled with constipation, especially preceding these attacks. He had also not felt well for nearly a week, and the day previous began having severe paroxysmal pains in the bowels, accompanied by nausea and vomiting, which continued during the night, and were still present. The skin was about normal; tongue dry, white fur in the centre; pulse 70, soft; temperature normal; appetite lost;

¹ Vol. XXXVI., 1878, p. 400.

bowels constipated; abdomen slightly tympanitic, and somewhat tender; no tumor could be felt; the material ejected by vomiting consisted of bile, mucus, and fluid taken into the stomach.

The patient frequently tried to eject gas from the stomach by belching. The swelling of the abdomen kept increasing until midnight, becoming finally enormous, and causing great distress. . . . I passed a No. 10 catheter into the stomach, when quite a quantity of gas escaped. The abdomen was so tense that it seemed as if the gut must rupture. A distinct ridge revealed (as I thought) the outline of the distended colon. . . . I kept him quiet with hypodermic injections until Dr. S. M. Hamilton, of Monmouth, who had been called in consultation, agreed with me as to the necessity of tapping, and very skilfully operated, perforating, as we supposed, the ascending colon, and giving vent to a very large quantity of offensive gas. This gave great relief. . . . At 11 o'clock I tapped the bowels again about one-half an inch above the first puncture, permitting the escape of a still larger quantity of gas. . . . He rested quietly until 3.30 o'clock A.M., when he began to sink, and died at half-past four.

Autopsy ten hours after death. *Rigor mortis* marked. On opening the abdominal cavity, I cut down upon what proved to be an immense sac-like dilatation of the sigmoid flexure which entirely covered the anterior surface of the bowels, and which we had punctured on the right side, instead of the ascending colon; it extended as high as the cruciform cartilage, and was perfectly black from congestion. Further examination revealed extensive enteritis and general peritonitis. The sac was empty, its walls thick and muscular, and it would hold at least a gallon. No fecal accumulation in any part of the bowels. No apparent contraction below the sac. No morbid deposit in the walls of the rectum. The liver and spleen were congested and somewhat softened; other organs healthy.

CASE 11. *Abnormal congenital development of the sigmoid flexure. Intestinal occlusion.* Dr. Eisenhart (Centralblatt f. Innere Medicin, No. 49, 1894).

Patient female, *æt.* thirty-five years; has always suffered from constipation and therefore resorted to various purgatives, so that she had an evacuation once in three or four days. In the year before, in consequence of a puerperium, she suffered a strong psychic disturbance and was placed in an institution for treatment. At this time a condition developed very much like the present: obstinate constipation, great distension and tenderness of the abdomen, nausea without vomiting, and marked disturbance of the general health. After many things had been tried, a drastic purge was given per os on the tenth day and an evacuation resulted, whereupon the patient rapidly recovered. Torpidity of the intestines as before.

Two days ago she was seized with pain in her belly, which day by day increased in severity and duration. At the same time a rapidly growing distension of the belly manifested itself and in consequence thereof there was marked disturbance of the general health, loss of appetite, and loss of sleep. No evacuation of the bowels in two days.

I saw the patient for the first time on October 5, 1893. She lay in bed moaning and complaining; face anxious and painful in expression, but fresh in appearance. Axillary temperature 37° C. Pulse 78. Abdomen greatly distended, like that of a gravid woman in the last weeks; greatest circumference, 103 cm.; distance from symphysis to navel, 16 cm.; from symphysis to xiphoid cartilage, 41 cm. Beneath the thin but otherwise unchanged abdominal walls, the greatly distended intestines, in very slow but uninterrupted peristalsis, are plainly visible; from up on the right side diagonally downwards to the left there stretches a segment of bowel which from its size (thickness of a man's arm) and its configuration (constrictions) appeared to be the transverse colon. The abdomen is painful to the touch, for the reason that peristaltic movements are thereby provoked. Vaginal examination, in so far as a result can be obtained without bimanual examination,

which was impossible, disclosed a normal condition; retroflexion of the uterus, which, as is well known, may cause occlusion of the bowel even in the non-gravid female, can be excluded. The rectum, so far as the finger can reach, free. No hernias.

* * * * *

The various means and measures resorted to for the relief of the occlusion proving fruitless, Professor Dr. Bauer was called in consultation; surgical interference advised, and the patient transferred to the surgical clinic. October 13, a cœliotomy was made. The extremely distended segment of bowel covered the whole field of operation, and rendered a recognition of localities rather difficult. An incision was therefore made into it, and although gas and a considerable amount of semi-solid fæcal matter were evacuated, but little diminution in size resulted. (The incision was immediately closed with sutures.) Nevertheless, it was now possible to recognize the obstructions; in the region of the sigmoid flexure the bowel was bent upon itself at a sharp angle, and several loops of the small intestines had passed through a slit in the mesentery and become thereby constricted. The obstructions were removed and the wound closed. The expected result did not follow. A few hours after the operation the previous condition of things again prevailed, and before the abdomen could be opened the second time the woman died, on the afternoon of the day of operation.

Post-mortem Examination. — The so enormously developed segment of bowel was not the transverse colon, as had been supposed, but the sigmoid flexure. It was about 60 cm. long, and lay in the form of an arc from the left side over and up to the right, and down on to the left, passing into the normal rectum. The lower segment of the flexure near its junction with the rectum, having become overfilled, was dragged downward, bent at a sharp angle, the rectum closed off, and the occlusion thus produced. The subsequent peristalsis drove the contents more and more into the diverticular-like space, and by the pressure thus made the upper portion of the rectum was

being constantly drawn downward, and was thus more and more shut off.

Width of flexure laid open, 33 cm. (normal width, according to Cruveilhier, 14 cm.).

3. Diverticula.

CASE 12. *Congenital diverticulum of the sigmoid flexure.*
Drs. Fütterer u. Middendorpf (Virchow's Archiv, Bd. 106).

Chr. H., fourteen years old; admitted to Julius Hospital, February 3, 1886. The father of the patient is alive and in good health, but the left side of his face, especially the left half of the lower jaw, is less developed than the right side. . . . Already at his birth, which was a perfectly normal one, the patient is said to have had an unusually large belly, larger than other children. Its circumference increased in the following years slowly but steadily; he, however, suffered but little inconvenience therefrom. He went to school and was a good scholar. About a year ago there was such a marked increase in the circumference of the belly, that he could not attend school regularly, and if he ran a little he lost his breath. No palpitation, patient claims. . . . He had about three stools daily.

Status Præsens.—The great distension of the abdomen has produced a distension of the lower portion of the thorax. The skin of the abdomen is pale, drawn very tense, not œdematous; on the anterior surface, corresponding, about, to the course of the vena epigastrica inferior, the veins are dilated and show through with a bluish tint; a similar network of dilated veins is seen on the outer side of the abdomen, about the region of the axillary lines. The abdomen is symmetrically distended, barrel-shaped; no tuberosities or protuberances noticeable anywhere. Eight centimetres above the navel and more particularly upon the left side, there are indications of a slight, horizontal, transversely running constriction. The navel is pushed out on a level with the rest of the abdominal surface. No especial changes to be seen on deep respiration or on change of position.

The circumference of the thorax, on a level with the mamillæ, $75\frac{1}{2}$ cm.; circumference of the abdomen on a line with the navel, 91 cm.; greatest circumference at a point 8 to 10 cm. above that of the preceding measurement, 100 cm.; distance from navel to xiphoid cartilage, 28 cm.; from the navel to the symphysis, 21 cm.; from the navel to the anterior superior spines of the ileum, right and left, 26 cm.

* * * * *

Percussion of the abdomen with the patient in dorsal decubitus gives everywhere a tympanitic sound; about 3 cm. above the symphysis and in the direction of the musculus quadratus lumborum, right and left, this becomes a dull tympanitic one; absolute dullness nowhere. The patient sitting upright, absolute dullness or flatness cannot be made out anywhere; the boundaries are very nearly the same in the sitting or lying position. . . . Auscultation of the abdomen, negative. The abdominal walls are very tense; more solid masses that could lead to the assumption of a knotty tumor are nowhere to be palpated. On striking the abdomen on one side, the wave is distinctly perceived on the opposite side and in the middle about the navel; the same result with the patient sitting upright or lying on either side. The consistency of the liver, soft, elastic. No swelling of the inguinal glands; no œdema of the lower extremities.

The finger introduced into the rectum readily sweeps the promontory; nothing abnormal about the pelvic organs; striking the anterior abdominal parietes, the point of the finger perceives the wave, though rather indistinctly, on the anterior rectal wall.

Urine scant, acid, opaque; contains albumen, but no sugar. Sediment consisting of amorphous urate of soda and crystals of uric acid. February 4, one litre of warm water is injected into the rectum; the point of the stomach tube (English), which was readily introduced to the height of 20 cm., could be felt 8 to 10 cm. to the left of the navel, and on a level with it. Nothing special found on percussion after the injection. Appetite moderate; fever none.

In the following days two semi-solid, pap-like stools were obtained daily by means of mild cathartics and daily injections, the point of the rectal tube being easily pushed up to the left costal border, about 30 cm. from the anal orifice. The fæces had always the same grayish-brown, dark color; odor not particularly offensive. By reason of the abundant dejections, the circumference of the abdomen decreased, and by February 8 this diminution reached 5 cm.; the belly became softer, but no difference on percussion could be noted; not even after the injection of two litres of water. Urine, daily quantity, 700 to 800 c. cm. Albumen disappeared after the third day of his sojourn in the hospital; the sediment disappeared likewise.

On February 6, when the abdominal walls had become very much less tense, and the circumference of the belly had decreased 3 cm., there was very plainly felt, on rectal palpation, above the promontory, a soft elastic swelling with smooth surface, and not delimitable upwards by palpation. Striking the belly, the concussion of a slight wave could now be clearly felt in the rectum. Temperature within normal limits.

February 8. An injection of one litre of lukewarm water was made this morning, and was followed by copious stools. Twenty drops of tincture opii are then given, and whilst the patient is narcotized, a trocar of moderate calibre is pushed into the left lumbar region, where a dull tympanitic sound had responded to percussion, and a grayish-dark, fluid, fæcal-like, odorless mass is evacuated, in which, upon microscopic examination, undigested muscle fibres are found.

The rectal tube was now introduced to the height of 25 cm., and the point could be plainly seen and distinctly felt from the exterior. An incision 4 cm. long was made in the linea alba, through the attenuated abdominal parietes, about 5 cm. below the navel. After dividing the peritoneum, there appeared in the line of the incision numerous dark, bluish red, turgescient, easily compressible veins, 2 to 3 cm. in calibre, which ran in all directions upon the grayish white and very tense wall of a cyst. Intestines were not to be seen. No ascitic fluid. There being great danger of hæmorrhage from the enormously dilated veins,

the operation was discontinued, the wound closed with three rows of sutures and an antiseptic dressing put on. . . . The patient never complained of pain; it was only the meteorism that annoyed him, and the stomach tube had to be introduced about four times a day to relieve him; frequently even this did not avail.

* * * * *

During his stay in the hospital, the patient took but very little solid food. He lived almost exclusively upon eggs and Tokay wine. The amount of fæces was never in proportion to the amount of food taken, but always four to five times, frequently more, in excess.

Post-mortem Examination. — Emaciated male cadaver; abdomen very much distended. On laying open the abdominal cavity, a sac is cut into, whose tensely drawn anterior wall is in close apposition to the very much thinned abdominal walls, and large quantities of very fetid gas are set free. It is more than half filled with fluid fæces (eight litres), and occupies the whole abdominal cavity. The diaphragm is pushed far up and stands to the right, in the mammillary line, at the fourth rib; to the left, at the lower border of the second rib.

The stomach lies in the left concavity of the diaphragm and its greater curvature runs in the parasternal line, about four fingers' breadth above the costal arch; almost the whole bowel lies up here and behind it, and maintains this position even after the above-mentioned sac has been evacuated. Both kidneys are in the normal position, and show no changes. The liver lies in the right concavity of the diaphragm, and is likewise pushed up; its lower border, in the mammillary line, four fingers' breadth above the costal arch.

In the stomach there are found, in small quantity, thin, bright-yellow, fæcal masses; the mucous membrane is unchanged. The mucous membrane of the small intestines is discolored a slaty gray; that of the large bowel, which contained hard fæcal masses, is similarly discolored.

The colon descendens, which is markedly contracted at its

lower portion, opens into the enormously dilated sigmoid flexure. . . . The colon descendens is united to the upper and anterior portion of the sac by a mesentery which is 8 cm. at its longest point; it has a calibre of 3.5 cm. at its point of flexure into the transverse colon, becomes smaller as it descends, until just at the opening into the sac, it is not more than 2 cm.

The longitudinal muscular fibres are here so closely pressed together that the individual tæniæ cannot be delimited from one another, whilst toward the convexity of the dilatation, they radiate out as thick, hypertrophied bundles of muscular fibres. The mucous membrane of the colon descendens, besides the discoloration described, shows at irregular intervals (0.5 to 1.0 cm.) small, brown, roundish, spots and points from the size of a pin's head and smaller.

At the entrance into the sac the colon is so narrow that it is only with great effort that a finger can be pushed through it.

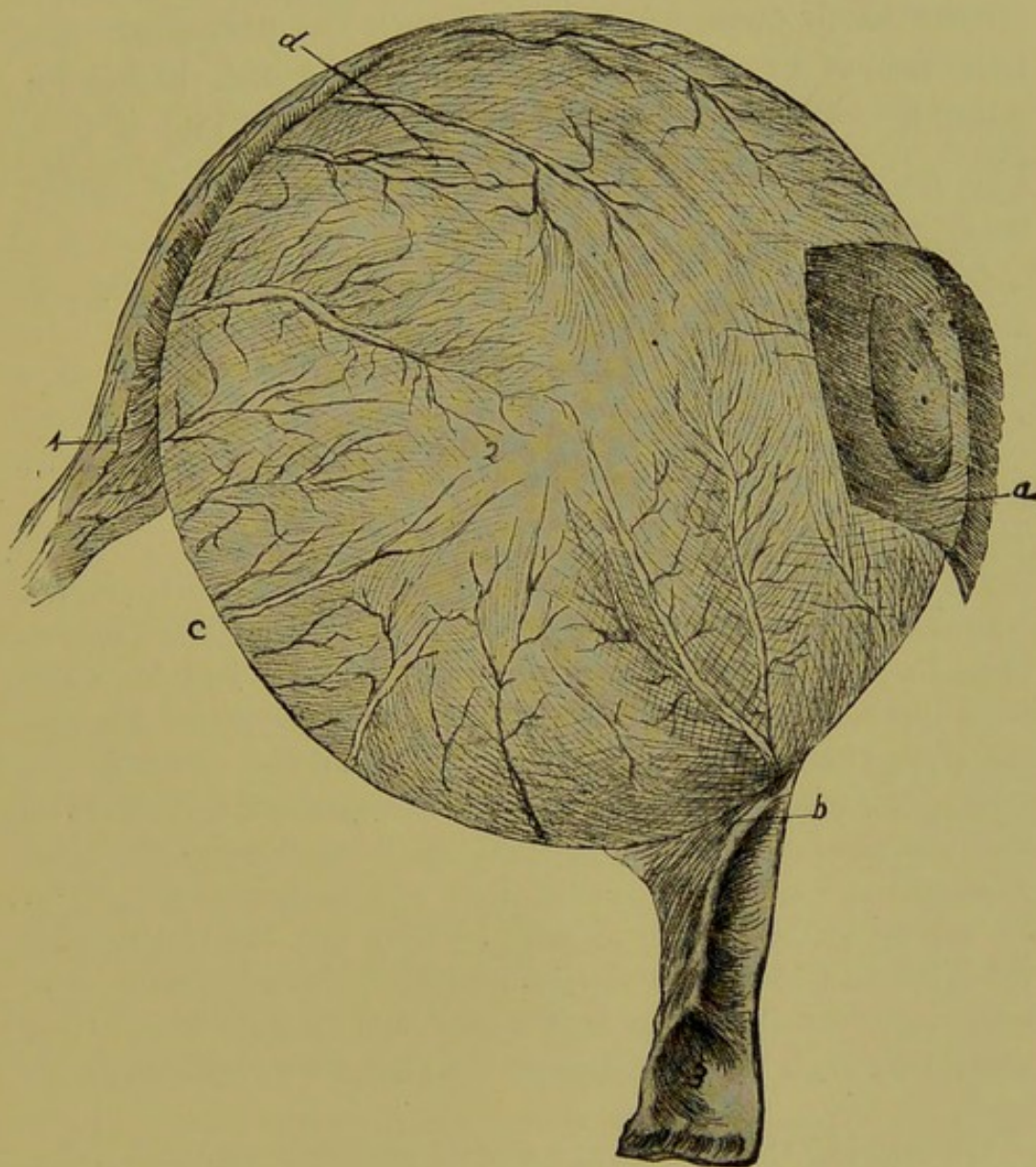
The mucous membrane of the dilated portion shows everywhere a rosy color, and is abundantly covered with depressions and brownish spots, like those above mentioned, though they are somewhat paler here and not so well delimited. No ulceration. The thickness of the mucous membrane, which averages about 1 mm., is subject to but slight variations. The muscular coat, strongly hypertrophied, has a thickness anteriorly of 2 mm.; posteriorly, of 5 mm.

Looking for the exit into the rectum, there was found at the lower and posterior section of the sac a semicircular slit, the concavity of which was directed upward and backward. A finger pushed through the slit, downward and forward, will be observed to glide along the lower wall of the sac, arching it forward, for a distance of 8 cm. before it reaches the rectum, which had been cut open to the sac. The lower anterior wall of the sac had here bent over on to the anterior wall of the rectum and the two became firmly united.

The mucous membrane of the rectum showed, with the exception of brown spots, like those already mentioned, nothing abnormal. The rectum was of normal width.

The exit of the dilatation was 47 cm. below the entrance, whilst the circumference of the sac was 66 cm.

It took 16 litres of water to fill the sac, and when it was held out free by its anterior upper wall, no water ran off.



1, Descending colon; 2, Dilated sigmoid flexure; 3, Rectum.

The reporters, from the arguments adduced in the discussion of the case, conclude that the malformation was a congenital diverticulum of the sigmoid flexure.

4. **Diaphragms.** — A fold of mucous membrane projects into the lumen of the bowel, and, according to its size, obstructs more or less the free passage thereof. It may stretch from wall to wall, and will then form a complete barrier to all communication between the part above and that below it; then, unless it be perforated, life is impossible. It may be in the form of a shelf, and it is in this way that it most frequently occurs, leaving a smaller or larger passage of intercommunication.

There may be but one diaphragm, or there may be several of them, that is, at different points.

They are found mainly in the rectum.

When they occur in the small intestines, death results at a more or less early period.¹

CASE 13. M. G., a medical officer in the French service, was always constipated from birth. He ate largely, but seldom passed a stool oftener than once in two months, and his abdomen assumed a large size. At the age of forty-two his constipation was usually prolonged to three or four months. In 1806, after medicines had been taken to procure a stool which had not been passed for upward of four months, abundant evacuations continued for nine days, and contained the stones of raisins taken twelve months before; but the constipation returned. In 1809 the enlarged abdomen became painful, vomiting supervened, and he died at the age of fifty-four, having seldom through life passed more than four or five stools in the year.

On opening the abdomen, a fibrous partition was found that obstructed the rectum, about an inch from the anus. Immediately above this partition the rectum was so enormously dilated as to fill all the pelvis and nearly all the abdomen. The enormous cloaca contained thirty kilogrammes of brown-

¹ See Part II.

ish black and very offensive fæces. Its inner surface presented gangrenous and ulcerated patches. The lowest part of the colon was enlarged to the size of the stomach, which latter, with the small intestines, liver, etc., appeared diminished in volume and capacity by the pressure of the distended rectum.¹

CASE 14. Quain, *Disease of the Rectum*, 1854, under the head of "Impaction of Fæces," describes the case of a man aged forty, who died with a large accumulation of fæcal matter which was evidently due to the presence of two crescent-shaped shelves of mucous membrane, one attached opposite the prostate, the other about four inches higher up. Each of these was more than an inch in breadth; the circular muscular fibres fully entered them and the longitudinal layer dipped in slightly at their base. Kohlrausch describes a similar case.²

B. ESSENTIAL PRIMARY ATROPHY OF THE LARGE BOWEL

Congenital Arrest of Development of the Muscular Apparatus of the Bowel

Nothnagel³ describes a condition of atrophy of the muscles of the large bowel which he regards as a congenital hypoplasia. This condition, which may be present in individuals with an otherwise excellent muscular development, is generally connected with a condition of chronic constipation. The patients in whom the condition was noted had all stated, and their statements were confirmed by careful observation, that they went a greater or lesser number of days without an evacuation.

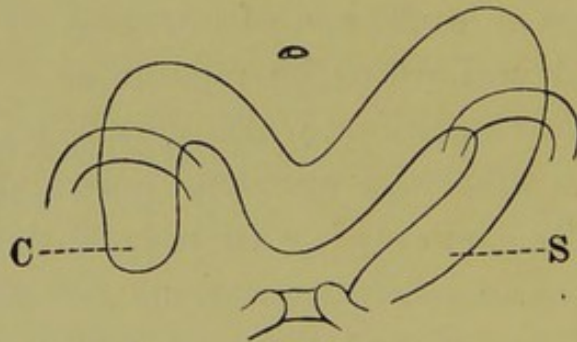
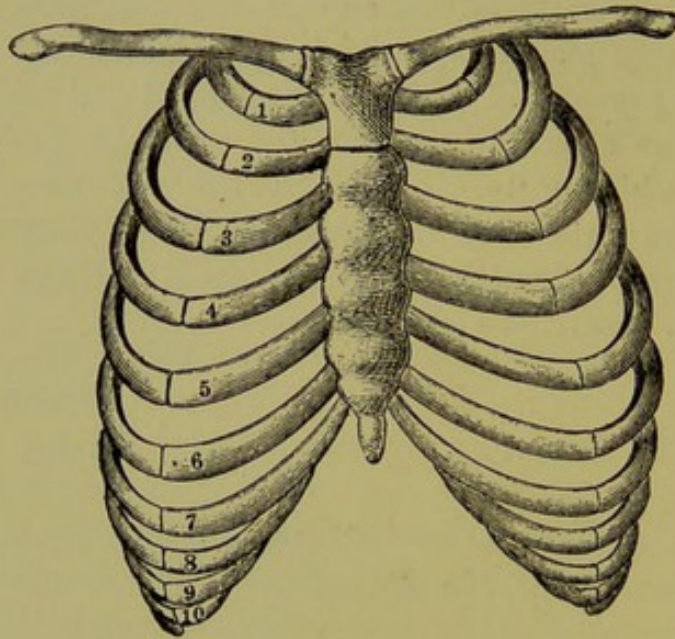
¹ Renaudin, *Dictionnaire des Sciences Medic.*, 1813, Vol. VI., p. 257. Copland, *Dictionary of Medicine*.

² Kelsey, *Disease of the Rectum*. Kohlrausch, *Anatomie u. Physiolog. der Beckenorgane*, Leipzig, 1854.

³ *Beiträge zur Physiologie u. Pathologie des Darmes*, Berlin, 1884.

C. DISLOCATION OF THE BOWELS. ENTEROPTOSIS¹

The intestines may be dislocated, *i.e.* pushed out of their normal position. The small intestines may be forced down from the abdominal into the pelvic cavity, and



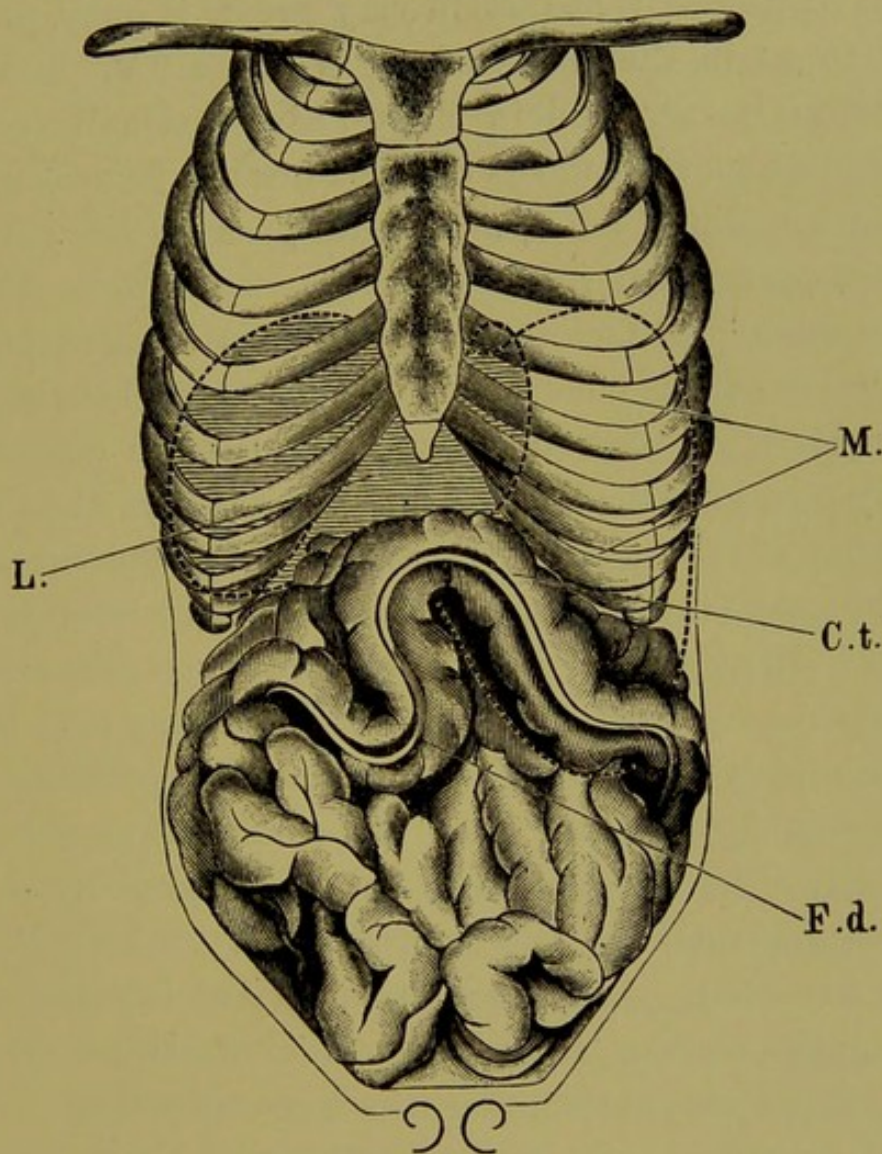
(From Rosenheim.)

C, Cæcum; S, Sigmoid flexure. The bowel is inflated.

in their descent will inevitably compel the descent of the stomach. The large bowel may be dislocated in its various sections. The most common form of dislocation is downward, — enteroptosis. The part said to be most liable to be thus affected is the right colic flexure (*flexura colica dextra*) with the transverse colon next in the order of frequency. From what I have seen, I am inclined to believe that the reverse is true; that the transverse colon is the part most frequently forced out of its normal posi-

¹ Glenard, *Lyon Medical*, Tome XLVIII., No. 13 et seq. Cuilleret, *Étude Clinique sur l'Enteroptose. Gaz. des Hopitaux*, September 22, 1888, and No. 105, 1889. Pourcelet, *De l'Enteroptose*, Paris, 1889.

tion, and that the right colic flexure is generally but secondarily involved. The views of Glenard, upholding the former position, are based mainly upon the theoretic-



(From Rosenheim.)

F.d., Right colic flexure pushed down and over to the navel; *C.t.*, Transverse colon; *L.*, Liver; *M.*, Stomach.

cal consideration that the right flexure is but loosely attached and rather mobile. However, be this as it may, it is the dislocation of the transverse colon that has for us clinically the greatest interest.

According to the extent of its depression, the transverse colon will present changes in its configuration. If it be but little depressed, it may have the form of an "M," whilst if the fall has been very great, it may present itself to us in the shape of a "U" or a "V."¹ When the colon is increased in length, as occasionally occurs, numerous abnormal twists and flexures are formed which, taking sometimes an upward turn, push up the stomach and the parts above it.²

The etiological factors that have been invoked for the production of this condition are numerous. Leaving out of consideration the rather few cases that are congenital, it may be said that all those conditions that tend to relax the tone of the abdominal walls and of the intestines are the most fruitful sources of intestinal dislocation. It is most frequently seen in women in whom, as a result of numerous pregnancies and subsequent neglect of the hygiene of the abdomen, the abdominal parietes have become flabby, relaxed, even to the extent of a pendulous belly. In the few cases that have come under my observation this was the natural history. This is generally admitted. Atonic conditions of the intestines and abdominal parietes after prolonged ailments, as typhoid fever, rapid emaciation, sometimes constipation of prolonged duration, with great overfilling of these parts of the large bowel,³ lead to enteroptosis. Other causes are tight lacing, trauma, acute inflammatory disease of the peritoneum.

¹ See history of Case 1, reported by William Levitt. Treves, *Intestinal Obstruction*, p. 124.

² Rosenheim, *loc. cit.*

³ Treves, *Intestinal Obstruction*.

This condition can be recognized in only one way, and that is by inflating the bowel with air or gas by means of a balloon or siphon (it is not always necessary to clear out the bowels before resorting to this procedure; accumulation of fæces does not diminish its effectiveness¹), and noting the contour of the bowel as outlined upon the abdomen. Normally the transverse colon is found between the xiphoid cartilage and the umbilicus (males), or at the umbilicus or a line or two below it (females); in enteroptosis it will be found below these points, more or less according to the extent of the dislocation. In one case that came under my notice, the transverse colon was found outlined at the level of the symphysis pubis.

Enteroptosis is always attended with constipation; or if the coprostasis was originally the etiological factor or pre-existent, it is very much aggravated thereby. Krez² calls particular attention to this feature. Of the five female patients with enteroptosis coming under his observation, four had suffered for a long time with most obstinate constipation, whilst the remaining one had constipation and diarrhoea alternately. In my experience (six cases), constipation was always present.

The obstinacy of the constipation, or its aggravation, is due to the fact that the colon is bent upon itself in various ways. Although it is true, as Ewald³ says, that under ordinary conditions this would not constitute a hindrance, as can be readily seen in the laboratory with what force and steadiness the fæcal bolus is driven for-

¹ Ewald, *Berliner klin. Wochenschrift*, 1890.

² *Muenchener medizinische Wochenschrift*, 1892, No. 35.

³ *Loc. cit.*

ward on its journey to expulsion, nevertheless, it does form an obstacle here, for the reason that the vigor inherent in the muscles of the gut is markedly diminished, and the powerful aid supplied by a tense abdominal wall, the abdominal pressure (*Bauchpresse*), is wanting, as a consideration of the etiological factors will show.

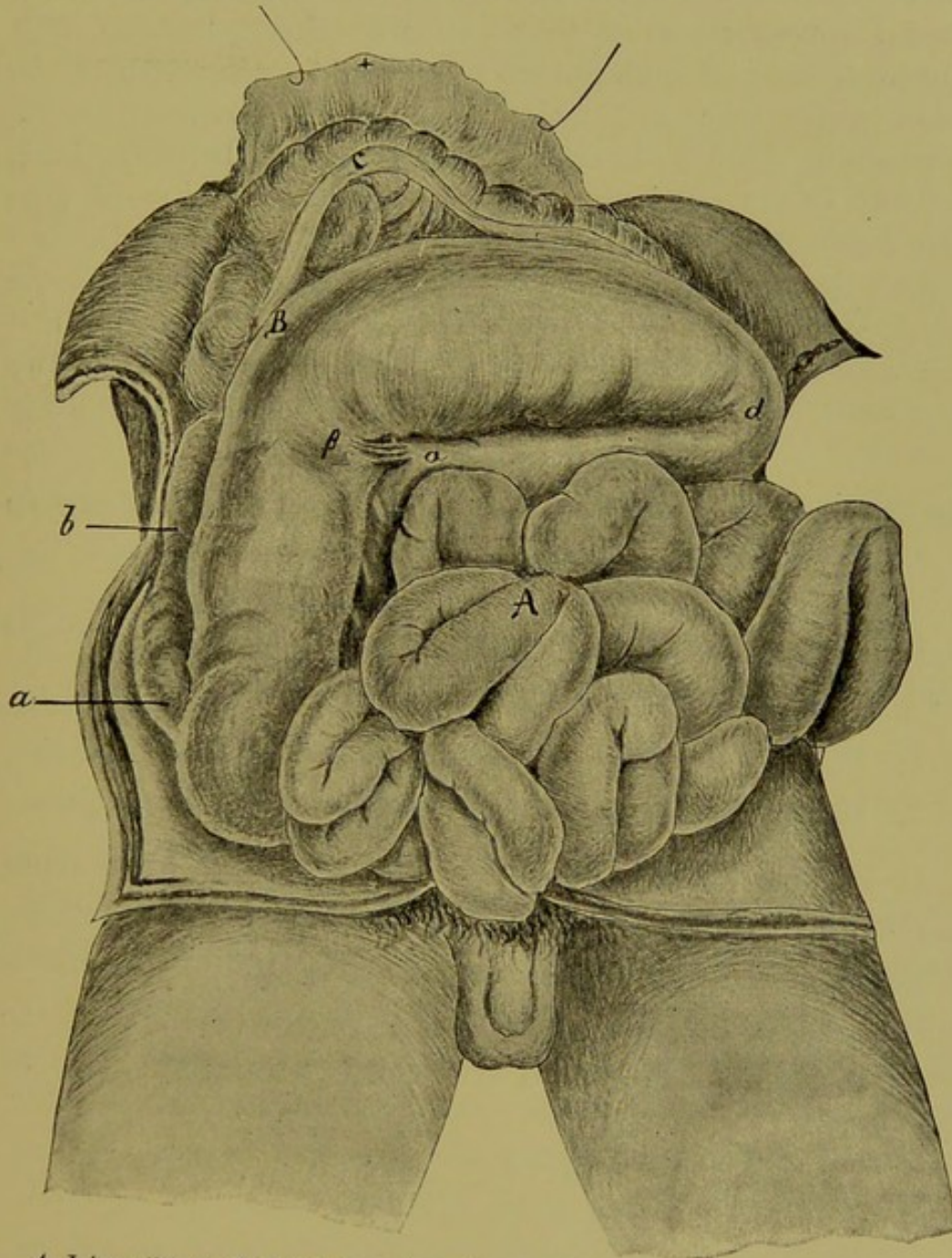
It is possible that exceptionally we may have produced as the result of the dislocation such marked contracture in the calibre of the transverse colon as to make it more like a cord, *corde colique transverse*, as Glenard¹ calls it; but that it occurs in any way with the frequency he would have us believe is open to great doubt. It is not possible that such a marked change in the appearance of a prominent and exposed portion of the intestine should have escaped the attention of the many great anatomists and pathologists in their studies upon the human body.

This point is of great importance from the standpoint of prognosis. The evils of enteroptosis can, as is generally admitted, be in a great measure remedied; but we are absolutely powerless against an enterostenosis, against a contraction of almost the whole length of the transverse colon.

Gruber described a dislocation to the right, of the sigmoid flexure, with enormous enlargement thereof. It was a post-mortem observation, the cadaver being that of a robust man. The abdominal cavity presented all the evidences of a long-extinguished peritonitis. The flexure lay in the fossa and in the right iliac region, and in the boundaries between the epigastric and the meso-

¹ Loc. cit.

gastric regions as far as the left hypochondrium. The jejunum lay to the left of it, and downward, in the abdominal and pelvic cavities.¹



A, Jejunum; *B*, Large bowel; *a*, Cæcum; *b*, Ascending colon; *c*, Transverse colon; *d*, Sigmoid flexure. *a*, Shank of the colon; β , Shank of the rectum. +, Section of the large omentum that has become adherent to the anterior abdominal wall.

¹ Virchow's *Archiv*, Vol. 56, p. 432.

“The sigmoid flexure proved thus to be an enormously lengthened section of the bowel, 47 cm. in length, the shanks (*Schenkel*) of which are united by a long, 39 cm., but, as already stated, not broad mesocolon, and therefore they lie in closest apposition when they are in a distended state. The length of tube of both is 1 m. 22 to 33 cm.; the width of the colon shank (the part which connects the flexure with the descending colon), increasing somewhat from below upward, is 6.3 to 7.4 cm.: the abnormal width of the rectal shank (the part connecting the flexure with the rectum) at the “S-like” curved descending portion 10.3 cm. in two directions; at the transition into the transversely placed initial section 6.5 and 8 cm., and at this last part 11.7 and 13 cm. respectively, in two directions.”

SECTION IV. CHRONIC CONSTIPATION FROM IMPAIRED PHYSIOLOGICAL FUNCTION

By impairment of physiological function we understand two very different conditions; namely:

1. Perverted action.
2. Imperfect performance of physiological function.

It is only to this category of constipation, and more particularly to the last subdivision thereof, that the term *Habitual Constipation* can be properly applied, for it is only under such conditions that a person may be constipated for a long time, and still retain a fair condition of health.

CHAPTER VIII

PERVERTED ACTION; SPASTIC CONSTIPATION

1. ENTEROSPASM

It has already been stated in the chapter on the physiology of intestinal movement that normally the circular and longitudinal muscular fibres contract *alternately*; in this way the chymus is held fast, and not allowed to retrograde; then the section of bowel is shortened, and it is pushed onward. Under the influence, however, of an abnormal stimulus, the physiological order may be perverted, in that the circular and longitudinal muscular fibres contract at the same time, synchronously and spasmodically, and all further movement on the part of the bowel, of the chymus, or of the residual and excrementitious matter, is inhibited. Moreover, as a result of this spasmodic contraction, the calibre of the bowels is greatly reduced, at times almost to the size of a lead-pencil.

This perversion of physiological action, the spasm of the intestinal muscles, enterospasm, may be general, *i.e.* involve the whole intestinal tract, from the duodenum to the rectum, or it may be partial, limited to a section more or less large thereof. It is *general* in basilar meningitis, in some of the pathological processes producing pressure upon the pons or the medulla oblongata, in saturnine intoxication. It is *partial* in colic, etc.

The partial is much more frequent than the general, and is most frequently located in the large bowel.¹

Leaving out of consideration the grave pathological conditions in which it is general, enterospasm occurs most frequently in gastric and intestinal indigestions; in congestions and in catarrhal inflammations of the intestinal mucous membrane; it is of almost constant occurrence in colitis. More rarely does it present itself as a pure neurosis, as in enteralgia, or as one of the manifestations of hysteria or of neurasthenia.²

In rare instances it may be observed as one of the phenomena of tabes dorsalis (*crises enteriques*³), even though the *crises gastriques* be wanting.

The constipation that thus results is known as *spastic constipation*.

In the majority of instances the constipation is but a secondary matter, as can be readily seen from the foregoing, that does not call for any special intervention, for a special therapy; that yields or disappears upon the proper treatment of the pathological conditions of which it is one of the consequences.

As an idiopathic affection, if such an expression be permitted of the condition under consideration, it is of very rare occurrence, and is always associated with neurasthenia or hysteria, even though their more characteristic features be in abeyance. In the unbalanced condition of the nervous system that is the chief characteristic of the morbid states just named, even an ordinary stimulus

¹ Rosenheim, *Pathol. u. Therap. der Krankh. des Darmes*, 1893.

² Kaczorowski, *Deutsche medic. Wochenschrift*, 1882, No. 1.

³ Rosenthal, *Magenneurosen u. Magencatarrh*.

that would otherwise have done no more than excite normal peristalsis may provoke an enterospasm.

Symptomatology. — In general enterospasm the abdomen presents a characteristic appearance; it is sunken in, the walls are flattened down, and it has a scaphoid, a boat-like, shape, as is very well seen in basilar meningitis and in saturnine intoxication. Although in intestinal inanition the belly is also very much sunken in, it has not the boat-like appearance, nor is the sinking in, the flattening down, so marked as in general enterospasm, where the calibre of the intestines is reduced almost to a minimum. **Partial** enterospasm, such as is specially referred to here, does not cause any change in the configuration of the belly. The *fæces*, when the stool is had, pass in the form of cylinders of very small calibre, from that of a lead-pencil to that of a thin finger, of greater or lesser length; these may be followed by cylinders of much greater circumference, or the whole stool may come in thin cylinders. Or the *fæces* may be discharged in the form of scibala of greater or lesser size; but this last stool is in no way characteristic. Altogether, the quantity evacuated is insufficient.

A symptom that may or may not be present is pain. According to Rosenheim, pain is of frequent occurrence. It may be in any part of the abdomen, but is usually located about the navel, or in the left lower section of the abdomen. It is described as a pressing, a drawing together. Fleiner, in his article, does not make mention of pain. In the very few cases, within the limitations set down here, that have come under my observation, there was no pain, only a feeling as if a cord were drawn

rather tightly across the abdomen; a sort of cincture feeling, but differing from that of tabes in that it was felt only anteriorly (not completely around), and mainly in the locality of the transverse colon, in the region between the epigastrium and the navel.

There is really but one characteristic feature, and that is the small-calibred cylinders of the stool.

If the whole evacuation be in this form, and continue to be so, then organic stenosis of the intestine must be excluded before the case can be set down as one of enterospasm.

2. ENTEROSPASM AND ATONY

Partial enterospasm may be associated with atony of the intestinal muscles. Under these conditions, the section of bowel above the seat of the spasmodic contraction becomes distended with residual or fæcal matters and with gas.¹

3. SPASMODIC STRICTURE OF THE RECTUM

A spasmodic contraction of the rectum has been described, with obstinate constipation as one of the attendant phenomena. According to O'Beirne,² it is the uppermost part or annulus of this section of the intestine that is usually the seat of the stricture. It is of exceedingly rare occurrence, so rare, indeed, that some excellent authorities either deny its existence absolutely, or ignore it *in toto*

¹ Diseases of the Intestine and Peritoneum, 1879 (Reynold's System of Medicine). Article "Enteralgia." Rosenheim, loc. cit. Fleiner, *Berliner klin. Wochenschrift*, January 16, 1893. Cherschewski, *Revue de Medic.*, October and December, 1883.

² New Views on the Process of Defecation, etc., 1834.

in their writings.¹ It is conceivable, however, and this the more so as the occurrence of partial enterospasm is generally admitted, that in hysterical and neurasthenic states, or under the influence of certain pathological conditions to be named further on, a spasmodic action of the muscles of the rectum might be provoked. The statements of Mayo,² Ball, and the most recent observations of Kelsey,³ seem to confirm this view.

Symptomatology. — The constipation is rather of the acute character. The abdomen is very much distended with fæces and gas. There is a great deal of straining at stool, and much suffering with it. A bougie, or rectal tube, introduced for the purpose of examination, will meet with so much resistance that frequently a degree of force will be required to overcome it that might, under other conditions, prove rather dangerous to the patient.⁴ If the stricture is located lower down, near the anus, the finger introduced will be tightly grasped by the spasmodically contracting muscle.⁵

4. SPASMODIC CONTRACTION OF THE SPHINCTER OF THE ANUS (WITHOUT FISSURE). IRRITABLE SPHINCTER

Much more frequently than the rectum the sphincter of the anus may be the seat of the partial enterospasm. It becomes then so firmly contracted that defecation is almost impossible.

¹ Van Buren, Lectures on the Diseases of the Rectum. Curling, The Diseases of the Rectum. Mathews, Diseases of the Rectum, 1893.

² Mayo on the Rectum (quoted in Pruitt's Surgery).

³ Kelsey, Diseases of the Rectum and Anus, New York, 1890.

⁴ O'Beirne, loc. cit.

⁵ Kelsey, loc. cit.

It may be a manifestation of an hysteria, or of a neurasthenia, but is most commonly seen in cases of sexual neurasthenia, dependent upon morbid states of the sexual organs. The obstinate constipation so frequently associated with spermatorrhea is undoubtedly very often thus produced.

An enlarged prostatic gland, or an inflammatory condition of that organ, may give rise to a spasmodic contraction of the rectum or anus. An inflamed or irritable urethra may likewise do so. In females, a spasmodic contraction of the sphincter may present itself in connection with chronic ailments of the genital organs.

Symptomatology. — The chief symptom is the contraction of the sphincter, which at times is so great that it is only with difficulty and by the use of some force that the examining finger can be made to pass, and then not without considerable pain to the patient. The examining finger is tightly grasped by the spasmodically contracted sphincter. Occasionally (it might be said frequently) the patient has great pain at the end of the evacuation (obtained by means of purgatives or clysters) produced by the spasmodic closure of the sphincter.

In very severe cases, with almost tetanic spasm, the fæces occasionally have a very peculiar appearance; they are flattened out, ribbon-like.¹

Other symptoms are: more or less uneasiness about the anus, which is most marked when sitting, and least when lying down; a feeling of fulness in the perineum; irritability of the bladder, as shown by the frequent micturition

¹ Henoch, Die Unterleibskrankheiten, 1863.

which, sometimes, is attended by a smarting or burning in the urethra.

The constipation is very obstinate; I believe, however, that it is not the sphincter alone that is responsible therefor, but that, by reflex irritation from the sphincter, a narrowing of the rectum, and a shutting off of the opening of the sigmoid flexure or a constriction of the annulus of the rectum, as O'Beirne describes it, is provoked.¹

Schroeder van der Kolk held that the habitual obstipation of the alienated arose from a spastic contraction of the descending colon inhibiting the onward passage of fæcal matter. From this point of view he devised his pills for the treatment of the same; viz. small doses of extractum aloes aquosum, and still smaller doses of the tartrate of antimony.

This opinion was combated by Griesinger upon various grounds. Latterly, Professor Rudolph Arndt,² in an article upon this subject, upholds the views of Van der Kolk that spasm is the cause of the constipation, though the same need not necessarily be limited to the colon descendens.

¹ Van Buren, Lectures upon the Diseases of the Rectum. Rosenheim, loc. cit. Goodel, *Journal of the Americ. Medical Associat.*, 1888, latter half, p. 15. A. Peyer, Die nervösen Affectionen des Darmes. *Wiener Klinik*, Heft 1, 1893.

² *Deutsche medic. Wochenschrift*, 1881, No. 29.

CHAPTER IX

IMPERFECT PERFORMANCE OF PHYSIOLOGICAL FUNCTION

Atony of the Intestine (Darmatonie). Causes and their Mode of Action

BY far the greatest number of the cases of habitual constipation that come under our observation are due to an imperfect performance of physiological function on the part of the intestines, more especially of the large bowel.¹

Atony (*atonia, infirmitas et remissio virium*) means a loss of vigor, a loss of normal muscular force; and loss of this means an incapability to perform normal function. It means also a loss of normal irritability; a lethargic state seems to come over the muscle, and it responds but slowly and imperfectly to the normal stimulus.

Muscle and muscular power keep pace with the amount of work they are called upon to perform. With active exercise of the part or organ, within physiological limits, the volume and tone of the muscle is preserved and kept at the normal; with scant use or disuse it loses both in volume and vigor. The bowels form no exception to this rule. Where from any cause the exercise of their muscular apparatus is diminished, it loses in vigor, it loses in normal irritability, and, without doubt, to a certain extent, in volume.

¹ See also Fleiner, loc. cit. Rosenheim, loc. cit.

The consequence of this atony of the muscular apparatus of the large bowel is an inability to perform normal function, namely, the expulsion of the residual material, and constipation results.

But it has still another effect. Judging by analogy, by what we see in the salivary gland, it may be assumed that the action of the muciparous glands is stimulated and the mucus secreted by them and discharged into the follicles is pressed out from them into the canal, where it fulfils its function, by the muscular contractions. Where, however, these contractions are wanting in so marked a measure as in atony, there will then be lack of stimulation, and, consequently, lack of secretion; moreover, much of what is secreted will be retained in the follicles, distend them, and become a source of irritation. This retention is still further favored by the sealing up, as it were, of the mouths of the follicles by the stagnating fæcal matter. Thus the dryness of the fæces, their hardness, and, perhaps, also the occurrence of ulcers in certain cases of marked constipation, wherein the question has arisen, "Which has preceded?" can be accounted for.

The causes that lead to such impairment are :

1. **Neglect to attend to the Calls of Nature.** — From the press of occupation, by reason of the etiquette of our day, from lack of opportunity at the proper time (such as is provided in most of the large cities of Europe), the call of nature is disobeyed. This does not happen once, but is of frequent, of daily occurrence, and, as a result thereof, a toleration is established both on the part of the mucous membrane and of the terminal nerve filaments, and that which was regarded by nature as a foreign body to be

expelled at the proper time, is now permitted to remain, to take up a permanent abode, as it were.

This is so well-known a fact within the experience of the generality of mankind, that it really needs no further elucidation. It is fully explained by what has been said previously upon the physiology of defecation, and upon the well-known facility with which nature becomes habituated to the presence of extraneous matters and influences.

2. **The Pernicious Habit of Reading at Stool.** — A great many good people have become and will become constipated, and cause themselves much annoyance and much useless expenditure of money by their attempts to do two things at one and the same time; namely, to empty their bowels and fill their heads.

Cloacina is very exacting, and demands the full concentration of the mind upon the duties there to be performed. It has already been set forth in a preceding chapter how the mind regulates, in a great measure, this important function, and in that light the deleteriousness of attempting to read during the process of defecation is clearly apparent. The inhibiting influence of the will being diverted from the spinal centre controlling the sphincter, the latter contracts at once, and, in consequence thereof, the rectum falls together, the opening of the sigmoid flexure is shut off, and perhaps itself narrowed, and further descent of faecal matter prevented. A sort of retroperistaltic wave sets in, which may even carry back faeces that have already partly descended into the annulus of the rectum.

I have had this controlling influence of the mind demonstrated to me, and have demonstrated it, in another way: When the call of nature came, some work or some reading

that was of interest was taken up, the mind plunged in *medias res*, and the call of nature left unheeded. Very soon, as the mind became absorbed in the work, the desire passed away. Then the thoughts would be again turned to the bowels and to the necessity of having a stool; a response, in the form of a call of nature, would soon follow; at first slight, then more forcible, until, on the way to the lavatory, the call became imperative and urgent.

3. **Food Defective in Residual Matter.** — It has already been shown that a certain amount of residual matter, as coarse vegetable fibre, etc., is necessary for the excitation of the large bowel to peristalsis. A food too rich in nutritive material, and very poor in residual matter, will cause constipation. The peristalsis of the large bowel is already normally slow, and if there be a lack of stimulus or irritation, it will cease almost altogether. In this country this factor stands out very prominently. Our food, the food of the people, is too rich in nutritive material, and too poor in residual matter: large quantities of meats, eggs, bread almost entirely starch, potatoes, and but little of the vegetables rich in cellulose. Moreover, great numbers of people, either from laziness, or from force of circumstances, live almost entirely upon prepared concentrated foods. The fruits that are eaten, as apples, pears, are deprived, before being eaten, of that portion which cries out to the bowel, like the policeman to the *habitué* of the street corner, "Move on."

The influence of the character of the food upon peristalsis is very well illustrated by the following, from veterinary medicine. Attention is called in the *Magasin f. die gesammte Thier-*

heilkunde, XXXII., p. 326,¹ to the fact that the machine-cut straw fed to animals, being cut too short, was in many cases the apparent cause of obstinate constipation, and frequently of death to the animals; it became packed so tightly in different parts of the large bowel, the cæcum, the transverse colon, the sigmoid flexure, that no medicament was able to move it on.

Food Deficient in Fats. — We occasionally meet with persons who take almost no fat at all with their food; their milk is skimmed, butter they do not eat, and whatever of fat there may be about their meats they cut away. They do this from false hygienic considerations, as to the preservation of the complexion, as to the maintenance of their digestive powers, or from bad early training.

The residue of unassimilated fat and the fat detritus are, no doubt, one of the many factors that excite the peristalsis of the bowels, both large and small; they are also an important constituent of the fæcal matter, tending to keep it soft. A deficiency thereof is therefore apt to manifest itself by constipation and an induration of the fæces even to such an extent that its discharge through the anus may be attended with considerable pain.²

4. **The Habit of Abstaining from Cold Water.** — Many people, from crude notions, or through bad advice, abstain altogether from the use of cold water; whatever of fluids they take is in the shape of warm decoctions.

Besides that these decoctions are in the majority of instances detrimental by the astringent properties they possess (decoctions of tea, of coffee³), they are deleterious

¹ Schmidt's *Jahrbücher*, Vol. 137.

² See Part II., "Constipation in Infants," Chapter IV.

³ I refer here only to the *abuse* of these articles.

by their warmth alone (hot water, infusions of camomile, of anise, etc.). The constant application of this warmth tends to establish a condition of turgidity of the circulation in the intestines, impairing thereby the functioning of the secreting organs located in the mucous membrane, and obtunding the normal sensibility of its nerve filaments. It has a relaxing effect on the muscle.

Cold water has a general stimulating, tonifying, effect on the intestinal canal both directly and reflexly, upon the circulation, upon the nerve filaments, and upon the muscular tunics of the intestine, as all who have ever experienced a cramp colic after a very cold drink will testify to.

5. **Want of Sufficient Physical Exercise.** — That a certain amount of physical exercise is necessary for the well-being of the human body is a well-demonstrated fact, patent to all. Exercise stimulates all the physiological processes going on within the organism; the circulation is hastened, the respiration is activated so that there is a greater exhalation of carbonic acid and increased inhalation of oxygen; destructive metamorphosis becomes more rapid, and the results thereof are more quickly excreted.¹ As a consequence, the muscles and other structures are invigorated, acquire greater power, and thus become important factors in the better execution of physiological processes.

Lack of sufficient exercise naturally entails the reverse of all this. Torpidity is the most marked feature, then, of the corporeal mechanism; the circulation becomes sluggish, the temperature is lowered, the respiration, *i.e.*

¹ Carpenter, Human Physiology. Landois, Human Physiology.

oxygenation, is retarded, and carbonic acid accumulates and tends to further deepen the lethargy, and destructive metamorphosis is slowed. As a result of this torpidity, the muscles become relaxed and weak.

A great many people, however, do not get the necessary amount of physical exercise, either from *indolent habits*, as we often see it among the more fortunately situated class, and particularly among the female portion thereof, or by reason of a *confining*, more especially, a *sitting occupation*.

In so far as our special subject is concerned, it can be readily understood how, from the torpidity of the muscles, from the want of the stimulating influence of vigorous oxygenation,¹ and from the increase of carbonic acid, all the consequences of their inactivity, such persons become constipated, even obstinately constipated.

It is also readily understood how prolonged confinement in badly ventilated rooms (working therein — even when the work is of rather an active character — and sleeping therein) causes constipation.²

6. **Muscular Weakness of the Abdominal Walls.** — This may, in some rare instances, arise from some defect of muscular development; most generally it is due to neglect of the proper measures after parturition.

A moderate degree of relaxation of the abdominal wall will not, in my opinion, — and herein I agree with Rosenheim, — produce, *per se*, constipation; but combined with some of the other etiological influences named, it is certainly most potent in developing a coprostasis, and in

¹ See the chapter on the "Physiology of Intestinal Movement."

² See also Birch, *Constipated Bowels*, 1868.

maintaining it. In its severest form, the pendulous belly, it is not only the sole cause of the constipation, but it is the most difficult, and not infrequently the insuperable, obstacle to the recovery of the patient.

7. **Obesity.** — Large deposits of fat about the abdominal parietes and the intestines tend to impairment of normal muscular vigor, to atony, to constipation.

8. **Prolonged Mental Work ; Prolonged Mental Worry ; General Depressing Influences,** lower the irritability of the nervous system, and, in consequence, all the physiological functions are very markedly slowed.

9. **Bad Teeth, or Want of Teeth,** prevent perfect mastication, and compel either the deglutition of badly masticated food, which will subsequently develop a dyspepsia, or a resort to a pap and slop diet.

10. **Old Age.** — Besides the feebleness of muscle, the torpidity of the secreting organs incident to this epoch of life, the lack, in many cases, of good masticating organs, the bland character of the food, the want of necessary exercise, are important factors in perpetuating a condition of constipation.

I have not counted among the etiological factors the habit of pill-taking, which many authors hold as the chief cause of the evil, for the reason that I do not believe that it is so.

My experience, both in hospital and private practice, has demonstrated to me that “purgative-taking” is not the *fons et origo* of constipation ; rather the reverse, purgative-taking is the result of constipation. That it finally aggravates the derangement, — of this there can be no doubt ; the excessive irritation of the purgative exhausts

the normal irritability of the intestinal tract, especially when the drug is so frequently repeated and in ever-increasing doses; a condition of over-fatigue, of exhaustion of the muscle, is established.

An over-indulgence in very coarse vegetable foods may produce the same result.¹ The great abundance of coarse residual matter causes an excessive irritation of the bowel just as do purgatives, and constipation, as a result of the exhaustion of the normal irritability, follows.

The prolonged use of warm or lukewarm or emollient injections is likewise injurious.² Their mode of action is readily understood. They cause turgescence of the parts, they enervate the muscle, they dull the normal irritability of nerve and muscle.

Among the incidental causes of constipation, and to which Birch³ has already called attention, is the inadvertent consumption of certain derivatives of the mineral kingdom, which tend to dry up the secretions of the bowels, and to lump and harden the fæces. These are alum, the salts of lime, the salts of lead, iron, and copper.

Alum is found in adulterated flour. It is said to be frequently used by millers to give their flour a lustrous whiteness. It is a constituent of many baking powders, and thus gets into the bread and other dietary preparations that we consume. *Lime salts*: The sulphate of lime is said to be used extensively in the preparation of various confections. The drinking water may be highly impregnated with the salts of lime, as we find in the well water of many country districts. Birch states that he has seen a number of cases of constipation so produced. In young infants it may be the lime-water added

¹ Rosenheim, loc. cit. Boas, Diät u. Wegweiser f. Darmleidende.

² See Nouveau Dictionnaire de Méd. et de Chirurg. Pratique. Article "Constipation."

³ Birch, Constipated Bowels, 1868.

to their milk. *Salts of lead*: Various cheap candies are colored with the red oxide or yellow chromate of lead. Numerous cases of constipation with colic, in children, from the consumption of such candies have been reported. Even graver consequences, intoxication and death, have resulted therefrom. This offence against public health merits the earnest attention of the authorities. The drinking water may be impregnated with lead from the pipes through which it is conducted. *Copper* we get with our pickles and various other like condiments. *Iron*: The prolonged use of preparations of iron may lead to constipation. Drinking water rich in iron, as the waters of St. Louis, Michigan, may have the same effect.

Mode of Action:

Though some of the etiological factors just named act chiefly upon the mucous membrane, obtunding its sensibility and the sensibility of its nerve filaments (as the neglect of the calls of nature, habitual use of food containing but little residual matter, adulterated food as just referred to), whilst others act primarily upon the muscular structures (as indolent habits, want of sufficient exercise, insufficient oxygenation), and others again upon the nerves governing the process of evacuation (as reading at stool, prolonged mental worry or occupation), nevertheless, the effect of all these factors is, in reality, one and the same, to wit, a loss of normal tone, of normal vigor, in the muscular coats of the intestinal tract, — an *atony of the bowel*. It can be readily understood that an atony could not occur, that the muscles could not fall into this lethargic state, if the mucous membrane, if the ultimate nerve filaments, retained their normal sensitiveness.

It is generally admitted that, as has been indicated at the outset of this chapter, the abnormal — it cannot be

called pathological — condition present in the great majority of cases of habitual constipation is an *atony of the intestine*.¹

An atonic condition of the intestine is not infrequently one of the sequelæ of the infectious diseases that are attended with abundant discharges from the bowels, as typhoid fever, dysentery, cholera. Here also the atony is, in greater part, a consequence of the preceding hyper-irritation.

Atony of the intestine is one of the prominent features of **chlorosis**; so prominent, indeed, that Sir Andrew Clark was disposed to look upon the disease as a copræmia. However this may be, this much can be said, that, the disease once developed, all the conditions thereof tend to make the coprostasis more obstinate. It is a generally admitted fact (and one that I hold as of the greatest importance) that there is insufficient oxygenation.² The stomach is very much disturbed; the appetite is poor and perverted; there is a distaste for the grosser kinds of foods, and what nutriment is taken is in concentrated form, and even of this but little is consumed. There is a feeling of languor, of fatigue, which opposes all exercise and active exertion; a loss of tone in muscle, shared by both stomach and bowels.³

¹ Fleiner, loc. cit. Rosenheim, loc. cit.

² Osler, Principles and Practice of Medicine. Rosenbach, O., Entstehung u. Hygienische Behandlung der Bleichsucht.

³ Rosenheim, loc. cit.

CHAPTER X

SYMPTOMATOLOGY

CONSTIPATION has but few characteristic symptoms ; when it has been said that the fæcal evacuations are retarded beyond the normal period, that the stool is hard and dry, and that the person is unable to have a full and free discharge without having recourse to a purgative, its special features have been described.

It is true, as has been pointed out,¹ that nature will, after a longer or shorter period of time, — from four days to three weeks, — make an effort to dislodge the accumulated material. It is, however, generally unsuccessful, always so when the constipation is due to atony, in that only a very few hard scibala, which had been pushed far down into the rectum by the *vis a tergo* and had set up an unusual irritation about the sphincter, are discharged, whilst the bowel above still remains loaded ; and even this does not occur frequently, once the constipation has become a habit. It is correct, therefore, to count among the characteristic features of this derangement the necessity of a purgative for the production of a full and free evacuation.

In addition to these special features, we have certain other phenomena, some of a local, some of a more general character, that present themselves to us in constipation.

¹ Kaczorowski, *Deutsche mediz. Wochenschrift*, 1882.

General Symptoms. — The tongue is coated; usually it is a thick, white fur; not infrequently, a yellowish one. The breath is offensive. The appetite is poor, maybe *nil*; sometimes dyspeptic phenomena, as eructations, heaviness after eating, — even after small meals, — nausea, are noted. Occasionally there is a disgust for food; the person cannot look at it. A bad taste in the mouth.

Headache is of frequent occurrence. It is really rather a feeling of fulness, of heaviness, of the whole head, or more particularly of the frontal portion, than a pain.

Vertigo, rushes of blood to the head, are complained of. In one case of prolonged constipation, due to anal fissure (which is reported more in detail further on), I saw *profound stupor*, so profound indeed that it was only with great difficulty that the patient could be aroused, and then he would murmur only a few unintelligible words, and relapse into his former state. This stupor had lasted, at the time I saw him, for over three weeks.

The perturbation may be more general. It may be a feeling of malaise, of hebetude, that renders the person incapable of doing any work. It may be a hypochondriacal condition that has supervened; the person is morose, moody, and preoccupied with himself. Again, it may manifest itself in a marked irritability; he (or she) is quarrelsome; nothing is right, nothing is proper, and he (or she) has a grievance against the whole of creation. I once knew a very eloquent professor who suffered from chronic constipation in whom this feature stood out so prominently as to become quickly known to the students, and they could tell at once, when he appeared on the rostrum for his lecture, by his manner and look, whether

he had had his clyster and an ample evacuation that morning, or whether his duties had kept him therefrom. Rosenheim¹ mentions alternate sensations of heat and cold. I have not observed this except in neurasthenics, and have ascribed it rather to an aggravation of the neurasthenia caused by constipation, than to the constipation itself.

Senator² holds that the phenomena are due to intoxication by sulphuretted hydrogen gas (SH_2), and bases his belief upon a case that came under his observation. At a later period, in a discussion of dyscrasias, he reaffirmed this view.³ To this it may be opposed that the case upon which this view is mainly based could very possibly have been, and the whole history points very much that way, one of ilio-cæcal intussusception. Such a state is, of course, altogether different in its effects upon the intestinal processes, and no conclusion could be drawn therefrom that would be valid for other conditions. Moreover, there is a possibility, even a probability, that in the case referred to a considerable quantity of sulphuretted matter was introduced from without. Besides all this, the investigations of Ruge,⁴ of Novack and Bräutigam,⁵ as already mentioned by Rosenheim, very clearly controvert such an opinion. These investigators have found that ordinarily the quantity of SH_2 in the admixture of intestinal gases is less than 0.1 per cent, rarely more, even when the fæces are long retained, and such a quantity is much too small to cause phenomena of intoxication.⁶

¹ Loc. cit.

² Senator, "Ueber einen Fall von Hydrothionamie," etc., *Berlin. klinische Wochenschrift*, 1868, p. 254.

³ *Zeitschrift f. klinische Mediz.*, Bd. VII.

⁴ Ruge, *Wien. Sitzungsberichte d. Akad. der Wissenschaften*, 1862, p. 729. Foster, *Human Physiology*.

⁵ Nowack u. Bräutigam, *Muenchener mediz. Wochenschrift*, 1890.

⁶ The experiments of Bergeon (*Nouveau Traitement des Affections des Voies Respiratoires*, etc., par les Injections Rectales Gazeuses, V. Morel, Paris, 1886) and others (*Medical News*, Phila., 1887), in the treatment of tuberculosis, demonstrate that large quantities of SH_2 can be introduced into the intestinal tract without causing the least systemic disturbance.

The explanation of Rosenheim¹ that they are caused by augmented putrefaction in the albuminoids, presents as many difficulties.²

My own opinion is that they are based upon disturbances of the nervous, circulatory, and glandular systems of the intestinal tract. All of these must suffer, more or less, in constipation, from the filling up of the bowel and the pressure necessarily exerted by the hardened masses. It may also be possible that the diffusion of CO₂ into the intestinal canal³ is interfered with and its consequent accumulation in the blood may contribute to the production of the perturbations described.⁴ We see similar phenomena in persons who are very much confined to their room, in whom there is an insufficient oxygenation, and consequently an increase of CO₂ (beyond the normal limit) in the system.

As to the loss of appetite alone, there is but little difficulty in its explanation. The atony of the intestinal muscles soon involves those of the stomach. The movements of this latter organ are very much slowed, and consequently the chymus is retained therein for a much longer time. The chemismus itself does not seem to be impaired.

¹ Loc. cit., p. 502.

² The investigations of Von Pfungen (*Zeitschrift f. klinische Mediz.*, Bd. XXI.) and others have all been made on persons in whom grave organic disease, as peritonitis, myelitis, existed, and in whom, therefore, all the bio-chemical processes must have been seriously affected. It may be justly questioned whether what holds good under those conditions will apply to constipation without the co-existence of organic disease; with an otherwise normal condition of the digestive tract, stomach included. Von Pfungen himself there says that where the secretion of HCl in the gastric juice is not diminished, the putrefactive processes occurring in the albuminoid matters in the large bowel are at about the normal. See "Auto-intoxication," in following chapter.

³ Normally a certain amount of CO₂ is diffused from the blood into the intestinal tract. See chapter "Flatus."

⁴ See Senator, *Berlin. klinische Wochenschrift*, loc. cit. Hoppe-Seyler, *Physiol. Chemie*.

In the intestinal canal the digestive process is not interfered with ; it is possible that there may be a greater splitting up of the albuminoids in the large bowel.¹

How the bad breath is produced, it is difficult to say. Whether it be that some of the inhaled air that is carried into the stomach passes thence into the intestinal canal, and becoming charged there with the odors from the fæces, or with volatile gases, is carried into the circulation and excreted through the lungs, or that these odors or gases pass upwards and through the stomach, and mingle with the expired air, is something yet to be determined.

Local Symptoms. — *Flatulence* :² a sense of distention ; a feeling of fulness, of heaviness in the belly. The abdomen may be distended symmetrically, or only in part thereof. Rolling and purring noises in the bowels. No tenderness of the abdomen. Colics not infrequent ; more rare in habitual constipation due to atony. *Stitches* in the side, under the liver or under the spleen ; in the back, in the lumbar region, sometimes as high up as the inferior angle of the scapula, which cause the persons considerable suffering and much uneasiness as to the state of their liver or of their kidneys. The pains are transitory ; there is an interval of rest of longer or shorter duration ; then the person feels something shooting up his bowels into the locality named, and the pains at once follow ; they are wandering, being now on one side, then on the other. They are more severe when the person sits or lies down, and are relieved by standing or walking.

¹ Von Pfungen.

² Accumulation of flatus.

All these phenomena are provoked by the distention of a loop or loops of intestine by accumulated flatus and the irregular peristalsis thus therein excited. A full discharge of wind per rectum will quickly effect their disappearance.

Itching at the Anus.— I have known constipated persons in whom the call of nature was expressed in an itching about the anus, which grew more intense the longer the evacuation was delayed, and disappeared at once with the discharge. Some of my patients informed me that they would have no rest until they had taken an active purgative, and thoroughly cleansed their bowels.

If the abdominal parietes be not too thick, the large bowel can be very readily palpated. If a condition of constipation exists, we will find more or less large faecal masses accumulated therein, which can be readily felt, and can be demonstrated to be faecal matter by the ease with which they are broken up with the fingers. They are most numerous and most readily felt in the descending colon and the sigmoid flexure; in cases of long standing, they can be found almost always in the transverse, and even in the upper portion of the ascending colon.

The faeces are harder and drier than normal; frequently hard and dry, and are usually evacuated in the form of scibala, varying in size from a hickory-nut to a horse-chestnut; two to three scibala may be agglutinated together, and thus form larger masses. I have seen them in the form of cylinders, and so hard that it required an axe to break them. They vary in color from a very dark brown to a black. There is nothing remarkable about the odor.

The special features of enterospasm have been already described.

As in all other ailments, so also here the symptoms given may be all present or the greatest part may be wanting (and this is not infrequently the case once the person has become habituated to the constipation), and between these two extremes we have the various and numerous gradations.

CHAPTER XI

DIAGNOSIS; PROGNOSIS

DIAGNOSIS — *Examination*

THE diagnosis alone of constipation is not a difficult matter. The patient himself will tell us that he is constipated, and when he has described to us the period of time intervening between one evacuation and the other, and when he has informed us that his bowels do not move without a purgative, without an injection, we can have no further doubts. Some difficulty may be encountered when we are confronted with that somewhat paradoxical condition where the patient complains of diarrhoea, whilst in fact he is constipated. However, even here we can readily acquire certainty. A careful examination of the abdomen, a careful examination of the large bowel, of the rectum, will disclose to us, if constipation be present, large masses of hardened fæces.

The principal point in diagnosis is to differentiate whether the constipation that we are called upon to treat is that form which can be called idiopathic — **habitual constipation** — or whether it is produced by one of the many pathological processes that may give rise thereto. This must be done by exclusion. For this purpose we must acquire a full history of the patient; we must carefully inspect his appearance and that of his body; we must

examine carefully his abdomen, his bowels, his rectum, and finally the fæces must be carefully studied, both macroscopically and microscopically.

By the inquiry into his history, we acquire valuable data as to the mode of onset of the constipation, the age at which it first manifested itself, and its duration. We learn whether at any time previous there was pain with the stool, whether there is pain with the stool now, before or after (ulcer, spasmus, fissure); whether the stools were admixed with recognizable blood; whether they were black and tarry (hæmorrhage of the bowel, high up); whether they contained or still contain large or small quantities of mucus, on top or closely intermixed.

We learn therefrom whether there is any reason to suspect tubercle. It is very important to know as to the probability of a tuberculous condition, for tuberculous stricture¹ is a possible factor that must not be overlooked in the process of exclusion. We may get data as to the family history that will indicate to us whether malignant disease should be suspected. We will learn whether the patient has ever had strangulated hernia; whether he has ever had dysentery, and possibly a subsequent contraction of the lumen of a section of the tube;² whether he has had any of the manifestations of syphilitic infection, — and syphilis may give rise to a stricture in the bowel.

We will learn whether the patient has had sexual ailments, as gonorrhœa, gleet, spermatorrhœa; whether he is addicted to evil practices, etc., all of which are frequent

¹ Treves, *Intestinal Obstruction*, p. 259. Koenig, *Deutsche Zeitschr. f. Chirurgie*, 1892.

² Treves, *loc. cit.*, pp. 255–263.

causes, direct or indirect, of obstipation.¹ We will gather indications as to whether the patient is a neurasthenic or an hysterical individual or not. Finally, we learn whether a foreign body should be suspected or not.

General inspection of the patient, of his body, will give weight to what we learn from his history as to tubercle, as to cancer. It will inform us whether the liver, the kidneys, the heart, must be looked to.

It will thus greatly facilitate our examination.

Local inspection of the abdomen will inform us whether it is normal or not; whether it is distended, and if so, whether it is symmetrically distended. It will furnish us valuable information as to the state of the portal circulation, and thus inform us as to the condition of the liver.

By a careful examination of the abdomen, we will be able to decide the question of effusions, of gaseous distention of the bowels, of tumors of the abdomen. We will discover the state of the bowels, of the peritoneum, whether they are normal or not. We will learn the condition of the abdominal walls, whether they have their natural firmness, or whether they are relaxed or flabby.

An examination of the large gut will at once disclose whether it is full or empty; whether it has its normal location. We will learn as to pathological processes within or around it; as to growths or foreign bodies.

A careful examination of the rectum will at once inform us as to the presence or absence of accumulations of fæces, of hæmorrhoids, of polypi, of ulcers, of fissures, of malig-

¹ A. Peyer, Die Nervösen Affectionen des Darmes. *Wiener Klinik*, January, 1893. Löwenfeld, Die Nervösen Störungen Sexuellen Ursprungs, 1891.

nant disease, of tuberculous, syphilitic, or dysenteric stricture, of shelves of mucous membrane, of foreign bodies; will at once inform us as to the condition of the mucous membrane and parts below, whether they are normal or not.

Of the greatest importance are the macroscopic and microscopic examinations of the fæces. By the macroscopic examination we note the general appearance of the stool, whether it is scibalous or of cylindrical form; its consistency, whether very hard, very dry, or only moderately so. We see the color thereof, whether brown, or black, or clay-colored. We note whether mucus is present in abnormal quantities or not. We discover the odor, and thus learn whether abnormal putrefactive processes are going on within the intestinal tract or not. We receive some indications upon the questions of enterospasm.

A microscopic examination will furnish useful information as to the food of the person; whether it is too concentrated or not; whether it contains too much indigestible matter; will inform us as to the presence therein of foreign matters, as blood, epithelium, mucus, and helminthes.

The difficulty in diagnosis encountered is chiefly that connected with the question of stricture; firstly, as to the presence or absence of a stricture higher up when the rectum is found free; secondly, if a stricture is present, is it an organic or a spasmodic stricture; thirdly, if organic, is it interstitial or extraneous (contraction of the inflammatory products of the serous coat; shrinking of the mesentery).¹

¹ Treves, Intestinal Obstruction.

Strictures, interstitial, comparatively of not infrequent occurrence, may result from any form of ulcerative disease, and may occur in any part of the intestinal tract. Those of the small intestines are generally located in the ileum, in the middle and lower portions thereof. They are much rarer than those of the large bowel, as 1:5 or 1:6. Of the large bowel (in fact, of the whole intestinal tract), the rectum is the most frequent seat of stricture; the sigmoid flexure is next after the rectum the most frequent site; then come, in the order named, the colon ascendens, the left colic flexure (*flexura coli sinistra*), the right colic flexure (*flexura coli dextra*). The cæcum is rarely ever thus affected.¹

When the abdominal walls are not too thick or too rigid, the large bowel can be readily palpated through them.

Procedure. — The patient (if a child, the bladder must be previously emptied) is placed on a firm couch in the horizontal position, with the head slightly elevated (by a cushion or by the head-piece usually found on couches), with the lower extremities extended. The examiner places himself to the right of the patient; he can seat himself, which is more convenient, on the couch beside him.

To facilitate reaching the bowel, the patient is told to keep his belly drawn in; this will shorten the antero-posterior diameter of the abdominal cavity, bring the parts more closely together and thus more within our reach.

To obviate the reaction, the muscular contraction and the consequent rigidity, which almost always follows when pressure is made upon the abdominal parietes, various expedients may be resorted to:

(a) The patient is impressed with the necessity of keeping his belly loose, relaxed.

(b) He is told to breathe deeply; this has a very relaxing

¹ Kelsey, loc. cit. Mathews, Diseases of the Rectum. Van Buren, Lectures upon the Diseas. of the Rectum.

effect upon the abdominal parietes. Furthermore, the deep inspirations, by causing deep descent of the diaphragm, will depress the bowel, especially the cæcum, 2 to 4 cm., and thus enable us to locate the latter more readily.

(c) The left hand is placed upon the abdomen, over the linea alba, with the larger part of the hand towards the left; pressure is there made, and all the reaction concentrated underneath it. The region to the right can now be palpated; no reaction on this side now following as long as the pressure with the left is continued.

Obrastzow uses the outer and thenar surfaces of the thumb of the left hand, and makes pressure as described.

Or the left hand can be placed as described above, and firm pressure with a pushing away, to the left, motion made; muscular contraction will be impossible. This is the expedient that I prefer.

In cases of great rigidity of the abdominal walls, I have found it necessary to have the lower extremities flexed; however, only to a moderate extent, *i.e.* so that the knees were just somewhat elevated above the plane of the abdomen. This will usually effect a sufficient relaxation without being in any way a hindrance to the examination.

Percussion. — I always make it a point to precede the palpation with percussion. Beginning in the right inguinal region and running obliquely upward and outward, we have the cæcum; upwards to the under border of the liver, the ascending colon, then to the right as far as the spleen, the transverse colon; here we must make our percussion more carefully, to differentiate the stomach from the colon. Then again downward to the crest of the ilium, the descending colon, and downward and inward in the left fossa iliaca to near the symphysis pubis, we have the sigmoid flexure.

From percussion we will derive much valuable information as to the locality of certain special sections of the bowel, and also whether these sections are more or less distended or not. It will be a sort of outline for us on which to palpate.

Palpation.—The cæcum and the sigmoid flexure may be palpated after the fashion of the stomach; the four fingers of the right hand, extended, are brought down perpendicularly on the part, with a light but firm pressure, raised and brought down again, until the whole section has been gone over. I prefer to palpate the cæcum in the same way as I do other parts of the large bowel, to wit: the four fingers of the right hand are placed where the inner or upper border of the cæcum is supposed to lie, whilst the thumb is placed towards the lower or outer border; gradually the fingers are pressed down more deeply, moved about and approached slowly until the part desired is felt between them or in the hollow of the hand.

For the ascending colon the fingers (of the left hand) are placed on the right flank. The four fingers, extended, are towards the back, whilst the thumb is forward and upward. The fingers are pressed in gradually deeper and deeper, other parts are pushed aside, and finally the ascending colon is grasped.

The transverse colon is palpated in the same way, with this difference only, that both hands are used, one on either side of the umbilicus. The fingers are placed toward the upper, the thumb toward the lower border. The same movement already described is made; the fingers are pressed in deeply, gradually, and slowly, the parts are rolled between the thumb and fingers until finally the bowel is grasped. Once seized, we can follow it for a certain distance, three to four fingers' breadth, to either side.¹

To palpate the sigmoid flexure, the examiner can remain in the position originally taken to the right of the patient; then in palpating after the last method, he will place the fingers towards the outer or lower border, against the ilium, and the thumb along the upper border. I have often found it convenient to change the position, to place myself to the left of the patient, facing his feet. This gives me command of the right hand in the same position as for the cæcum.

We can facilitate our examination by drawing on the abdomen or by keeping in mind the following lines:

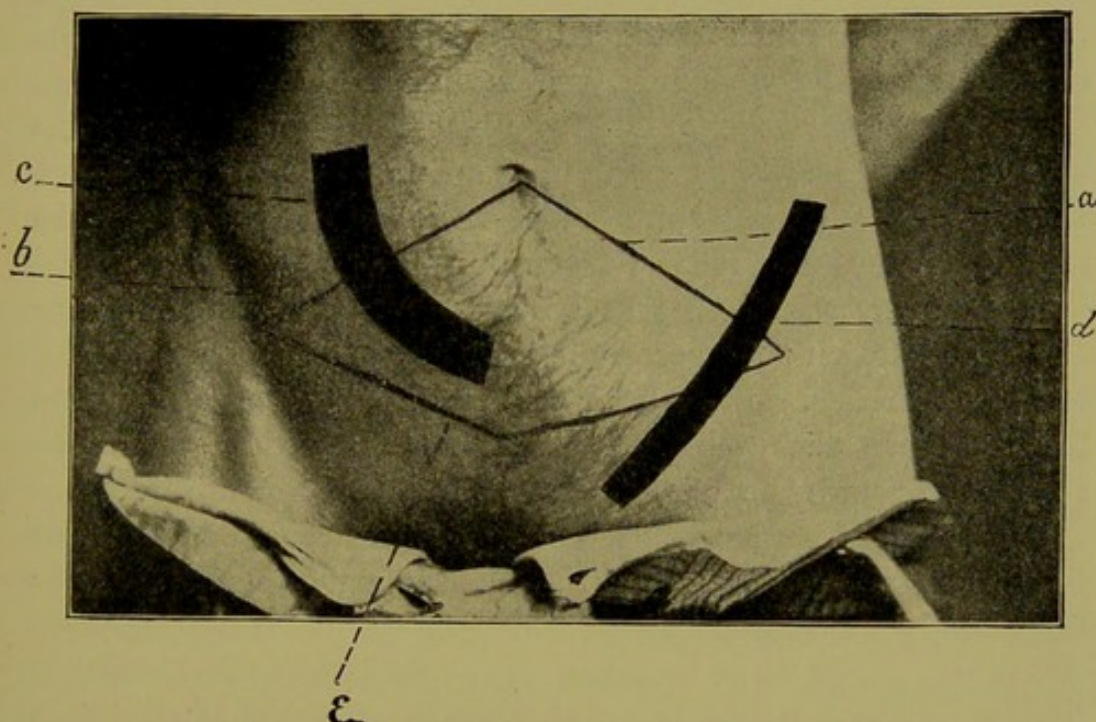
¹ Obrastzow. See further on.

1. From the umbilicus to the right anterior superior spine of the ilium.

2. From the umbilicus to the left anterior superior spine of the ilium. These are the *lineæ spino-umbilicalis*.

3. From the right to the left anterior superior spine of the ilium. This is the *linea interspinalis*.

The exact point at which to palpate for the various sections of the large bowel are shown in the following figure.



a, Left *linea spino-umbilicalis*; *b*, Right *linea spino-umbilicalis*; *e*, *Linea interspinalis*; *c*, Cæcum and ascending colon; *d*, Descending colon and sigmoid flexure.

Cæcum. — For the cæcum we will begin on the right side, on the *linea interspinalis* upward along to the *linea spino-umbilicalis*; here we will palpate from below upward, *i.e.* from the crest of the ilium toward the umbilicus. Ordinarily, according to Obrastzow, the cæcum is found in the outer or in the middle third of the right *linea spino-umbilicalis* — removed about 5 cm. from the spine of the ilium, and not reaching the *linea interspinalis*.

In cases of constipation the cæcum may be filled to almost any extent with fæcal matter and gases, and is, therefore, more

or less dilated. It may extend upward to the anterior third of the linea spino-umbilicalis and down to the linea interspinalis and beyond. In one case of enormous accumulation of faecal matter, grape-seeds, grape-skins, etc., the caecum extended from the anterior superior spine of the ilium, to the left, to within 2 cm. of the linea alba; downward it filled out the whole inguinal region, reaching to the symphysis pubis.

In another case, a patient aged seventy, suffering with chronic cystitis, greatly emaciated, and in whom the large bowel was very much distended with gas and stood out prominently upon the abdomen, the caecum looked like a large bologna sausage; it extended from below the linea interspinalis up and somewhat beyond the linea spino-umbilicalis, and from the anterior superior spine of the ilium, half-way into the middle third of the linea spino-umbilicalis.

The **transverse colon** will be found between the umbilicus and a line drawn transversely across along the under border of the costal arches. In males it will usually be found from 1 to 3 cm. above the umbilicus; in females it will be on a line running through the umbilicus, or 1 to 2 cm. beneath it.

There are of course many incidents and accidents that may tend to change its position, either depressing or elevating it, as has already been described in the chapter on "Enteroptosis." All these things must be taken into account in the history of the patient, and borne in mind when the physical examination is made.

The **sigmoid flexure** will be generally found at a distance of 3 to 5 cm. from the left anterior superior spine of the ilium toward the umbilicus on the left linea spino-umbilicalis, and crossing, also, downward, the linea interspinalis.

In cases of constipation it may be distended to almost any extent. It may reach from the crest to the supra-pubic space and from the anterior superior spine to the umbilicus, depending upon the length of time the constipation has lasted, and the extent of accumulation allowed.

Sounds. — The caecum may not give forth any particular sound on palpation; usually, however, a rumbling or purring noise produced by the dislocation of flatus is heard.

In the transverse colon we may occasionally have a similar rumbling sound.

In the flexura coli sinistra, where we may have marked tympanitic resonance on percussion, we may get a rumbling sound, as loud, almost, as that of the cæcum and from the same cause.

In two cases I heard a splashing noise; but I am not positive that it was produced in the bowel. In the one case the stomach gave a like splashing noise on palpation. No exact differential diagnosis could be made on this point, as the patients would not, under any circumstances, consent to the introduction of the stomach tube. However, from the location where the sound was obtained, far over toward the spleen, and judging from the point at which the gastric splashing sound was obtained in the other case, I believe that the splashing was really produced in the flexure, and was not merely a sound made in the stomach and conveyed from thence.

Over the sigmoid flexure we may get the same rumbling, purring sounds or none.¹

In all cases much depends upon the individual tendency to the production of flatus, which is more marked in older persons than in the young, and greater in those with depressed vitality than in persons in robust health.

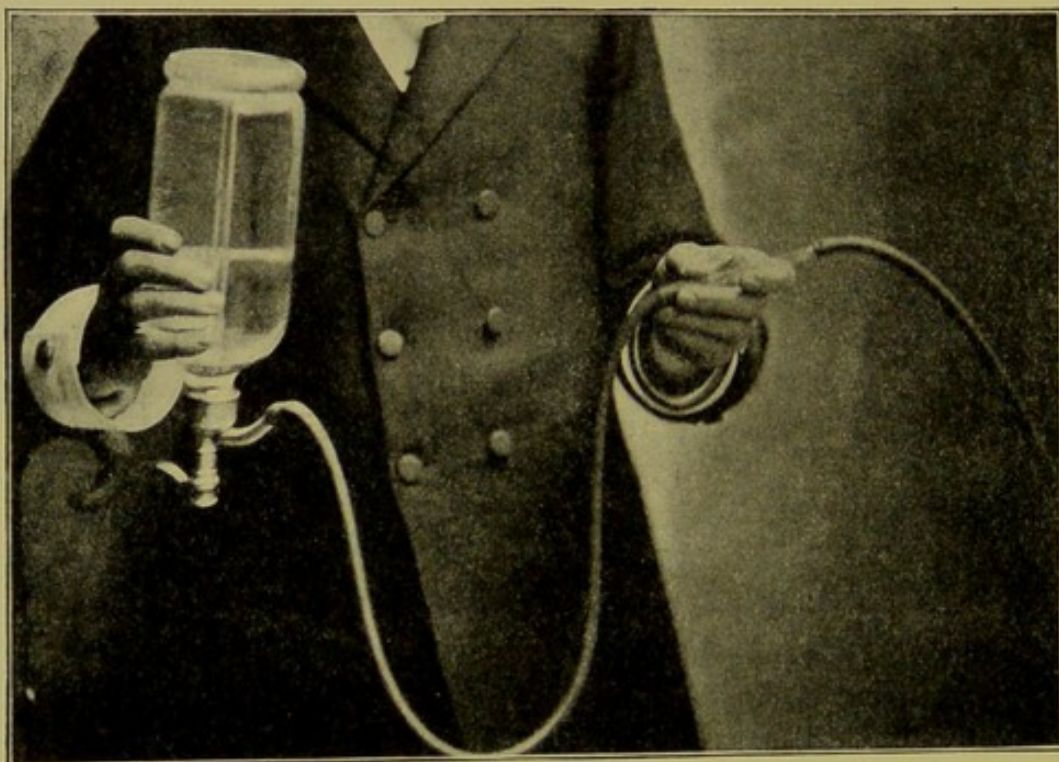
Having finished the palpation of the large bowel, we will palpate the rest of the abdomen, after the manner already described, causing the fingers to penetrate as deeply as possible, but without causing the patient any pain.

By palpation we will learn much as to the state of the bowel, whether it is empty or full; whether it contains much of hardened fæces or not. We will also learn whether there are any growths within the intestinal canal, or extraneous to it and pressing upon it. In females, we will also learn much as to the condition

¹ Obrastzow, "Zur physikalischen Untersuchung d. Magens und Darms," *Deutsch. Archiv f. klin. Medicin*, Bd. 43. "Ueber d. physikal. Untersuchung des Darms," *Archiv f. Verdauungskrankheiten*, Bd. 1.

of the genital tract, whether the cause of the obstipation lies therein or not.

Great assistance in examining the large bowel will be afforded us by inflation.¹ We can insufflate it with carbonic acid gas from an ordinary siphon of charged waters,² or we can inflate it with atmospheric air by means of a balloon.



ARRANGEMENT OF APPARATUS FOR INFLATION BY MEANS OF THE SIPHON (OF CARBONATED WATER).

The gas of one siphon of carbonated water (Seltzer, Vichy), amounting ordinarily to $1\frac{1}{2}$ to 2 litres, more than suffices to distend the large bowel.

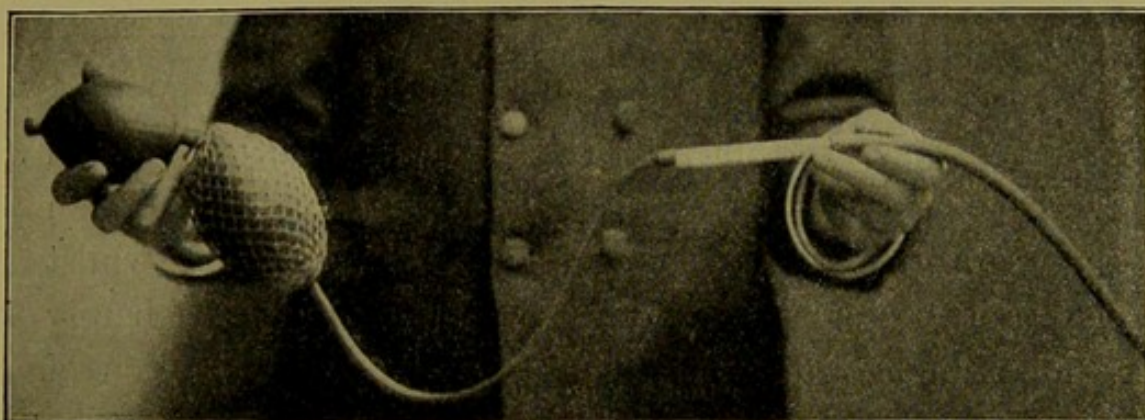
¹ Senn, *Experimental Surgery*, 1889. Behrens, *Ueber den Werth der kuenstl. Auftreibung d. Dickdarmes mit Gase u. Fluessigkeiten*, Goettingen, 1886. Damsch, *Ueber d. Werth d. k. Auftreibung d. Darmes d. Gase*, *Berliner klin. Wochenschrift*, 1889. Rosenheim, loc. cit.

² Schnetter, *Deutsches Archiv f. klinische Medicin*, Bd. 34. Fougerey, "Des Injections Rectale Gazeuses," *Gazette des Hopitaux*, 1886, p. 1116.

According to the more exact investigation of Damsch, one litre of air is all that is usually required.

The bowel will be outlined to us very clearly upon the abdomen, and we will, moreover, have a good percussion surface. (By a careful percussion after inflation, we may be able to locate either a foreign body or a tumor or an induration that might not be otherwise perceptible.)

By inflation we will very readily learn whether the gut occupies its normal location, or whether a dislocation of a section thereof has occurred.



ARRANGEMENT OF APPARATUS FOR INFLATION BY MEANS OF THE DOUBLE BALLOON.

We will learn the size of the large bowel, whether it is normal or not; we will be able to see, to a considerable extent, the configuration of the sigmoid flexure, and thus learn whether it is of normal or abnormal conformation.

By inflation we can distinguish whether certain abnormal growths that we may discover by abdominal palpation are of the intestines or not; moreover, we will learn to what organ they do belong. By the distention of the bowels with gas the tumor is gradually pushed away, and it always retreats in the direction in which the organ of

which it is a part is located. Thus, tumors of the kidney will be pushed back, behind, and become imperceptible; of the liver, to the right, into the hepatic region; of the spleen, to the left, into the left hypochondrium. Tumors of the stomach will be pushed upwards.

By this method we may be able to discover a stricture that could not be found otherwise. The air will penetrate the bowel up to the point of stricture, dilate it, and make its outlines distinct on the abdominal parietes; whilst above the stricture, the part not dilating to that extent, its contour will not be so clearly outlined on the abdominal surface.

Auscultation can be combined with the insufflation. The entrance of air into the free and dilating portion will be accompanied by a loud, hissing sound, which can be readily heard by the aid of the stethoscope; whilst beyond the point of stricture the sound will be barely perceptible. Moreover, on percussion over the region of the large gut, as already described, we will find that the part this side of the stricture, freely insufflated, will give a marked tympanitic sound; whilst above the seat of the stricture the sound will, in comparison, be flat.

If we attempt to inflate the portion beyond the seat of stricture, we will find it attended with considerable difficulty; it will require a much longer time, and then the distention will not be so marked as that of the portion below it.¹

If it be a question of stricture, it is perhaps better to empty the bowel thoroughly, by means of a purge or large clyster, before inflating.

¹ Rosenheim, *loc. cit.*

For the examination of the rectum, the patient should be placed in Sim's position, on the left side, with knees well drawn up. The buttocks being held well apart, the anus and exterior surroundings are carefully inspected.

With the well-oiled finger carefully introduced, the rectum can be explored through the whole of its lower four or five inches, and its condition learned (hæmorrhoids, contraction, etc.). Much may be learned, moreover, by this examination, as to the condition of the prostate, of the posterior urethra, of the ureters, of the ovaries, of the uterus, — all of which are at times important factors in the production of constipation.

It may be necessary to supplement such an examination with an ocular inspection. This will be greatly favored by the use of a head-mirror, or of an electric forehead-lamp.

As to the further details regarding the diagnostic points of stricture of the various portions of the intestinal tract and the various methods of examining the rectum, and the instruments employed therefor, the reader is referred to the works of Van Buren, Kelsey, Mathews, Cripps, and to the article of Dr. H. A. Kelly,¹ in the *Annals of Surgery*, 1895. For special information with reference to the diagnosis of abdominal tumors, the works of the great gynecologists, the larger treatises upon surgery, and the lectures upon abdominal tumors lately delivered by Dr. William Osler in Johns Hopkins Hospital may be consulted.

¹ "A New Method of Examination and Treatment of the Diseases of the Rectum and Sigmoid Flexure," *Annals of Surgery*, April, 1895.

Peristaltic movements may be visible sometimes upon the surface of the belly, when the abdominal walls are very thin and relaxed. Abnormally strong peristaltic movements so visible, is one of the features of all forms of stricture. They begin in the part above the point of contraction; they may be either slow, vermicular, now gently rising, now disappearing, or they may manifest themselves as irregular, violent movements, attended with considerable suffering. The loop of intestine promenaded across the abdomen may be so much dilated that the small intestine may be mistaken for the large bowel, and the latter for the stomach.

Rosenheim¹ attaches much importance to this phenomenon and says: "In doubtful cases, visibility of the peristalsis will speak in favor of an already long-existing obstacle."

Stool. — Cylinders of small calibre, of the size of a pencil, or of the small finger, are held to indicate a spasmodic narrowing of the lumen of the bowel. They are also seen in the stools of persons having a tendency to diarrhoea, in whom the fæces contain a superabundance of water.² Tape-like bands denote a stricture of the rectum.³ The absence of these forms does not, however, *per se*, exclude the existence of a stricture, spasmodic or organic.

Stool in the form of scibala, hard and dry, always points to atony of the intestine.

The indications afforded by *color* as to the presence of blood have been already mentioned. The absence of bile is indicated by the peculiar color of the stool; it is an ashy-gray. Such stool is also very sticky, adhering like tar to the vessel and has usually a frightful odor (wanting in vegetarians).

¹ Loc. cit.

² Rosenheim, loc. cit.

³ Kelsey, Mathews, Ball.

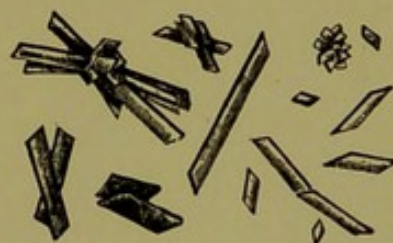
Mucus in considerable quantity *upon* the stool indicates a hypersecretion from the rectum. Though this is frequently due to a catarrhal condition of the mucous membrane, it does not necessarily always indicate this. It may result from a temporary irritation of the muciparous follicles produced by some transitory cause, as prolonged pressure of irritating particles in the fæces. Considerable mucus *intermixed closely* with the fæcal matter indicates a catarrhal condition located rather higher up, in the small intestine, the cæcum, the ascending or transverse colon.

Microscopic Examination of the Fæces.¹

Hæmatine, the coloring matter of the blood (recognized by formation of Teichmann's crystals), and crystals of



CRYSTALS OF HÆMATOIDIN FROM
FÆCES. (Jaksch.)



TEICHMANN'S HÆMIN CRYSTALS.
(Jaksch.)

hæmatoidin indicate the presence of blood, and point to a hæmorrhagic effusion into the bowel at a more or less early date.

Pus, when recognizable, indicates the presence of an abscess, or of an ulcerative process in the intestine, or

¹ See chapter "Fæces."

the effusion of pus from an abscess exterior to it into the intestine.

Pus and *hæmatoidin* crystals point to cancerous disease. Occasionally the characteristic structural elements of this morbid process can be discovered in the fæces.

Charcot-Leyden crystals will many times denote the presence of helminthes.¹ Leichtenstern has found them also in the fæces of phthisical persons.²

The *ova* of various intestinal worms may be thus discovered.

Furthermore, and of importance for the special condition under consideration, such examination will disclose to us whether the person has sufficient residual matter in his aliment, or whether it is defective therein.

For the better examination of the fæces both macroscopically and microscopically, the following method is recommended by Dr. Herz: A small quantity of the fæces taken from diverse portions of the stool is rubbed up in a mortar with some water. This addition of water is necessary with all stools, even with thin ones, for true watery stools are rather infrequent, and in the former the mucous element having a specific gravity nearly like that of the corpuscular neutralizes the influence of the centrifuge. A five per cent solution of carbolic acid answers very well for this purpose, as it disinfects the excrement and destroys or masks to a great extent the disagreeable and often nauseating odor. When thoroughly rubbed up, the mass is subjected to the action of the centrifugal machine. As each of the constituent elements of the fæces has its particular specific gravity, the mass under the influence of the machine must dissolve itself into a number of separate and distinct layers.

¹ Rosenheim, loc. cit.

² *Deutsche medicinische Wochenschrift*, 1886. Jaksch, Klinische Diagnostik.



Microscopic Appearance of some Constipated Faeces
A Case of Four Year's Duration



On the surface there is a layer of turbid fluid, swarming with bacteria. Beneath this are the mighty layers of the vegetable constituent, the cellulose. Hereupon follows a black ring made up almost entirely of residual muscular fibre. Beneath this, and forming about one-eighth of the whole column, we find a number of narrow layers which contain the least numerous, but diagnostically the most important elements, separated from each other, as round cells, clostridia, starch, etc.

Thus already by mere inspection we may form an idea as to the composition of the fæces.

For microscopic examination a portion is removed from the individual layer with a long pointed pipette.¹

When the micro-organisms are the main objects of examination, the electrolytic action of the galvanic current may be employed for sedimentation, after the method of Winkler and Fisher. Two plain iron wires are connected with a battery (they worked with two carbon-zinc elements, about 200 milli-amperes) and their free ends introduced into the vessel containing the fluid to be sedimented. Care must be had that the free ends do not come in contact with each other and so form a short-circuit. This can be readily avoided by keeping them apart by means of a small block of wood; even a large pledget of cotton wool will answer. Five to fifteen minutes, according to the strength of the current employed, suffice for the sedimentation. Under the electrolytic influence there is, as is well known, a formation of gas; gas bubbles form a layer of froth in the neck of the flask, and beneath this is a turbid layer containing the micro-organisms, and from this a portion is taken up by means of a fine pipette.

For this process, the fæces are prepared as already described for the procedure of Herz. Winkler and Fisher maintain that, furthermore, amœba are much more readily recognized, as the current stimulates them into active movement.²

For other and further details on this very interesting subject, consult v. **Jaksch**, *Klinische Diagnostik*, **Rosenheim**, *Darmkrankheiten*.

¹ *Centralblatt f. innere Medicin*, 1892, p. 883.

² *Centralblatt f. innere Medicin*, No. 1, 1893.

The diagnosis of idiopathic constipation having been thus arrived at, we will differentiate the *atonic* from the *spastic* form by the history and symptoms already given in preceding chapters.

The atonic condition of the bowel can be demonstrated in a more positive manner, just as it is done for the stomach; namely, by the splashing (*plaetschern*) sound. It has been found by Boas,¹ and confirmed by the investigations of Friedenwald,² that in normal persons 500 to 600, and even 700 c. cm., of water must be thrown into the bowel before the splashing sound can be obtained; while in an atonic state of the intestine the splashing and succussion sound can be heard after 300 to 400 c. cm. have been allowed to flow in.

To bring out this phenomenon, the bowels having been previously well moved, warm water (90° to 100° F.) is allowed to flow slowly into the bowel; otherwise, if there be much force to the injection, the fluid may pass beyond the ileo-cæcal valve and give rise to erroneous conclusions. At 300 c. cm. the flow is stopped and the bowel palpated; if the splashing sound is not heard, we proceed on to 350 to 400 c. cm., and so on.

In some few cases this symptom may fail us altogether, and still atony be present.

As to the differentiation between acquired atony and congenital atrophy of the intestinal muscles, we must be guided by the history of the case. The constipation due to the latter condition dates from a very early period of life without any appreciable cause, as catarrh, etc., therefore. Furthermore, as has been pointed out, there is in this condition rather a slowness of discharge than a constipation. On the whole, however, it may be said that congenital atrophy is exceedingly rare, and cannot be clearly recognized during life.

¹ Personal communication.

² "Atony of the Intestines," *Medical News*, August 11, 1894.

PROGNOSIS

It is not at all a question as to life. This, as has been already stated at the outset, is not endangered by constipation. Exceptionally, however, and it is well to remember this, a fatal result may follow. Death has occasionally resulted from ileus paralyticus,¹ and I myself saw a case, already once referred to here, in which, despite apparent recovery from the constipation, death from asthenia, undoubtedly a consequence of the prolonged retention of faecal matters, ensued.

It is really only a question as to recovery. On this head it may be said that it is, as a rule, favorable. Almost all cases, even when considerable dilatation or even hypertrophy of the bowel has already occurred,² when properly managed, recover and resume a normal habit. The exceptions to the rule are these:

I. Where there is a marked dislocation of the bowel of long standing, the prognosis is doubtful.

II. When the abdominal walls are very flabby and relaxed, when the belly is pendulous, so that the Bauchpresse, the pressure of the abdominal walls upon the gut, is lost, although much may be done by mechanical aids, it is, nevertheless, very doubtful whether a restoration to the normal can ever be effected.

III. Old people. Here, besides atony, we have a degeneration, resulting from age and from the prolonged atony. There are, besides, other factors, which will be mentioned further on, that tend to make the prognosis unfavorable.

¹ See also James T. Goodhart, M.D., in *Trans. Clinical Society*, London, Vol. XIV. A case of ulceration with hypertrophy and dilatation of colon, perforation, and peritonitis.

² See following chapter.

CHAPTER XII

THE CONSEQUENCES OF CONSTIPATION

THOUGH persons go through life constipated without suffering any serious derangement therefrom, it is none the less true that in many others it becomes the etiological factor, as has been well established by ample clinical observation, of various, and even very grave morbid processes.

In constipation there are three prominent incidents :

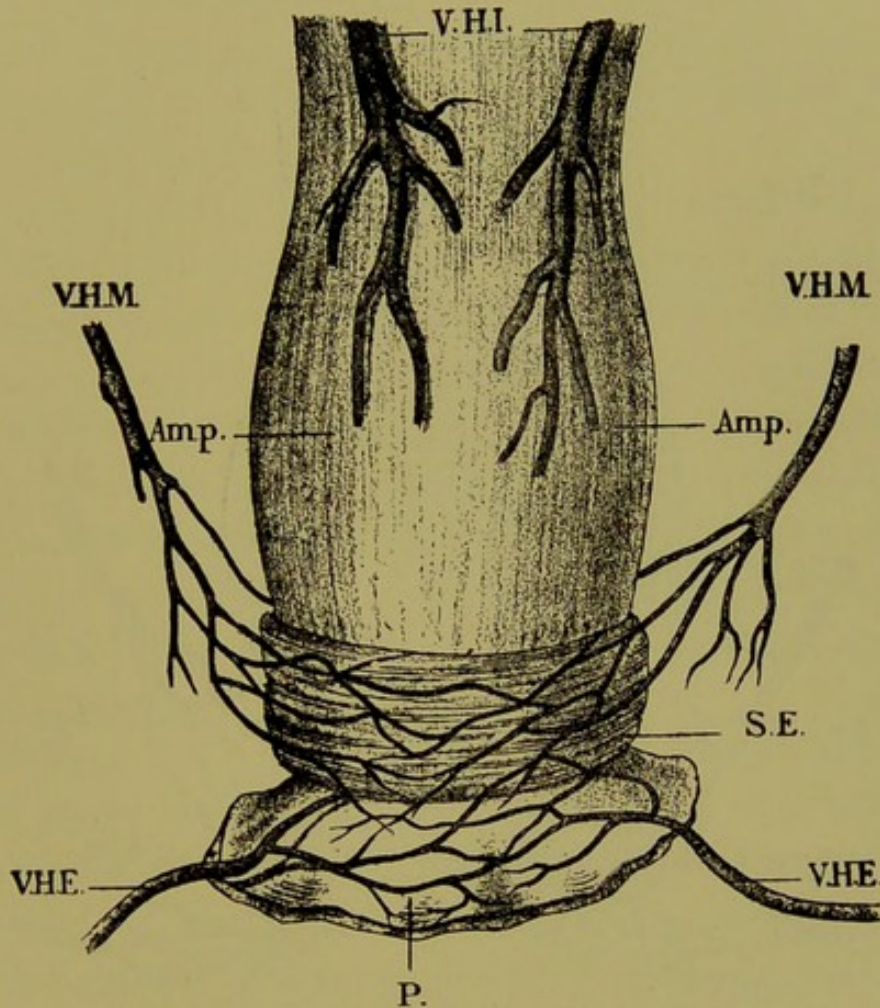
(a) There is an inhibition of peristalsis.

(b) There is an accumulation of residual matter, and, as a result of its prolonged sojourn in the bowel, an inspissation, and consequent hardening of the same occurs.

(c) The circulation of the blood in the bowels, especially the venous part thereof, is greatly furthered by the peristaltic movements, *i.e.* by the muscular contractions concerned therein. In constipation, however, in consequence of the inhibition of the peristalsis, of the distention of the bowel and the pressure upon it by the accumulated and indurated fæces, the circulation is slowed, and a turgescence or congestion occurs.

The ailments which may be developed in consequence of these deviations from the normal, and which might, therefore, be looked upon as complications of constipation, are :

I. Hæmorrhoids (*αἷμα*, blood; *ρῥεῖν*, to flow).—That hæmorrhoids may be directly due to constipation, there



(From Duret. *Archives Gen. de Médecine*, December, 1879.)

DEMI-SCHEMATIC VIEW OF THE EXTERNAL SURFACE OF THE AMPULLA OF THE RECTUM.

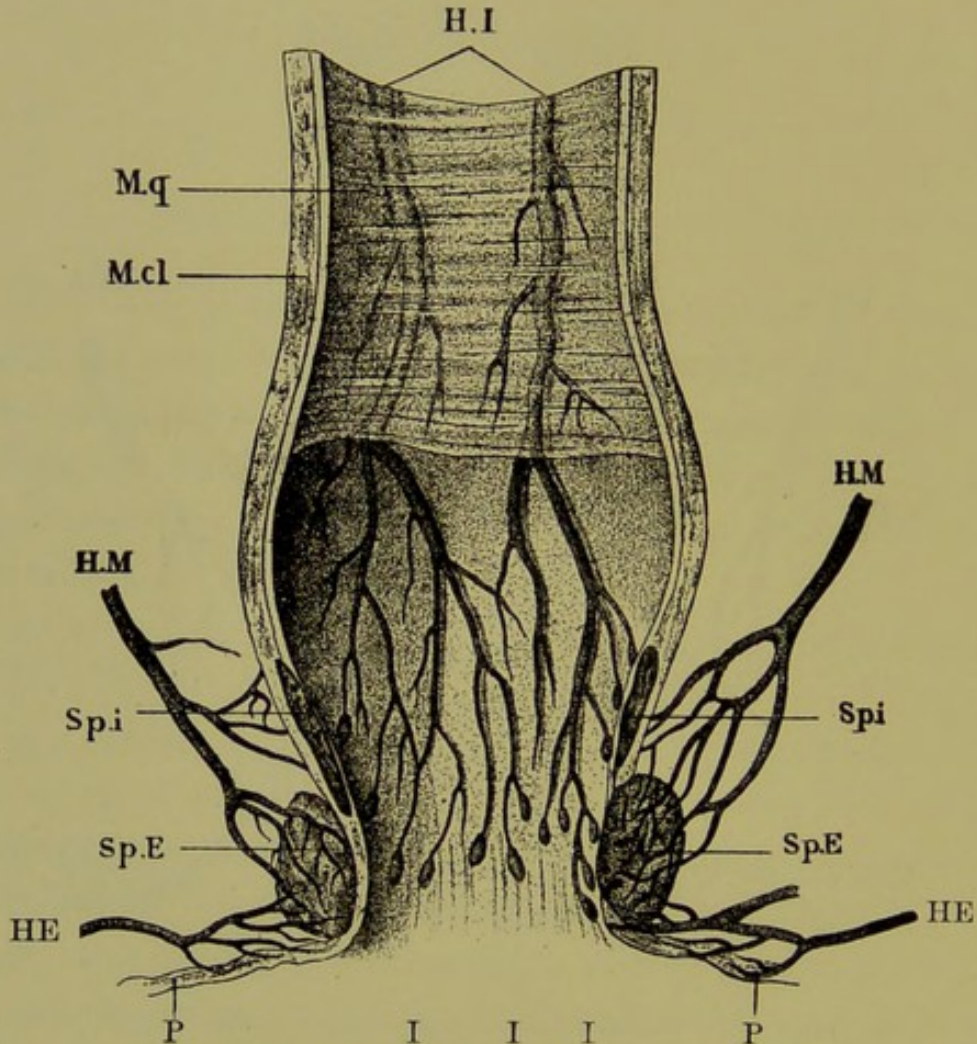
Amp., Ampulla; *SE.*, External sphincter; *P.*, Skin of the margin of the anus dissected up and thrown back; *VHI.*, Internal hæmorrhoidal vein; *VHM.*, Middle hæmorrhoidal vein; *VHE.* (Subcutaneous), External hæmorrhoidal vein.

can be no doubt. Bodenhammer¹ expressed himself very clearly to this effect already at an early date, and it has been confirmed in the very recent works of Rosenheim,²

¹ Bodenhammer, *Diseases of the Rectum*, 1857.

² *Krankheiten des Darmes*, 1893.

Courtois-Suffit,¹ and Mathews.² The modus of their production is not difficult to understand.



DEMI-SCHEMATIC VIEW OF THE INTERNAL SURFACE OF THE AMPULLA OF THE RECTUM.

Mq, Mucous membrane dissected up and cut away below; *Mcl*, Muscular coat; *Spi*, Internal sphincter; *SpE*, External sphincter; *P*, Skin; *HI*, Internal hæmorrhoidal vein; *HM*, Middle hæmorrhoidal vein; *HE*, External hæmorrhoidal vein; *III*, Small terminal ampullæ (of the vein).

The hæmorrhoidal veins of the rectum, from their dependent position, and the fact that the portal system, of which they are part, has no valves and that the pres-

¹ *Traité de Médecine*, Charcot, Bouchard, Brissaud, 1892, Vol. III.

² Mathews, *Diseases of the Rectum*.

sure therein is very small, have a natural tendency to congestion, which is only obviated by the energetic peristaltic contractions along the whole bowel, especially along the large gut. In constipation this *vis a tergo* is wanting. Moreover, other incidents to congestion of the rectal veins develop.

The pressure of the column of the indurated fæces upon the upper portion of the rectal parietes must naturally tend to produce congestion and dilatation in that portion of the vessels located in the lower section.

Owing to the lethargic state of the bowel and the hardened condition of the fæces, the pressure of the abdominal walls (*Bauchpresse*) will be called in to an undue extent to expel the excrementitious matter, and this will still further favor the congestion of the lower sections of the hæmorrhoidal veins.

Owing to the lack of pressure from behind, the *vis a tergo* above mentioned, the contraction of the muscular coat of the rectum upon the vessels — the hæmorrhoidal vessels pass out through the muscular walls by small buttonhole slits which are not bordered by fibrous tissue — will tend to the production of a congestion therein and of the development of phlebectases.

From constipation results the free use of purgatives, and these are important factors in the production of hæmorrhoids.¹

II. Anal Fissure (*irritable ulcer*²), **Erosions about the Anus.** — This ailment, of which Van Buren³ says that it

¹ Rosenheim, Kelsey, Mathews.

² Van Buren, Lectures on Diseases of the Rectum.

³ Loc. cit.

is capable of causing more intolerable suffering than any other that flesh is heir to, is frequently the result of constipation. The friction caused by the passage of the indurated fæces over the very delicate integument covering the anus, combined with the violent efforts of the expulsive muscles necessary for its evacuation, and the not infrequent forcible dilatation of the anus, can very readily produce the crack or fissure which constitutes this disease.¹

III. **Typhlitis** (*Typhlitis stercoralis*²). — This is due to the distention of the cæcum by the accumulating fæcal matter; the pressure produced thereby upon its walls, and the irritation caused by the induration of the mass or the presence of many irritating particles therein.

IV. **Appendicitis**. — I hold that this very grave affection is in the majority of cases provoked by constipation (temporary or habitual). It seems to me more than demonstrated by the fact that in the greater part of the cases the materies peccans found in the appendix is fæcal matter. Thus,

Symonds³ found that in twenty-three fatal cases of appendicitis there were fæcal concretions in twenty-two, and a foreign body, a grain of wheat, only in one.

Matterstock⁴ found fæcal concretions in fifty-three per cent of his one hundred and sixty-nine collected cases.

Fitz,⁵ in one hundred and fifty-two cases of perforated appendicitis, found fæcal masses in forty-seven per cent.

¹ Bodenhammer, On Anal Fissure. Van Buren, loc. cit.

² Henoch, Unterleibskrankheiten.

³ *British Medical Journal*, December 19, 1885.

⁴ Gerhard, Hdb. der Kinderkrankh., IV.

⁵ *Transactions Assoc. of American Physicians*, Vol. I., 1886.

Kelynack,¹ who has studied this subject, says: "There can be no doubt but that far and away the most frequent abnormal contents of the appendix are hardened fæcal masses, which are frequently infiltrated with lime salts, forming distinct concretions."

At a late meeting of the pathological section of the Academy of Medicine (New York),² a similar opinion as to the predominance of fæcal accumulations in the appendix was expressed by the gentlemen present.

From my standpoint, it can be readily understood why this should be so. The frequency of the disease is also explained. In constipation, the residual matter accumulates in the cæcum and distends it; the opening leading into the appendix is thereby enlarged.³ Fæces can now pass into the appendix, or rather are driven into it by the constantly growing mass. Their return, however, into the cæcum is prevented by this same mass of fæcal matter, which acts as an obstructing wall against anything coming from the appendix, and by lack of sufficiently powerful muscular effort. This fæcal matter in the appendix, becoming inspissated and indurated, acts as an irritant and develops the pathological conditions that constitute appendicitis.

The statement of Fenwick⁴ that out of forty-three cases of perforative appendicitis, where the previous state of health has been recorded, he had found that only in three instances had there been any definitive constipated

¹ Kelynack, A Contribution to the Pathol. of the Vermiform Appendix, 1893.

² Meeting in April, 1895.

³ See case of Morris Price on p. 148.

⁴ Clinical Lectures on Obscure Diseases of the Abdomen, 1889.

state of the bowels, does not detract from the force of my argument. My experience has taught me that many more persons are constipated than really have an idea that they are so. With some, the evacuation, every morning, of a few hard, rocky scibala, requiring considerable effort for their expulsion; with others, a scant evacuation even every third or fourth day, — is held as evidence of regularity, and they will tell their physician, when the occasion arises, that their bowels are regular. Furthermore, attacks of temporary constipation are entirely overlooked or forgotten by the great majority of people.

This point, the etiology of this disease, I hold of the greatest importance, both as to the therapeutics in the early periods of such cases, and the prophylaxis of perforation.

V. **Enteritis Membranacea** (*Membranous enteritis*). — Litten¹ maintains that constipation is, in very many cases, the cause of this very troublesome affection.

VI. **Proctitis** may result.²

A very remarkable case of sloughing of the rectum as a consequence of fæcal impaction is reported by Dr. W. M. A. Wright.³

CASE 15. The patient, a lady aged sixty-five, who had had piles for the last twenty years but who was in other respects quite healthy, who led an active outdoor life and whose bowels were stated to have always acted most regularly, became ill on January 22, 1884. When visited on the following day, she said her piles had become inflamed, and on examination a ring of them was found external to the anus, nipped by the sphincter,

¹ *Berliner klinische Wochenschrift*, 1888, No. 29.

² Mathews, loc. cit.

³ *Lancet* (London), June 6, 1885.

congested, very tender, and irreducible. Anodyne treatment was adopted locally and generally. On the 25th profuse leucorrhœa set in and on the 27th complete retention of urine, which lasted for eight days. On the 28th diarrhœa came on, and the skin over the gluteus maximus on both sides of the anus, but especially on the right, became very tense, red, glazed, and erysipelatous-looking. On February 1 an external opening formed on the right side, about an inch from the anus, and almost all the fæces began to pass through it; by the 4th power over the bladder was regained and the inflammation had sufficiently subsided to allow of a rectal examination, when an enormous mass of fæces was found, broken up by the finger, and partially removed by an enema; daily enemata removed the entire mass by the 10th. When the fæcal tumor was partially got rid of, the internal opening was made out clearly about one inch and a half up the gut on the right side, and as large as a half-crown piece. On the 14th a secondary abscess, with odorless pus, opened into the fistula, after which recovery was uninterrupted.

Dr. Wright remarked that the inflammation of the piles and the sloughing of the rectum were undoubtedly caused by the pressure of the fæcal mass (just as a fœtal head may cause sloughing of the vagina in the second stage of a tedious labor); the periproctitis and erysipeloid condition of the skin over the buttock was caused by the escape of the fæces into the cellular tissue of the ischio-rectal fossa.

VII. **Fæcal Tumors** (*Koth tumoren*), **Concretions**, **Enteroliths**. — By reason of the lethargy of the bowels, and the consequent stagnation of fæces, collections of it may form in one part of the gut or another, and which, taking on diverse shapes and forms, are frequently mistaken for dislocated organs, usually for wandering kidney, or for abnormal growths, or for abscesses, and errors, therefore, made in the diagnosis, prognosis, and, what is worse, in the treatment.

CASE 16. *Fæcal tumor mistaken for a nephritis, later on for an abscess.* (Archives Générales de Médecine, T. XX., 1829, p. 581.)

Lanvin, *æt.* twenty-five, joiner, of sanguine temperament, called Dr. Ducos on July 24, 1828. He had an attack of acute nephritis, characterized by great pain in the region of the right flank, which travelled down the length of the ureter into the bladder. Painful retraction of the testicle of the affected side; moderate thirst; urine red; fever slight (leeches, calming potions). . . . 26th. All the symptoms on the part of the bladder have disappeared and the renal pain is greatly diminished. The patient not having had an evacuation for four or five days already prior to the attack, and the digestive organs presenting no point of inflammation, Dr. D. prescribed Ole. Ricini ζ i. This was rejected by emesis . . . gastritis; delirium (leeches, gum water). . . . 28th. The night was fairly quiet; the gastritis has disappeared; the pain in the flank always of the same intensity; tumefaction in this region; the belly in the rest of its extent is supple (purgative injection). He has had several stools, and, in consequence thereof, some looseness, which lasted for several days. . . . 29th. Consultation; thirty leeches on tumor, which has grown steadily. Belly always supple. . . . August 2d. Condition unchanged, tumor continues to grow (thirty leeches, poultices over tumor). . . . 6th. Same condition of tumor; the centre somewhat fluctuating; it seems certain that an opening into it will have to be made. Before proceeding to make this opening, Dr. Dardouville proposed the administration of a laxative, that he might assure himself that the intestinal canal was perfectly free throughout its whole extent, so that in case the abscess broke into the bowels, the purulent fluid would have a free course. (Ole. Ricini ζ i, Syr. Alth. ζ i, Syr. Caryophylli Rubr. ζ i.) The patient took this mixture in tablespoonful doses throughout the day and evening; in the course of the night he had abundant alvine discharges, hard and of grayish color. On the following morning the tumor had almost entirely disappeared. In one word, the patient was cured; not a trace of the abscess existed any more.

Four cases are reported by Bright.¹

CASE 17. *Accumulation of fæces in the sigmoid flexure of the colon, imitating organic tumor.*

August 1, 1840, I was requested to see a young gentleman who had been brought to town a few days before, convalescent from a severe attack of purpura followed by extensive pleuropneumonia. He had been seized in the night with bilious vomiting, great prostration with writhing pain in the abdomen. The pulse was frequent and small, the countenance sunk and pallid, and I found considerable tenderness on pressure; there had been but one small motion the day before and another that morning, but I could see neither. The first idea which suggested itself was of some severe obstruction of the bowels, or hernia amongst other causes. I inquired for any pain towards the groin, and on placing my hand low down in the left iliac region, not far from the internal ring, I felt a distinct tumor. The part of the abdomen between that and the margin of the ribs on the same side was more tender than any other, and somewhat tense. I naturally felt uneasy lest some mechanical or organic cause should exist. The tumor was more diffuse than any ordinary hernial protrusion and yet its more prominent part felt circumscribed; it did not dilate on coughing. A poultice was applied over the left side of the abdomen, and two grains of calomel with half a grain of opium were ordered; effervescent draughts with excess of alkali were given to allay the sickness, and a large injection of soap dissolved in water was thrown up. These remedies having been repeated two or three times, we procured before night a feculent evacuation of solid lumps, and the tumor in the iliac region was quite removed and all the symptoms subsided.

CASE 18. *Fæcal accumulation in the colon, imitating malignant disease of the liver.*

A. B., a seafaring man aged about fifty-five, was admitted into Guy's Hospital under my care, with a hard lobulated

¹ *Guy's Hospital Reports*, Vol. V., p. 302.

tumor, about midway between the point of the ensiform cartilage and the umbilicus, in which he suffered considerable pain, both from pressure and without it. His complexion was sallow; his bowels stated to be freely open. After a careful examination, I felt very little doubt that the tumor was organic and connected with the left lobe of the liver, nor did the effect of the remedies or the appearance of the patient at all undeceive me for some weeks; but I presently began to suspect that the pains of which he made such frequent complaint were rather of a spasmodic character, and such as indicated some detention of fæces in the intestine. I therefore put him on a more decided plan of purging than at first, though the bowels had never been neglected. He now took repeated doses of comp. extract of colcynth, galbanum pill, blue pill, and small quantities of muriate of morphia. The effect was, after a few days, to bring away a quantity of hardened balls of fæces, and in proportion to diminish the supposed malignant tumor, till both pain and morbid growth and every other symptom of disease had disappeared.

In diseases of the liver with disturbed biliary secretion, such lumping together of fæces, more particularly in the rectum, is not rare.

The following very interesting case was communicated to me by Dr. Arthur Kahn, of this city:

CASE 19. Faecal accumulation mistaken for wandering kidney, for tumor of the liver, for a growth connected with the genital tract.

Mrs. R. E., aged forty-one years; married; has three children. Since three years she has on her right side, about three inches from the umbilicus, a palpable tumor, which has grown but very slowly. She consulted a number of physicians, therefore, and different opinions were expressed as to the organs with which it was connected. It was regarded by some as a wandering kidney, by others as a tumor of the liver, and still others regarded it as connected with the genital tract, and proposed an operation for its removal. This was declined.

After the lapse of the time mentioned she came to me for treatment. General history as above given. Present condition: she is obstinately constipated. This constipation dates far back, and is becoming more and more obstinate. The stools cause her great pain, and the fæces come out in hard lumps and pieces unless immense quantities of water are frequently injected. There is a feeling of fulness in the right hypochondrium, just above the tumor. Sometimes ructus. After eating the feeling of fulness and of oppression is very pronounced. Above the tumor and outward there is a circumscribed painful zone.

Patient is very nervous and very irritable. Otherwise in good condition, rather vigorous, with a good panniculus.

Since four days patient has been troubled with an unceasing desire to go to stool, with severe colicky pains, without sufficient discharge. The abdomen is somewhat distended; the walls rather tense. She has been taking opiates without, however, being in any way benefited: the pains have become more violent, almost intolerable.

The tumor is located in the region already described, on a direct line with the umbilicus; is of the size of a man's fist and rather knobbish.

An examination of the abdomen showed that the tumor was rather round than oval, and was further removed from the costal arch than would be the case with movable kidney. The urine varied but little in quantity.

The borders of the liver could be well defined, and it was shown that the tumor was entirely independent of this organ. As to its connection with the ovaries or uterus, this could not be demonstrated with any certainty.

I prescribed large doses of podophyllin (0.02 pro dosi) with strychnine and hyoscyamus (aa 0.0015) and belladonna (0.006) every three hours, until an effect was produced. I also ordered warm baths, abdominal pack, massage. After seven hours of great suffering, so severe that the patient fainted several times, she had several evacuations and discharged more than half a bucketful of fæces. In this she found a thick ball, which so

distinguished itself by its size, its color, and its hardness, that it attracted her attention. It was so hard that it was broken up only with considerable difficulty by the use of a poker. In the evening I found the patient well, but somewhat weak.

Two months thereafter the tumor reappeared, but under the use of purgatives again vanished. It manifested itself again nine months thereafter, and the same treatment had the same happy result.

I have not seen the patient since.

These tumors are formed by the accumulation of fæces around a foreign body, — chaff of grain, stone of fruit, seed, piece of bone, etc.; sometimes a particularly hard portion of fæces forms the nucleus for further accretions. Very frequently the tumors become incrustated by the deposition of salts upon them, and then present varying degrees of hardness to the touch.¹

CASE 20. *An intestinal concretion, the surface of which was covered with long prismatic crystals of triple phosphate.* Dr. Hector W. G. Mackenzie (Transactions Pathol. Society, London, Vol. XLIII.).

A woman aged seventy, who had been a sufferer for many years from constipation, took a large dose of salts to relieve her bowels, which had not been opened for some days. When the bowels were moved, she was much alarmed at finding what felt like a hard bony mass presenting itself at the anal orifice. This, as afterwards turned out, was a concretion; but she imagined at the time that part of her body, perhaps her backbone, was coming away, and she made every effort to retain it in its position. She succeeded in putting it back into the rectum, where it remained for four months, at last coming away one day in spite of her. At the time it was voided some

¹ Leichtenstern, Ziemssen's Cyclopædia, Vol. VII. Rosenheim, loc. cit.

of it was broken off, so that originally it was larger than it now is. It is about the size of the astragalus, and weighs 497 grains. . . . Dr. Bernays has very kindly submitted the specimen to chemical examination, and has reported that the crystals consist of ammonio-magnesian phosphate, with a trace of organic material.

The mass may become permeated with mineral matter, petrified, in fact, and form an enterolith.

CASE 21. *Removal of an enterolith, etc.* Dr. Sabin (Transactions of the N. Y. State Medical Association, Vol. II.).

On September 1, 1884, my father and myself were called to see Miss L., aged thirty-five years, who was pale, thin in flesh, — almost a skeleton, — and looked careworn and weary. She said that she was twice mechanically relieved, years ago, of impacted fæces by the breaking down and removal of the masses; that she had much pain in the rectum, and was in general a great sufferer; but although she believed that her condition was substantially the same, she would not consent to even a digital examination without ether. During the narcosis I found a hard mass, as large as a turkey's egg, not capable of receiving any impression from the finger. . . . At the appointed time on the succeeding day I again administered ether, of which a very large quantity was used. The operation, which consisted of dilating the sphincter, and crushing the stone with strong forceps and removing it in pieces, lasted an hour and ten minutes. . . . An attempt was made to get it away whole, but on account of the brittle nature of the shell it broke, which very much facilitated its removal. The mass that was removed weighed $4\frac{1}{2}$ ounces, more than half an ounce having been lost by crumbling. This mass, on close examination, was seen to consist of petrified fæces. According to the patient's statement, it must have been forming from fifteen to seventeen years; still it had never given her trouble until within a few weeks past. She would often take laxative medicine, which would produce stools, but she could not say that

she had ever felt relieved. I had the specimen of stone analyzed by Professor W. P. Mason, M.D. He reports the composition as follows: Organic matter, phosphate of lime, phosphate of magnesia, carbonate of lime, sulphate of lime, silica a trace. The main constituent is phosphate of lime.

Owing to the imperfect depuration, or rather want of depuration of the digestive tract, foreign matters, both vegetable and mineral, are allowed to collect therein, together with the fæces, into a mass, and form concretions or enteroliths, which may reach great size. Moreover, by reason of the slowness of movement, and consequent long retention, deposits may occur from the natural secretions of the body, and thus give rise to the formation of an intestinal stone.

CASE 22. *Concretion, consisting mainly of the chaff of oats.*

Turner reports the case of a man who suffered from obstinate constipation; had already some years before passed two or three bullet-like lumps, and since then had a continual uneasy and annoying sensation in the left side. After four days of absolute constipation, Turner found the abdomen very sensitive and detected in the epigastric and umbilical regions a large, round, hard, and but slightly movable tumor. He regarded it as a scirrhus. Eight days later the tumor began to descend, to the great relief and comfort of the patient; very soon it could be felt in the rectum by the introduced finger, and was quickly extracted. It was found to be a concretion made up chiefly of the chaff of oats, and was about twice the size of a billiard ball. Later on thirteen more such concretions, ranging in size from a pigeon to a hen's egg followed. Thereupon the patient was completely relieved.¹

¹ *Edinburgh Monthly Journal*, 1841. Quoted from Hensch, *Die Unterleibskrankheiten*. Other similar instances are reported by Pereira, *Food and Diet*. Third Edition. (Article "Oats.")

CASE 23. *Enormous concretion of iron and magnesia, removed by operation from the lower bowel.* Reported by Jonathan Hutchinson (Transactions Pathological Society, London, Vol. VI.).

A lady past middle age consulted Mr. Lacy, in May, 1853, with the account that she had, for more than twelve years, suffered extremely from constipation, and most painful sensations in the lower bowel. . . .

On passing the finger into the bowel, a hard uneven substance was encountered, having somewhat the shape of a vase and being at least fifteen inches in circumference. Its exterior did not in the least resemble indurated fæces, feeling indeed as hard as a stone and being rough like an oyster. Very fortunately its interior was not so hard as the outside, otherwise its removal might have been impracticable. By the use of a pair of long polypus forceps a hole was gradually made into its centre, and working outwards from this by degrees the mass was broken down and extracted piecemeal by means of a scoop. Many sittings were, however, required before this result was obtained. . . .

The outer part of the concretion consisted of concentric layers of what looked like a red stone, and which proved on examination to be a compound of iron and magnesia. The interior was softer,—a mixture of the earthy and ferruginous matters with many thousands of strawberry and other seeds. . . .

Nearly thirty years ago the patient had been in the habit of taking carbonate of magnesia very frequently, in large doses, for the relief of stomach irritation and had also, about the same time, used the sesquioxide of iron very freely during attacks of tic-douloureux. It was from shortly after this period that her first symptoms of intestinal irritation dated. For twelve years past she had never taken either of the drugs named.

The following interesting case was reported in the daily press, *Baltimore American*, and copied in the *Cincinnati Enquirer*, September, 1895.

CASE 24. The operation of laparotomy performed on Jere Hollinger, near Greencastle, Franklin County, resulted in the discovery of a hard ball of sawdust. Mr. Hollinger, while building a house often chewed a chip, particles of which he swallowed, forming the ball.

A very interesting case of intestinal calculus of almost pure cholesterine has already been given at the outset (see page 61).

* * * * *

To what an enormous extent fæces may accumulate in the bowels, and still the patient not be aware that he is constipated, is very well shown by the following history reported by Morris Price, L.R.C.P.:¹

CASE 25. In August, 1877, I was consulted by a young lady, aged twenty-four, who complained of symptoms of indigestion, occasional vomiting, etc. . . . A week later being no better I asked her to undress, that I might properly examine her. To my astonishment I found that she had large, nodulated, firm, painless, movable tumors, occupying the lower part (and chiefly the left side) of the abdominal cavity. There was no gastric tenderness, menstruation had been regular, *the bowels were being moved, in fact there existed a spurious kind of diarrhæa.*² I considered it advisable at once to examine the rectum, when I found that this was tremendously distended and packed full of dry, nodulated, earthy fæcal matters, the anus being in a continual state of patency, due to the paralysis of the sphincter by mechanical distention. So much was the rectum distended that a child at full period could easily have passed through it. . . . This individual, when a child, was in the Denbigh Infirmary, under the care, I believe, of Dr. Turnour, for accumulation in the bowels.

Getting the patient to the edge of the bed covered with a sheet of oilcloth and using plenty of soaped warm water, I

¹ *British Medical Journal*, 1886, II., 1211.

² Italics mine, Illoway.

diligently dug away at this mass with my finger (which I think better and safer than a spoon) for a considerable length of time, finding that the mass was gradually descending as it was removed below. Suffice it to say that in this way the whole mass in the colon and rectum were cleared.

* * * * *

Eighteen months afterwards I was called to her again.

This time I found her just in the same state; applied the same treatment, but not with the same success, inasmuch as a mass was left in the sigmoid flexure of the colon which would not descend into the pelvis. This could easily be felt by introducing a long tube against which the point would impinge, but which would give way under a little pressure. Injections were of no avail, coming out as administered, owing to the compactness of the mass. After this attempt to clean the bowels, symptoms of complete obstruction supervened, as evidenced by her vomiting every meal she took, as well as a stoppage of any faecal discharge from her bowels.

These symptoms were not accompanied by any greater distention or tenderness of the abdomen, neither was there any additional pain; and in spite of the administration of various kinds of purgatives and medicines, as well as enemas, they continued for several weeks. . . . While she was away an idea on one occasion suggested itself to my mind of doing something for her. The idea, was to introduce my hand into the gut and to push it up as far as possible with the intention of getting out and removing the obstruction. . . . I operated with the assistance of my old master, Dr. Davies of Llanfair, Talhaiarn, and Dr. Roberts. My intention was to dilate the anus, but finding this impracticable, under chloroform I divided the whole structures back to the coccyx. Now I could easily pass my hand, and Dr. Roberts passed a long tube in by my wrist, through which warm soaped water was injected. At the top of the pelvis I came across the big mass which I had so often felt and vainly attempted to remove, but now I could easily crush it. The arm was now withdrawn, when the whole mass was expelled. After reintroducing the arm, I found that the

colon was in a very abnormal condition, because, instead of there being an ascending, transverse, and descending colon, it was one *tremendously distended chamber*,¹ and with my whole arm introduced up to the axilla, I could, on account of her great emaciation, investigate and manipulate every part of the abdominal cavity with the other hand externally. Strange to say, in the neighborhood of the right iliac fossa I found an opening of an oval shape large enough to allow the passage of a good-sized plum (an inch and a half long) with a well-defined margin. This was plugged with a lump of hard fæcal matter, which was removed and crushed in the large amount of water which had by this time been injected. Every part was now thoroughly examined, and after satisfying myself that there could be nothing more the arm was withdrawn. Sutures were carefully inserted, a soft catheter placed in the bladder, and by and by a large dose of opium was given. . . .

After this she got up, gradually resumed her ordinary diet, and I took care to watch her carefully for some time with the satisfaction to find that the bowels gradually resumed their normal functions without the use of aperients or enemas: the bowel no doubt, as time went on, in spite of the extraordinary distention, resuming its tone and contractile power; while the inestimable advantage of a sphincter capable of discharging its functions, has been regained. In this way the patient has kept for over seven years. Lastly, what the above opening was, unless it was the ileo-cæcal valve, I am at a loss to know.

VIII. **Dilatation.** — Accumulation of fæces leads to distention and to dilatation of the gut. The dilatation may be general, involving the whole large bowel from the cæcum to the anus, as in the case above recited, or partial, affecting a certain section of the gut only.

*Habershon*² has reported a number of cases of marked dilatation of the cæcum. He has seen cases in which the

¹ Italics mine, Illoway.

² Habershon, Diseases of the Abdomen, 3d edition, p. 517.

colon was so enlarged as to measure twelve to fifteen inches in circumference.

The **sigmoid** flexure may be the part dilated.

CASE 26. *Idiopathic dilatation of the large intestine.* Samuel Gee.¹

A boy came under my notice when he was four and a half years old. When he was three months old he began to have difficulty in passing his motions, which were hard. His belly began to swell when he was twelve months old, and afterwards it became continuously bigger. When I first saw him he was thin. His abdomen was very large; everywhere resonant to percussion; what looked like coils of intestine were distinctly seen; the tension of the abdomen and the dyspnœa were very great. His bowels had not acted for two days, and an enema of warm water was given. Fifteen minutes afterwards he passed a large quantity of very dark, loose fæces, smelling badly. The same evening he began to vomit; he thrice vomited large quantities of sour brownish liquid not stercoral in smell or look. In short he seemed threatened with ileus. Next day I passed a long tube up his rectum as far as it would go, and so let off a little loose, slaty colored, stool and a very great quantity of wind. His belly became much smaller and softer. The vomiting ceased. Appetite for food returned. He was able to lie down. After this I tried diverse means to get his bowels to contract; namely, cold douches to the belly, friction with stimulating liniment, passage of a tube twice a day, and careful bandaging of the abdomen. But to no avail. The child became thinner, and after ten days I desisted. He seemed much as usual until about a fortnight afterwards the urine was observed for the first time to be bloody; it had been examined several times before and found to be natural. He quickly became worse: very abundant watery diarrhœa set in and he died two days afterwards.

When the belly was opened after death, nothing was to be

¹ St. Bartholomew's *Hospital Reports*, 1884, XX. 19.

seen therein save two great pieces of intestine, which were the sigmoid flexure hugely distended. It formed two sacs which lay side by side, one sac filling up the right half of the belly and the other the left. The anus led into the lower end of the right sac, which passed upwards and opened under the diaphragm into the upper end of the left sac by a short strait of narrower bowel, whence there was a descent into the left half of the sigmoid as hugely distended as the right. This descending sigmoid sac led, in the left iliac fossa, into the lower end of the descending colon. The colon was quite natural, both in size and position, and lay hidden behind the enormous sigmoid flexure, cæcum, and small intestine. Diameter of widest part of sigmoid was about four inches, its muscular coat and nerves were greatly hypertrophied. The liver was much pushed back; structure of both liver and spleen natural. Kidneys very hard, quite like the kidneys of dilated heart; cortical structures distinct, veins dilated. Pelves of kidneys were much dilated; ureters also; in right ureter was a hæmorrhagic ulcerated ring, coated with uric acid. The condition of the kidneys and ureters was probably due to pressure. . . . *At present for want of a better explanation I think that mere constipation and retention of wind are the cause of the dilatation.*

CASE 27. *A case of so-called idiopathic dilatation of the colon.*
By Angel Money and Stephen Paget.

The patient was first seen by Mr. Paget on September 13, suffering from enormous distention; he measured sixty inches round, and twenty-six from the ensiform cartilage to the pubes. The whole abdomen was evenly distended, globular, extremely tense, and resonant or even tympanitic; there was no pain or tenderness, no movement or gurgling. The condition of his lungs was most alarming; nothing was heard but loud mucous râles; he was very livid, and his breathing was quick and shallow. He just could stand or walk a few steps with support. His history was as follows: He was fifty-five years old, and for the last five years had been living alone, drinking incessantly both beer and spirits. The distention had been coming

on for some months, but had become worse rapidly during the last week. He had all the aspects of an habitual drunkard, — the typical nose and face, the arteries very tortuous and rigid, the legs œdematous, the urine high colored, 1022, albuminous. His bowels had always acted regularly, though lately they had been somewhat constipated; they had acted freely the day before.

* * * * *

At the necropsy the enormous distention was still found to be present, and to be clearly due to dilatation of the colon. But it was not simply a uniform or moderate distention of every part of the colon; the dilatation of the sigmoid flexure took the lion's share in the enlargement, there being two large sacs, each far bigger than any ordinary dilated stomach; and these two sacs alone would have been sufficient to have caused a distention second only in degree to that distention from which the patient suffered.

The contents of these great sacs and of the rest of the dilated colon were chiefly a light brown, pultaceous, fermenting, and semifluid substance which had the consistence of ordinary gruel. In addition to this semisolid stuff there were accumulations of gas and of fluid; and, strange to say, at the hepatic flexure of the colon, which was not nearly so dilated as the rest of the large bowel, there was a big scibalous mass which presented in its stony hardness a curious contrast with the pultaceous substance already mentioned.

* * * * *

In addition to the dilatation of the cavity of the colon there was also considerable hypertrophy of its walls, which was especially evident in the three longitudinal muscular bands, but existed in the circular fibres also.¹

Despite the statement in the history, it is very clearly evident that the patient must have had periods of long and obstinate constipation with much accumulation of

¹ *Transactions Clinical Society, London, Vol. XXI.*

fæces and gas. This (with the alcoholic habits of the patient) readily explains the dilatation, and demonstrates it to be not an idiopathic, but a secondary, dilatation, a consequence of constipation.

* * * * *

When the sigmoid flexure is filled with accumulated indurated fæces it may be drawn downwards into the pelvis by the weight of the mass. By this sinking down, the uppermost portion of the rectum is bent upon itself, and thus all communication between it and the sigmoid flexure shut off. Furthermore it compresses the rectum, and thus effects an obstruction.

When this has occurred, there will be found on examination of the rectum upon its anterior wall a protuberance hard and knotty, which with a little manipulation can be pushed upwards and out of the pelvis. In females an examination per vaginam will disclose the tumor pressing upon the posterior vaginal wall, and possessing the characteristics described.

The following observation of Asmus¹ is very characteristic :

CASE 28. A young girl, twenty-five years of age, became obstinately constipated by opiates, which she had taken for the relief of violent toothache. The remedies ordered provoked stools, but never to the satisfaction of the patient, who always felt as if there was still more to be evacuated. Very soon the belly became distended, the discharges smaller and smaller, and she had violent colics. Medicines and clysters were without avail ; the latter were even painful, and but a few drachms of fæces would be brought away in the course of several days. At the end of half a year the pains were unceasing, and robbed

¹ Casper's Wochenschrift, 1834, p. 166. Quoted from Henoch, loc. cit.

the patient of sleep. She became emaciated, had anorexia, vomiting, dysuria, a heaviness of the pelvis, and a constant feeling as if she must go to stool. But she had no stool, not even flatus passed. The rectum being examined a tumor was found located upon the anterior wall of the rectum, which it pushed back upon the posterior wall, and thus mechanically shut off all communication between the parts above and those below. The tumor was very tense, of stony hardness, immovable, and on pressure excited a desire to go to stool. Guided by this last feature large doses of Ole. Ricini were ordered, and efforts made during the process of defecation to push the tumor upwards and forwards with the finger introduced into the rectum. In three days incredible masses of scybala, hard like stone, were passed, whereupon the tumor entirely disappeared.

The **rectum** may become an enormous pouch. In the case reported by Dr. I. T. Goodhart of "ulceration with hypertrophy, etc., of the colon," the rectum laid open and measured from one cut edge to another gave a circumference of seventeen inches.

CASE 29. Dr. Revillout, service of Professor Vulpian. Gazette d. Hopitaux, 1877, No. 75.

A man aged forty was admitted to the Charité, ward Saint-Jean de Dieu, No. 1. He had an enormous belly which presented two distinct zones on percussion; there was found on the inferior section of the abdomen, on the declivity, and when the patient was made to change his position, always up to the same level, a very apparent dulness, corresponding to a manifest fluctuation; in the superior section, on the contrary, a tympanitic resonance is heard.

The intra-abdominal return circulation was evidently very much disturbed, for all the superficial veins, both of the thorax and of the abdomen, stood out prominently, markedly developed, so as to permit of a very active supplementary venous circulation. The first impression that was made by these phe-

nomena was that this was a case of atrophic cirrhosis of the liver, with embarrassment of the portal circulation leading to ascites and to engorgement of the superficial veins and to some œdema of the lower extremities. This diagnosis once made, nothing occurred to contradict it. . . . Questioned as to his history, he stated that at his birth he had an imperforate anus; an operation which was successful was made, and for seven years thereafter he was compelled to wear a canula in the artificially made anus. He attached no importance to this, however; he lived as do other persons, married, and became the father of a family. Nevertheless he always felt some embarrassment at stool; the evacuations were not free, and it required much effort to discharge a minimal quantity of fæces. In this last period when he came to regard himself as seriously sick, he was often seized with paroxysms of suffocation; he could not breathe; he felt himself choking, and made unheard of efforts to unload his belly, and when he succeeded in discharging a little flatus he felt relieved. In the intervals between the paroxysms he was fairly well.

* * * * *

At the autopsy, in place of the cirrhotic liver which was expected, there was found an extraordinary dilatation of the sigmoid flexure and of the rectum. These two sections of the large bowel formed an enormous pouch, which gave forth a loud noise when the scalpel was pushed into it and allowed the escape of a quantity of gas and of fæcal matter. Measured the following day, and although already considerably contracted, the pouch was 90 cm. long, at least, and 70 cm. in circumference at its middle. The anus was found very narrow and drawn together on all sides by a very resistant cicatricial tissue. The point of the finger could barely be made to penetrate. Immediately above the obstacle the dilatation began.

There was this peculiarity about the dilatation, that the parietes, far from being distended and thinned, as would be supposed, were hypertrophied and fortified in all their constituent tissues. The muscular and mucous coats were increased five-fold in power. The whole intestinal wall had a thickness of

about one-half cm.; there were seen on the internal surface glands equally enlarged and groups of follicles much more prominent than is usually the case.

* * * * *

The *ampulla* of the rectum alone may become largely dilated.¹

As in other organs, so also in the intestines dilatation may be attended by *hypertrophy*. It is mentioned as having been observed in the cases of Gee and Revillout, and the following cases are still further and marked illustrations :

CASE 30. *A case of ulceration with hypertrophy and dilatation of colon, perforation, and peritonitis.* Dr. James T. Goodhart. (Transactions Clinical Society, Vol. XIV.)

Emma R., *æt.* seventeen, was admitted into the clinical ward of Guy's Hospital. Her father is dead; the cause of his death is unknown. Her mother is still a healthy woman. One brother died of rheumatic fever. The patient has always had delicate health; has never had rheumatism. In December, 1879, her usual health began to fail, but she had no definite symptoms—no especial pain. Her abdomen has been gradually increasing in size since January of the present year (1880), but more rapidly in the last month, and she has been worse for three weeks in her general health. She has never had severe pain in the abdomen, but has had slight sudden pain at times. The bowels have been irregular since January—since, that is to say, the onset of the abdominal swelling. Sometimes she has had constipation, at others diarrhœa. For the last three weeks the latter state has existed; the bowels acting seven or eight times a day, the motions being offensive, blackish in color, and for three weeks she has been unable to retain her motions. The action of the bowels has caused no pain. When admitted she was remarkably anæmic, spare;

¹ See Chapter XXII., "Atony of the Rectum."

she was so bloodless as to suggest that she had lost blood from some source. She had an anxious expression; pulse 128, and the abdomen was much distended. It was at first thought by the clinical clerk that some abdominal tumor was present, and certainly on first placing the hand on the abdomen the case had that appearance, for a large, very hard mass was felt to occupy the right side from the iliac region to the hypochondrium. But on a more prolonged palpation the tumor disappeared, to be succeeded by the occurrence of one in the epigastrium or left iliac region. Moreover, there was resonance all over the abdomen, and on inspection the intestine could be seen in peristaltic action. The umbilicus was distended, but there was no thrill. The abdomen was not tender, and there was no evidence of any enlargement of liver or spleen. . . .

Post-mortem Examination.—The abdomen was enormously distended and tympanitic. On throwing back the abdominal parietes and exposing the intestine, the colon was seen to be greatly dilated and occupying the entire front of the cavity. The sigmoid flexure occupied the right iliac fossa, having pushed the cæcum, which was not enlarged, backwards and inwards. Tracing the bowel from the ileum along the ascending colon, it was found that the large intestine suddenly dilated about the hepatic flexure. Below this point it became wider and wider, so that the rectum formed a large cylinder. The dilated part contained a large quantity of black pultaceous matter without scibala, and some of this was exuding into the peritoneum from a small perforation in the sigmoid flexure. The peritoneum contained some very foul gas and a small quantity of purulent fluid. The dilated colon, particularly its lower part, was almost cartilaginous in its toughness, and was *hypertrophied* to about one-sixth of an inch in thickness. On laying it open two superficial ulcers were found close to the anus, each the size of half a crown, and more or less oval in shape; a little higher up were two others, and in the sigmoid flexure was a large one with sinous margins in the middle of which was a small, sloughy patch, with a central perforation previously de-

scribed. Higher up still the mucous membrane was reddened in several places, and here and there was an erosion. All the ulcers presented similar characteristics; the mucous membrane was destroyed, leaving the muscular fibres exposed; the surfaces were smooth, the edges were thickened and rounded. The remainder of the bowel, small intestine, and stomach were healthy and contained little fæces or food. There was no stricture of the rectum or anus and no fissures. The uterus, ovaries, liver, spleen, and kidneys were all healthy.

CASE 31. Dr. E. F. Walsh in the *Northwestern Lancet*, Vol. XIII., reports the case of a child aged eight years, in whom great distention of the gut with hypertrophy of the muscular coat were found. The bowel measured from the cæcum to the rectum nine to ten and a half inches in circumference. The *hypertrophy* of the colon *was marked*, being greater in the sigmoid flexure, where it measured one-eighth of an inch in diameter.

As in the heart, this hypertrophy is the effort of nature to counteract the effect of the dilatation.

* * * * *

Copland, quoted by Habershon,¹ mentions **œdema** of the right leg produced by a distended and overfilled cæcum. This is due to pressure upon the iliac veins. The œdema may be about the ankles.

A tendency to **varicocele** has also been observed as a result of mechanical hindrance to the free return of blood from the spermatic vein.²

* * * * *

Distention of the bowels by fæces or gas may produce **ulceration**. Several such ulcers, *ulcers by distention*, have been already reported.³ In Case 4 reported in my

¹ Habershon, loc. cit., p. 318.

² Henoch, Die Unterleibskrankh.

³ See Goodhart, loc. cit.

paper, "On Treatment of Intestinal Obstruction by the Force Pump,"¹ it is stated: *In some portions of the small intestine there were noticed small holes, as if made by a punch; from the lack of any evidence of severe inflammation in the surrounding structure, and from the general healthy appearance of the intestine, I was led to the belief that these were post-mortem occurrences; if not, they might have appeared in the last thirty-six hours, when the vitality was already very low.* These small holes were seen on the inner surface of the intestine and did not perforate it. They were about the size of the head of a ten-penny nail. I could not account for them at the time, but in the light of subsequent study it is clear to me that they were ulcers by distention, the intestines having been very much distended by flatus.

* * * * *

Accumulations of fæces and subsequent dilatation may not be unimportant factors in the production of **enteroptosis** and **dislocation**. Habershon² reports a number of cases of dislocation of largely dilated cæcum.

IX. Diverticula. — A further effect of the atony of the intestine and consequent prolonged detention of fæcal matter therein is the formation of diverticula, that is, the sacculi or haustra, formed by the circular and longitudinal bands of muscular fibres, become distended. The fæces contained in them is removed from the onward current in the lumen of the bowel — and is thus less accessible and more difficult of expulsion — and this difficulty is rendered greater by the atony of the muscle. Further accumula-

¹ *American Journal of the Medical Sciences*, January, 1886.

² *Loc. cit.*

tion still further distends the sacculus, and the pressure exerted may be so great as to effect a separation of the bundles of muscular fibre and a pushing out between them of the mucous membrane — constituting a hernia.

False diverticula of the intestine. Dr. Bristowe.¹

CASE 32. In the second case (which was that of a woman *æt.* sixty-nine, who died of cancer of the stomach, liver, peritoneum, and pleura) were found throughout the whole length of the colon, but chiefly in the sigmoid flexure, large numbers of globular sacculi from the size of a pin's head to that of a marble. They all occurred in those portions of the intestine to which appendices epiploicæ were attached, and projected into them. Their parietes were formed by a prolongation of the mucous membrane and by the fat of the appendices. The muscular coat was for the most part deficient, so that, though a few fibres were detected by the microscope in the walls of some of the smaller ones, the sacculi may fairly be looked upon as hernia of the mucous membrane. Their orifice of communication with the intestine was comparatively small, circular, and smooth, and each one of them was filled by an indurated lump of fæces, which allowed of ready enucleation. No stricture was detected, nor any other disease whatever of the large intestine. Its walls were totally free from cancerous growths, and no disease existed in the pelvis capable of producing obstruction. It seems most probable, however, that the cause producing this abnormal condition must have resembled that operating in the case of sacculated bladder; very likely habitual costiveness may have brought about some of the ill effects which might be expected to follow on actual obstruction.

Wallman² saw in the case of an invalid who had reached the age of sixty-six years, nine true diverticula on the large bowel.

¹ *Transactions Pathological Society*, London, Vol. VI.

² *Virchow's Archiv*, Vol. XIV., p. 202.

They were arranged as follows: One on the colon ascendens, three on the transverse colon, three on the colon descendens, and two on the sigmoid flexure. Of these, seven were on the free surface of the haustra.

W. Hale White¹ presented to the Pathological Society a specimen showing diverticula from one-third to one-half an inch deep on the descending colon, sigmoid flexure, and first part of the rectum. Each diverticulum had a fold of mucous membrane around its orifice.

CASE 33. J. V. Lentaigne. (Transactions of the Academy of Medicine in Ireland, 1884.)

* * * * *

On opening the abdominal cavity the large intestine was seen to be fringed by a double line of bluish-black, glistening tumors, mostly about the size of grapes, but some of them as small as swan shot, while a few were nearly as large as a pigeon's egg. On handling these they seemed to be quite solid and rather hard; some of them hung from the gut by a short but narrow pedicle, whilst others were apparently sessile. . . .

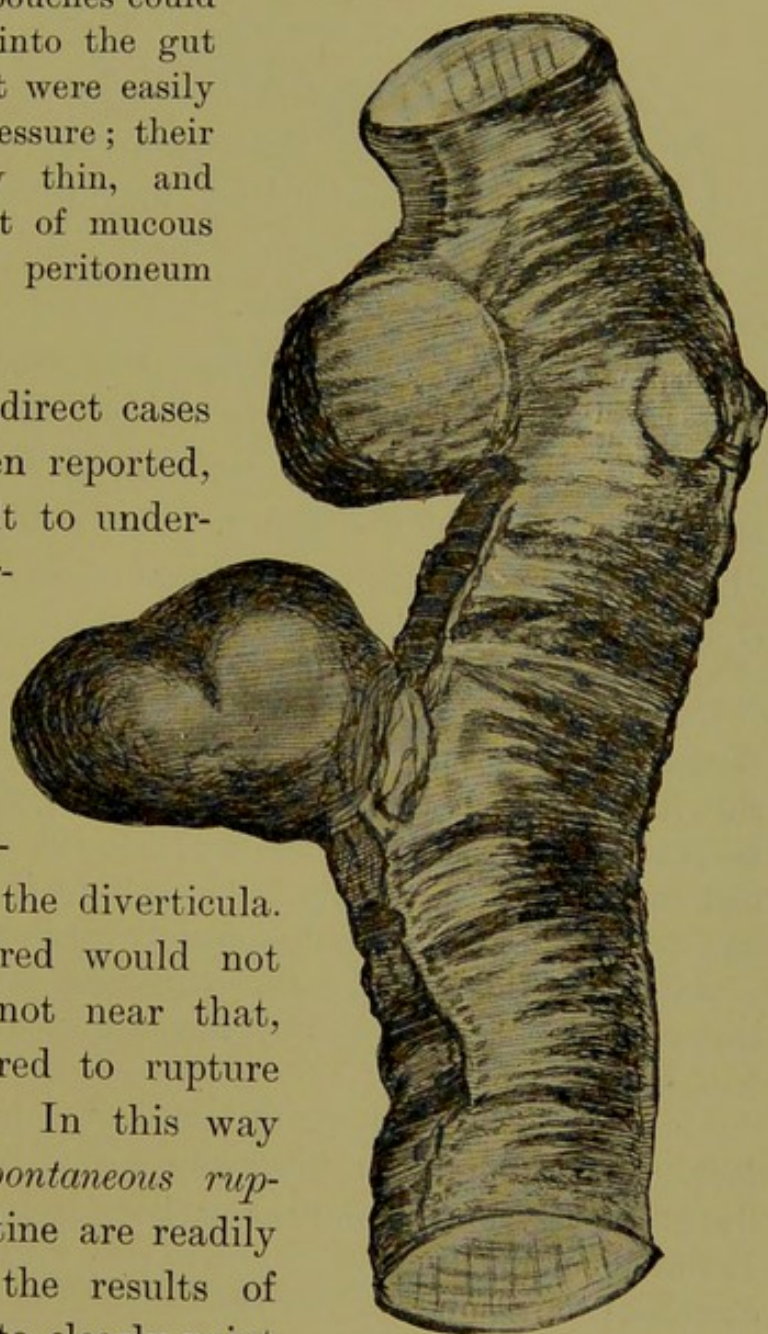
On opening the gut the central cavity was found to be narrowed and to contain but little fæces; the muscular fibres, especially the longitudinal set, were very much hypertrophied. The mucous membrane presented a number of shallow depressions, each of which corresponded with one of the tumors on the outside. All the tumors were found to be pouches, each one tensely filled by a single lump of fæces of stony hardness; they were lined by mucous membrane of a brownish color, but otherwise apparently normal, and the depressions seen on the inside of the gut were formed by a number of folds radiating from the tightly closed mouth of each cavity.

These pouches were divisible into two classes, the greater number of them consisting simply of the normal pouches of the intestine, with more or less narrowing of the neck of the pouch;

¹ *Transactions Pathological Society*, London, Vol. XXXVI.

the walls of the cavities were composed of the normal constituents of the intestinal wall, and their contents could be easily squeezed out into the general cavity of the intestine. The other set of pouches could not be emptied into the gut by squeezing, but were easily burst by much pressure; their walls were very thin, and seemed to consist of mucous membrane and peritoneum only.

Although no direct cases have as yet been reported, it is not difficult to understand how a perforation of the intestine might very readily occur through the mucous membrane in one of the diverticula. The force required would not be very great, not near that, of course, required to rupture the three coats. In this way the cases of *spontaneous rupture* of the intestine are readily explained, and the results of necropsies seem to clearly point thereto.¹



FALSE DIVERTICULA.
(From Treves' Intest. Obstruction.)

¹ Herschl, *Wiener medizinische Wochenschrift*, 1880. No. 1, "Zur Mechanik der diastatischen Darmperforationen."

False diverticula are occasionally found about the *small intestine*, sometimes in great numbers;¹ but whether they stand in any relation to the subject under consideration is



DISTENTION DIVERTICULA, crowded along the mesenteric border of the jejunum. (From Sir Astley Cooper's "Hernia.")

a question. Treves speaks of them as diverticula by distention; if this be the cause of their production, then they may certainly be related to one form of constipation or another.

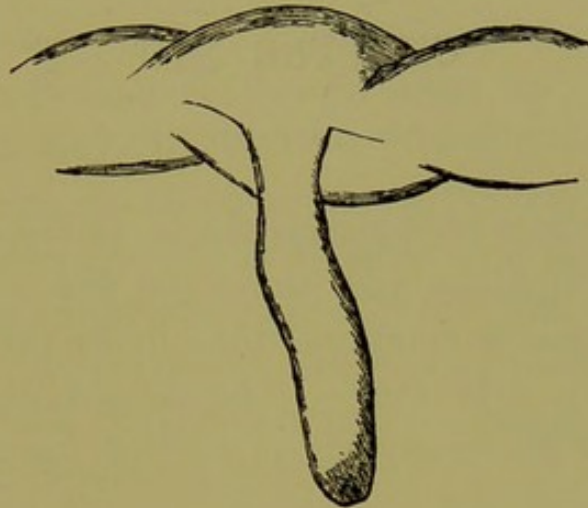
However this may be as regards the very minute diverticula of the other sections, it is not improbable that diverticula of the ileum, false or true (like Meckel's diverticulum), may have the same etiological factor as do those of the large bowel.

CASE 34. T. Diller. (Medical News, February 8, 1890.) Barbara R., German, *æt.* sixty-four, married, transferred to this hospital from the insane department of the Philadelphia hospital. . . . October 20 she vomited several times and had some diarrhœa, the stools being light in color. . . . She had cold sweats, subnormal temperature, and died October 24.

Autopsy.—The small intestine normal in calibre, except in three or four places where the lumen was contracted from one-half to three-fourths. The smallest length of intestine with diminished calibre was about four inches long, the longest a foot. Proceeding from the ileum, about two feet above the ileo-cæcal valve, an appendage or diverticulum was discovered. It was about four inches in length and with a lumen of sufficient size to permit the introduction of the middle finger. It joined the intestine nearly at right angles and was of a uniform diameter in its entire length, though a trifle smaller nearer the extremity than at the junction with the bowel, as seen in the cut.

¹ Wallmann, *loc. cit.* Treves, *loc. cit.*

A slight uniform dilatation of the ileum was noted in the region of the bowel from where proceeds the process. . . . The diverticulum or blind pouch ended in a rounded extremity and was filled with soft fæcal matter. . . . The large



intestine varied greatly in its lumen; in the ascending, and part of the transverse colon, being very large, then a sudden diminution in the diameter until it would not permit of the introduction of an object larger than the thumb. This contracted portion of the bowel was about ten inches long. . . .

Remarks. — As to the diverticulum it might have been congenital or acquired. The fact that the bowel was so enormously contracted and dilated (a condition I have a number of times noted in autopsies upon the insane, and which I believe to be due to the habit of constipation) is favorable to the latter view. . . .

X. **Hernia** may result from violent straining at stool¹ (which the constipated so often do).

¹ Cooper, Surgical Dictionary.

CHAPTER XIII

THE CONSEQUENCES OF CONSTIPATION (*Continued*)

XI. **Diarrhœa with Constipation.** — In the course of an obstinate constipation, and whilst the gut is still packed with hard fæces, a condition that looks very much like diarrhœa may supervene. The evacuations from the bowels, which previously were inhibited for long periods, are now *more or less frequent* in the *day* and the stools are thin.

As to the causes that call forth this exaggeration of peristalsis, which is, nevertheless, mainly inefficient, I believe that, in the first place, it is due to the irritant character of the chyme. By the long constipation and impaction the digestive function of the stomach has become impaired, its work is not well done, and the chymus is thrown into the intestine in an insufficiently prepared state. Here the digestive power being also greatly enfeebled, the necessary elaboration does not take place; hence much undigested material remains in the chyme and noxious substances are developed therein in its downward course. It acts thus as an irritant already in the small intestine, provokes an exaggeration of peristalsis therein, which is communicated to the large bowel as the irritant chyme reaches it, and it is carried rapidly through and discharged.

It may also be that the fæcal masses, by the long continued pressure exercised, have provoked an undue irritability in the muscular coat, perhaps also in the ultimate nerve filaments, so that, although unable to throw off the impacted masses, the new material arriving is quickly expelled. Or it may be due to some special irritation about the rectum.

The fluid material forces or makes its way through the gut between one wall of the intestine and the corresponding side of the impacted fæces. It has been said that the column of fæcal matter may be hollowed out and form a veritable channel, giving free exit to the chyme arriving. This, however, is exceedingly rare.

This diarrhœa differs from the ordinary forms in not being diarrhœa at all, in the common acceptance of the term, but only a semblance thereof, produced by the frequent trips of the patient to the vessel or closet.

Its characteristic features are :

The stools, though thin, are scant.

They are not as frequent as would appear from the number of times the patient goes to the closet or vessel ; many times he has nothing more than a discharge of flatus.

The stools are black, tarry, and offensive.

They usually lack the products of a catarrhal irritation.

A striking example we have already had in Case 25, reported by Dr. Morris Price.

A very illustrative case of this kind came under my own observation.

CASE 35. April, 1892. I was requested by a colleague to see a case with him. Mr. S., *æt.* fifty-five, has been sick

since February, having had, according to his physician, a complication of diseases; at first an attack of pneumonia; then diphtheria, and now he is suffering from obstinate diarrhœa. Patient is a well-formed individual, who must have been quite stout; belly rather large. He lies in bed in a stupor from which he can be roused to a certain extent; he will mumble something in reply to the question, and relapse at once into his former state. Face rather ruddy, tongue dry and somewhat cracked, yellowish coat. Eyes closed, pupils react to light. Belly large; soft; skin inclined to be flabby; no manifestations of pain on pressure. He has had diarrhœa now for nearly two weeks, having ten to fifteen stools a day or more, and it has not been possible to check it. He gets up when he feels the necessity for going to the vessel. The matter was discussed, and we finally agreed upon a pill of opium and gallic acid, with a little ipecac. This did not avail much, and I saw him three or four times more, the medicine being changed each time, without any benefit. I then suggested to the physician in attendance that he wash out the bowel. At my next visit I was assured that the bowel had been washed out; but the diarrhœa still continued. I now requested to see the wife and questioned her closely. She informed me that he would get up very frequently, fifteen to twenty times a day, walk over to the chamber, sit a second or two and return to bed. Sometimes there would be a tablespoonful or two of fœcal matter, very thin, in the vessel; at other times nothing. There was at no time, since the beginning of his ailment, a discharge as large in quantity as one commonly sees in diarrhœa. Whether he had any pain at stool, she could not say, as no intelligent answer could be gotten from him; but she was under the impression that sometimes when he was on the vessel he had pain, and she concluded so from the drawing of the face, the grimaces that she several times observed. I concluded that an examination of his rectum was a *sine qua non*; I had the bed drawn to the window, patient turned with his back to me, and buttocks well drawn apart. At first nothing was noted, but upon pulling

apart the margins of the anus, unrolling it as it were, I found a fissure. Any further examination of the rectum was prohibited by the great pain the patient seemed to suffer, as indicated by his squirming and moaning on the mere introduction of the tip of the finger. On the third day thereafter the patient was allowed to inhale a little chloroform, and about 4 P.M. the fissure was incised. The following morning our patient was considerably out of his stupor, could talk fairly well, his eyes were wide open, but he complained of great weakness. The wife informed me that soon after the operation he went to the vessel, and he must have had eight or nine stools till morning. Each time he passed more than half a chamber full of fæcal sausages, black as tar, and hard as a rock. She had tried to break them with an axe but they had resisted. Every evacuation was made up chiefly of such cylinders. A tonic regimen was prescribed; he improved rapidly, and in less than a week he was able to get out of bed and to walk around. I did not see him after this.

Four months later he died. I learned subsequently from the wife, that though he was up and about, he never gained much strength; never sufficiently to resume his occupation of clothing cutter. In the last four weeks of his life he lost his strength rapidly. He died of exhaustion, it was said.

An obstruction of the rectum by foreign material may have a like effect.

CASE 36. Reported by J. G. Bride.¹ Man, *æt.* seventy-two, was admitted for diarrhœa, which had been preceded by constipation. He complained of much pain and a sense of constant weight at the lower bowel, and of frequent, but difficult micturition. I explored the rectum, from which a large hard mass, found to be fig seeds, was removed by the handle of a spoon and injections of warm water. The means of weighing it were not available, but the accumulation *in situ* could not have weighed little short of a pound. The diarrhœa ceased

¹ *Lancet*, London, 1885, Vol. II., p. 597.

without further treatment, but the bowel did not regain its usual power for several days.

XII. Intestinal Obstruction. *Ileus*.¹—Fæces may accumulate so largely and become impacted so firmly as to constitute a veritable obstruction to the onward passage of advancing fæcal matter.

A mass of indurated fæces may become dislodged and take up a new position in such a manner as to completely obstruct the lumen of the bowel, preventing even the passage of flatus.

We may thus have a *mechanical ileus* developed more or less suddenly, with all the symptoms of acute obstruction, great pain, inhibition of fæcal discharges, rapid accumulation of flatus and distention, even to stercoraceous vomiting.

Fæcal concretions (also results of constipation) may produce a like condition.

A section of the gut, usually above the point of greatest accumulation, may become paralyzed from over-distention by flatus, and in this way a condition of acute obstruction, or rather pseudo-obstruction, a sort of *ileus paralyticus*, be developed.²

XIII. Torpid Liver (*torpor of the liver = deficient secretion of bile*).³—Nothing has been said as yet, to my knowledge, as to the relation of hepatic disturbances to constipation, in so far as the latter may stand as the etiological factor for the former. In a few cases that came under my

¹ From εἴλω = to close up, or εἰλέω = to twist, Ὁ ἰλεός, εἰλεός. Kraus, Krit. Etymol. Med. Lexikon, Göttingen, 1844.

² Henrot, Des Pseudo-Etranglements, Paris, 1865. Hensch, Rosenheim, loc. cit.

³ Murchison, Croonian Lectures, "Functional Derangements of the Liver."

observation, in which the habitus and habits of the patients were known to me, it has seemed to me that the attacks, if I may so call them, of torpid liver stood in direct relation to a previously developed constipation.

XIV. **Jaundice** may be caused by accumulation of fæces and impaction thereof in the right colic flexure and the adjacent sections of the transverse colon. (By pressure upon the ductus communis.)

CASE 37. *Fæcal accumulation in the colon imitating hepatic enlargement.* Bright (No. 2).¹

I was requested by Mr. Baldwin to see an old gentleman in the city, confined for several days to bed, gradually becoming jaundiced; the tongue furred; appetite gone; pulse excited; no sleep; considerable general enlargement of the abdomen with some tenderness; frequent hiccough and some retching; the bowels were reported to be by no means constipated and some of the motions which I saw were well supplied with bile, and not scant. On examining the abdomen more carefully, there was a distinct hardness discovered, which I concluded to be the liver, extending from the margin of the ribs on the right side to below the umbilicus. For some days we continued to treat him on the supposition that some organic change had taken place, and were of course very apprehensive of the result. We gradually, however, began to suspect that the bowels were scarcely enough acted upon, and we increased our purgatives; the compound decoction of aloes with senna and alkali, and the compound galbanum pill with blue pill and extract of colocynth were largely administered; and the quantity of feculent matter which we daily had the opportunity of seeing was almost beyond belief. All the swelling gradually subsided; the dulness on percussion gave way to the clear sounds of hollow viscera; the jaundice disappeared; the appetite returned; and in a few weeks the patient was completely

¹ Loc. cit.

restored, and is now in perfect health without the vestige of hepatic lesion. In this case I have not the slightest doubt that, however much the liver was gorged, as in all probability it was, the greater part of the enlargement and dulness of the hepatic region was from feculent matter confined in the colon.

The following very interesting case is reported by Friedrichs in his *Clinical Treatise on Diseases of the Liver*.

CASE 38. A female, aged twenty-five, living in the country, who had already aborted several times, believed that she was in the family way owing to the cessation of menstruation, the presence of squeamishness, etc. The ordinary medical attendant enjoined the strictest rest, which from her anxiety to avoid, at any price, a fresh abortion, she maintained by lying for six months upon a sofa. A vaginal examination was not permitted; it was only by feeling the abdomen that the medical man recognized a round tumor rising up out of the pelvic cavity, and reaching by degrees to the umbilicus. Meanwhile the anxiously expected movements of the child did not make their appearance; and notwithstanding the most careful nursing, the young woman fell away, became of a pale-yellow color, lost her appetite, got œdema of the feet and at length complete jaundice. A second medical man, who was called in, declared that the disease was an enormous swelling of the liver, and denied the existence of pregnancy; in opposition to which the first medical man urged the fact (which he had observed) of the tumor growing upward from below. On my opinion being asked, I examined the abdomen more closely. It was remarkably distended and tender; a tumor was seen rising up from the left side of the cavity of the pelvis, which felt doughy, and at the umbilicus extended $1\frac{1}{2}$ inches beyond the median line; the cæcal region yielded a clear tympanitic sound as far as the linea alba. The hepatic dulness, in a line with the mamma, extended from the fifth rib to 8 cm. ($3\frac{1}{5}$ inches) below the arch of the ribs, but in the axillary line did not pass beyond the margin of this arch. Transversely, through the epigastric region, there ran a cylindrical

swelling, which was tender upon pressure, and which yielded upon percussion, at some places a clear sound, and at others a dull one. The bowels were moved every second day, and the color of the stools varied, being sometimes pale and sometimes dark. Hence, I expressed my opinion that pregnancy did not exist (an opinion which was supported by the form, and more especially by the doughy consistence of the swelling, which could only have arisen from an unusually long sigmoid flexure distended with fæcal matter), and that the condition of the liver could only be judged of after the evacuation of the intestinal canal. By means of clysters and compound infusion of senna, an extraordinary amount of fæces was evacuated. After eight days it was reported to me that the lower tumor had disappeared, that the liver was much smaller, and that the jaundice had diminished. Three weeks later, when the patient presented herself to me, after having drunk of the Kreuzbrunnen Springs of Marienbad, no enlargement of the liver was any longer to be detected; by means of purgatives she had lost her hope of a child, and at the same time her anxiety about a diseased liver.

Leube also calls attention to jaundice in this way produced.¹

XV. **Atony of the Stomach** may result from prolonged atonic constipation of the bowels.²

XVI. **Auto-Intoxication.** — It is a question that has been much discussed, and has already been referred to elsewhere in this book: Does constipation give rise to auto-intoxication? In the solution of this question there naturally arises the other question as to the mode of production of the headache, the anorexia, the insomnia of the constipated. It has been assumed by some that they

¹ *Specielle Diagnostik*, 1895, Vol. I.

² I have observed this in quite a number of cases; shall return to it again elsewhere.

are the result of intoxication. If this be correct, then auto-intoxication may occur. I hold, however, that they are not due to auto-intoxication. This I believe to be clearly demonstrated by the fact, the common observation of the whole profession, that upon a thorough purgation these symptoms disappear at once. Intoxication cannot be so quickly banished. It is furthermore proven by the cases reported of large accumulations of fæces of long standing, wherein, if auto-intoxication does so readily occur, we should certainly have had it in a marked and grave degree. This position is also taken by Bouchard. He says:¹ "The objection often raised to the hypothesis of auto-intoxication of fæcal origin is the fact that constipation is compatible with good health. If the hypothesis were true, auto-intoxication should be realized in its highest degree in the constipated. I answer that constipation must be regarded as a protection against auto-intoxication. It presumes that all that can be absorbed has been absorbed. In constipation there is at first a preliminary phase in which the danger of auto-intoxication exists; in the second phase it cannot exist any more." The preliminary stage he refers to is only found in the acute forms of constipation, in which, owing to acute pathological processes, toxic materials are generated in large quantities, and by reason of the obstruction, are absorbed. But in the other forms of constipation, especially that which chiefly interests us here, where there is merely a stagnation and induration of fæces, intoxication does not occur.

There is, however, danger of intoxication, and intoxication does in fact occur, when we have a diarrhœa estab-

¹ Bouchard, *Les Auto-Intoxications*, p. 155.

lished with the constipation. As has been already pointed out, the fluid matter then in the small intestine is abnormal in character, containing irritant and noxious substances, and, pouring out over the impacted fæces, the surface of which is softened, additional toxic matters are set free; these all coming in contact with the mucous membrane, absorption and intoxication may result. This poisoning of the system may reach a dangerous degree, and even cause death.

The case of constipation and diarrhœa (Case 35) reported here by me fully supports this position. The patient presented all the evidences of intoxication, and, as the history shows, it was under just such conditions as above described that the intoxication occurred. And though he apparently recovered, I am nevertheless firmly convinced that his system suffered irreparable damage, and that his subsequent death was directly due to auto-intoxication.¹

¹ See Albu, Ueber die Autointoxicationen des Intestinaltractus, Berlin, 1895. See also the chapter on "Symptomatology," this book.

CHAPTER XIV

THE CONSEQUENCES OF CONSTIPATION (*Continued*)

XVII. **Functional Disturbances of the Nervous System.**

— Besides the various pathological conditions connected directly with the digestive tract, all more or less painful, some even attended with no inconsiderable danger, which may result from constipation, there are functional disturbances of the nervous system, of which it is undoubtedly the etiological factor.

A. *Palpitation of the Heart.* — This is the most common of the functional disturbances of the nervous system caused by constipation. During a period of prolonged constipation, attacks of palpitation, of hurried cardiac action, will come on without there being anything abnormal discoverable about the heart. In these paroxysms, besides the subjective sensation, there is also exaggerated activity of the organ; the heart contractions are augmented in force and there is increased frequency of pulsation. Sometimes there is irregularity of action, as manifested by arrhythmia or intermittence.

These attacks cannot, according to Kisch, who has studied this subject carefully, be mistaken for paroxysms of angina pectoris, as all the evidences of increase of blood pressure by vascular spasms, as coldness and pallor of hands, formications, etc., phenomena characteristic of angioneurosis, are wanting.

In the case related by him, the cardiac impulse was strongly visible at the normal point, the pulse was soft and 100–120 in the minute.

With the restoration of the function of the bowels to the normal, this cardiac neurosis disappears.¹

B. *Hæmicrania*. — Next in frequency of occurrence is hæmicrania. Kisch² remarks that he has observed in quite a number of instances, especially in men and women with the mark of abdominal plethora, a venous hyperæmia of the whole abdomen, attacks of hæmicrania, which though they obstinately resisted all methods of treatment, both local and constitutional, would yield readily to, and were permanently cured by, the use of Marienbad-glauber-salts. In some of these cases, pains in the epigastrium, in the cæcum, which would appear as prodroma of the typical paroxysm, pointed out the relation of the hæmicrania to the condition of the intestinal tract. He also calls attention to this point, worthy of note, that though the administration of an active purgative may cut the paroxysm short, nevertheless it is only when the constipation has been overcome that a permanent cure is established.

C. *Tic-douloureux (Trigeminal Neuralgias)*. — Charles Bell³ already made the statement that constipation is the cause of various facial neuralgias. Stromayer⁴ held that trigeminal neuralgias were to be regarded as reflexes of morbid processes in other parts, principally in the intestines, and more particularly of constipation.

¹ Kisch, *Berlin. klin. Wochenschrift*, 1887.

² *Ibid.*

³ *Practical Essays*.

⁴ Quoted by Gussenbauer, *Prager medicin. Wochenschrift*, 1886.

In an address before the Medical Society of Prague, Gussenbauer¹ stated that latterly he had found that it was not necessary to operate as frequently in cases of trigeminal neuralgia as he had formerly believed. In twenty-eight cases of this form of neuralgia — cases of central origin being, of course, excluded — he had operated only four times. He had found that a methodical treatment, with a view to a restoration of the normal functioning of the bowels, is the best method of curing obstinate and painful neuralgic affections. The following very interesting case reported by him is excerpted here in brief.

CASE 39. Mrs. —, *æ.t.* forty-two. She was married at eighteen. After her last confinement her menses became irregular, she had fluor albus, and was generally invalided. She was treated with cauterization; curetting; she took cures at various health resorts (Badekuren), but was never completely restored. In the last five years an obstinate constipation had supervened upon her other troubles; stools every two or three days hard and scibalous. Intermittently purgative diarrhœa. Three years ago she had an attack of trigeminal neuralgia. In 1883 she consulted Bamberger and Nothnagel, and was treated with the usual remedies and relieved. The relief, however, did not last long, the pains returned with increased severity, and she was referred to Professor Albert, who resected the alveolus inferior (nerve). One year and a half later the neuralgia reappeared, the pain recurring every two or three minutes, and lasting about twenty seconds. She came under his [G.'s] care, and he treated her on the lines indicated. The constipation was so obstinate in the first two weeks as to require frequent injections. In the second week some remission in intensity and duration of the neuralgic paroxysms was noted. In the third week the patient suffered

¹ *Prager medicin. Wochenschrift*, 1886.

untold pains, and it was only the firm conviction that the neuralgia would disappear with the relief of the constipation that kept him from resorting to other remedies. After the third week marked improvement; attacks less frequent, less intense; patient could sleep part of the night; could take more nourishment (sour milk and white bread). After four weeks attacks much more rare, of little intensity and brief duration, and after five weeks they disappeared altogether, and have not returned since.

Of the trigeminal neuralgias it is mainly that form which is distinguished by intermittent paroxysms of pain, by typical convulsive movements of various muscles of the face, and by characteristic vasomotor disturbances, that is so related.¹

D. *Morbus Basedowii*.²—Federn has described a circumscribed atony of the gut, *i.e.* an atony in patches, alternating with patches of normal muscular force, which he regards as an etiological factor of *Morbus Basedowii*. His observations have not been corroborated. Indeed, his own statements seem so fanciful, and his cases are of so negative a character on the points to be demonstrated, that for the present the Scotch verdict of “not proven” must be rendered.

As to the mode of production of the functional troubles described, it may be said that they are due to the systemic disturbances³ that a prolonged and obstinate constipation may produce, and that in consequence thereof the general nutrition becomes much impaired, and the functional neuroses are developed. It is also more than

¹ Gussenbauer, *loc. cit.*

² Federn, Ueber partielle Darmatonie u. ihre Beziehung zu *Morbus Basedowii* u. anderen Krankheiten. *Wiener Klinik*, March–April, 1891.

³ See p. 108.

likely that in some instances, especially in the case of the functional heart troubles, they are produced in a more direct way: the accumulated material sets up an irritation in the ganglionic cells, between the coats of the intestine,¹ and this irritation is conveyed along the sympathetic system and also along the vagus nerve to the head or heart.²

An *irritating, harassing cough* without any pathological substratum therefor in the bronchi or in the larynx, a reflex cough without any discoverable point of irritation either in the nose or in the throat, will sometimes be found to be intimately related to the persistent constipation present, and that with the cure of the latter the former will disappear.

An *otalgia* may be set up by irritating matters in the bowels.³

There are other neuralgias also due to constipation, but these may be produced in a merely mechanical way by the pressure of accumulated feces upon the various nerve tracts in the abdominal cavity.

E. *Lumbo-abdominal Neuralgia*. — Kisch⁴ reports the case of a wealthy factory proprietor, aged fifty, who had suffered for years from pains shooting from the lumbar vertebra into the scrotum, paroxysmally, every few days, sometimes several times in one day. He had been treated in various ways without relief. He had obstinate constipation, and an examination of the rectum revealed hæmorrhoids. By attention to these two abnormalities he was cured completely in several weeks.

¹ See Chapter I.

² See Illoway, "Cardiac Disturbances of Gastric Origin," *New York Medical Journal*. April 24, 1897.

³ Lauder Brunton, *The Disorders of Digestion*.

⁴ *Loc. cit.*

Overalgia.

*Sciatica*¹ may be thus produced.

* * * * *

F. *Insomnia*. — Constipation is not infrequently the cause of sleeplessness, both in adults and children. A relief of the coprostasis is followed by a disappearance of the insomnia.²

In my own experience I have observed this insomnia in adults only when the coprostasis was attended with marked dyspeptic phenomena.

* * * * *

Psychoses. — Whether constipation may be an etiological factor in the production of mental ailments is a question that has not as yet been considered by alienists. Among the older writers various disturbances of the intestinal canal are mentioned among the physical causes, but constipation is not named. Pritchard³ describes among his etiological factors a condition of intestinal disturbance, in which constipation alternating with diarrhoea is a prominent feature; it is evidently, as there described, the constipation resulting from intestinal catarrh, and he himself says it is not the constipation, but the underlying condition, that acts as the provoking cause. Esquirol⁴ in his table of physical causes does not mention constipation, though he refers to it at another place, and calls attention to its importance in the treatment of the malady. Dr. Marcus Feyat⁵ in a monograph

¹ Henoch, *Die Unterleibskrankh.*, Third Edition, 1863, p. 483.

² A. W. McFarlane, *Insomnia and its Therapeutics*, 1891.

³ James Cowles Pritchard, M.D., F.R.S., *A Treatise on Insanity*, 1835.

⁴ E. Esquirol, *Des Maladies Mentales*, 1838.

⁵ *De la Constipation et des Phénomènes Toxiques quelle provoque. Étude de Pathologie Nerveux et Mentale*, 1890.

on constipation and the toxic phenomena that it produces, with special reference to the nervous system, seems to hold that constipation is occasionally the direct cause of mental disease.

Judging by analogy, from the well-established fact that hallucinations may be provoked by disturbances of the stomach, of the bowels,¹ it might, very properly, be assumed that constipation, when attended with marked indigestion, and the consequences thereof, — abundant development of flatus, distention of the bowels, sense of weight, oppression, colicky pains, — could *per se*, when long continued, cause a more decided perversion of the mental balance. In further support we may cite the condition of hypochondria that frequently attends obstinate coprostasis.

* * * * *

XVIII. Enlargement of the lingual tonsil, and therefore persistent and irritating cough.²

XIX. Diseases of the genital organs in young women.³ Constipation in young women when long continued may give rise to morbid processes in the genital organs. This occurs more particularly when there is great accumulation and marked induration of fæces.

In the male it may give rise to pain in the spermatic cord⁴ or in the testicle.

Pain in the loins, in the groin.

¹ Dr. Marie Bra, *Manuel de Maladies Mentales*. Pritchard, loc. cit. Griesinger, *Die Geisteskrankheiten*.

² B. Robinson, *Etiology and Treatment of Certain Kinds of Cough*, *American Journal of the Medical Sciences*, November, 1895.

³ Dr. Eliza H. Root, in "Proceedings of the Illinois State Medical Society," 1890, *New York Medical Record*, 1890.

⁴ Charles Bell, loc. cit. Quoted also by Brunton, loc. cit.

XX. Chlorosis (*chloro-anæmia*), fæcal anæmia.¹

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XXI. **Constant Noises in the Abdomen** (*borborygmi*).—
 A not inconsiderable number of persons are troubled with continual noises in the abdomen. These *borborygmi* are more or less loud, and in some cases can be heard at quite a distance, three to four feet, from the person. They are incessant; there is a constant rumbling and growling and squeaking in the abdomen, with but very brief intervals of quiet. This condition is a source of great annoyance to the persons so troubled, and not infrequently to their immediate surroundings. It has in some instances compelled absolute withdrawal from society.

According to my own observation, it is chiefly women who are thus troubled, and of these again mainly such as have confining occupations,—seamstresses, shop-girls, book-keepers, housewives who are such home bodies that they will not take sufficient outdoor exercise. I have found them all to be constipated, and even those who claimed more or less regularity of action for their bowels were proven to be costive by an inspection of their fæcal discharges.

In consequence of the constipation the flatus developed is retained and accumulates, and chiefly in the small intestines. It excites a local peristalsis there, is driven from one section of the loop to another, from one loop to another, and thus the noise is produced. In the case of a young shop-girl under my care, in whom the noises were very loud, the hand laid upon the abdomen could detect

¹ *British Medical Journal*, November 19, 1887. *New York Medical Record*, 1887 (latter half). Osler, *Practice of Medicine*, 1892.

very distinctly the movements of the small bowels underneath it; sometimes the peristaltic wave could be seen upon the abdominal wall.

Many of these persons are much troubled with colics.

A cure of the constipation relieves the patient of the noises.

SECTION II. — TREATMENT

CHAPTER XV

TREATMENT

Treatment of Constipation due to Atony of the Intestine.

FROM what has been said in the preceding chapters it can be readily seen that habitual constipation is not the trivial matter it is held to be by most people, but that it is a derangement which, by reason of the grave evils that may arise therefrom, should be remedied as soon as possible, and therefore deserves the earnest consideration of all whose function it is to study and treat disease.

Constipation dependent upon an *atonic condition* of the intestinal muscular apparatus being, as already set forth, the most frequent, the most common form that presents itself to us, the consideration of its relief must naturally take the first place.

The indications for treatment are here, as in other morbid conditions, twofold.

- I. The removal of the cause — *remotus causa tollitur effectus*.
- II. The restoration of the bowel to its pristine vigor.

I. The first indication we will meet by instructing our patients in the following rules, and insisting strenuously upon their observance. These rules have the consensus

of the whole profession, and their rationale is already explained in the chapter on the etiology of habitual constipation.

1. Go to the closet once a day, call or no call.

Ever since Trousseau¹ one of the principal features in the treatment of constipation has been the recommendation that the individual go to the water-closet every day and at the same hour; the time most favored being that after breakfast. On the last part of the recommendation I deviate from the usual practice. I instruct my patient that he must go to the closet once every day, *shortly after a meal*, but at such period of the day at which he finds it most convenient, at which he can take ample time for the business before him, whether that be after breakfast one day, after lunch or dinner the next, or after dinner or supper on still another day. I have done this and still do this for the reason that I have found in a number of instances that patients cannot comply absolutely with the rule of the French clinician, and a neglect of it on one day is at once followed by a relapse of the constipation. This is the age of irregularity of habit; one retires early one evening, and rises with the lark the next morning, with ample time for all the duties before him; another night we are kept up to the wee sma' hours, and rise in the morning with barely sufficient time to dress. Or again, we may be very much occupied at a certain hour one day, and may have nothing to do at the same hour on the following day. I prefer, therefore, that the patient shall go to stool at the time of day at which it is most convenient for him or her, and have

¹ "Lectures on Clinical Medicine," *Engl. Tr.*, Vol. II., p. 492, Phila. Edition.

found that the bowels accustom themselves to respond to such *irregularly regular* solicitation as regularly as in the cases of a fixed and unchangeable period.

2. Do not leave the call of nature unheeded ; respond promptly or with as little delay as possible — before the call dies away.

3. Do not read a book or paper or occupy your mind whilst engaged in the performance of your duty in the sequestered realm of *cloacina*. Keep your mind fully upon the business before you.

4. Eat and drink properly.

5. Take a sufficient amount of exercise.

6. Do not overtax your brain ; it is a delicate organ and resents terribly all abuse. He who would have a healthy body must keep a healthy mind. Give your brain diversion and your body sufficient exercise.

7. Do not take any purgatives ; they are the enemies of a regular habit. They promote constipation.

8. Have your bedroom well ventilated.

Diet. — The importance of a well-regulated diet for the normal performance of physiological function on the part of the bowels cannot be overestimated. It has already been shown that *fæcal* matter is made up in greater part of the indigestible residue of the alimentary matters. A microscopical examination of *fæces* shows an abundant quantity of cellulose or vegetable wood-fibre. It is very evident therefore that a proper diet is one that with sufficient nutritive material furnishes the necessary quantity of residual matter to incite the bowels to action. With persons inclined to constipation or already suffering therefrom, such articles of food as contain a large per-

centage of indigestible fibre should occupy a prominent place in the diet list ; viz.

Rye, as Bread. — Rye bread has the advantage that it retains its humidity and at the same time preserves its flavor. “When made of flour not too finely bolted, rye bread is suited to certain forms of dyspepsia with costiveness, and the subjects of which are of a sanguine temperament.” Rye meal boiled in water (rye mush) is very useful in cases of habitual costiveness, taken with molasses ; or in cases less obstinate, eaten with milk.¹

Oats. — “A diet of oats has the credit of tending to keep the bowels open ; and I have seen it apparently have this effect in several instances of habitual constipation when taken at breakfast in the form of porridge.”²

I recommend oatmeal regularly, except in cases where a catarrhal condition of the stomach or bowels exists. I direct that it be well boiled in a double pot, a steamer, and be eaten with syrup (New Orleans, in place of sugar), about two tablespoonfuls, and milk.

I have generally been well satisfied with its action.

Where it causes a sort of a diarrhoea, running through the intestinal canal with great rapidity and undigested, it must, of course, be stopped, as, if continued, it would certainly prove detrimental. When this is due to the oatmeal not being properly cooked, as is sometimes the case, this only need be remedied.

Cracked Wheat. — It can be used in the form of mush or as the more constituent element of a soup.³ It is excellent as bread, Graham bread, Graham crackers, etc.

¹ Pereira, Food and Diet, Phila. Edition.

² Dr. Christison, Dispensatory. Pereira, loc. cit.

³ Boas, I., Diät u. Wegweiser für Darmleidende, Berlin, 1890.

Hominy, Cabbage, Cauliflower, Asparagus, Spinach, Dandelion, Lettuce, the Tops of Beets, Greens. — “The green matter of plants is in general little acted on by the stomach of the higher animals. . . . The green matter of plants contributes, as above mentioned, to the action of the bowels by its excremental properties.”¹

Carrots, Turnips, Parsnips, Green Beans, Green Peas, Cucumbers, Fruits. — The value as a stimulus to peristaltic action of some of these articles may be enhanced by the method of preparing them for use; as **Sauerkraut**, which can be eaten raw or cooked, or the various **Vegetable Salads** prepared with oil and vinegar.

Other articles of diet which, though their percentage of residual material is small, even minute, are nevertheless of importance as tending either to excite peristalsis or to keep the fæces soft and pasty, are: **Butter, Buttermilk, Cottage Cheese, Fats, Oils (vegetable), Vinegar, Molasses or Syrup, Salt.**

All such articles as have a tendency to constipate must be prohibited. These are more especially:

Rice. — “Indeed it is generally believed to possess a binding or constipating quality; and in consequence is frequently prescribed by medical men as a light, digestible, and uninjurious article of food in diarrhœa and dysentery.”²

Barley, Sago, Potatoes (mashed), Dried Peas, Dried Beans (particularly in the form of mush or pap). They are apt to cause flatulence and thereby are still further detrimental.

Cheese, other than that mentioned above.

Cocoa, Green Tea,³ Nuts, Blackberries, Bilberries, Mustard, Pepper.

¹ Prout, *On the Nature and Treatment of Stomach and Urinary Diseases*, 1840. Pereira, loc. cit.

² Pereira, loc. cit.

³ Contains a considerable amount of tannin, more than black tea. Pereira, loc. cit. The ordinary article is said to be very much adulterated and dyed with verdigris.

“Man is a cooking animal,” a great philosopher has said. All his food must first be prepared before it is fit for consumption. The essentially American method of cooking food, namely *frying*, must be absolutely prohibited as unsuitable for the constipated. The food thus prepared is positively deleterious. It is a potent factor in the production of dyspepsia and all dyspepsias tend to constipation. Moreover, constipation is attended with more or less of dyspepsia, and the aggravation of this latter by the fried food will make the patient very miserable.

Diet List for Constipated Persons.

Soups : meat broths ; vegetable soups ; oatmeal soup ; cracked wheat soup.

All soups must be thin.

Fish : fresh only, of all kinds and prepared in any way. Fried fish and fish prepared with mustard or peppers excepted.

Meats : fresh only, of all kinds and prepared in any way except by frying.

Eggs : except fried.

Miscellaneous : Cottage Cheese, Butter, Buttermilk.

Bread and Farinaceous Articles : Graham bread, Graham crackers, brown bread, rye bread. All bread must be cold. Oatmeal crackers, oatmeal mush, hominy, cracked wheat, rye mush.

Macaroni, vermicelli, in small quantity and to be eaten with fruit-jelly, or syrup (molasses).

Vegetables : cabbage, sauerkraut, greens, cauliflower, asparagus, spinach, beet-root tops, dandelion (boiled), onions (green), carrots, turnips, turnip-cabbage, onions (boiled). Potatoes very sparingly and only boiled in their jackets or baked. Radishes in season. Rhubarb plant (syrup can be used in the preparation thereof in place of sugar).

Salads, prepared with vinegar and oil or with vinegar alone : Lettuce, dandelion, beets, cucumbers, Bermuda onions.

Desserts : raw fruit ; stewed fruits ; baked apples ; light puddings, bread or fruit ; ice cream ; ices.

Tea or Coffee. When coffee is taken, it should be *good*, not dish-water. It should be allowed only for breakfast. Where the habit has been established, a small demi-tasse may be allowed after dinner.

The tea or coffee must be drunk fairly cool. Exception can be made for winter mornings.

Tea (preferably black tea, though even this is said to undergo adulteration and dyeing), when taken for breakfast, may be of fair strength ; but not more than one cup to be allowed. When taken after dinner, it should be weak. Where cheaper grades of tea are used (from necessity), it is well to instruct the patient that the first water poured on the tea should be decanted off and thrown away ; thus a great deal of the noxious matters, if any exist therein, and some of the tannin constituent is gotten rid of.

The tea, like the coffee, should be drunk fairly cool, except on winter mornings when a certain amount of heat may be allowed therein.

Special Dietary Directions. — Stewed fruit should constitute one of the regular dishes both of the morning and of the evening meal. It should be eaten freely ; in much larger quantity than is customary — a good, large plateful at each of the meals named. Of excellent service are stewed fresh apples, stewed fresh pears, stewed fresh plums, and, when out of season, these fruits dried. Two or three varieties may be boiled together, as apples and pears or apples and plums, plums or prunes and figs. Tamarinds, where they can be obtained, are also useful. Dried prunes or plums should be cut up before boiling. Cooked whole and eaten that way, they tend to constipate after a while. Dried peaches and canned peaches have a tendency to constipate, and should not be taken

therefore in any quantity. When raw fruit is eaten in the morning, — and all juicy and tart fruits are good, — the stewed dish can of course be omitted. Baked apples are very effective with many people. They can be eaten two or three times a day.¹

Boas directs his patients to take a tablespoonful of sugar of milk in a glass of milk three times a day, believing that it possesses laxative properties. I prefer to prescribe molasses or syrup to be taken with mush or macaroni or to be eaten with bread after the fashion of the children of the South.

A glass of buttermilk may be taken twice a day as a sort of lunch between the morning and the noon meal, about 10 A.M., and between the noon and the evening meal, about 4 P.M.

Patients must eat *moderately*; gross eating tends to constipation.

Drink. — The importance of water to the animal economy is well known and need not be dwelt upon here. What concerns us to know, is the fact that cool water excites intestinal peristalsis and energizes intestinal action, whilst at the same time it dilutes the intestinal contents, which greatly facilitates their propulsion. The effect is undoubtedly due to the exciting action of the cold, and is very well and clearly demonstrated by the violent peristalsis or colic excited when the temperature of the drink taken is too low, and by the universal experience that warm drinks allay peristalsis, even though they do dilute the intestinal contents.² Cool, fresh water

¹ Pereira, loc. cit.

² Handbuch der Allgemeinen Therapie (Ziemssen), Band II., Theil I. Leichtenstern Allgm. Balneotherap., p. 296.

should therefore form the staple drink of the constipated or those so inclined. In addition we should direct them *to take a drink of cool, fresh water the first thing on rising in the morning or before the breakfast is eaten and just before retiring at night.*

Soda water with tart fruit syrups may be permitted. So also the class of mineral waters known as table waters.

Root beer, a fermented decoction of *sassafras* and *sarsaparilla* (the decoction put up in bottles and sold everywhere, sold at soda stands by the glass), and *sweet cider* are allowed; can even be recommended as beneficial.

To be avoided are the *artificial seltzer* waters which are taken by many people in lieu of plain water. The habit of drinking hot water on arising in the morning is to be condemned. Alcoholic liquors, especially red wines, brandies, whiskies, gins, liqueurs, are to be prohibited.

Where, in consequence of established habit or for some other cause, some form of alcoholic stimulant is required, we may permit a glass of light, tart, white wine, as the lighter Rhine wines and our native wines, Catawba, Delaware, California Riesling, or a light beer.

Exercise. — The necessity of exercise, of muscular activity, in the open air to the well-being of the human economy is well known; its importance for the proper performance of physiological function on the part of the intestine has been already set forth.

Exercise may be taken in various ways: *Walking, horseback riding, swimming, rowing, riding in a vehicle.*

Walking is one of the best forms of exercise; can be indulged in at any time; costs nothing and is therefore

within the reach of all. It answers all that can be demanded of exercise; viz. it sets into activity all the muscles of the body, stimulates respiration and thereby the inhalation of oxygen, stimulates and makes more energetic the heart's action, thus increasing the rapidity of the blood current, arterializing the blood more fully and distributing greater quantities of oxygen to the tissues.

Investigations upon the circulation have shown that the negative pressure in the thorax during inspiration has a most powerful aspirating action upon the returning venous blood current, and this is rendered still more powerful by increase of frequency and depth of inspiration.¹ Braune has demonstrated that the fasciæ around Poupart's ligament are so arranged that movement in the hip joint produces an aspiration of the blood in the crural vein and hastens its onflow into the inferior vena cava,² and naturally the more extensive and the more frequent the motion, the stronger the aspiration. A similar arrangement, though not so powerful in effect as either of the others, has been claimed for the fascia and muscles beneath the clavicle.³

Walking, which makes all these factors more effective, is thus of especial benefit to the constipated. The circulation in the intestinal tract being greatly increased in activity, a greater amount of oxygen is carried into all its

¹ Bush, Allgemeine Orthopädie, Gymnastik u. Massage. Handbuch der Allgemeinen Therapie, Band II., Theil II.

² Die Oberschenkel Vene in anatomischer u. klinischer Beziehung, Leipzig, 1873. Handbuch der Allgemeinen Therapie, Band II., Theil II.

³ Herzog, Beiträge zum Mechanismus der Blutbewegung, etc. *Deutsche Zeitschrift für Chirurgie*, Bd. 16, p. 1, 1881. Handbuch der Allgemeinen Therapie, loc. cit.

tissues, and oxygen, as has been shown by Nasse, stimulates intestinal peristalsis.¹

The lymphatic currents are also quickened by these same agencies and necessarily the lacteals and lymphatic spaces are emptied with greater rapidity; absorption is hastened and the whole digestive process rendered more energetic, more perfect, and the volume of gases, flatus, developed is greatly diminished.

In this way also greater energy is imparted to the muscular structures and peristalsis becomes more perfect.²

It is true that to be beneficial a certain amount of ground should be covered, and it is likewise true that most of our patients, especially in this country, are but poor walkers. This is, however, a difficulty readily overcome. Walking is a matter of education. This is clearly shown by the rapidity with which army recruits accustom themselves to great distances without experiencing any ill-effect therefrom.³ The person who feels fatigued after a walk of five blocks to-day will, with daily practice, accomplish ten or fifteen blocks within a week. Thus our patients must be taught to walk until they can take their mile or two or their spin for an hour without feeling at all fatigued.

I have also found that very often, especially in the case of ladies, the difficulty in walking lies in the shoe; a very thin sole that allows all the inequalities of the pavement, the hardness of the rock, and the sharpness of the cobblestone to be readily felt through it, brings on fatigue very

¹ Nasse, *Zur Physiologie d. Darmbewegung*, 1866. Foster, M., *Physiology*.

² Foster, M., *Physiology*.

³ Dr. L. Blondlot, *Manuel d. Gymnastique*, Paris, 1877.

rapidly. A good stout sole, that provides for the foot a very elastic superpavement as it were, is a requisite *sine qua non* for this the most healthful and most inexpensive of exercises.

The following rules may be given to the patient for his guidance :

Do not walk immediately after a hearty meal ; wait till the digestive process is well on its way, an hour and a half after a breakfast, two or three hours after a dinner.

Walk at a fairly brisk gait (except in hot weather). Too slow or too fast fatigue quickly.

Where convenient, walk in a park or in the open country.

Take your walk in the cool of the day in the warm months, and in the warmest part of the day in the cold months, if you can so arrange your time.

Never walk till you are tired. Keep this side of the limits of fatigue.

Do not eat heartily immediately upon your return from a long walk ; if you need something to refresh you, a cup of hot milk, a glass of buttermilk, a cup of tea, a cup of beef tea (made with the extract), a small glass of beer with a bit of bread, or a glass of wine and a wafer or bit of bread for persons who are accustomed to these, will fulfil all the requirements ; it will refresh you and not impair your appetite ; in fact, will improve it.

One of the immediate and direct benefits of this exercise to the constipated is the ease and facility with which accumulations of flatus, a source of great annoyance, frequently of suffering, and an obstacle to recovery (by reason of their keeping the bowels distended), are discharged.

Swimming is also an excellent form of exercise, espe-

cially adapted for the summer, for climates where walking is too fatiguing at that season of the year. It has in addition the advantage of the stimulating effect of the cold water upon the abdominal parietes, and through them upon the abdominal viscera, especially upon the intestines.

Horseback Riding. — When for any reason persons will not or cannot walk, horseback riding will very well take its place. The shaking and jarring of the bowels and abdominal viscera with every movement of the horse renders it especially suitable to the constipated. Moreover, the rapid carrying of the body through space, and the necessary muscular effort to maintain the seat, to maintain the equilibrium, make it, in a way, even more energetic than walking. A trotting horse should be had for the exercise.

Rowing is not as good an exercise for the purposes of this derangement as either of the three before mentioned.

Riding in a Vehicle. — A carriage or buggy or street car is of no benefit to the constipated. The only vehicles, if vehicles there must be, that are in any way serviceable are the lumbering omnibus that travels over a road paved with cobblestones and the springless cart, which provide shocks and jars and shakings-up innumerable for the body. For torpid livers, the springless cart, a long ride every day along a country road, or even the top of an omnibus will do good service. I have seen marked benefit derived from them in chronic hepatic congestions.

Bicycle Riding as it is usually done, with the body well bent forward and all the thoracic and abdominal viscera compressed, I consider worse than useless for the constipated.

There are several important points connected with the question of exercise which it is well to bear in mind.

1. All exercise to be of the greatest benefit must be taken in the open air. Even when patients say that they have sufficient work and exercise at home, and that it is rest they want rather than exercise, we must nevertheless insist upon their taking some exercise in the open air, and even if by so doing they must neglect some of their duties at home. It has been with me a matter of frequent observation in persons, especially housewives, who were kept very much confined at home that, despite physical work which afforded sufficient muscular exercise, the appetite would fail and the bowels would become costive, and this even in good homes. It was because of insufficient oxygenation; because of the lack of that superabundance of oxygen which we take in in great draughts, and scatter throughout all our tissues when we exercise in the open air. A day out in the country, even a long walk through the city, through the park, effected at once a marked change for the better in the persons above referred to. It is the air bath that we require as much as anything else.

From ample clinical observation I have come to conclude that, under normal conditions at least, the position of Nasse,¹ that O incites to peristalsis, is correct, and that CO₂ allays peristalsis. I am fortified in this conclusion by the experience of Birch,² who, in cases of obstinate constipation, saw almost immediate effects from the inhalation of O, and by the experience of Dr. Ach. Rose,³ who claims remarkable results from

¹ Loc. cit.

² Constipated Bowels, the Various Causes, etc., Phila. Edition, 1868.

³ "Therapeutic Effects of Carbonic Acid," etc., *New York Medical Journal*, March 9, 1895.

the local application of CO₂ in all intestinal complaints attended with great irritability and much pain.

2. All exercise must be kept this side of fatigue. The amount of exercise to be taken must be regulated by the vigor of the patient and never allowed to go to the point of exhaustion. The patient must feel refreshed, invigorated, and his appetite must have been aroused; then will he have benefited by the exercise.

3. It must never be taken upon a full meal, for with the task of digestion before it the system is unequal to the effort. As to the proper time, that has been indicated in the rules for walking.

4. Human nature accommodates itself very rapidly to changes of conditions and circumstances, and for this reason a variation in the form of exercise is desirable and advantageous.

Furthermore, the habits and occupation of the patient must be taken into consideration when ordering exercise. Thus we would not prescribe walking for a letter carrier or riding for an omnibus driver. A change from the usual, from what their nature has become accustomed to, is what is wanted and what we must prescribe.

There is one form of exercise which is not generally referred to under this head, as it is more in the nature of work, mention of which must not be neglected, and that is **gardening** or **farm work**. In a few cases of severe indigestion and obstinate constipation, alone or combined, where the opportunity offered for taking this form of exercise, the patients derived the greatest benefit therefrom; in fact, their rapid recovery was in a great measure due thereto.

Other etiological factors must be met according to their nature.

Adulterations. — Where adulteration of food or drink are the etiological factors as already described, we must see to it that such impure articles are banished from the dietary of our patient.

The breads here recommended, rye bread or graham bread, are generally free from adulteration; it is only the very fine white flours that are liable thereto.¹

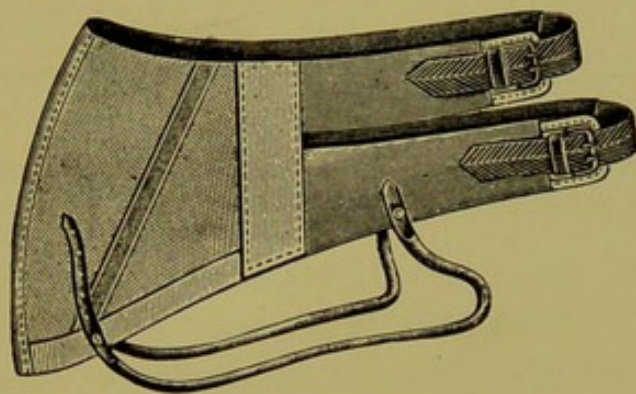
Baking powders: only such as contain no alum must be used. Where we have reason to suspect that the water is impregnated with toxic agents, we must either abstain from it *in toto*, confining ourselves to the use of the mineral *table waters*, or we must see to it that it is well filtered.

Hard water that disagrees should likewise be filtered or distilled, or, if a change is absolutely necessary, either the mineral table waters may be substituted, or, where these cannot be had for any reason, filtered rain water can very well take their place.

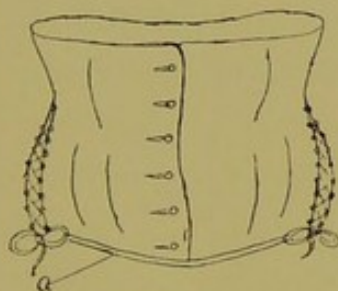
Relaxation of the Abdominal Walls, or its extreme degree, Pendulous Belly. — This condition, which is most frequently met with in women, and is usually the result of neglect of the proper toilet after parturition, occurs occasionally in men (as also in women) as a result of loss in the panniculus adiposus. Where the relaxation is not very great, much may be done to restore the tone of the abdominal parietes by measures to be described farther on. For the pendulous belly nothing can be done to restore it to its former condition. In both conditions, however, the fault can be

¹ Birch, loc. cit.

at once remedied in a measure, and greater comfort afforded the patient by the application of a well-fitting abdominal bandage or belt.¹ Excellent ones are made of this shape, and are for sale with instrument makers.



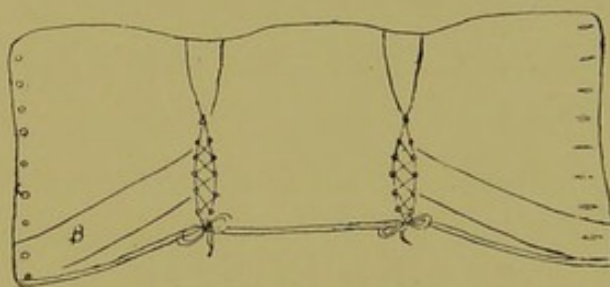
ROSENHEIM'S BANDAGE.



CORSET-SHAPED ABDOMINAL BANDAGE.

Laced over the hips. (Designed by the author.)

a, Half-inch binding put on tightly to brace lower part of bandage.

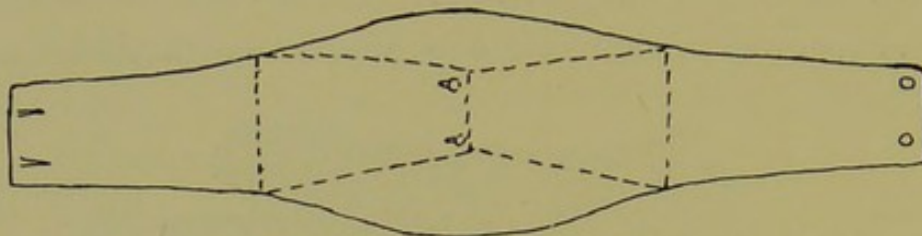


The same open. *B*, braces.

Where the item of expense is an important factor, a plain roller band about four inches wide can be used. It is rolled around one thigh first and fastened, and then swung around the lower part of the abdomen, and then upwards until it has just passed the navel. Where there is a tendency to slip, the whole bandage can be held up by two bands thrown across the shoulders like suspenders.

¹ These belts and bandages are also suitable for the cases of Entero- and Splanchnoptosis.

A cheap bandage or belt can be made of canvas and of the shape shown in the cut. It answers very well.



The end pieces are made sufficiently narrow so that they can be crossed on the back and brought forward and buttoned in front, as shown in the cut.

CHAPTER XVI

TREATMENT OF CONSTIPATION DUE TO ATONY (*Continued*)

Second Indication. — The restoration of the bowels to their pristine vigor.

It is to-day a fact admitted by all, by the most eminent clinicians,¹ that a restoration of normal tone to the bowels can be best achieved, and in the great majority of the cases achieved only, by means of the mechanical methods of treatment. These, with which every practising physician needs familiarize himself, are :

- I. Massage.
- II. Hydrotherapy.
- III. Electricity.

I. MASSAGE

That massage is of the greatest efficacy in the treatment of constipation is now generally admitted. Professor Nothnagel² says that it takes front rank in the treatment of this derangement. Le Marinel³ has published but lately a long list of cases successfully treated. In my own hands it has likewise proved of the greatest efficacy, and has given me results as I have never obtained with me-

¹ Gussenbauer, *loc. cit.* Nothnagel, *Wiener mediz. Presse*, 1890.

² *Loc. cit.*

³ *Annales de la Société Royale des Sciences Medicales et Naturelles de Bruxelles*, Fascic. I. and II., 1890.

dicinal agents, no matter of what nature or how administered.

Furthermore, the results and benefits are so striking and manifest themselves so early that the patients themselves gain confidence in the treatment, and do all in their power, by the observation of the rules and regulations laid down for them, to carry it to a successful issue, whilst it was just the reverse with the medicinal treatment. The patients, seeing no results, soon grew tired of rules and regulations, relapsed into their former modes of life and vicious habits, and thus destroyed whatever chance of success it may have had.

Physiological Action. — It is not to the purpose of this book to go into a detailed account of the *modus operandi* upon the tissues, of the physiological action, of massage; it will suffice here to say that :

It has been demonstrated by Mosengeil,¹ and these experiences and results have been confirmed by Salis, by Genersich,² by Paschutin,³ by Reibmayer,⁴ and by still others, that massage stimulates absorption, and that under its influence even foreign bodies that had been introduced subcutaneously could be made to penetrate into the depths of the perivascular spaces. Clinically it has been shown that inflammatory exudations, even when old and organized, can be broken down and liquefied and

¹ "Ueber Massage, deren Technik, Wirkung," etc., *Verhandl. d. Deutsch. Gesellschaft für Chirurgie*, 4th Congress, 1879.

² "Die Aufnahme der Lymphe durch die Sehnen," etc., *Arbeiten aus d. Phys. Anstalt zu Leipzig*, 1870.

³ "Ueber die Absonderung d. Lymphe im Arm des Hundes," *Ibid.* 1872.

⁴ *Die Massage u. ihre Verwerthung in den verschiedenen Disciplinen der Medicin*, Vienna, 1881.

reabsorbed, and serous effusions be made to disappear in brief time.¹

It stimulates the circulation. The veins pressed upon in the course of the manipulations are more quickly emptied; the venous column in advance is forced onward, the arterial circulation in the immediate locality is hastened, and then the whole blood current is considerably quickened.

At the same time the lymphatic vessels and spaces being acted upon in a similar manner, these streams are likewise quickened, and thus nutrition and metabolic metamorphosis hastened. It is by this quickening of the blood and lymph currents that the greater rapidity of absorption finds its explanation.²

It acts upon the muscle as a whole, and upon the muscular fibres individually, in which it provokes fibrillary contractions. This contraction, for the production of which the mechanical action alone suffices, is increased both in amplitude and magnitude by the greater activity of the circulation, consequently greater oxygenation, and therefore increased assimilation and more rapid discharge of waste.³

The ganglionic nerves in the parts massaged are stimulated and exalted in their functioning power, and this exaltation is reflected back to the nervous system in general, and greater activity in the physiological

¹ Bush, *Handbuch der Allgemeinen Therapie* (Ziemssen), Bd. II., Theil II.

² Bush, *loc. cit.* Le Marinel, *loc. cit.* Reibmayer, *Die Technik der Massage*.

³ Zabłudowski, *Ueber die physiologische Bedeutung d. Massage. Centralblatt f. d. medic. Wissenschaften*, No. 14, 1883. Dr. Georges Berne, *Le Massage*, Paris, 1894.

functioning of all the various organs over which it presides results.¹

Technique. — Massage, whether it be derived from the Greek *μάσσειν* (*massein*), to rub, or from the Arabic *mass*, to press gently,² means in reality the manipulation of a body by the hands of a manipulator, and the carrying out thereon of various well-devised movements. The movements may be divided into four great groups, with more or less numerous subdivisions: ³

(a) **Effleurage** (*Stroking*). — Is made in diverse ways according to the locality and the extent of region to be treated. It can be made with the hand or with two hands, with the tips of the fingers or with the thumb alone. When the hand is used, it is so applied as to fit snugly to the configuration of that part of the body to be treated, the greatest pressure being exercised upon the side where the great vessels, lymphatics, and veins are found. Whichever way this manipulation is made, it is always a go-and-come movement, more or less rapid, with the pressure always made centripetally, in the direction of the heart. No pressure is made on the return to the point of beginning. The location of the lesion, whether superficial or deep-seated, determines the amount of the pressure to be made. The deeper seated the lesion, the greater the pressure to be exercised.

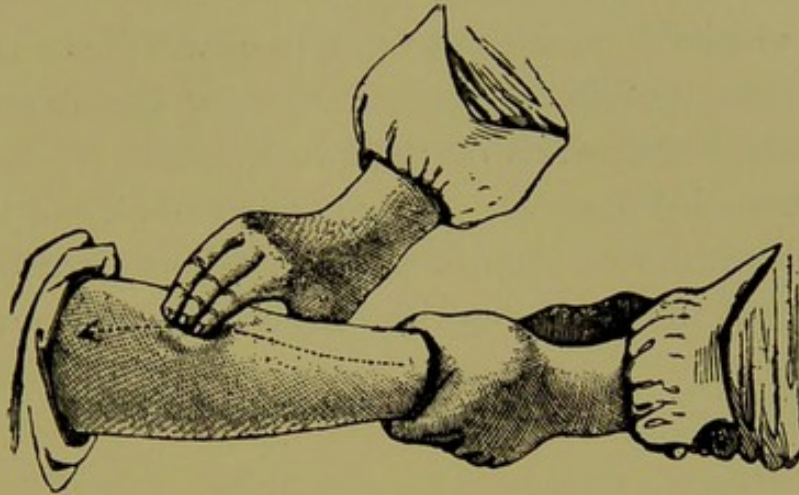
The aim of *effleurage* is to force back any superfluous liquids in the part massaged and to activate the circulation in general, both sanguine and lymphatic.

¹ Technic of Ling's System of Manual Treatment, etc., by Arvid Kellgren. See chapter "Nerve Vibration." Reibmayer, loc. cit. Schreiber, Praktische Anleitung zur Behandlung durch Massage.

² Bush, loc. cit.

³ Reibmayer, Die Technik der Massage. Berne, loc. cit.

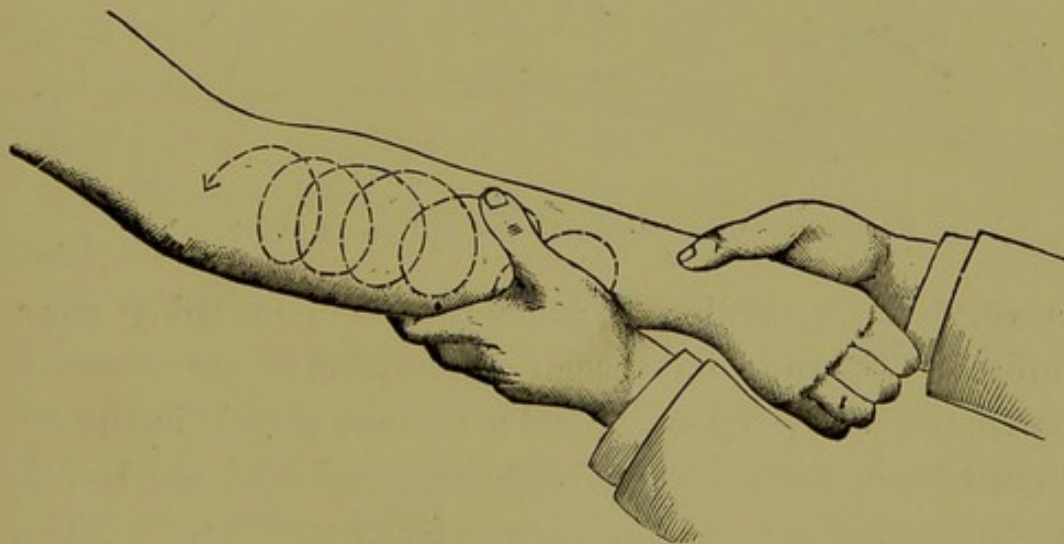
(b) **Frictions** (*Massage à frictions, Reibungen, rubbing*).
 — These, which are always vigorous movements, are



EFFLEURAGE WITH THE TIPS OF THE FINGERS. (*Reibmayer.*)

made in a circular direction with the whole hand, more especially with the tips of the fingers or of the thumb.

This movement is always supplemented with strong



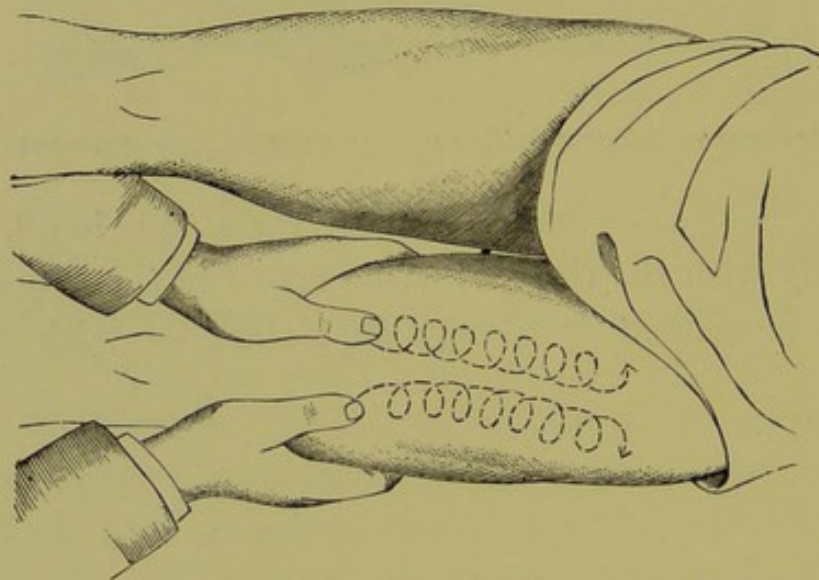
FRICTIONS WITH THE THUMB. (*Ostrom.*)

centripetal stroking, made with the same or with the other hand.

Frictions can be made in any direction. The purpose

of the movement is to break up any pathological products and to scatter them in the surrounding healthy tissue.

(c) **Petrissage** (*Druecken*, kneading, pressing, rolling). — This can be done with the thumb or with both thumbs, or with the thumb and index finger or thumb and four fingers, with the palms of the two hands. When petrissage is intended more as a pressing movement, and is made with the thumb or thumbs alone, it differs from *frictions* in this, that the circle described in making the movement



PETRISSAGE WITH THE TIPS OF THE THUMBS. (*Ostrom.*)

is very much smaller, the sphere of action being more limited. It finds its special application there where a particular tissue or organ, as a certain muscle in the extremities, in the abdomen, a special section of the bowel, can be picked up and out from the surrounding structures and rolled or kneaded or pressed between the palms of the hands, or between the thumbs or thumb and four fingers.

In carrying out this manœuvre, we must avoid the

localities especially rich in blood-vessels, nerves, and lymphatics, as Scarpa's triangle or the axilla.

Its effect is like that of friction, though greater.

(d) **Tapotement** (*Percussion*).—The group richest in subdivisions. The principal, only, of these subdivisions, those which are more particularly required for our purposes, will be named here.

Clapping, with the flat of the hand; with the dorsum of the hand; with the dorsal surfaces of the last phalanges.

Hacking (*hachure*), with the ulnar borders of the hand.

Punctating, with the points of the fingers.

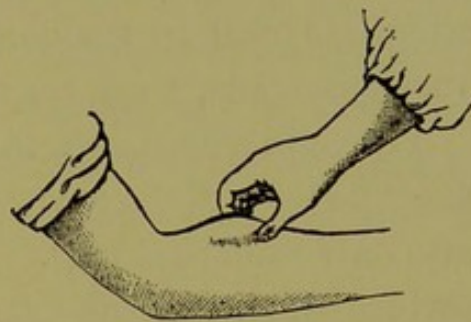
Beating, with the clenched hand.

These movements are all made from the wrist.

Shaking, concussing (*Erschütterung*). The part to be treated is grasped with the hand or with two hands, and rapid movements made in a horizontal or transverse direction.

Vibration (oscillation), of two kinds, strong and light. The strong vibration (the shaking of Kellgren) is executed, according to Kellgren, as follows: "The part of the hand which during the manipulation of shaking comes in contact with the patient's body, is the distal phalanx of one or more fingers, and it or they should be applied softly and not pointedly.

"The movement starts from the elbow joint of the manipulator, where there is slight flexion and extension.



PETRISSAGE OF A MUSCLE BETWEEN THE THUMB AND INDEX FINGER. (R.)

Between it and the ultimate phalanges of the fingers, the bones of the forearm, wrist, and hand, with their intermediate joints, act, so to speak, as links in a chain, through which a wavelike motion is sent and propagated to the part worked upon.

“The movement of the hand is very quick. The joints must not be kept stiff, but just so far extended that elasticity is permitted and not hindered.”

This manipulation is said to quicken resorption, to stimulate, and to invigorate. It is applied chiefly to the various organs, larynx, eyes, stomach, etc.

The mild vibrations, the vibrations of authors, are thus described by Kellgren: “The vibrations are, one might say, only mild shakings. The whole or part of the palmar surface of the hand or fingers is used in this kind of manipulation. Here, as in the shaking, there is flexion and extension at the elbow, but they are much smaller. The movements in the loose wrist joint are abduction and adduction (*i.e.* radial and ulnar flexion) of the hand, which lies immovable so far as the part of the surface of the body on which it rests is concerned. Through the quick succession of the individual movements, the vibrations are produced.

“The straining of the muscles in the operator’s arm ought to be so slight as to be scarcely perceptible to any one who has his hands over them. On no account are the vibrations to be produced by the continued strong contractions of the muscles of the shoulder, arm, and hand.”¹

The masseur usually anoints his fingers with some oily

¹ Kellgren, loc. cit.

substance, — fats, olive oil, cold cream; vaseline is now generally used for this purpose.

Abdominal Massage. — This should be made upon the *naked* abdomen. It can never be so effective when made over a covering cloth, as can be readily understood. All impediments to the circulation, as corsets, must be removed, and all bands must be loosened.

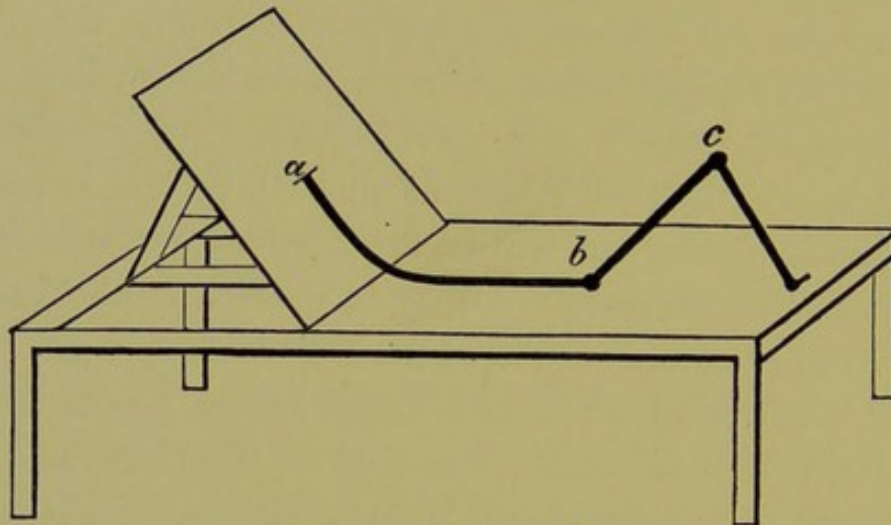
When, as not infrequently happens in males, the abdomen is very hairy, it must be first shaved, or, at least, the hair cropped close to the skin with a curved scissors; otherwise the hair will become matted by the massage, and the manipulations will be attended with considerable pain. Even a furunculosis may be excited if the hair is allowed to remain.

The duration of a sitting is usually from five to fifteen minutes, according to the obstinacy of the case and the magnitude of the abdomen. It is desirable, especially for novices in the art, that the sitting be divided into two parts with an interval of rest between them. In this interval the patient can be allowed to rest upon the couch or to promenade up and down the room; or he or she can execute certain gymnastic movements to be described further on, as the physician may think proper or necessary. For children a sitting of three to five minutes amply suffices.

As to the amount of force to be used in the manipulations, that is difficult to describe. It can be laid down as a rule, however, that the massage, referring here to abdominal massage only, *must never give pain*, and to produce a bruise or an ecchymosis of the cuticle is a striking demonstration of unskilfulness. The skilful masseur

will never cause pain even when he works with some force.

For abdominal massage the patient is placed on a couch or sofa with the head somewhat elevated and the knees drawn up so that head and knees shall occupy about the same plane; thus:



a, Head. *c*, Knees. (*R.*)

Where the couch is a level one, a pillow or two beneath the head, and the knees drawn up as shown in the cut (so that they shall constitute the apex of a triangle the sides of which are formed by the legs and thighs—the feet resting flat upon the couch), will answer.

In this position the abdominal parietes are fully relaxed, and the internal organs can be readily reached.

It happens occasionally that the manipulations are rather unpleasantly felt at the first sitting. This is due to the involuntary contraction of the muscles of the abdominal wall, and the resistance thus offered to the hand of the operator. This, however, soon disappears and the abdomen will remain relaxed unless the manœuvres

are made with too much force, when the abdominal parietes will again become tense and thus shield the organs beneath them against too brutal an assault. If, after eight or ten sittings, the abdominal walls still remain firm, tense, without any tendency to relax,—and this despite all precautions,—or if but one side relaxes and the other side remains tense, then the question arises as to the correctness of the diagnosis and whether or not the products of an inflammatory process or a heterologous formation underlie and are the cause of this unyieldingness on the part of the abdominal muscles.¹ A very interesting and illustrative case is related by Reibmayer.² This is a point of the greatest importance and to be well borne in the mind, especially when we have to deal with women, in whom such conditions are not of rare occurrence.

The masseur sits or stands to the right of the patient.

He must see to it that the clothes of the patient are not soiled with the fatty matter used for anointing his fingers. This is readily accomplished by means of a towel laid over the clothes folded back from the belly.

I myself prefer to make the massage dry, *i.e.* with unanointed fingers, according to the advice of Kellgren,³ for the reason that I believe that in this way a greater and better effect is obtained.

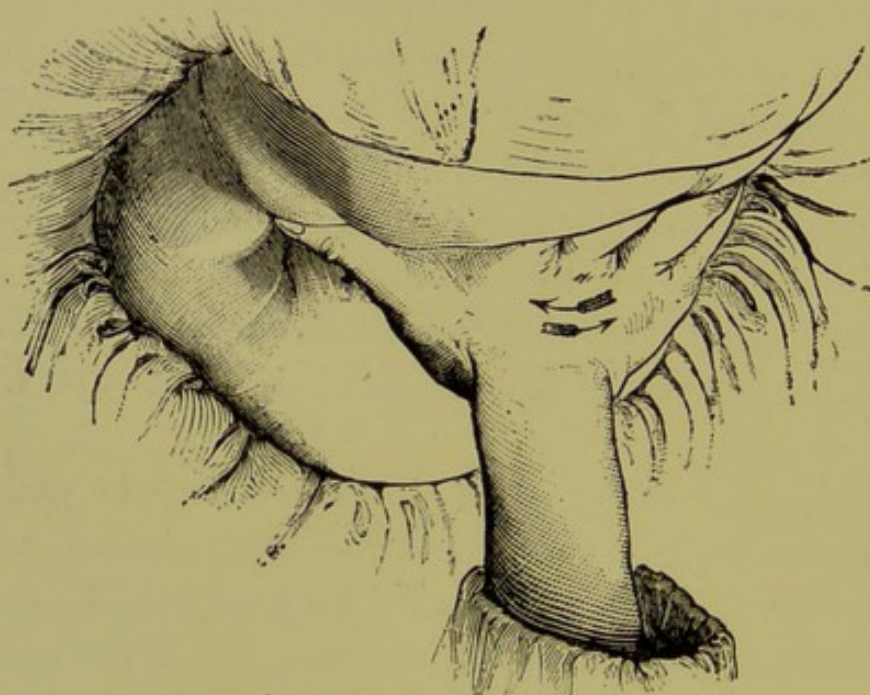
Operative Technic.—The manipulations employed in abdominal massage may be divided, for a better comprehension of their purpose, into the following groups:

¹ Reibmayer, *Die Unterleibs-Massage*.

² *Loc. cit.*

³ Kellgren, *loc. cit.*

- A. Manipulations addressed to the abdominal walls where these are relaxed.
- B. Manipulations addressed to the small intestines.
- C. Manipulations addressed to the large bowel.
- D. Manipulations addressed to the nerve centres.
- E. Closing manipulations, or manipulations addressed to all the abdominal organs.



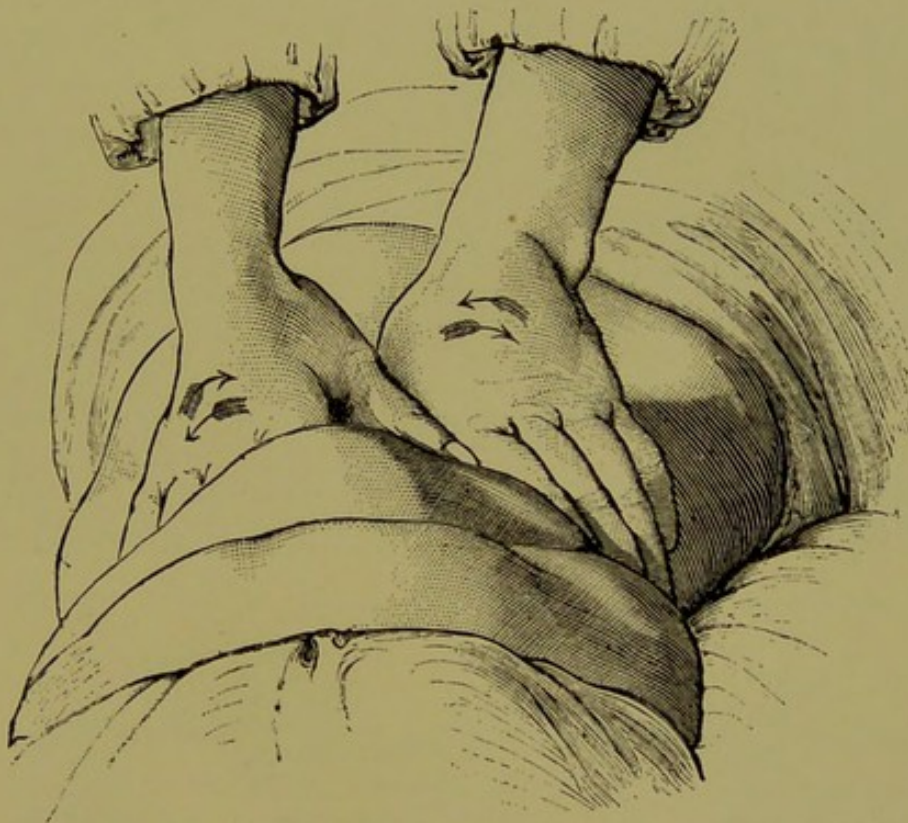
DIVISION OF THE BELLY WITH ONE HAND. (R.)

A. Manipulations addressed to the Abdominal Walls where they are relaxed. 1. *Division of the Belly with one or Both Hands.*—The thumb fully abducted from the hand, with the radial surface of the index finger, forms the crescent-like instrument with which the manoeuvre is made. The belly is divided transversely, from right to left, the part of the hand described pressing down into it and moving at the same time slowly from above downward. A somewhat lateral motion is also given to the

hand. The movement is made with the elbow and wrist joint.

If the manoeuvre is made with two hands, when the belly is very large, then they move in opposite directions, from the middle outward and again inward.

2. *The Rolling of the Belly.*—The flat hand and adjoining surface of the forearm are placed over the abdomen,



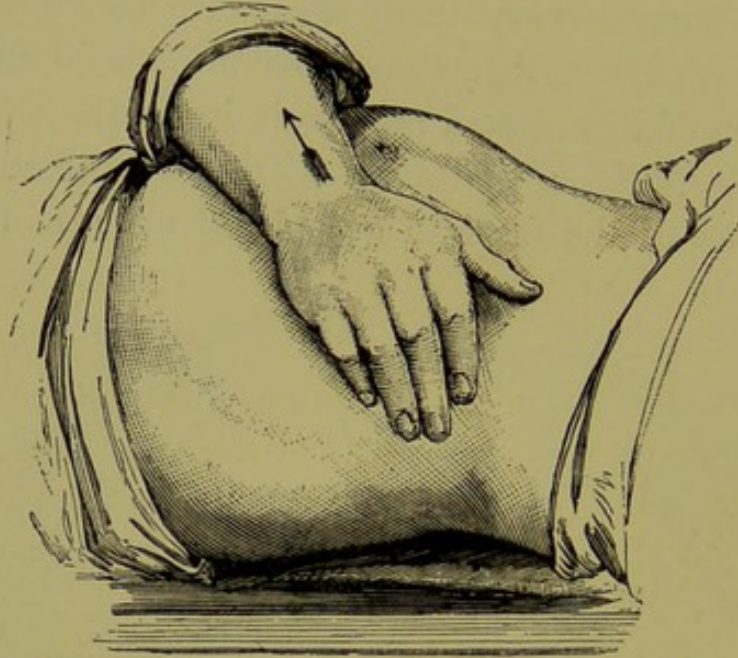
DIVISION OF THE BELLY WITH TWO HANDS. (R.)

and with this the abdominal walls are rolled to and fro as a dough is rolled with a rolling pin.

If the belly be very large, then the manoeuvre is carried out with the aid of an assistant. The assistant, to the left of the patient, places his hand as described. The two hands cross each other, and then with united force the manipulation is made.¹

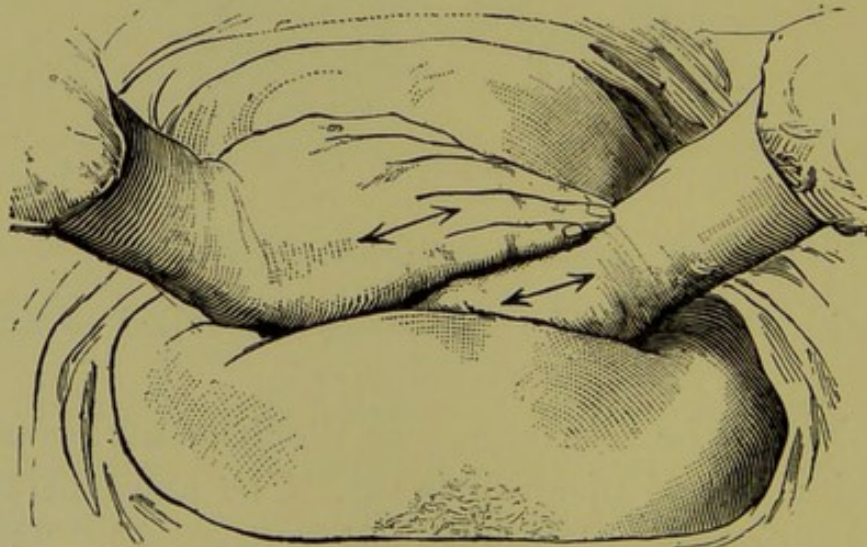
¹ Reibmayer, *Die Unterleibs-Massage*, 1889.

3. (a) *Petrissage or Kneading of the Abdominal Walls.*
 — Beginning in the right inguinal region, a section of the



ROLLING OF THE BELLY WITH ONE HAND. (R.)

abdominal parietes is taken up between the palmar surface of the hand and the forefinger and thumb and rolled



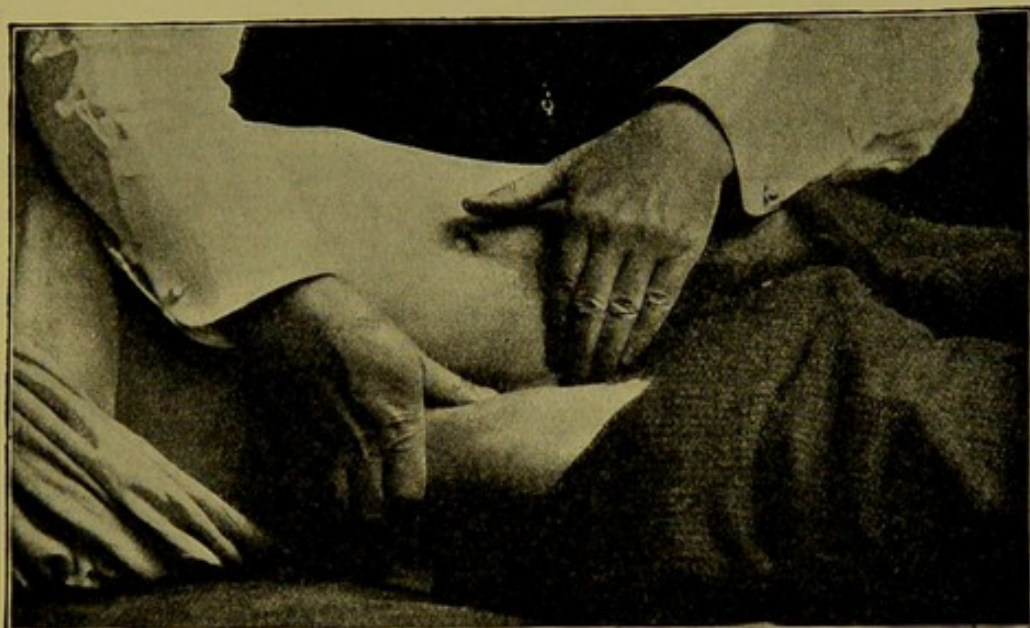
ROLLING OF THE BELLY WITH TWO HANDS. (R.)

and rubbed between them with some force. Whilst the right hand, with which the movement is begun, is thus

engaged, the left hand is passed over and beyond it, takes up an adjoining section and carries out the same movement.

In this overhand way the manipulation is carried on until the whole abdominal wall has been kneaded.

(b) According to Berne, it can be made in this wise:¹



(c) It can also be made with the hand in the form of the "Kammgriff." See cut on page 218.

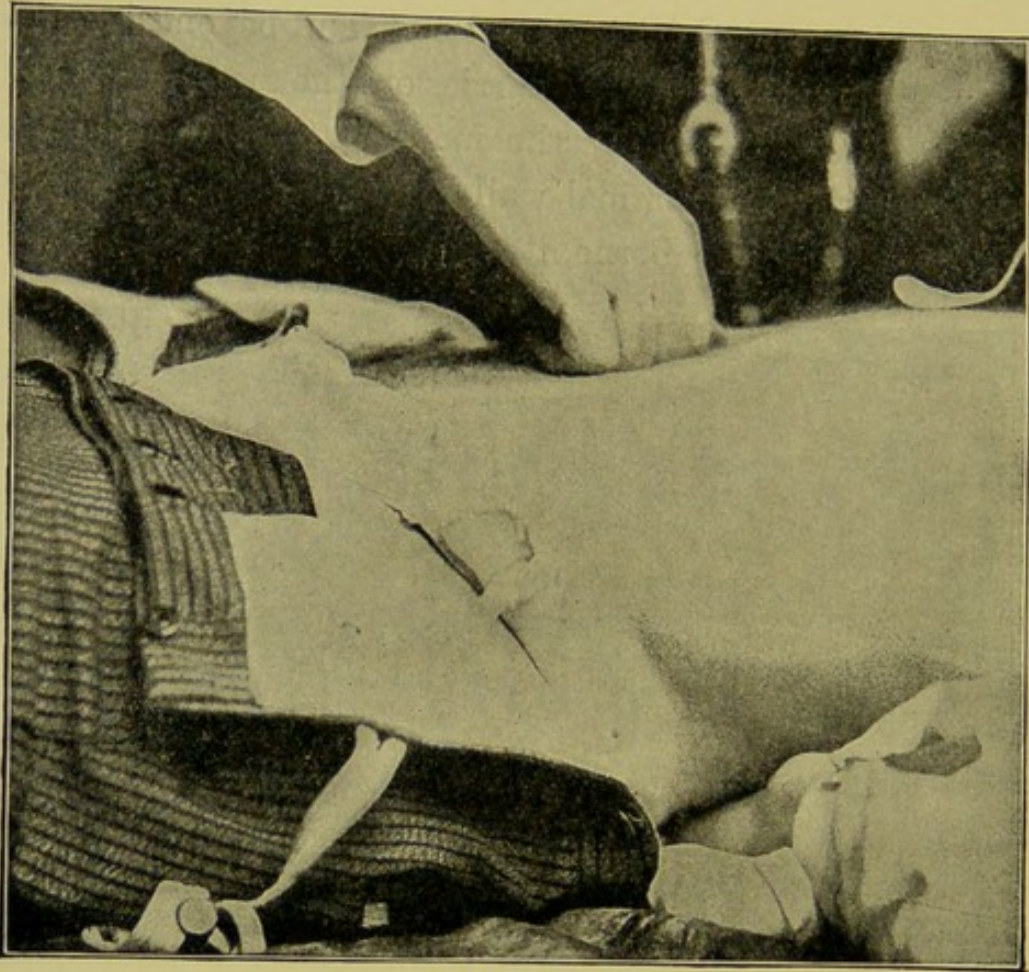
The manipulation in this form is made with the knuckles.

In this way a certain amount of petrissage of the intestine is also made. The movement is often rather painful, and it is best therefore not to press down forcibly or deeply, but to make it rather superficially.

(d) According to Reibmayer,² the manipulation is sometimes very difficult of execution for the reason that the abdominal muscles contract at once strongly and firmly, and all kneading is out of the question. When this is the case, we must proceed very gently and make the

¹ Berne, loc. cit.

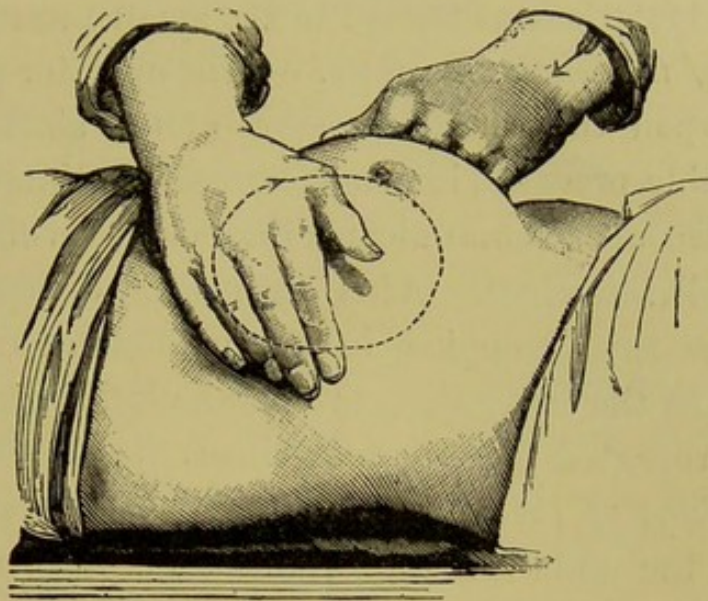
² Loc. cit.



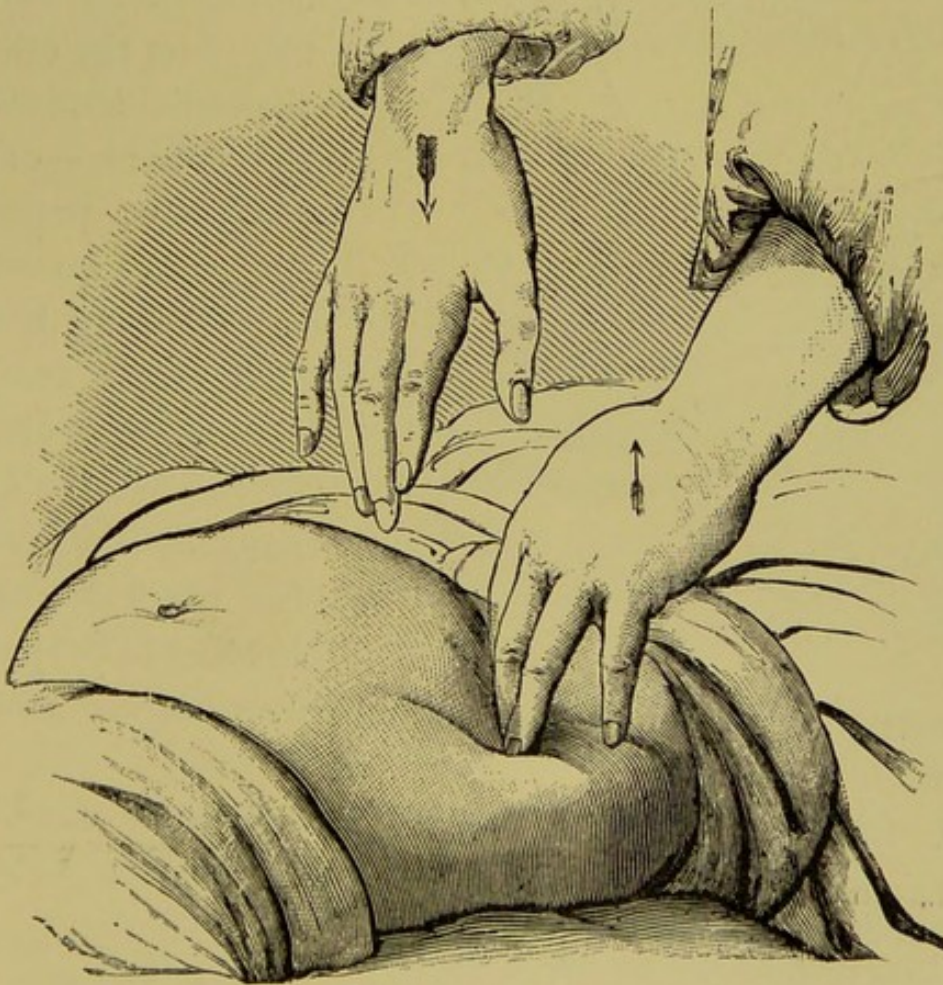
KAMMGRIFF.

manipulation after this fashion, with both hands: One hand, the fingers lightly flexed (a loose fist), is placed on one side of the belly; the other hand, open, is placed to the other side and both work towards each other, the abdomen being pushed now to one side and then to the other.

4. *Punctuation.* — This manipulation is rather irritating and stimulates the abdominal muscles to powerful contractions. The index fingers of the two hands are employed for this manoeuvre. They are raised and brought down alternately upon the abdominal parietes without any especial force. The whole abdomen is thus gone over.



KNEADING OF THE BELLY. (R.)



PUNCTATION. (R.)

B. Manipulations addressed to the Small Intestines. 1. *Vibration of the Small Intestines.*¹ — The operator places his hand flat upon the umbilical region of the abdomen, and by an equable pressure, intermittent and continued for ten to fifteen seconds, communicates the vibrations of his hand to the small intestines. After an interval of rest, equivalent to the time occupied in the manœuvre or longer, according to the indication, the manipulation is resumed. It can be repeated three or four times.

2. *Shaking of the Small Intestines.* — The hand is laid flat upon the umbilical region, and then its borders — on



CIRCULAR EFFLEURAGE.

one side the ulnar border of the little finger, on the other the radial border of the thumb — are gradually pressed deeper down, so that the small intestines are forced up into the hollow of the hand. The hand is held firmly in position and, holding to the parts

beneath, makes rapid to-and-fro and partly rotatory movements.

3. *Circular Effleurage.*² — This is a circular stroking

¹ I., Estradere, *Du Massage, son Historique, etc.*, Paris, 1863. Le Marinel, loc. cit.

² Leon Petit, *Le Massage par le Médecin*, Paris, 1885. Le Marinel, loc. cit.

movement made with three fingers of the right hand around the umbilicus as a centre. The thumb is placed below the umbilicus, and acts as a point of support, whilst the three fingers sweep around the umbilicus in a circle.

The effect of this movement can be heightened by enlarging the circle described, and by exercising an intermittent pressure with the fingers.

This manœuvre is said to be very irritating, especially to nervous females. The firmer, however, the pressure, the less irritating the movement. It seems then to have a quieting effect on the peristalsis. It is said to act chiefly reflexly.¹

C. Manipulations addressed to the Large Bowel. — For these various manipulations the patient must hold his abdominal walls relaxed.

1. (*a*) *Manipulation intended to break up Accumulated Faeces.*² The operator to the right of the patient, facing him. — The extended fingers of both hands are placed over the cæcum, and then with the pulps of the fingers deep pressure is made, so as to break up the accumulated and hardened material by pressing it down against the posterior wall of the pelvis. Whilst the fingers are in this position, the arms as a whole make a rotatory movement and very short lateral motions from right to left, so that the manœuvre may be more effective. The hands are carried over the whole tract of the large bowel down to the terminus of the sigmoid flexure.



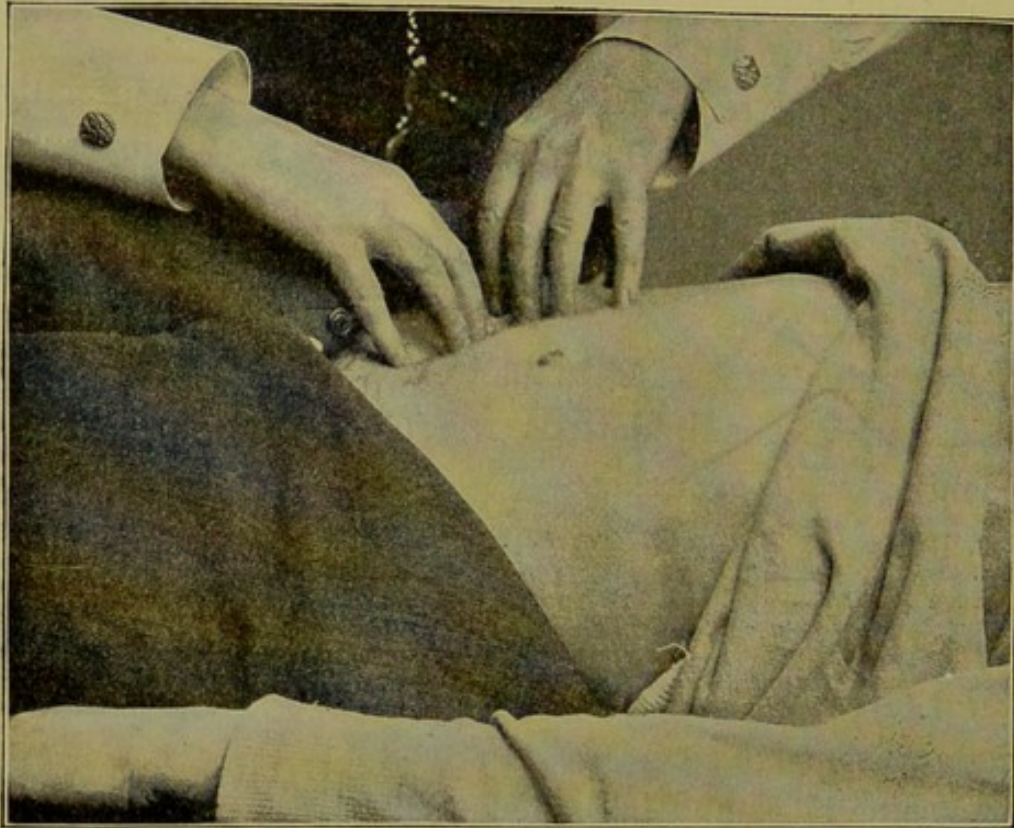
(Le M.)

Or (*b*) the manipulation may be made in this way,

¹ Reibmayer, Die Unterleibs-Massage.

² Le Marinel, loc. cit.

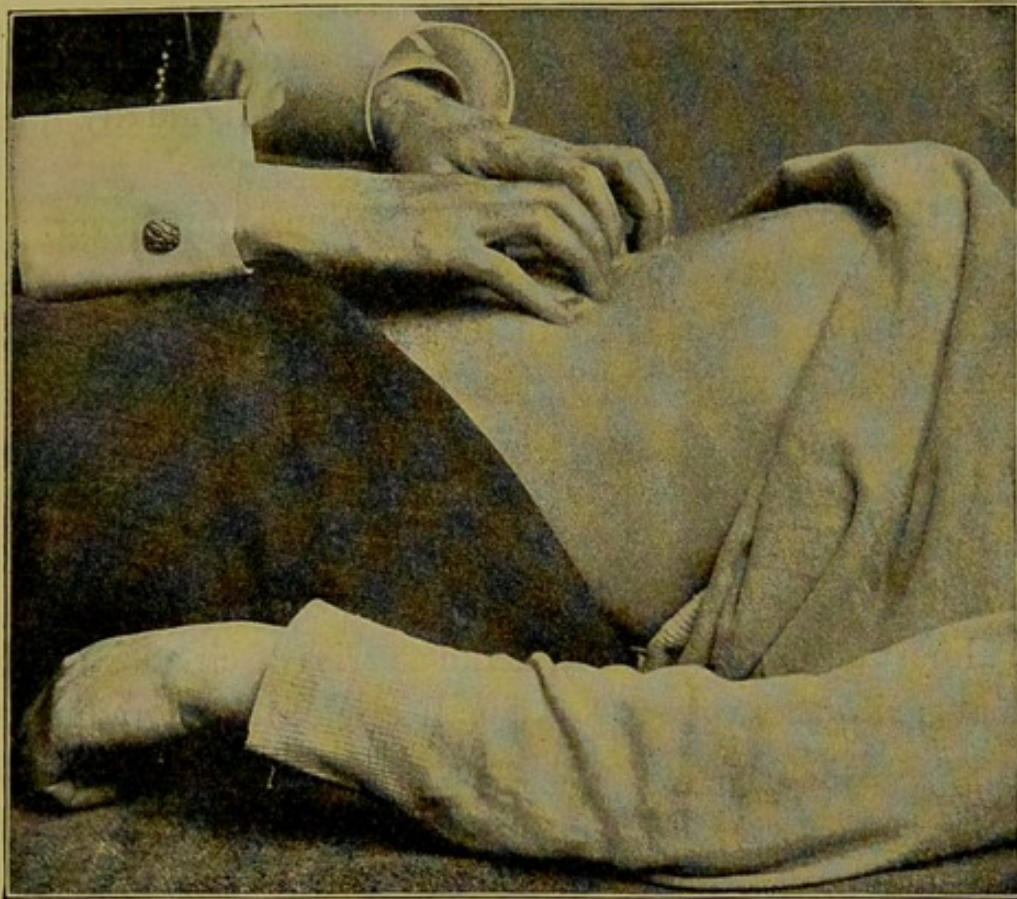
which is perhaps more efficient: The extended fingers of both hands are placed over the cæcum so that the dorsal surfaces almost face each other, *i.e.* one palm fronts toward the feet, the other to the right and somewhat upward.



TO BREAK UP INDURATED FÆCES IN CÆCUM AND ASCENDING COLON.

Then the fingers execute a piano-playing movement over the part. In this way, and while executing this piano-playing movement, the fingers are promenaded over the large bowel, from right to left, to the descending colon. At this point the position of the hands is changed, the right hand is placed just below the margin of the costal arch, over the descending colon, with the palm facing downward to the feet; in front of it (downward) is the left hand, its dorsal surface fronting to the right palm; the manipu-

lation is then made, as already described, down the descending colon to the terminus of the sigmoid flexure and beginning of the rectum, at which point the fingers are made to dip in more deeply. They are then removed and carried back to the point of beginning. The manœuvre



TO BREAK UP INDURATED FÆCES IN TRANSVERSE COLON.

can be repeated two or three times, especially in the early stages of treatment.

It has also the further effect of pressing scibala out of the sacculi of the gut.

With the same object in view the manipulation for the *transverse colon* may be made thus: The four fingers of both hands, flexed somewhat at the knuckles (the articulation between the first and second phalanges), are placed

with their tips resting on the transverse colon, just beyond the right colic flexure to the left. The thumb, abducted, is placed below these, and, resting rather firmly upon the abdomen, forms a point of support for the other part of the hand. The piano-playing movement, as already described, is made with the fingers; alternating with this a rotatory movement is made with them so that a series of small circles are described by them individually and synchronously.

In this way the whole transverse colon is gone over.

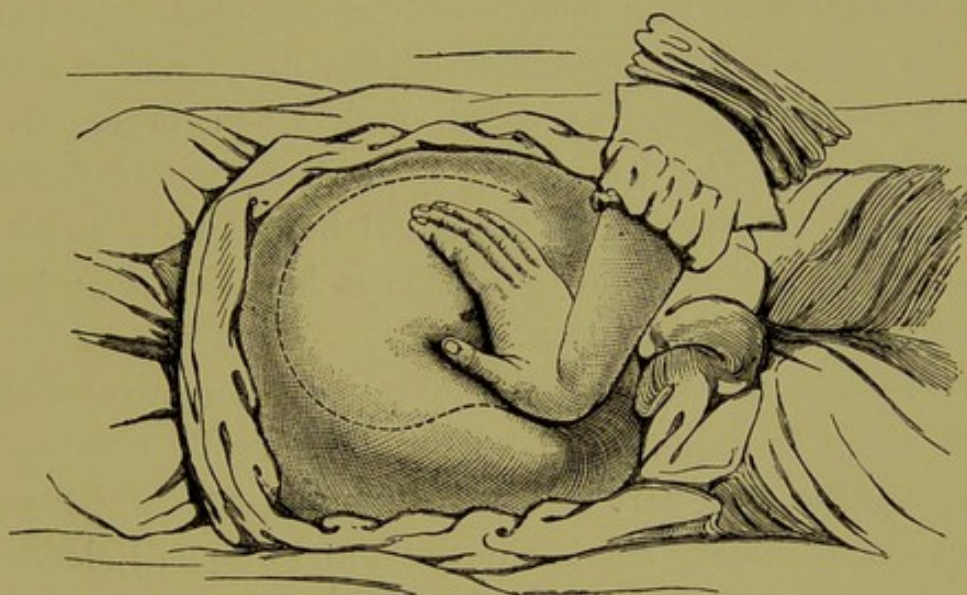
For the *descending colon* and the *sigmoid flexure* this manipulation can also be made in this wise: The three fingers of the right hand flexed lightly at the knuckles, and placed so as to rest with their tips over the point of beginning of the descending colon. The thumb, extended and resting firmly on the belly, supports the hand.

The fingers holding firmly to the abdominal cuticle, so as almost to be one with it, make a series of circular movements; in these at first a small circle, then, gradually, larger and larger ones are described; then they are lessened in size, made smaller and smaller, until the fingers have again returned to the point of beginning. The whole descending colon and the sigmoid flexure are thus gone over.

2. (a) *Intended especially for the Liver and the Colon Ascendens.*—The hand is laid flat upon the belly,—almost at right angles to its arm,—the heel of the hand in the right inguinal region, and the fingers extending obliquely upward toward the navel.

The palm of the hand, especially the ball of the thumb and of the little finger, presses down more deeply and more forcibly, whilst the fingers lay on but lightly and

make no pressure at all. The ulnar border of the hand is pressed down deeper than the radial, so that in this direction also the hand has a somewhat oblique position. This is done so as to force the liver from below between the hand and the diaphragm, and thus exercise a moderate pressure upon it. The hand now makes a circular movement, as indicated in the cut, upward and outward until it comes in contact with the border of the costal arch. Here it makes a small turn, whereby the arm of the



FOR COLON, LIVER, AND GALL BLADDER.

operator is somewhat abducted from his body. The hand then travels to the left over the epigastrium along the lower boundary of the costal arch and over the left colic flexure on to the descending colon, and down until its ulnar border touches the left anterior superior spine of the ilium. It is now carried down along the sigmoid flexure, downward and inward, and directly across the region of the bladder—the elbow joint and arm of the operator approaching his body—to the point of beginning.

In making this manipulation, the wrist is held rather fixed, the movement being more of the elbow and shoulder joints. Placed thus, a fair amount of force may be used in the manipulation without undue fatigue to the operator.

In making the manipulation, avoid coming into forcible contact with the bony processes, the anterior superior spines of the ilium and the lower borders of the tenth ribs, otherwise considerable pain may be caused.

The effects of this manœuvre are directed principally to the colon ascendens, the liver, the gall bladder, somewhat to the transverse colon, and, when practised as described here, the descending colon, the sigmoid flexure, and the lower section of the small bowels are also acted upon. It finds its main indication in hepatic disease¹ and in constipation due to such.

As almost all cases of habitual constipation are attended with some torpidity of the liver, I generally employ it, but only the first part of the manœuvre, that which acts upon the ascending colon, the liver, and the gall bladder; the second part of this manipulation, *i.e.* that from the epigastrium to the left, I omit, preferring other movements of greater efficiency so far as these parts are concerned.

3. *Manipulation for the Whole Large Bowel; Transfer Movement.* — (a) The operator places himself so that he faces the feet of the patient. The right hand is laid flat on the right inguinal region over the cæcum, with the heel of the hand toward the costal arch and the fingers pointing toward the thigh. The left hand is so placed

¹ Reibmayer, *loc. cit.*

that its bent fingers rest upon the second phalanges of the right hand.

This is done so as to increase the depth of the pressure. The fingers of the right hand are made to dip in *gradatim*, so that the deepest pressure is made with the tips of the fingers. The hand is now drawn up towards the costal arch, over the cæcum and colon ascendens as well as over the right colic flexure or the region where it



FOR CÆCUM AND COLON ASCENDENS. (R.)

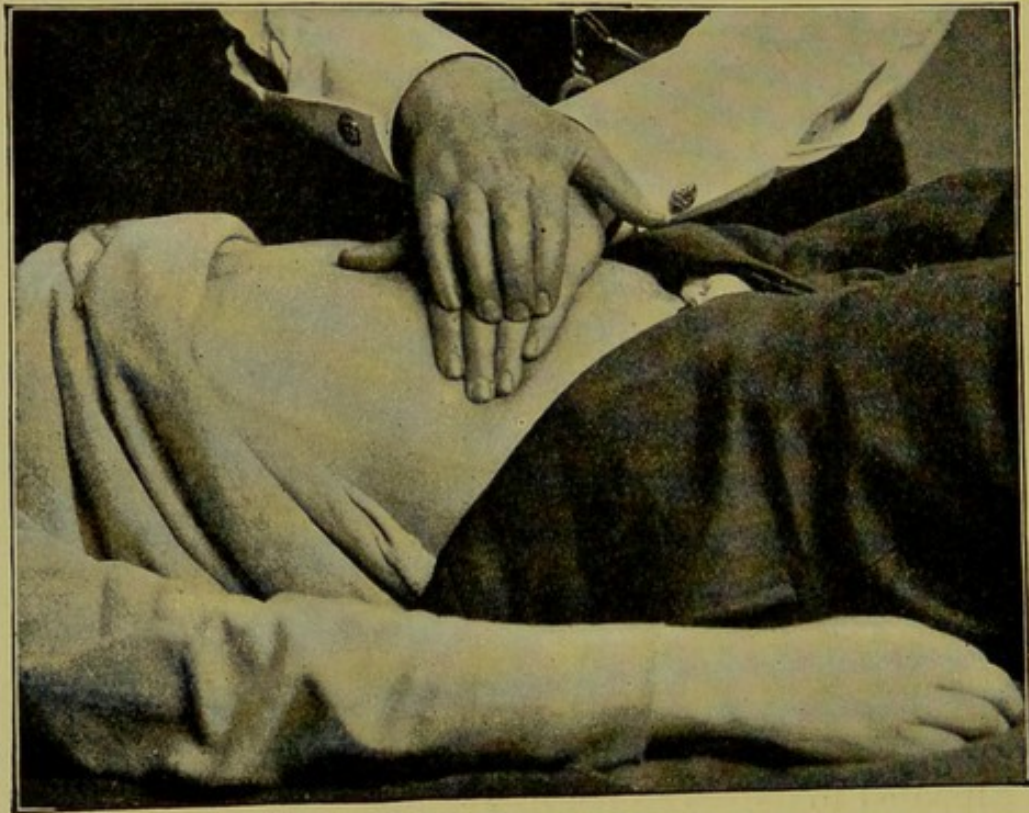
is supposed to lie. The hands are then removed, replaced at the point of beginning, and the manœuvre repeated a second and a third time.

(b) The operator now turns around face to face with the patient (to the right of him — or, what I regard as a more convenient position, wherein greater effectiveness can be obtained, on the left side of the patient), and placing his hands in the manner already described, with the tips of the fingers about the region of the right colic

flexure or beginning of the transverse colon, he carries them over the transverse colon, the left colic flexure, and the beginning of the descending colon.

Repeated three or four times.

(c) The physician again on the right of the patient, face to face with him. The right hand is placed over the descending colon with the tips of the fingers touching the



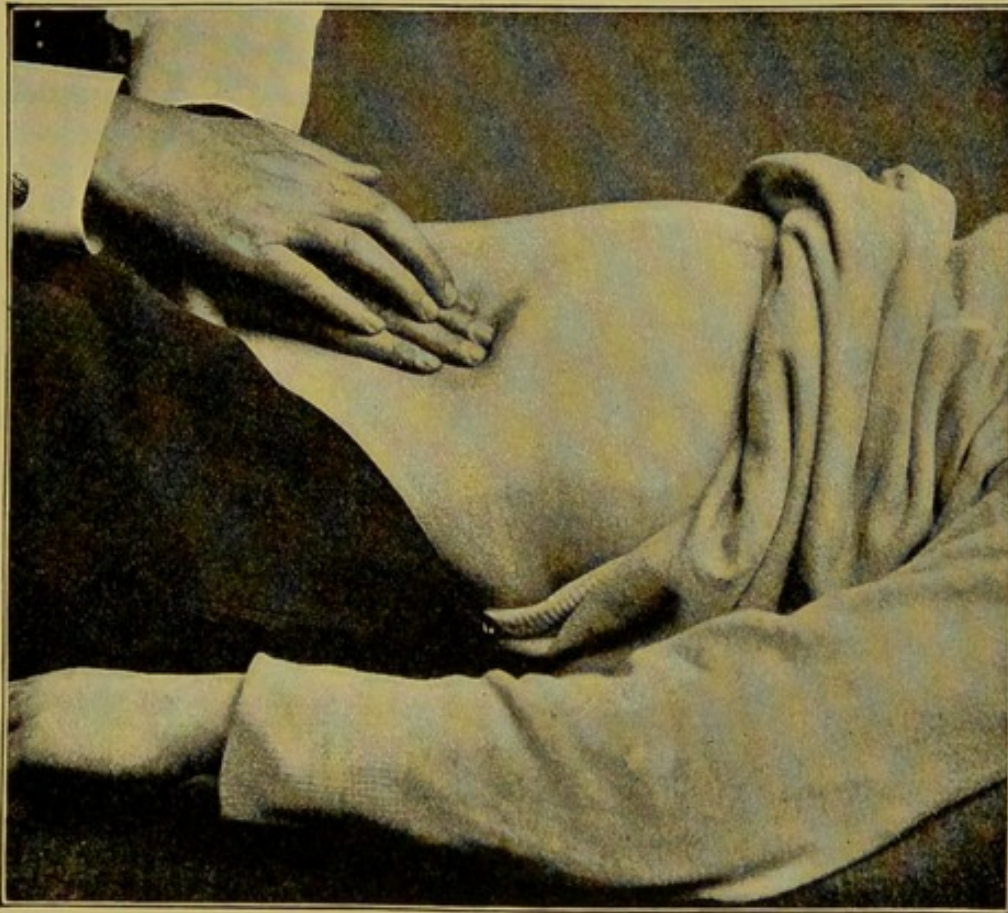
FOR THE TRANSVERSE COLON.

left half of the costal arch. The left hand is placed upon the right in the manner already described in (a), and the same manœuvre carried out from above downward over the descending colon and the sigmoid flexure. About the brim of the true pelvis, at the symphysis pubis, the fingers are pressed in still deeper so as to press upon the annulus of the rectum.

This is repeated three or four times.

The object or purpose of this manipulation is to hasten the carriage forward of the matters that have been broken up by the manipulation previously described.

In cases in which it is difficult to execute this manoeuvre over the transverse colon with the four fingers as de-

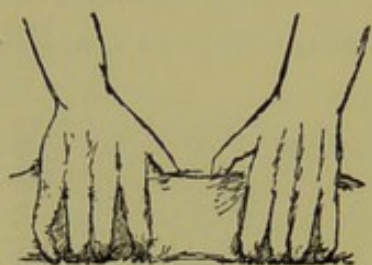


FOR THE DESCENDING COLON AND SIGMOID FLEXURE.

scribed, and this may happen, more particularly, in men with very heavy abdominal parietes, it can be made with two fingers only (the first and the second), reinforced by the same fingers of the other hand; or it can be made with the thumb alone, as in children, considerable force being used. (See Part II., "Massage.")

4. *Petrissage of Different Portions of the Large Bowel.*¹

—(a) This manipulation is made by sinking the hands down deeply into the abdomen of the patient and grasping, successively, diverse parts of the large bowel, beginning with the cæcum, and rolling and kneading them between the thumb and four fingers.



(Le M.)

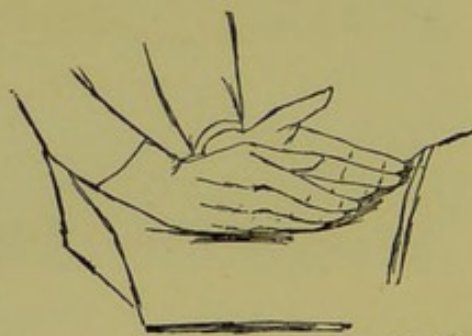
To act upon the cæcum and ascending colon, the operator stands to the left of the patient, so that the four fingers shall be on the outer,

and the thumb on the inner, side.

For the descending colon the operator places himself to the right of the patient.

This movement is rather difficult of execution, especially for novices, sometimes even for experienced masseurs, as in cases where there is a marked panniculus adiposus, or where the patients will persist in keeping the abdominal walls tense.

Under these circumstances it may be carried out in this wise: The ulnar borders of the two hands are sunk down deeply into the abdomen, one on the outer and the other on the inner side of the gut, so as to get it between the two palms between which it is then rolled and kneaded.



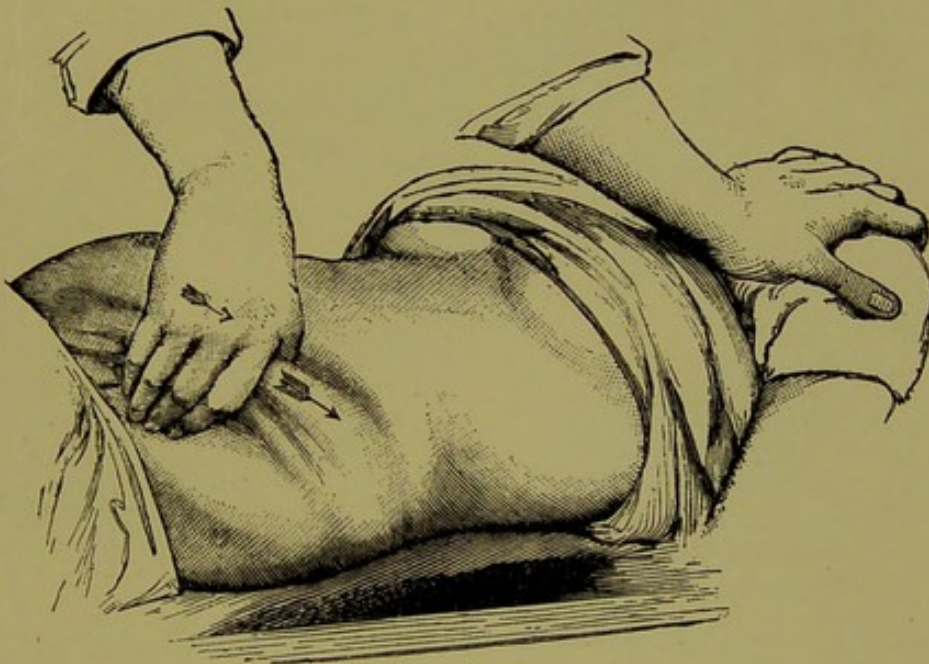
(Le M.)

(b) I make the movement in this way: The flat hand is placed over the section of the gut to be kneaded; then

¹ Le Marinel, loc. cit.

the four fingers on one side and the abducted thumb on the other are sunk down into the abdomen, gradually deeper and deeper, until the gut is seized; it is then rolled and kneaded very gently between the fingers and the thumb.

As to how to get hold of the various portions of the large bowel, this has already been set forth fully in the chapter on "Diagnosis."

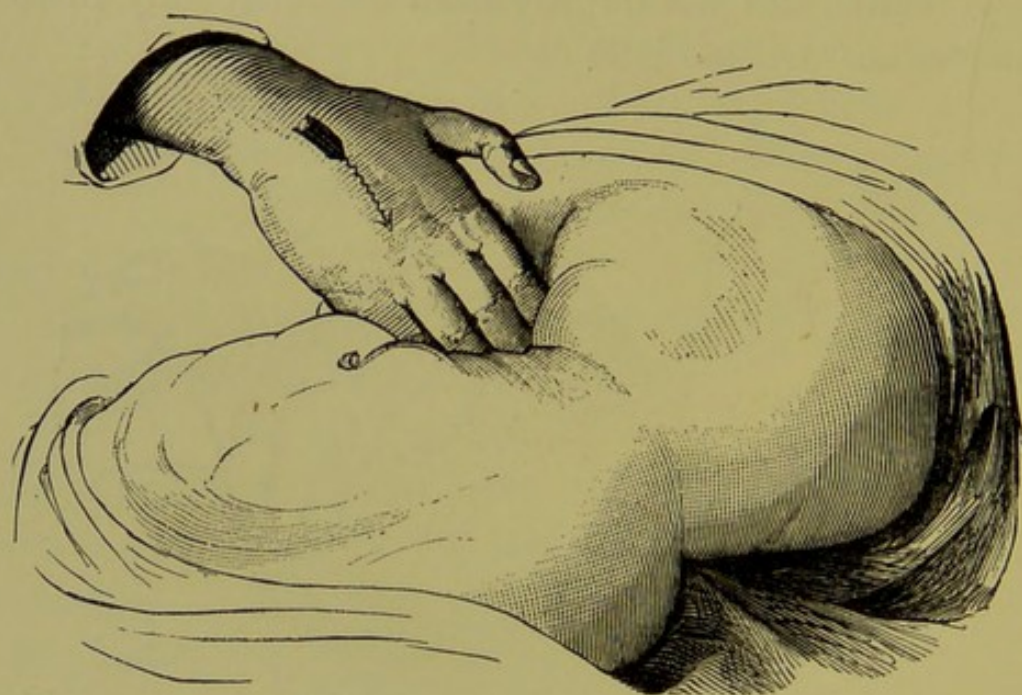


KNEADING AND RAISING OF SIGMOID FLEXURE. (R.)

D. Manipulation addressed to Nerve Centres. Vibration of the solar plexus.—Vibrations and the technique of their production have been already described. They are employed more especially in the treatment of nervous ailments, after the manner devised by Kellgren.¹ In the treatment of habitual constipation, the only manipulation made coming under this head is vibration of the solar plexus.

¹ Loc. cit., "Nerve Vibrations."

The *solar plexus* lies in front of the abdominal aorta, about the middle of a line drawn from the xiphoid cartilage to the umbilicus. The tips of the four fingers, extended or slightly flexed at the knuckles, are placed upon this line, and about this point, are pressed in deeply, and the vibratory manœuvre carried out.



VIBRATION OF SOLAR PLEXUS. (R.)

E. Closing Manipulations; Manipulations addressed to all the Abdominal Organs. — Abdominal massage is closed with a series of manipulations described as “tapotement” (percussion), the varieties of which have already been named. These manœuvres are based upon certain physiological investigations of Golz,¹ and are believed to effect in a manner, directly or reflexly, all the abdominal organs.

¹ (Klopfversuche) Beiträge zur Lehre von den Funktionen der Nervencentren des Frosches, Berlin, A. Hirschwald, 1867.

It is very evident, therefore, that movements of such gravity must be carefully made, and in such a way that no possible injury can result therefrom. The gravity of a blow upon the abdomen, and the serious consequences that might result from one badly administered, must be constantly borne in mind. In fact, it can be formulated, as a rule, as has already been said, that force — brute force — has no part in the manipulations of abdominal



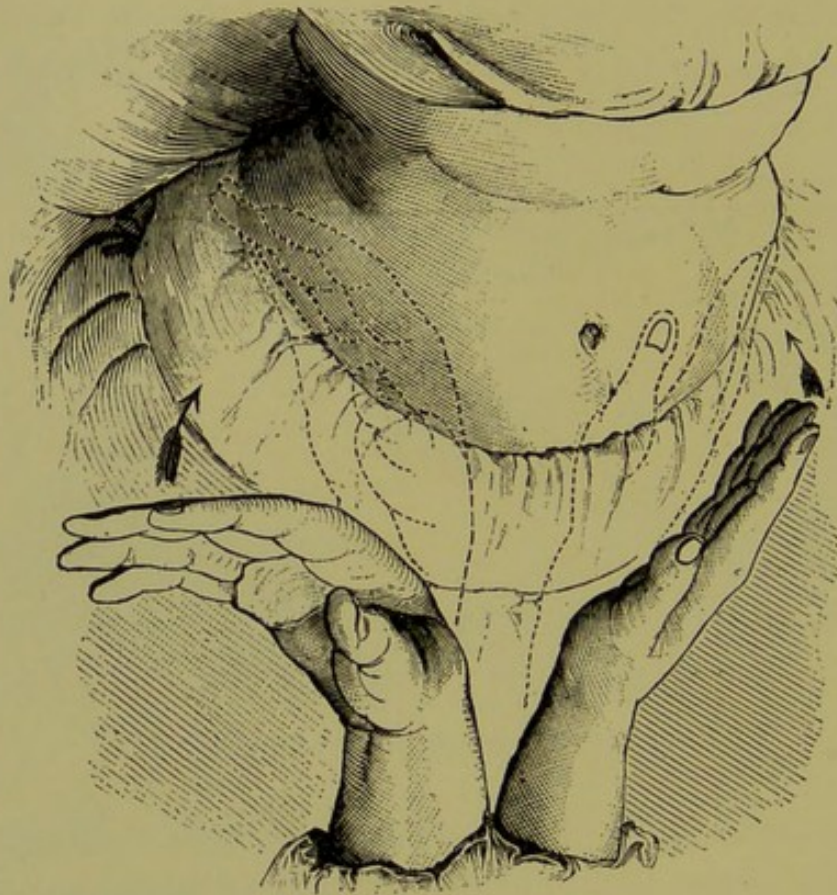
HACKING OF THE BELLY. (R.)

massage, and that the operator who causes his patient pain has yet to learn the rudiments of his art.

Tapotement. — The manipulations are made with the abdomen drawn tense, always.

1. *Hacking (Hachure).* — This is a manœuvre the execution of which requires some skill. It is made in this way: The fingers of the hand are separated from each other, and the hand, hanging loosely as it were in the wrist joint, is allowed to fall on the abdomen (the walls of which had been previously contracted), but in such a

way that only the ulnar surface of the little finger, phalanges and small portion of adjoining metacarpal bone, are allowed to come in contact with it. The fingers in falling close together like the leaves of a fan. The blow thus struck is elastic and painless. Some also allow the



CLAPPING OF THE BELLY. (R.)

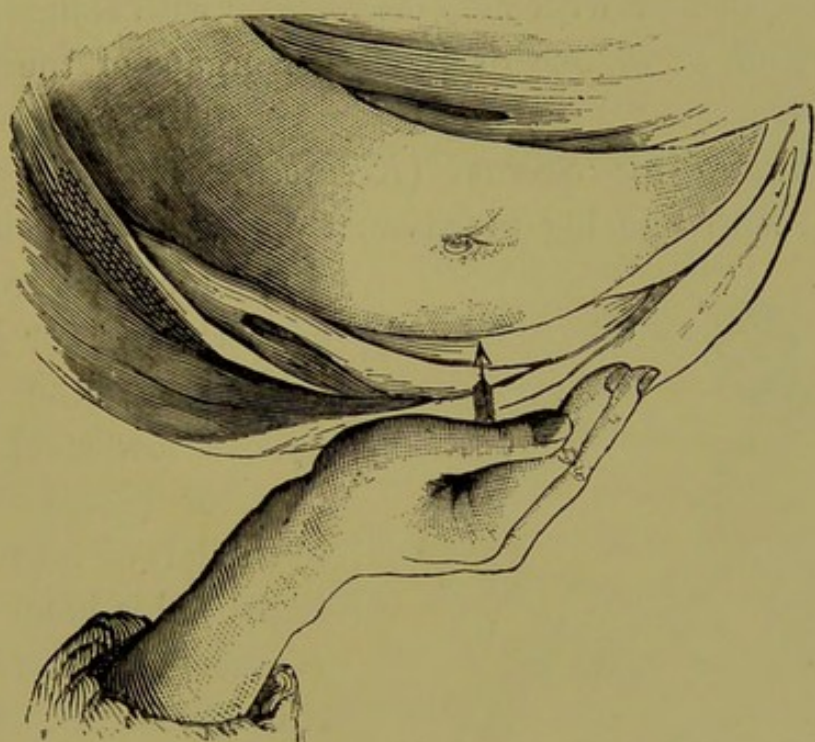
ulnar surface of the ring finger to come in contact with the belly, making thus two blows struck in rapid succession. Both hands are used in this manipulation, and they move in opposite directions, the one falling whilst the other rises.

2. *Clapping*. — Clapping is executed with the flat hand

(hand fully extended), with the palmar¹ or dorsal surface,² according to the effect desired to be obtained.

When the dorsal surface of the hand is employed, it is with the dorsal surface of the two last phalanges of the fingers only that the movement is executed.

Where we desire the action to be very mild, the manipulation can be made in this way: The hand is hollowed so



TAPOTEMENT À L'AIR COMPRIMÉ. (R.)

that it holds within its boundaries a certain volume of air. As it descends upon the belly, this volume of air in the falling hand becomes compressed, and when the belly is struck, it is rather by this cushion of compressed air than by the hand. This is known as "tapotement à l'air comprimé," percussion by means of compressed air.

¹ Made in this way, it is said to have a calming effect. Georges Berne, loc. cit.

² Exciting, stimulating effect, like *hacking*.

3. *Beating of the Belly.*—When percussion is made with the fingers drawn into the palm of the hand, so as to almost make a fist, but still hollow, a sort of air-cushion between the palm and the palmar surface of the fingers, it is called beating. Not much employed.

The following movement comes into use, in so far as we are here concerned, only in cases of habitual constipation complicated with hæmorrhoids or with congestion of the rectum, or of one or the other organs of the female genital tract.

4. *Beating the Sacrum (Kreuzbein Klopfung).*—The patient, with one leg in advance of the other, bends the



BEATING OF THE SACRUM. (R.)

body far forward, and supports him- or herself by resting the hands upon a low stool. The operator places himself to the left of his patient, clenches his hand in the manner just described in No. 3, and allows it to fall upon the sacrum. As it comes in contact with the latter, the air-cushion is displaced and the hand firmly closed. Carried out in this way,

the blow is more elastic and much less painful. Though essentially a movement of the forearm, still the wrist must not be immobilized, but must participate in the motion. The beating is done in a circular direction. This ma-

nœuvre, introduced by Brandt, is said to have a powerful resorbent, antiphlogistic action.¹

It will of course be readily understood that all the manipulations here described are not needed in all cases. Thus, where the abdominal muscles are not relaxed, as in the young and in many males, the manœuvres designed for the abdominal parietes, group *A*, can certainly be omitted. Again, in cases where there is but moderate relaxation of the abdominal walls, some only of these manipulations will be necessary, whilst the others may be omitted. Moreover, all masseurs or operators adopt a certain limited number of manipulations which they make by preference and in the execution of which they acquire great skill.

However, the physician — and I hold that massage is as much his province as the setting of a fracture or the application of electricity — should familiarize himself with most, and if possible all, of the manipulations here described, and be prepared to make them. This for the reason that my experience, limited somewhat though it be, has demonstrated to me that with massage, just as with medicines, in chronic cases a change from time to time in form and mode of administration is of the greatest advantage. The system becomes as readily accustomed to certain manipulations, and does not react to them as energetically any more, as it does to certain drugs.

I schedule my manipulations about as follows :

Case 1. No special relaxation of abdominal walls.

First Week. *Introductory Effleurage.* — In all cases, whether the manipulations of group *A* are required or not, I make, at the outset of the treatment, a very light introductory effleurage

¹ Reibmayer, loc. cit.

merely to accustom the abdomen to the touch of the operator. It is done in this wise: the abdomen is stroked lightly with the flat of the hand, or rather of the fingers, from the epigastrium to the symphysis pubis, and from the right and left boundaries into the linea alba, a hand being placed on either side. In females with uterine disorders of a congestive character the effleurage is made in accordance with the rule, from the periphery to the centre, *i.e.* from the symphysis to the epigastrium.

Second Week.

Manipulation, Group <i>C</i> , 1, <i>b</i>	Manipulation, Group <i>C</i> , 1, <i>b</i>
Manipulation, Group <i>C</i> , 2	Manipulation, Group <i>C</i> , 2
Manipulation, Group <i>C</i> , 3, <i>a, b, c</i>	Manipulation, Group <i>C</i> , 3, <i>a, b, c</i>
Manipulation, Group <i>B</i> , 2	Manipulation, Group <i>C</i> , 4
Manipulation, Group <i>D</i> , 1	Manipulation, Group <i>E</i> , 2
Manipulation, Group <i>E</i> , 1	

Case 2. Considerable relaxation of the abdominal walls.

First Week. Introductory

Effleurage.

Manipulation, Group <i>A</i> , 3, <i>a</i>
Manipulation, Group <i>A</i> , 4
Manipulation, Group <i>C</i> , 1, <i>b</i>
Manipulation, Group <i>C</i> , 3, <i>a, b, c</i>
Manipulation, Group <i>B</i> , 2
Manipulation, Group <i>D</i> , 1
Manipulation, Group <i>E</i> , 1

Second Week.

Manipulation, Group <i>A</i> , 1
Manipulation, Group <i>A</i> , 3, <i>a, c</i>
Manipulation, Group <i>A</i> , 4
Manipulation, Group <i>C</i> , 1, <i>b</i>
Manipulation, Group <i>C</i> , 2, <i>a</i>
Manipulation, Group <i>C</i> , 3
Manipulation, Group <i>C</i> , 4
Manipulation, Group <i>E</i> , 2

Case 3. Pendulous belly.

First Week. Introductory

Effleurage.

Manipulation, Group <i>A</i> , 3, <i>c</i>
Manipulation, Group <i>A</i> , 4
Manipulation, Group <i>A</i> , 1
Manipulation, Group <i>C</i> , 1, <i>b</i>
Manipulation, Group <i>C</i> , 3, <i>a, b, c</i>
Manipulation, Group <i>B</i> , 2
Manipulation, Group <i>D</i> , 1
Manipulation, Group <i>E</i> , 1

Second Week.

Manipulation, Group <i>A</i> , 1
Manipulation, Group <i>A</i> , 3, <i>a</i>
Manipulation, Group <i>A</i> , 2
Manipulation, Group <i>C</i> , 1, <i>b</i>
Manipulation, Group <i>C</i> , 2
Manipulation, Group <i>C</i> , 3, <i>a, b, c</i>
Manipulation, Group <i>C</i> , 4
Manipulation, Group <i>E</i> , 2

These schedules are used alternately, one week the one and the following week the other, and thus on throughout the whole period of treatment. It is of course understood that the requisite changes are made in the programme whenever the necessity therefor arises; *e.g.* we will omit the more powerful manipulations, when from indiscretions on the part of the patient colicky or spasmodic conditions accidentally supervene, and confine ourselves to the mild and soothing effleurage movements.

Frequency of Treatment. — The patient should have no less than three treatments per week, — every other day is better, — and this with the greatest regularity.

Usually in a very short time after the inauguration of the massage treatment, sometimes after two or three sittings, and in rare instances already after the first, the bowels will begin to move regularly every day, and patients may feel inclined to lessen the number of sittings per week. Still, as the stools are as yet hard and scibalous and insufficient in quantity, and as relapse readily occurs, the physician should insist most strenuously upon three sittings per week as an absolute necessity. Only when the stools have again resumed their normal form and are of sufficient quantity can the number of sittings per week be lessened.

One treatment per week or an occasional treatment cannot give any satisfaction, either to physician or patient.

Duration of Treatment. — Under very favorable conditions six weeks may suffice, and the bowels, then functioning normally, will continue to gain in strength and vigor from their own physiological action. Under other conditions three months may be required, and this is about

the average period. This is also the experience of Le Marinel.¹ It may even take longer. The dictum of that eminent clinician Nothnagel is, "Continue until success is achieved, even if it takes months and months."²

Mode of Cessation. — I believe, and I carry this doctrine into practice, that the cessation of massage should be gradual. The rationale thereof can be readily understood; we have so many analogous instances in medicine, and it was so essential a principle with the older physician, that details as to the why and wherefore are not necessary here. When the patient has had three sittings per week, or every other day regularly for six weeks or any other period, and the bowels are acting regularly and normally, we reduce the number to two, then to one sitting, per week, and lastly to one in two weeks. We reduce the number of manipulations, omitting gradually the more powerful ones. Then the patient can be discharged. In this way we fortify the good results already obtained, guard against relapses, and keep our patient under observation for a sufficient length of time to be fully assured as to the outcome of our treatment.

* * * * *

Instrumental Massage. — It has been suggested, and no doubt from pecuniary considerations and from reasons of delicacy, as where the operator is other than a physician, that mechanical appliances be used for the carrying out of massage treatment. Sahli³ has suggested the use of a

¹ Loc. cit.

² *Wiener medizinische Presse*, loc cit.

³ "Ueber Massage des Unterleibs mittelst Eisenkugeln," *Correspondenzblatt Schweizer Aerzte*, XVII. 19, 1886.

three- or five-pound old-fashioned cannon-ball covered with chamois-skin. This is to be rolled over the tract of the whole large bowel by the patient himself, either before rising in the morning or on retiring at night, or at both times. Dr. Ach. Rose has claimed some success with this method.¹

Dr. S. Feilchenfeld² has employed steady pressure in the treatment of constipation, with meteorism and atony of the intestine. He has made for this purpose a cushion containing three to four pounds of shot, which by means of thin layers of cotton-wool are divided into equal and even layers, and the whole then thoroughly quilted through. The cushion is made in the form of the belly, so as to fit it, and to exert, when on, an equable pressure upon it. By means of bands or tapes it can be tied to the body, and thus kept in position.

It can be applied in the morning before rising, or at night on retiring; in a few cases he has allowed it to remain on all night; usually, however, an application of one-half to one hour has sufficed to call forth a regular stool.

He has obtained good results with it also in hæmorrhoidal troubles.

Dr. Arthur Kahn³ has invented an apparatus for self-massage which is highly spoken of.

This instrument is intended for the purposes of general massage, and not for that of the abdomen alone.

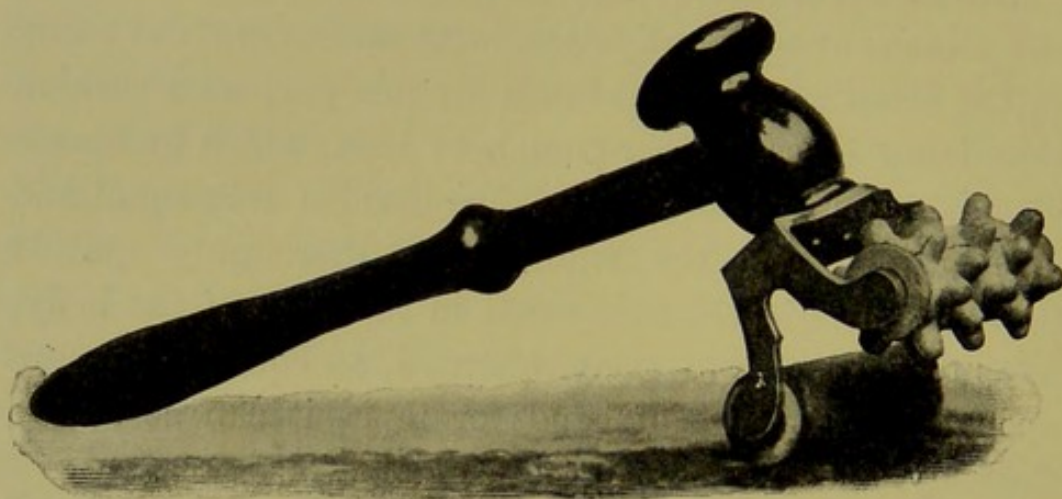
As far as my own experience goes, I must say, referring

¹ *New Yorker medic. Monatschrift*, January, 1893.

² *Deutsch. medic. Zeitung*, No. 75, 1891.

³ *Centralblatt f. Chirurg. u. Orthop. Mechanik*, Berlin, 1889, V., p. 4, and personal communication.

here to abdominal massage only, that the mechanical appliances cannot replace the hand of the skilled operator, and especially if that operator be a physician. However, this much must be admitted, that whenever patients cannot, for any reason whatsoever, avail themselves of the services of a masseur, instrumental massage is the



KAHN'S ROLLER.

best and only substitute. Likewise when patients cannot have the treatment at the hands of a masseur with sufficient frequency, the use of appliances (and those described here I hold to be the best) in the interval will add materially to the efficacy of the infrequent manipulations of the physician.

CHAPTER XVII

TREATMENT OF CONSTIPATION DUE TO ATONY (*Continued*)

Massage (*continued*); **Swedish Movements.** *Kinesipathy* (*Heilgymnastik*).— A branch of massage, and a not unimportant one, is kinesipathy, or the Swedish movement cure, so specially designated because it was in Sweden where the system received its greatest elaboration and found its most general application.

It is maintained by some that kinesipathy is a necessary complement of massage, and must always follow it, and that massage alone is not very effective. Without at all disputing the value of these exercises, especially for those morbid conditions that pertain to the domain of orthopædics as has been set forth by Bush,¹ I must say that so far as constipation is concerned I prefer that, whenever possible, the patient shall take exercise in the manner described in Chapter XV., and I think it will be generally admitted that for this purpose such dietetic exercise is amply sufficient, really nothing else equal to it, and that kinesipathy, or medical gymnastics, can then be omitted from the list of measures to be employed.

However, there are instances that come under observation occasionally, where for one reason or another the patient cannot get the requisite dietetic exercise; here

¹ Handbuch der Allgemeinen Therapie, Ziemssen, Bd II, Th. II.

the movement cure will find excellent application, and add to the efficiency of our massage treatment.

As to the physiological action of these movements, the same principles pertain here that have been set forth in the section on exercise in general.

The movements are divided into three great groups:

1. Active movements made by the patient himself without the assistance or interference of another person.

2. Movements against resistance. These movements always require an assistant. The resistance is offered now by the physician (or gymnast), now by the patient.

3. Passive movements, where the patient himself is altogether passive, the movements being made by a second person.

It is generally desirable for the greater ease and comfort of the patient, and the greater facility with which the movements can be made, that a special garb, such as is used in all gymnasiums for the purpose, shall be worn by the patient whilst taking these exercises. (The usual suit of woollen underwear as worn by most men in this country will do very well. For ladies, if they prefer, a loose, sleeveless vest of woollen or thinner material, a pair of drawers, and high stockings will fill all requirements.) It is not, however, indispensable; only, if the ordinary garb be worn, we must see to it that all bands (neck bands, belly bands, garters) be loosened, so that both respiration and circulation shall be perfectly free and unimpeded.

As to the number of movements to be made at each sitting, that is a matter that must be decided for each case individually. The rule laid down for dietetic exer-

cise, namely, that it should never reach the point of fatigue, holds good for medical gymnastics, and we will be governed therefore in our prescriptions by the habit and experience of the patient. We will, as a rule, begin with a smaller number and with weaker movements, and gradually, as the patient becomes accustomed to the exercise, increase the number of the movements or the frequency of repetition of each individual movement, as well as go over to such exercises as require greater force and greater exertion in their execution.

RULES

Begin with the weaker movements, put the more forcible in the middle, and close again with the weaker (about in the order of arrangement of the three groups here).

The resistance movements should alternate with active movements of another part of the body. Thus after every such exercise the patient should take a turn for a minute or two the length of the room, or if the lower part of the body be engaged in the movements under resistance, he can make some of the active arm movements figured here.

With the active and passive movements such pauses are not required.

A gymnastic seance lasts from one-half to one hour.

I. ACTIVE MOVEMENTS

These movements are, as already stated, made by the patient himself by the voluntary exercise of his muscles without the aid or interference of another person, and constitute the essence of what is known as chamber gym-

nastics. They can be made as well at the home of the patients, in the intervals of treatment (by the physician), as in a regularly arranged gymnasium.

Patients must be carefully instructed not to contract the muscles spasmodically in the making of the movements. The movements should be vigorous and regular, and not entail any unnecessary fatigue.

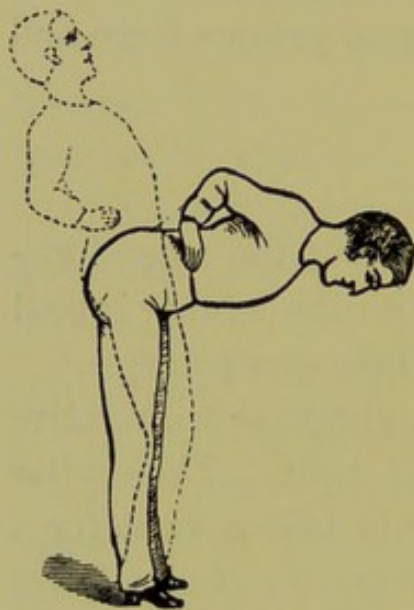


FIG. 1.

Bending of the trunk forward and backward. Five to ten times.

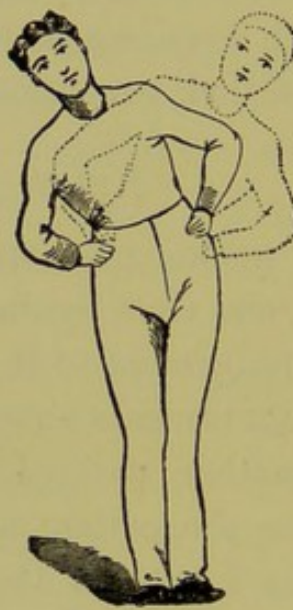


FIG. 2.

Lateral inclination of the trunk. Five to ten times.



FIG. 3.

Rotation of the trunk. Ten to fifteen times.

FIG. 3. The patient, placing himself in the upright position, lower extremities firmly fixed, and with hands upon the thighs, rotates the trunk from right to left and left to right.

FIG. 4. The person, placing himself as described above, rotates the trunk upon the hips from right to left and left to right, so that he shall describe a cone, the circular base of which shall be as extended as the lumbo-sacral articulation will permit. During all the phases of the movement

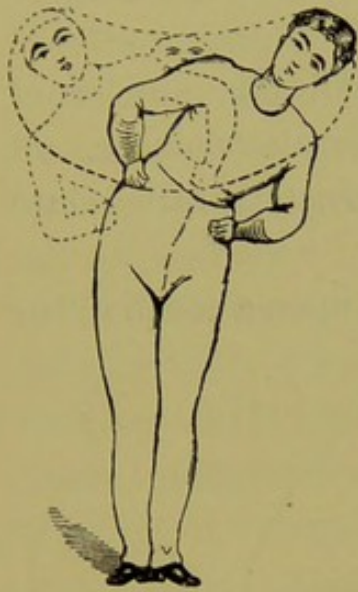


FIG. 4.

Circular movement of the trunk with inclination, to the right and to the left. Three to six times.

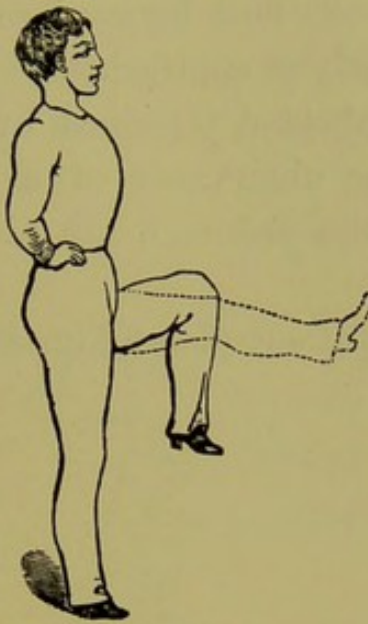


FIG. 5.

Extension and flexion of knee, forward. Five to ten times.

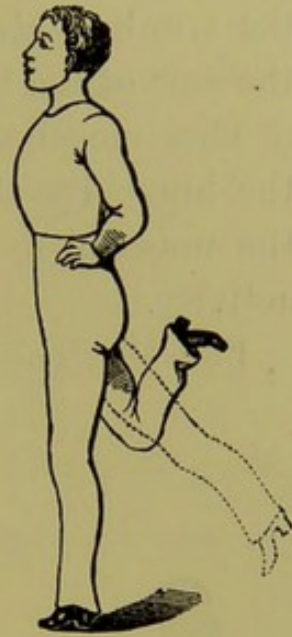


FIG. 6.

Extension and flexion of knee, backward. Five to ten times.



FIG. 7.

Raising the knee as high as possible, anteriorly. Ten to fifteen times.

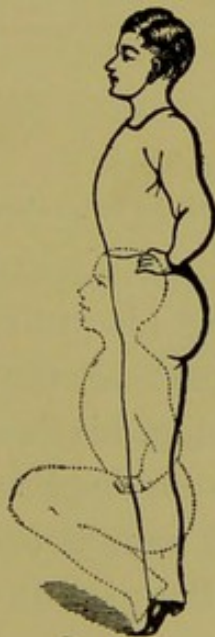


FIG. 8.

Squatting and rising. Three to six times.

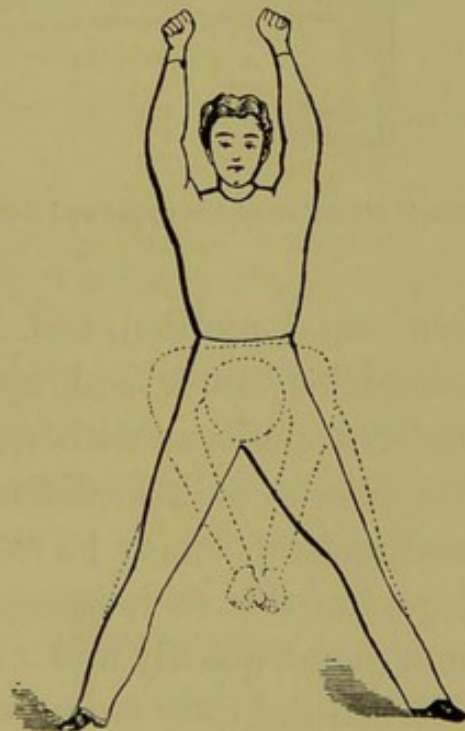


FIG. 9.

Wood-chopping movement. Two to six times.

the trunk is always face forward so that no twisting of the axis of the body is entailed.

This movement is determined by all the muscles of the hip. By the observance of a certain cadence, all the muscles of the abdomen are alternately called into activity.¹

FIG. 10. The patient places himself upon a couch in the

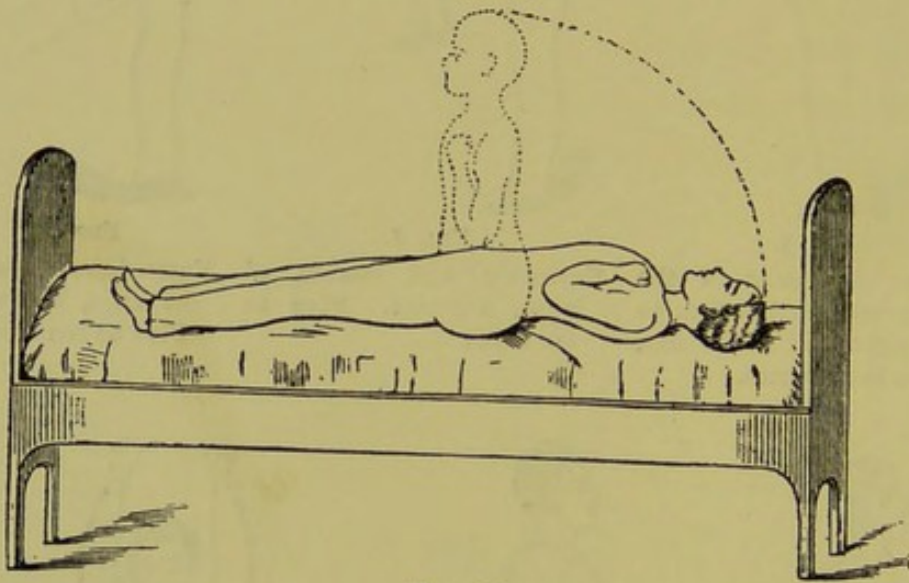


FIG. 10.

Rapid elevation of the upper and lower part of the body, alternately. Four to eight times.

horizontal position, and, folding his arms upon his chest, raises his trunk and upper part of the body into the upright position without moving his lower extremities. It may be a little difficult to accomplish at the outset, and assistance may be required at first to hold down the legs, but this soon passes and the patient can execute the movement quickly and with ease.

Then the body is thrown back upon the couch and the legs are drawn up, the knees flexed upon the thighs, and

¹ Le Marinel, loc. cit.

the thighs upon the pelvis as far as they will go; after holding them a few seconds in this position, they are extended vertically to their full height. Then these are lowered and the trunk raised, and so on, alternately.

The movement of raising the trunk can be made still more difficult by placing the hands beneath the head, or by holding weights

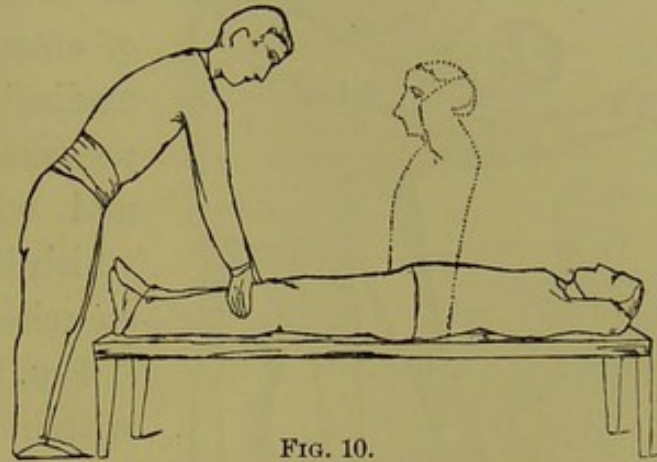


FIG. 10.
Assistant holding down the legs.

or dumb-bells in the hands and holding them near the body.¹

This movement brings into play all the abdominal muscles, and through them (besides by the direct pressure brought to bear) influences all the abdominal organs. It is, therefore, the most important of all the movements that are made.

II. MOVEMENTS AGAINST RESISTANCE

These movements always require the assistance of a second person, a gymnast or a physician. The resistance, made in the course of these movements, is offered, now by the patient, now by the physician. Although a certain amount of force must always be used in the course of these exercises, it must never be so great that the resistance cannot be readily overcome, especially by the patient, so that he shall not be compelled to excessive contraction

¹ Le Marinel, *loc. cit.*

of his muscles by which they will be thrown into a tremor,

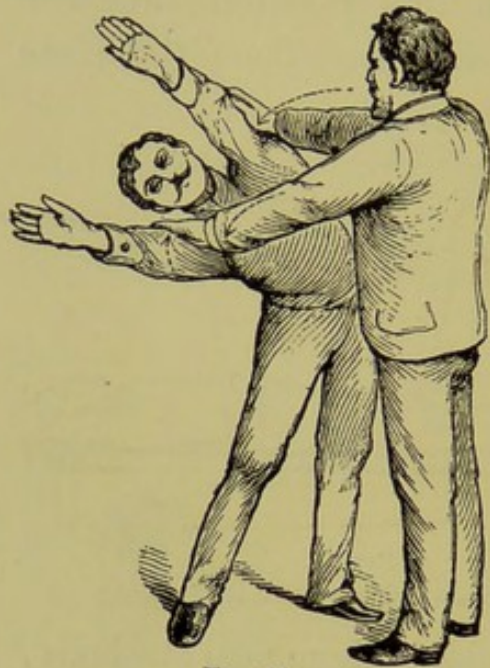


FIG. 11.
Standing spread. Alternating lateral
inclinations.

or that the physician shall be forced to unnecessary and useless exertion. *All trials of strength* are prohibited in medical gymnastics; they prevent that equable and normal contraction of muscle which it is the object of these exercises to effect.¹

FIG. 11. The patient stands with his legs spread apart and raises his arms over his head, so that the volar surfaces of the hands front each other. The physician places himself

before the patient, grasps both his arms about the elbows, and bends the trunk, the *patient resisting*, at first to the right. Then the patient raises his body against the resistance of the physician. Then the movement is made to the left, and so on, alternately, three to five times for each side.

Women can sit whilst making this movement.

FIG. 12. The patient

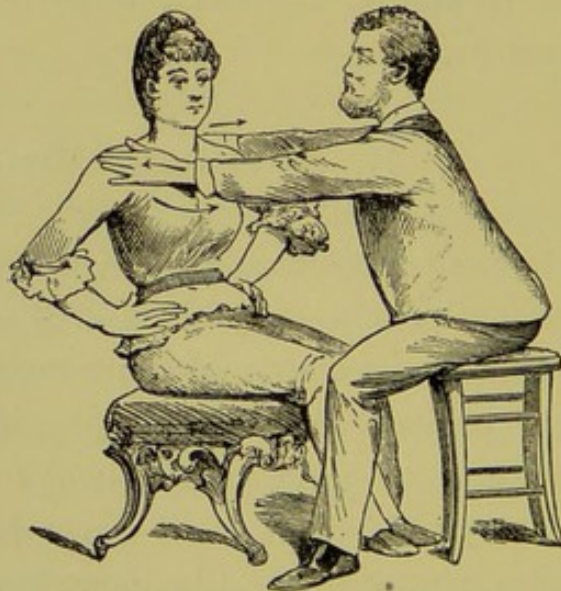


FIG. 12.
Opposite-sitting. Trunk rotation.

¹ Reibmayer, Die Unterleibs-Massage.

sits upon a chair or ottoman or stool, with knees brought together and the arms akimbo, with the hands resting upon the hips. The physician sits opposite, facing the patient; places his hands upon the latter's shoulders, and rotates the trunk, the *patient resisting*, to the right. Then the patient brings it back against the resistance of the physician to the initial position. The movement is then made to the left. Three times to each side.

FIG. 13. The patient places himself in a riding posture upon a high bench, and lays his head upon the left arm of the physician, who is behind him. The physician passes his left arm underneath the left arm of the patient, from before backward, allowing his hand to rest upon the patient's back. The right hand is pushed through from underneath the patient's right axilla, curves upward and forward so that the fingers come to lie upon the patient's shoulder.

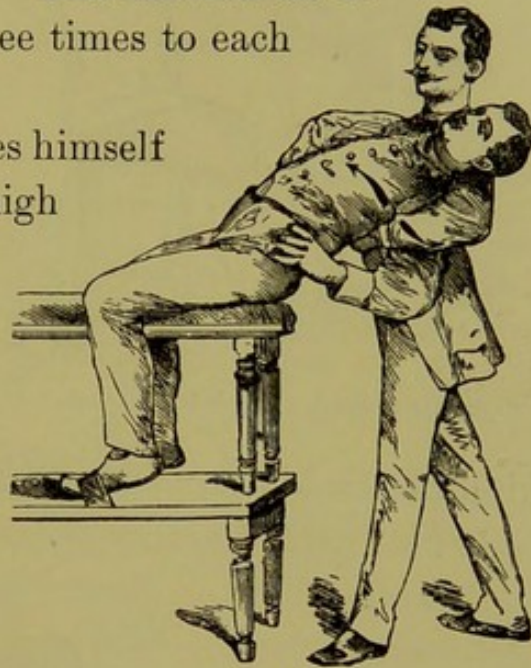


FIG. 13.
Riding position. Trunk rotation.

The physician now rotates the trunk toward the left, the *patient resisting*. The patient then brings his body back to the initial position, the physician offering the resistance. In making the rotations to the right, the physician changes the position of his hands, the right assuming that of the left, and the left that of the right.

FIG. 14. The patient sits with closed knees upon a chair or stool with the hands resting upon the hips. The physician sits opposite, facing his patient, places his hands upon the latter's shoulders, and bends the body forward, the *patient resisting*. The patient then straightens up again, the physician offering the resistance.

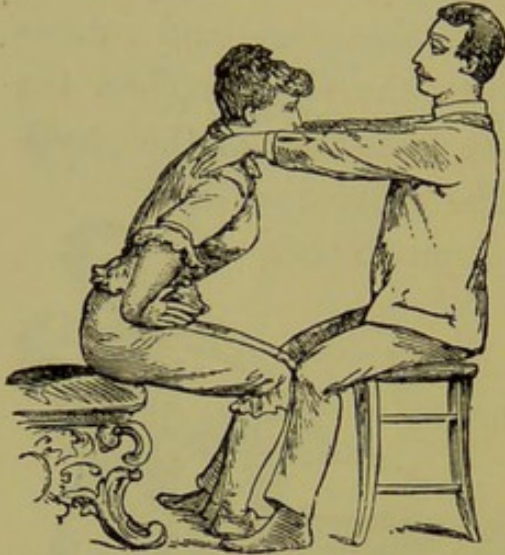


FIG. 14.
Opposite-sitting. Trunk inclination.

FIG. 15. The male patient is placed upon the high bench in riding posture. The physician stands behind him, places his hands upon his shoulders, and bends the body far forward, so that the whole abdomen is very well compressed, the patient making resistance. The patient then brings his body back to the initial position, the physician now resisting.

FIG. 15. The male patient is placed upon the high bench in riding posture. The physician stands behind him, places his hands upon his shoulders, and bends the body far forward, so that the whole abdomen is very well compressed, the patient making resistance. The patient then brings his body back to the initial position, the physician now resisting.

FIG. 16. The patient is placed in the position for abdominal massage, with the flexed

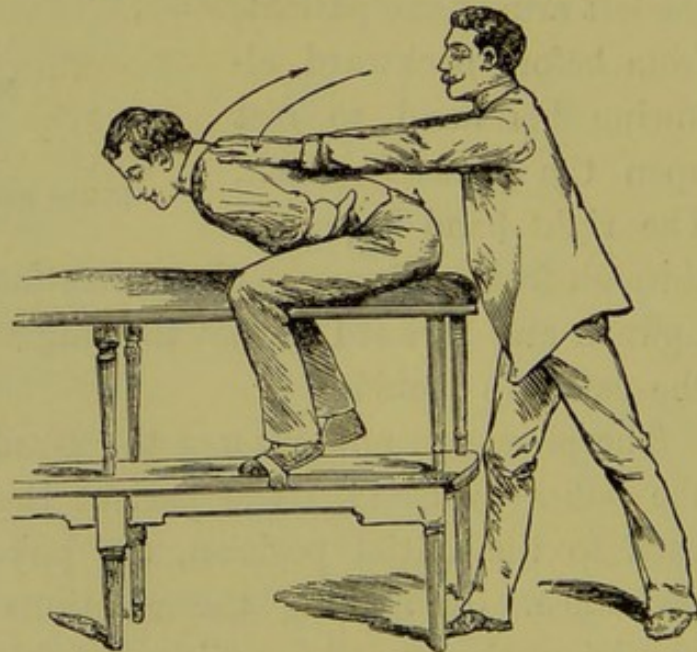


FIG. 15.
Riding posture. Trunk inclination.

FIG. 16. The patient is placed in the position for abdominal massage, with the flexed

knees in close apposition. The physician sits to the left of his patient, places his left hand upon the outer side of the patient's right knee, and the right hand upon the outer side of his or her left knee.

The patient now spreads his knees apart, the *physician resisting*; the left knee, in moving, comes in contact with the physician's left arm, and the right knee with the physician's right arm. This makes the movements more equable



FIG. 16.

Half-lying. Knee separation, with lifting of sacrum.

and less exhausting for the physician. Then the knees are brought together by the physician, the *patient resisting*.

FIG. 17. The patient in the same position as for the previous exercise. The physician, to the left of the patient, places his hands on the inner sides of the latter's knees. He now spreads the knees apart against the resistance of the patient, and the patient brings the knees together against the resistance of the physician.

In *females*, with each of the two movements just described

the patient raises her pelvis till it is almost on the same plane with the head and the knees.

In *males* the elevation of the pelvis is unnecessary (except if atony and prolapse of the rectum be present, then the exercise is made just as in females). The resistance then not being as great, the physician can place himself more to the feet of the patient,

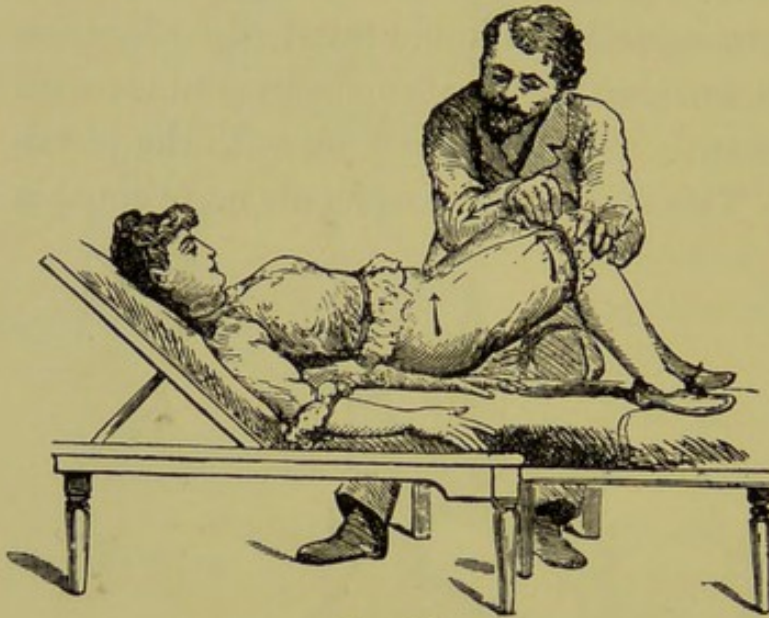
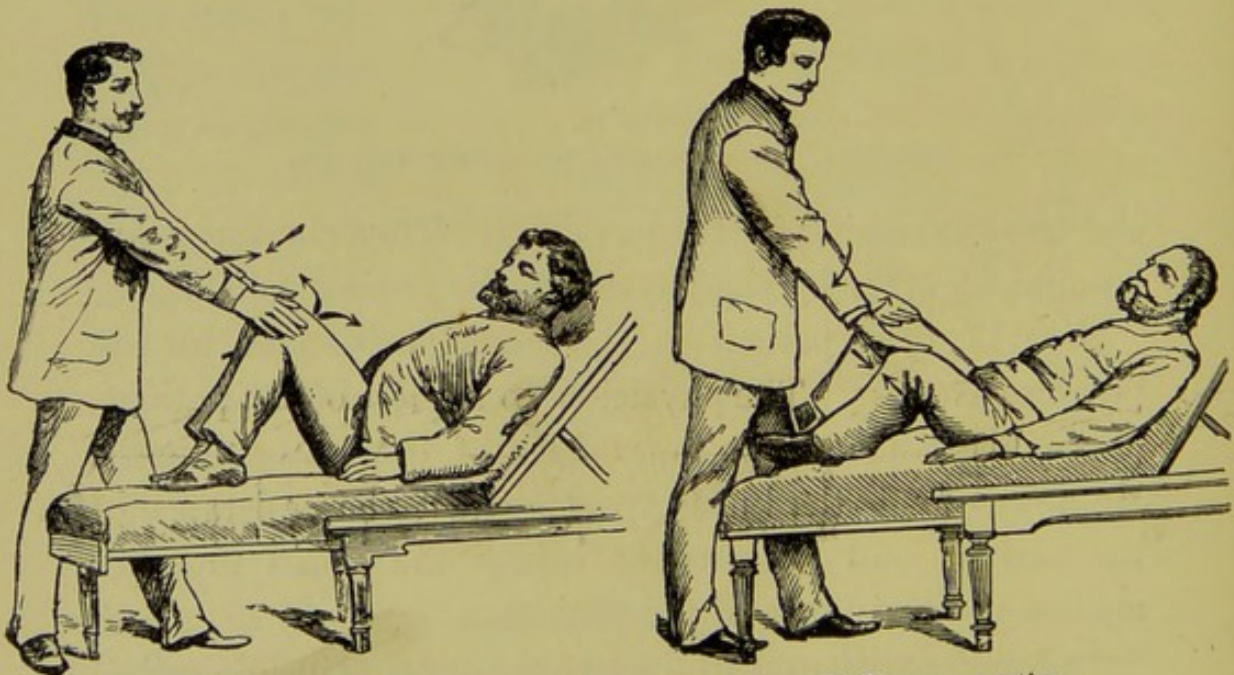


FIG. 17.

Half-lying. Knee closure, with lifting of sacrum.

facing him, as shown in cut.



(a) Knee closure.

(b) Knee separation.

FIG. 18. The patient squats down and holds himself in this position by resting his hands upon the pins of a mast (as in the cut) or upon the back of a chair. The physician, to the right of the patient, places his right hand upon the patient's abdomen and his left upon the back, about the lumbo-sacral junction. The patient, holding his knees firmly together, now raises himself to the full upright position against the resistance of the physician. In raising himself, the patient describes an arc-line, upward and forward, with his pelvis.

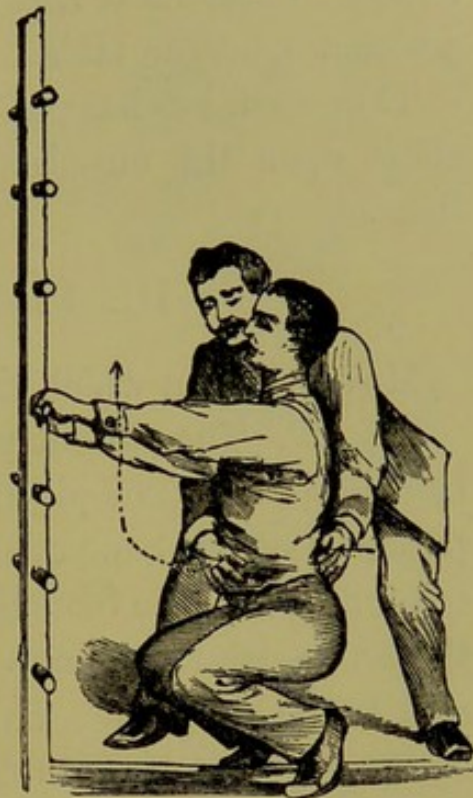


FIG. 18.

Squatting with arc-like rising.

FIG. 19. The patient lies down upon a table, belly downward, but so that only the lower extremities rest upon the table, whilst the rest of the body is free therefrom and entirely unsupported. The feet must be held down upon the table by an assistant, whilst the patient must hold his body out in the horizontal position.

As this movement entails a high degree of tension upon the abdominal muscles, the patient must be assisted at the outset in getting into position. It is done in this wise: The patient kneels upon the table, and after the feet have been fixed down by an assistant, the physician catches the patient with his arms under both axillæ and brings him into the desired posture. He then lets go, allows the

patient to retain this horizontal position for a few seconds, and again placing his hands upon the patient, about the region of the false ribs, brings him back to the kneeling position upon the table.

This exercise has an invigorating and strengthening effect upon the muscles of the belly, the back, and the loins.

III. PASSIVE MOVEMENTS

Movements in which the patient is altogether inactive.

FIG. 20. The patient places himself in the semi-recumbent position. The physician, standing by the side of the patient, lays one hand upon the patient's knee, and with the other he grasps the foot about the metatarsal bones or about the ankle joint, and now makes rapid flexion and extension in the hip joint. This alternate flexion and extension of the hip joint is repeated six or eight times for each leg.

The knee must not be flexed too strongly in making the movement.

FIG. 21. The patient kneels upon an ottoman or cushion. The physician, standing behind, places his hands firmly beneath the patient's axillæ and rotates the trunk with a rather rapid motion (no resistance must be offered by the patient) ten to twelve times. A short pause can be made in the middle of the exercise.

FIG. 22. The patient sits upon a high bench or upon a narrow stool, with his arms akimbo and with the hands upon his hips. The physician or gymnast places himself behind the patient, lays his two hands upon the latter's shoulders, and rolls his trunk, the patient making no resistance at all, three times to the right and thrice to the left. As

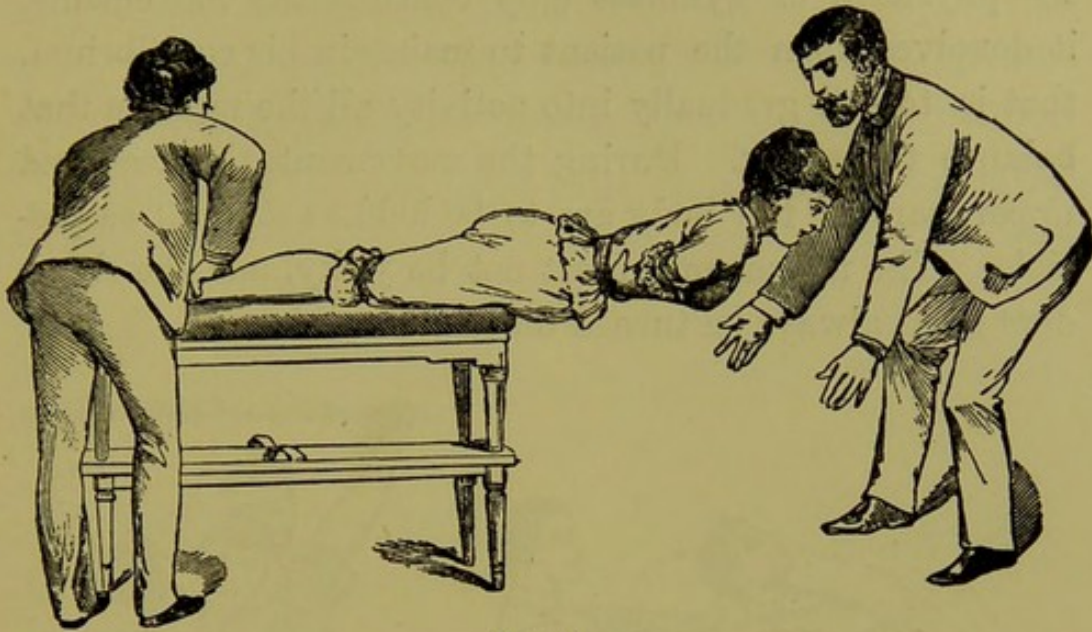


FIG. 19.
Lying over; holding trunk.

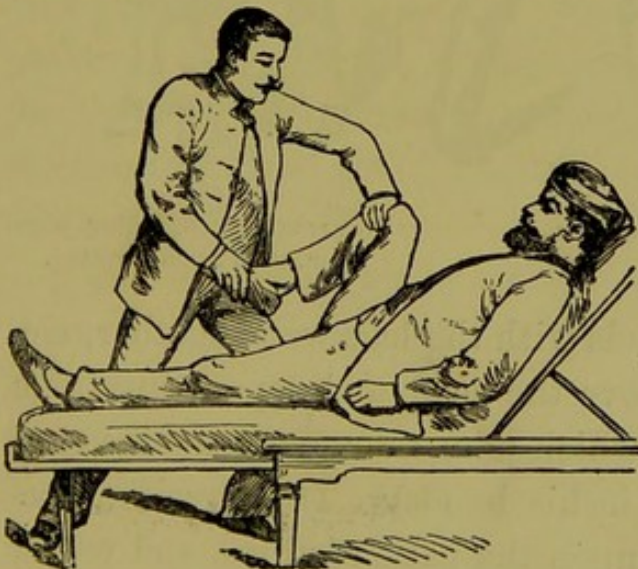


FIG. 20.
Half-lying, thigh-flexing, and pressing down of
knee.



FIG. 21.
Trunk rotation. Kneeling posi-
tion.

the physician or gymnast only controls the movements, it devolves upon the patient to maintain his equilibrium, that is, to call gradually into activity all the muscles that balance the trunk. During the movement, the head and upper part of the body are to be held as straight as possible. The movements must not be jerky, and the shoulders must always be turned on the same plane.



FIG. 22.
Trunk-rolling. Riding position.

FIG. 23.
Hip rotation. Standing position, with arms elevated.

FIG. 23. Patient stands with the legs well together, elevates the arms fully above the head, and, separating them widely, grasps a pole (which hangs down from above, or which is merely placed in his hands). The physician, behind, places his hands upon the patient's hips, and whilst the latter, with feet firmly planted, seeks to maintain the upright position, the physician rotates the pelvis rapidly

around in a circle to the right three to six times and as many times to the left. The patient's pelvic and hip muscles must be as passive as possible during the movement.

In cases of flabby abdominal walls, or even pendulous belly, so often met with in married women, and in the large, full, rounded abdomens indicative of an abundant panniculus adiposus, the movements shown in Fig. 10 of Group I., and that shown in Fig. 20 of Group II., are especially indicated and of the greatest service.

MACHINE MOVEMENT CURE ; MACHINE GYMNASTICS (MASCHINELLE HEILGYMNASTIK)

I. Dr. G. Zander, of Stockholm,¹ invented and perfected a series of machines by which the resistance movements and the passive exercises can be made with but little loss of time. In many of the large cities of Europe, and in one or two in America, special institutions have been established, fitted out with the machines, and operated for the sole purpose of thus treating patients. If such an institution is at hand, the physician, if he so desires, can avail himself thereof, and recommend his patient thereto, for the gymnastic part of the treatment.

It must be stated, however, that, in the opinion of experts in this matter, the machine method has no other advantage over the manual than that of greater facility and greater rapidity in the handling of patients.²

II. When such an institution is not convenient, and when, for any reason whatever, the physician himself cannot give the patient the benefit of the second and

¹ Bush, Reibmayer, loc. cit.

² Reibmayer, loc. cit.

third group of gymnastic exercises, he can avail himself of certain other mechanical devices for resistance exercises which the patient can readily use at his own home.

Such machines are: the rowing apparatus of Sachs (Fig. 24), the rowing apparatus of Ewer (Fig. 25), and the restaurateur of Sachs (Fig. 26).¹

For greater safety, a thick cord of a certain length is run through the rubber tubing of the different Sachs machines, so that in case of a break or tear, the patient will not fall back and do himself injury.

* * * * *

Contra-indications to Massage

When not to practise it. — In all cases where, upon examination, the bowels are found to contain very much indurated fæces, masses of stone-like hardness that cannot be readily broken down with the fingers, massage treatment will not be instituted until the intestinal canal has been thoroughly cleared by means of injections of water, of oil, by means of oil administered freely by mouth, and reinforced by clysters, by means of the scoop, or even of the hand.² Otherwise there is danger of lacerating, or even of perforating, the intestine in the course of the manipulations.

During the menstrual period, the treatment should be intermitted. It should not be resumed till a few days after the cessation of the flow.

In chronic diseases of the female genital tract, as pelvic cellulitis, retro- or peri-uterine hæmatocele, chronic inflammation of the ovary, of the tube, we must refrain from the more forcible, from the more powerful, manipulations, already described. We will confine ourselves

¹ Reibmayer, loc. cit.

² See History, p. 148.

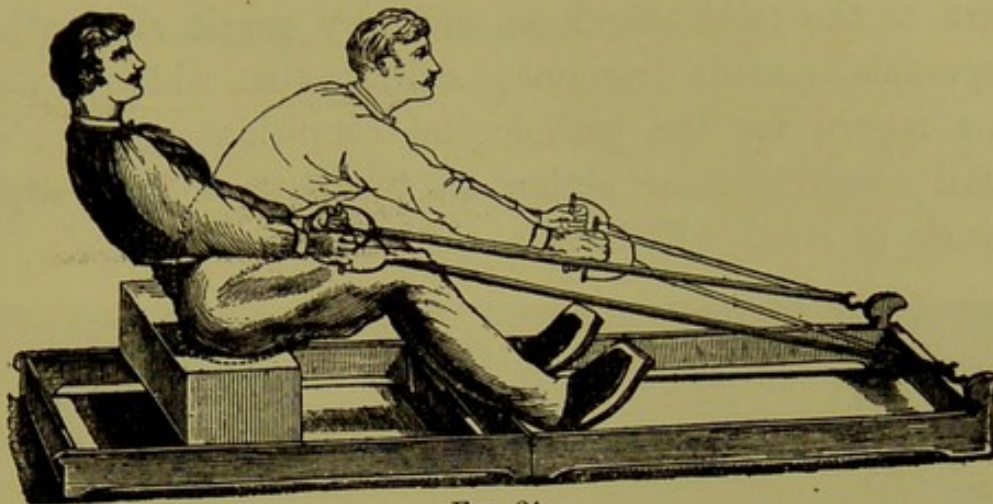


FIG. 24.

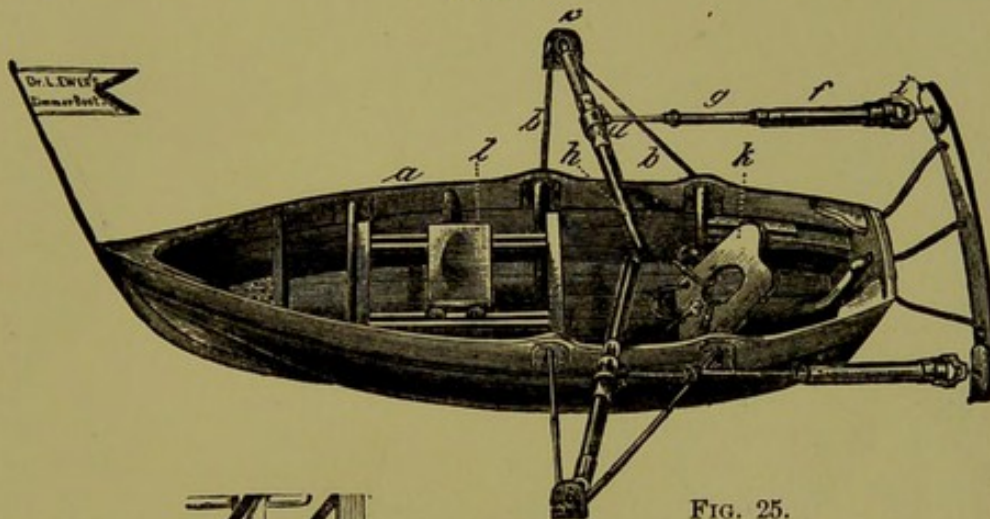


FIG. 25.



a, middle section of the boat; *l*, seat running on a rail; *k*, movable footboard; *h*, rudder that can be carried in any direction by reason of *c*, *d*, *i*, ball and socket joints; *b*, arrangement to hold the rudder firmly. In the brass tube *f*, a piston-rod is worked up and down by the rudder, and to effect its easier return a spiral spring is arranged in the tube *g*.

To make the work accord with the strength of the worker, the following further arrangements have been provided thereon: The centre of motion of the rudder is movable; the nearer it approaches to *c*, the more easily the movements are made. In the tube *f*, at the point *i*, there is a slit which can be entirely closed or kept more or less open by a ring. The larger the opening, the more freely the air can rush in under the piston, and the easier the work will be.

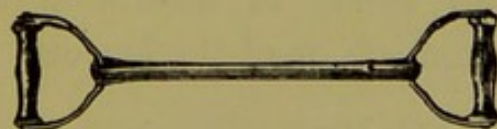
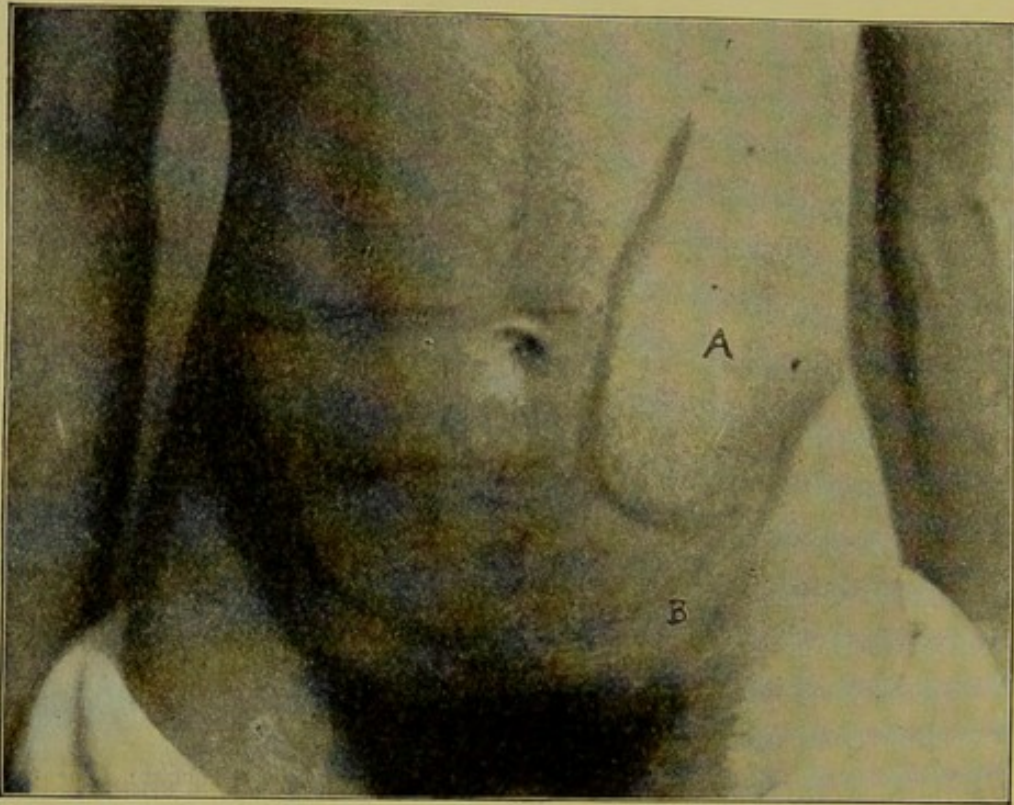


FIG. 26.

a, Movement with Sachs Restaurateur.

b, Goodyear's Pocket Gymnastium.

here to the mild effleurage and very gentle and rather superficially made frictions;¹ still, so, that whilst having due regard for the pathological conditions present, we shall obtain regular action on the part of the bowels, which in itself will have a reflex curative effect.



CASE WITH GREATLY ENLARGED SPLEEN.

A. Outline of Spleen.

B. Line of Massage for Sigmoid Flexure and beginning of Rectum.

For the novice in massage manipulations, pregnancy should constitute an absolute prohibition therefor.

Massage (gymnastics always, of course, included) is to be rejected in all acute inflammations of the intestine, of the peritoneum, or of the intra-abdominal vessels; in all forms of ulceration (round or tubercular) of the stomach or of the bowels; in all cases of tumor (polypus,

¹ See Manipulations, in the section devoted to the Massage of Children.

sarcoma, carcinoma, etc.) within or around the alimentary tract.¹

In a case of greatly enlarged spleen overlying the whole left half of the transverse colon, the left colic flexure, and the larger part of the descending colon, I directed the massage from the cæcum upwards over the transverse colon as far as the right border of the enlarged spleen, making the various manœuvres already described; then the hand was carried over into the left iliac region at the lower border of the spleen, and the sigmoid flexure and the beginning of the rectum were manipulated. The spleen itself and the parts beneath were left untouched.

The result of treatment was all that could be desired.

On Massage and Swedish Movement Cure (Gymnastics)

REIBMAYER. Die Technik der Massage. Die Unterleibs-Massage.

SCHREIBER. Praktische Anleitung zur Behandlung durch Massage und methodische Muskelübung.

BERNE, G. Le Massage. Paris, 1894.

OSTROM, KURRE W. Massage and the Original Swedish Movement Cure. Philadelphia, 1890.

SCHREBER. Aerztliche Zimmergymnastik. Leipzig, 1884 (19th Edition).

FROMM. Zimmergymnastik. Berlin, 1887.

¹ Reibmayer, Die Unterleibs-Massage. Le Marinel, loc. cit.

CHAPTER XVIII

TREATMENT OF CONSTIPATION DUE TO ATONY (*Continued*)

HYDROTHERAPY

THE measures to be considered here, having especial reference to their applicability in the treatment of constipation due to atony, are :

Clysters.

Cold tub-baths.

Douches (showers).

Cold compresses.

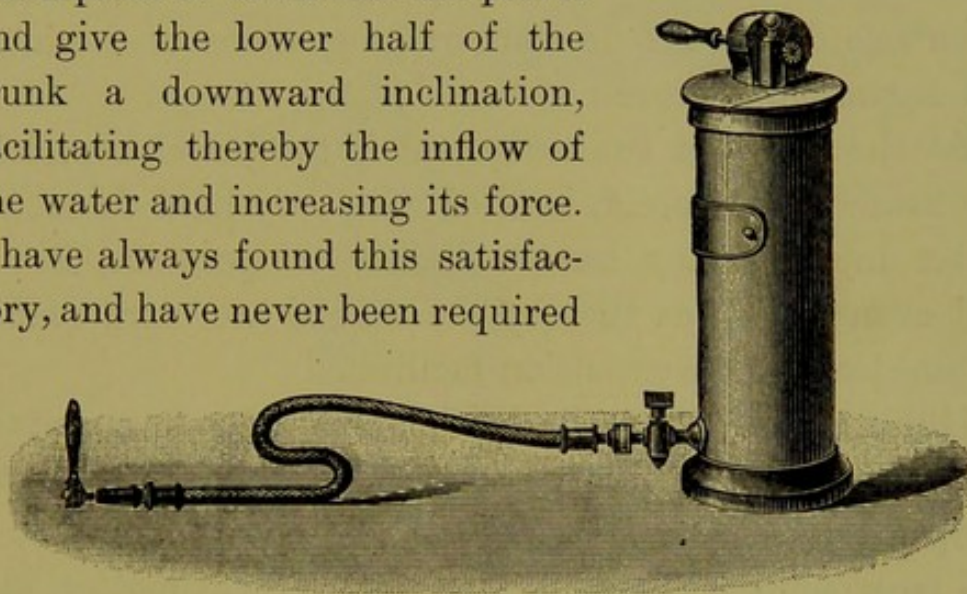
Cold moist-frictions.

1. **Clysters.** — Rectal injections, medicated and otherwise, are well known, as also their mode of administration. The fountain syringe, with a bag of the capacity of two or three quarts, is generally the most useful and the most convenient instrument, as it does not require the intervention of a second person as is the case with the various other kinds of syringes.

There is one defect, however, that is common to them all, namely, that the rectal point is too short. The effect of this is that it permits of the ampulla of the rectum becoming filled too quickly and overdistended, and thus a further and higher ingression of the fluid is prevented. Where this is of rather frequent occurrence, a marked dilatation of the pouch with atony of the rectum will

result. A longer nozzle, about the length of the vaginal point (about five and a half inches), is an absolute necessity, and where such cannot be had a rectal tube will obviate the difficulty.

A very important point, one not to be forgotten in our instructions to the patient, is that of position. The person to take the injection should place himself in the horizontal position on the bed or couch, with a pillow beneath the hips so as to elevate the pelvis and give the lower half of the trunk a downward inclination, facilitating thereby the inflow of the water and increasing its force. I have always found this satisfactory, and have never been required



SELF-ACTING CLYSOPUMP.

to resort to the knee-elbow position sometimes recommended. The injection should never be taken in the sitting posture, as is so frequently done by women.

For habitual constipation cold water injections have long been recommended, and I have myself in some few cases obtained very good results therewith. These injections differ from the other and manifold clysters, in that they are not medicated, that the quantity of water injected is usually larger, and that the temperature of the same is considerably lower.

The amount of water for an injection is from one-half to two quarts, which, with the apparatus named and the position described, will readily flow in. The temperature of the water should be from about 80° F. to 75° F., and as the patient becomes accustomed thereto it is gradually reduced still further to 70° F., and even to 65° F. It should not be lowered beyond this. When water of a lower temperature, 65° F. to 55° F., is used, not more than one-half or three-fourths of a pint should be injected, as otherwise dangerous fluxions or congestions of the internal organs might result.

At the *outset* of the treatment if the bowel, especially the lower part thereof, is filled with very hard fæces, the water injected may have a higher temperature, 90° F. and even 95° F., as thereby the masses are more readily softened and their expulsion facilitated.

Hühnerfauth¹ proceeds in this wise: He first empties the lower bowel with a moderate quantity of water, at a temperature of from 77° F. to 69° F., or, at the outset of the treatment, if there be much hard fæcal matter, at a higher temperature. Following this, a larger quantity of water, one-half to one litre,² at a temperature of from 86° F. to 77° F., is allowed to flow in slowly, and the patient told and coaxed to retain it as long as possible. Gradually, as already stated, the temperature of the water for the injections is lowered.

As to the frequency with which these injections are to be taken, that will depend upon whether the clysters con-

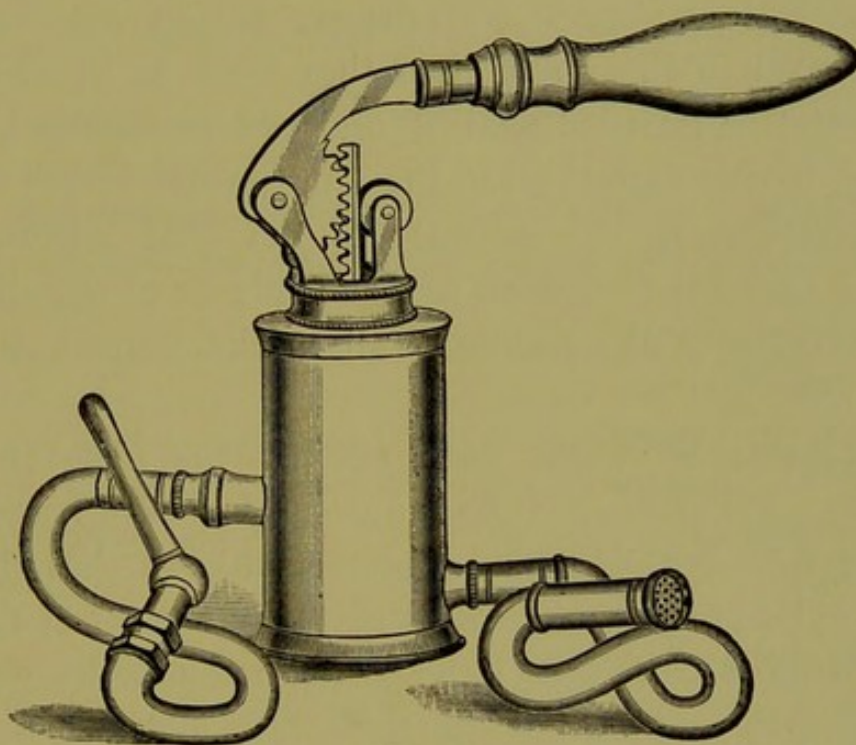
¹ Dr. George Hühnerfauth, Ueber die habituelle Obstipation u. ihre Behandlung, etc., Wiesbaden, 1890.

² A litre = 2.1135 pints (Dunglinson's Medical Dictionary).

stitute an essential element of the treatment, or whether they are only incidental thereto.

(a) Where they constitute an essential feature, they can be taken at first every day, then every other day, and, as the peristalsis becomes more vigorous and more active, at longer intervals.

They can be taken at almost any convenient hour.



FORCE PUMP.

Before arising in the morning, two hours after breakfast, or just before retiring at night, are perhaps the most suitable periods. If possible, the injection should always be taken at the same period of the day, as some regularity is also here of apparent benefit.

In cases of great obstinacy, where the lethargy of the bowel amounts almost to a paralysis, a more powerful

and more effective instrument will be required. Here the force pump will render excellent service.¹

If the cold injection does not prove satisfactory, we may avail ourselves of the powerfully stimulating action of rapid alternation of temperature by alternate hot and cold injections. A cold injection is taken, or given first and followed, fifteen minutes after its discharge, by a hot one, — temperature of the water 101° F. to 103° F.

It is with clysters as with drugs; persons soon become accustomed to them, and then they cease to be effective. This must be guarded against, and can be readily accomplished by the variations in the temperature of the water, by variations in the quantity of the fluid injected, by having care not to distend too suddenly or to overdistend the ampulla of the rectum,—all in the manner already described.

Moreover, we must warn against the abuse of the clyster. Taken every time the desire for stool arises, the necessity for the abdominal pressure, which, as has already been said, is so important an element in the act of defecation, is done away with; the abdominal muscles get out of the habit of acting in this way, and constipation results, or, if already present, is greatly aggravated.²

(b) Where clysters are only an incident in the treatment of constipation by massage or electricity. As we are frequently not able to obtain in the early period of treatment a sufficient discharge from the bowels by these measures, and as it is one of the chief rules of treatment

¹ See my paper on "Intestinal Obstruction," *American Journal of the Medical Sciences*, January, 1886.

² Winternitz, *Hydrotherapie*, *Handbuch der Allgemeinen Therapie*, Ziemssen. Beni-Barde, *Nouveau Dictionnaire de Médecine*.

that the use of purgatives must cease at once, we will, whenever the necessity for a more thorough clearing out of the intestinal canal arises, *i.e.* when the effects of the retention become too disagreeable for the patient to endure any longer, avail ourselves of the clyster to afford the relief required. This may be once in three or four days, once a week, even once in two weeks. The ordinary cool injection, water at the temperature of from 80° F. to 75° F., will fully answer the purpose.

As to the mode of action of the clyster upon the intestine, it may be said that it is

1. **Mechanical.** — The intestine is distended by the mass of water injected, and the muscles thereof are thus excited to contraction.

2. **Thermal.** — It has been demonstrated, both experimentally and clinically, that cold water will arouse the peristaltic movements of the intestines, and this so markedly that not infrequently they can, in rather thin persons, be discerned through the abdominal parietes. Warm water allays peristalsis, and it is for this reason that constipation is so generally observed in persons addicted to warm injections.¹ Hot water, like cold, excites peristalsis, as I have already set forth elsewhere.²

Both these moments act upon the ultimate nerve filaments distributed in the mucous coat, and through them the various muscles are aroused to action. Moreover, by reason of the stimulation of the ultimate nerve filaments, of the direct mechanical influence of the impact of the water upon the tissues, and of the contraction of the muscles, the blood-vessels are contracted, the blood is driven forward more rapidly, the contracted vessels dilate, are again contracted, and thus finally the whole intestinal and gastric circulation is accelerated. A greater amount of oxygen is carried to the parts, the energy

¹ Winternitz, *loc. cit.*

² *American Journal of the Medical Sciences*, January, 1886.

of the nerve action is heightened thereby, and, as a result, the physiological functions are much better performed.

It acts upon the intestines in still another way. It has been shown by the investigations of Röhrig¹ that injections of water into the rectum increase the rapidity of the portal circulation and heighten the pressure in the hepatic cells. There is an increase in the quantity of bile secreted, and increase of bile means exaggeration of peristalsis.

The methodical use of rectal injections of cool or cold water is more especially indicated in the cases of habitual constipation dependent in a measure upon internal hæmorrhoids.

In the constipation of chronic intestinal catarrh.

In the constipation connected with icterus. Intestinal irrigations, with one to two litres of water at a temperature of 77° F. to 73° F., methodically carried out, one to three times a day, have, according to Krull, given most excellent results in jaundice. There is a rapid abatement of all the annoying symptoms.²

Small injections of very cold water, temperature 60° F. to 55° F., are very effective in the hyperæsthesia of the rectum sometimes found associated with neurasthenia and hysteria.

2. **The Cold Tub-Bath** (*Halbbad*, Winternitz). — The cold tub-bath is the bath in the ordinary bath-tub, with the water at the temperature as it flows from the hydrant, plus what it may gain from standing in the tub over night.

It is always my direction that the water be allowed

¹ "Experimentelle Untersuchung üb. die Physiologie der Gallenabsonderung." *Wiener mediz. Jahrbücher*, 1873.

² Mosler-Krull, *Berliner klin. Wochenschrift*, 1877.

to run into the tub the night before, and to stand therein till morning.

In winter, the bath-room should be well heated, so that there may be no danger of taking cold on emerging from the bath.

The cold bath should be taken daily; the best time is on rising in the morning, or just before dinner (noon). I never advise it at night. Before getting into the tub, the hands and forearms, especially about the wrist, should be well moistened with cold water; then the face and neck, and then the head. The chest (thorax) should now be well wetted, and in warm weather, or with persons who perspire very freely, also the axillæ. The bath proper, which in summer may be of longer duration, should not last over a minute in winter; very obese persons may prolong it to three minutes. However, summer or winter, it should always end before the second chill can come on. Whilst in the bath, and just after getting out, vigorous friction with a very coarse towel, or with a bathing-glove, or with a flesh-brush, should be made.

For persons not accustomed to cold bathing and rather afraid of it, I direct that they get into the bath with the water at 95° F., and that then, whilst they are in it, the temperature be gradually reduced, by the addition of cold water, five degrees. After a few days, they will get into the bath with water at 92° F., and reduce it, whilst they are in, five degrees. By this method of gradual reduction of the initial temperature of the water, and a further reduction of five degrees, the system becomes gradually, and still very quickly, inured and accustomed to cold water, so that in a short time the cold

bath with the water as it flows from the hydrant will become not alone a pleasure, but a daily necessity.

When the indications, therefore, exist, the bath may be made more stimulating by the addition of salt, chloride of sodium (common or sea salt), to the water. (From five to nine pounds of salt to thirty gallons of water.)

Its mode of action is this: The cold bath stimulates the whole nervous system and gives tone to it, acting as it does upon the ultimate nerve filaments throughout the cutaneous surface of the whole body, and perhaps, also, directly upon the cord. The process of combustion, *i.e.* oxygenation, is hastened and made more extensive; respiration is deepened; the circulation is invigorated, and all the other physiological functions are quickened and more perfectly performed. In this way the tone of the muscular system is raised, and the muscles aroused from their lethargic state. Furthermore, the cold water acts directly upon the muscles, causing them to contract, — clearly demonstrated by the cramp in the calves, or in the feet, that occasionally seizes the bather on getting into the cold water. The abdominal muscles are invigorated, and their lost tone is restored to them. By the increased combustion, excess of fat deposited around the intestines is consumed; by the quickening of all the other functions and their more perfect performance, by the contraction of the muscles, any redundancy of tissue in the abdominal walls is taken up, reabsorbed. They lose their flabbiness, become firm, afford the requisite support to the abdominal organs, and are adequate to exercise, when called upon, that pressure upon the bowels which is so necessary to normal defecation.

The cold bath is specially indicated in the constipation of neurasthenia.

In conditions of great flabbiness of the abdominal walls, — pendulous belly.

In the constipation due to large deposits of fat in the mesentery and around the intestines.

The salt bath should be advised for persons who do not react quickly to the cold water alone. It is of advantage in anæmics, in cases of chlorosis, and in jaundice.

3. **The Cold Moist-Rubbing** (*Die Kalte Abreibung*).— It is made in this wise: A large sheet (bed sheet) is folded up, placed in a bucket of cold water, and allowed to remain therein over night. (If it be dipped and wrung out of cold water several times, shortly before using, it will answer very well.) In the morning it is wrung out, unfolded, and thrown from the back over the shoulders of the person to be treated, like a mantilla. The assistant (a member of the family, friend, or bath attendant) now places his hand upon the sheet, as it lies upon the body, and with long, up-and-down strokes rubs the dorsal, whilst the patient, grasping the various forward ends of the sheet, rubs the anterior surface of the body with them.

Or it may be applied in this way: The assistant having wrung out the sheet holds up one corner, and, placing the further corner of the same side in the axilla of the patient, folds the sheet around him completely, and as smoothly as possible, from the neck down, by the corner which he holds. The free end coming over the still bare shoulder (in the axilla beneath which the further end of the sheet is held) is stuffed into the ring formed at the neck. The anterior borders are folded around the lower extremities and held there by them, they being brought together. Placing his hand upon the sheet, he now rubs the body with it in long up-and-down strokes, as already stated.

Care must be had that all the various parts of the body are well rubbed, and several times each.



APPLICATION OF THE WET SHEET. (*Preller.*)

The moist friction is made from three to five minutes (at the outset of the treatment the shorter period will suffice), then the wet sheet is let fall, and a dry one, ready

at hand, wrapped about the patient, and his body well dried.

Just as for the cold bath, it is necessary that the patient shall well moisten his hands, forearms, face, head, and neck with cold water before the wet sheet is thrown over him¹ to guard against a possible internal fluxion that might result from the sudden contraction of the cutaneous capillaries.

On rising in the morning or shortly before dinner (noon) are very suitable periods for this treatment.

As to its mode of action, all that has been said of the cold bath will apply here. The process of combustion is accelerated, the respiration is deepened, and a greater quantity of oxygen thus carried into the body. The tonus of the vessels is elevated, and the circulation is invigorated. The ultimate nerve filaments are powerfully stimulated, and this stimulation is transmitted to the cord and cerebral centres, and as a consequence the nervous or mental equilibrium, which may have been disturbed or depressed, is restored to the normal. The result of all this is that the various functions are better performed, and greater energy imparted to the muscular system.

In all cases where the cold tub-bath is indicated but cannot be had either for lack of facilities or by reason of disinclination of the patient, the cold moist-rubbing will prove an excellent and effective substitute.

It is of great benefit in neurasthenia, in the constipation due in a great measure to hæmorrhoids, and in that condition described as irritable rectum.

4. **The Cold Abdominal Compress** (*Neptune's Girdle*). — Of strong towelling, forty to fifty centimetres (sixteen to

¹ As to the further reasons for this, consult Winternitz, *Hydrotherapie*, and Beni-Barde; see especially the experiments of Brown-Séguard, Edwards, and Tholozan.

twenty inches) in width (dependent upon the girth of the person, the longer the girth the greater the width required), sufficient to encircle the lower half of the trunk three times, is taken, and two-thirds of this placed in very cold water, and allowed to remain therein for some time (about an hour). It is then wrung out, rolled up into the form of a roller-bandage *beginning with the dry end*, and then swathed around the lower half of the trunk. In this way the moist portion of the bandage will come upon the body, and will be covered by the dry part thereof. The whole is kept in place by long tapes attached to the extremity of the bandage.

The whole bandage can be covered with a covering of flannel, or if evaporation is to be entirely prevented, a piece of oiled silk or gutta-percha paper can be laid over it.

The best time for the application of this wet compress is the night. I direct the patient to put it on before retiring at night, and to take it off in the morning before he gets out of bed, and to dry immediately and thoroughly the part where it had been applied.

Hühnerfauth¹ advises that in the winter season patients applying the wet girdle at night should wear a flannel bandage around the abdomen during the day.

The mode of action is the same, though of course limited in extent, as that of the other procedures already described. The application of the cold bandage has a strong, stimulating effect upon the nerve endings and the vessels, particularly in that part of the body which is always kept warm. The cutaneous capillaries and blood-vessels are contracted, and the blood driven in upon the abdominal organs. A reaction, however, soon follows.

¹ Loc. cit.

The bandage is soon warmed, and by reason of bad conduction becomes blood-warm. The water therein is converted into vapor, forming a layer between the skin and the bandage; this stimulates the dilation of the cutaneous blood-vessels, and draws as it were the blood from the abdominal organs outward into them. In this way, the internal organs are unloaded, and any tendency to hyperæmia or congestion relieved.

Besides this local action it has a more general effect. The stimulation of the nerve endings is transmitted to the cord and cerebral centres, and the various organs are more vigorously innervated and stimulated to a better performance of physiological function.

This effect will be in proportion to the degree of coldness of the bandage when applied, and to the length of time it remains moist.

Where, as occasionally happens, the bandage does not warm sufficiently; where it causes a contraction of the blood-vessels only, and the reaction does not follow; where, consequently, the skin beneath remains pale and anæmic,—it indicates that the stimulus of the cold in the bandage was not sufficiently strong. We can remedy this, and avoid the unpleasant effects that might follow, by preceding the application of the girdle with more vigorous thermic and mechanical influences. Before the bandage is put on, that part of the body should be rubbed well with very cold water. The required reaction will then very soon follow the application of the wet abdominal bandage.¹

It is indicated in the constipation of chronic gastric or intestinal catarrh; in that dependent upon defective functioning of the intestinal secreting apparatus; in the constipation connected with hepatic disturbances; in fæcal retention due to irritability or hyperæmia of the various female genital organs.

5. **The Douche** (*Shower Bath, Fall-bäder*).—This has

¹ Winternitz, *Handbuch der allgemeinen Therapie*, loc. cit.

numerous forms: The rain bath (shower bath), the circular needle bath, the mobile fan douche, etc.

The water used in the douche may be either cold alone or hot and cold alternately, and then it is called the Scotch douche.

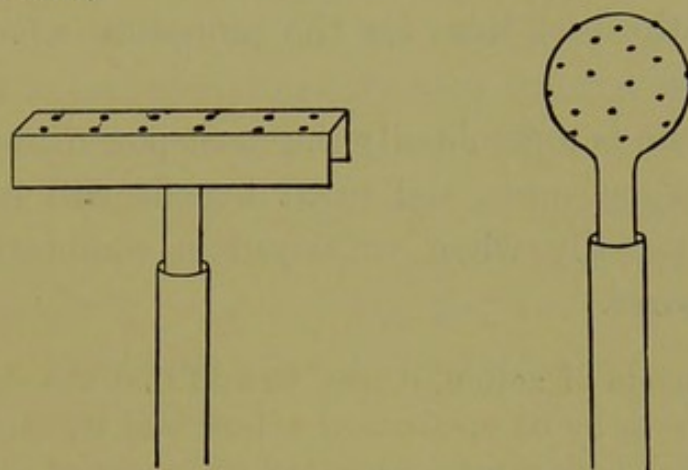
Where a properly arranged bathing or hydropathic institute is at hand, and the patient is in a position to avail himself of its benefits, we can advise that he take alternately the circular needle bath and the cold rain bath for from one to one and one-half, or even to two minutes (as he gets accustomed thereto), and that this be followed by the application of the fan douche (Scotch, where it can be had) over the region of the large bowel, and more particularly over the region of the cæcum and sigmoid flexure.

In anæmics, rather feeble persons, and such as do not react well to cold, the douche should be preceded by a warming-up procedure, such as the hot-air bath of a few minutes' duration. This will effect an accumulation of sufficient warmth to enable the system to better resist the depressing action of the cold, and the already stimulated nervous system will tend to a quick and healthful reaction.¹

Where for any reason the advantages of such an establishment cannot be had, I advise my patients to arrange an abdominal douche for themselves, in this way: A piece of rubber tubing twenty to twenty-five inches in length is attached to the faucet of the hydrant, preferably in the bath-room if there be one, and the patient having placed himself upright either in the bath-tub or in an ordinary wash-tub, at a distance from the mouth of the tube, the

¹ Winternitz, loc. cit.

stream is turned on and directed (a second person holding the tube) against the patient's abdomen. When it can be had, I have a nozzle having several small openings, something like this,



SPRINKLERS.

or round like that of a sprinkler, attached to the tube. Any tinsmith can furnish such a nozzle.

Where the house is provided with a hot-water arrangement, we can, by attaching a like piece of tubing to the hot-water faucet, have a Scotch douche for our patient.

Where for any reason this simple arrangement cannot be made, for want of proper facilities or what not, I have insisted upon my patient buying or borrowing a bath-tub, and having obtained it to take a douche in this wise: The patient lies down in the tub, and a second person (an assistant, friend, or member of the family) having filled a large pitcher with cold water allows it to flow in a small stream from a height of five or six feet upon the patient's belly, following the position of the gut. He can be douched in this way with hot and cold water alternately.

I have obtained very good results with this rather crude arrangement.

I have usually found the morning hour, on rising from bed, when the body still retains the warmth accumulated therein, as the best time for the procedure when carried out at home.

The douche is undoubtedly the most powerful of all the hydropathic measures, and great benefit will be derived from it, especially when employed in combination with other measures.

As to its mode of action, it may be said that the douche produces its effects by its *mechanical* action and its *thermic* influences, and that both can be magnified or depressed according to the mode of production of the douche. Otherwise it acts like the other procedures of this method already described, only in a greater measure by reason of the plus influence of the impact or concussion.

There is a general stimulation and elevation of energy of the whole cerebrospinal nervous system; the circulatory and respiratory apparatus are invigorated, and the muscular system acquires greater force. Thus Maggiora and Vinay¹ have shown that a rain bath of 50° F. under a pressure of two atmospheres increases the work-capacity of the muscular system threefold; the Scotch douche, ranging from 98° F. to 53° F., doubles the muscular force; even douches of tepid water produce considerable effect.

Applied to the abdomen, it acts more directly upon the parts concerned and soon provokes energetic and persistent peristalsis.

It is indicated in all forms of constipation, but especially so in the cases of dilatation of the gut or any section thereof, a consequence of the constipation and tending to perpetuate it.

¹ *Blätter f. klinische Hydrotherapie*, January, 1892.

In cases of constipation with marked atony or ectasia of the stomach.

If hydropathy be the method selected wherewith to treat our case of constipation, of the measures described one will be ordered in all cases, namely, *clysters*, and circumstances and conditions already detailed will govern us in the selection of the others. Thus in a case where **deposit of fat** appears to be the real etiological factor, we will also prescribe the cold bath; if this cannot be had, the *cold wet-rubbing*. In addition we will direct that twice or thrice weekly an *abdominal douche* be taken — Scotch douche by preference.

Where an **atony of the gut** is the cause of the constipation, or where marked dilatation has already ensued, we will employ by preference, in combination with the *clyster*, the *douche*.

In depressed conditions, as in hypochondria or mild types of melancholia, the *douche*, preceded by the *hot-air bath*, will be the treatment; or if not this (as when the appliances are not at hand, or the patient cannot avail himself of an institute, or if the heat, the force, are contra-indicated), the cold moist rubbing.

If an intestinal catarrh be the foundation of the derangement, we will resort, in addition to the clysters, to the cold compress, Neptune's girdle, and to an occasional douche. And so on, as already set forth above.

* * * * *

For a clearer understanding as to the exact meaning of very cold, cold, hot, the following table of Dr. Beni-Barde is here given.

46° F. to 53° F.	. . .	Very cold
53° F. to 61° F.	. . .	Cold
61° F. to 68° F.	. . .	Fresh
68° F. to 78° F.	. . .	Chill taken off
78° F. to 86° F.	. . .	Tempered or lukewarm
86° F. to 104° F.	. . .	Warm
Above 104	Hot ¹

Winternitz, "Hydrotherapie," in Ziemssen's Handbuch der Allgemeinen Therapie, Vol. II., Part III. Winternitz, Die Hydrotherapie auf physiologischer Grundlage, 2 vols. Beni-Barde, Manuel Médical de Hydrotherapie. Brouardel, P., L'Eau et les Maladies, 1892. Krüche, A., Lehrbuch der praktischen Wasserheilkunde. Lange, Wasserkuren im Eigenen Hause. Duval, Traité Clinique et Pratique d'Hydrotherapie, Paris, 1888. Baruch, "The Uses of Water, etc." Preller, Anleitung zum Gebrauch der Wasserkur u. der Kiefernadelbäder, Ilmenau, 1884.

¹ Nouveau Dictionnaire de Médecine, Jaccoud.

CHAPTER XIX

TREATMENT OF CONSTIPATION DUE TO ATONY (*Continued*)

ELECTRICITY

THAT with the electrical current we can, under ordinary conditions, provoke an evacuation of the bowels is a fact well attested by numerous observations. This point is indeed so well established that Curci¹ claims that by means of electricity we can readily make the differential diagnosis between obstipation due to atony and impaction of fæces, and occlusion of the bowel by intussusception, volvulus, internal strangulation, etc., in those obscure cases where by reason of absence of characteristic symptoms the exact condition confronting us cannot be otherwise made out. Whether it will suffice as a method of treatment for the permanent relief of atonic constipation, that is still a question upon which opinions differ.

Erb,² from personal observation, confirms the very favorable reports of Benedikt,³ Scapari,⁴ Stein,⁵ and

¹ "L' elettricità contro la paralisi e la paresi intestinale," *Il Raccoglit. Med.*, 1877, 30.

² *Handbuch der Electrotherapie* (3 Bd. der Allgm. Therap. Ziemssen).

³ "Ueber d. Electr. Behandlung der Obstipation," *Allg. Wien. Med. Zeitung*, 1870, 33.

⁴ "L' elettricità nella coprostasi da atonia intest.," *Ann. unives.*, 1881. Febr., p. 97.

⁵ "Die farad. Behandlung der Obstipation," etc., *Centralblatt f. Nervenheilkunde*, 1882, No. 9.

others, and recommends it as a most excellent measure for the relief of the derangement. Rockwell¹ holds a like opinion.

Leubusher,² in a study of the question, reported fifteen cases observed by him in the Institute for Nervous and Mental Affections, of Professor Binswanger. Out of these fifteen cases, there were but four in whom the result was at all permanent; that is, that the bowels still acted regularly three months after the cessation of the treatment. In two cases no result at all was obtained, and in the others the relief afforded was but temporary, the patients relapsing into their former constipated state upon the cessation of the electrization.

That occasionally, even frequently, it fails altogether, is admitted by Erb, Rockwell, and others.

That it is a most valuable aid to other measures, of this there can be no doubt. Nothnagel³ recommends it combined with massage; Hühnerfauth⁴ employs it in combination with hydropathic measures, and has thus obtained excellent results. My own experience is confirmatory of this.

As to the form of electricity best adapted to the relief of constipation, there is also a difference of opinion. Older writers, as Duchenne, Hoffmann, and others, used the faradic current only, and Erb, upon physiological grounds, seems to hold it to be the best. Rockwell expresses himself

¹ *Med. and Surg. Electricity*, B. & R., 1888.

² *Centralblatt f. innere Medicin*, 1887, p. 457, "Die Behandlung der chron. Stuhlverstopfung."

³ *Wiener mediz. Presse*, loc. cit.

⁴ *Ueber die habituelle Obstipation u. ihre Behandlung mit Electricität Massage u. Wasser*, Wiesbaden, 1890.

very clearly upon this point: "Both the galvanic and faradic currents may be used, but my preference has been and is for the faradic. Its powerful mechanical and limited reflex effects seem to be better adapted to restore the impaired irritability of the muscular coats." Leubusher, in the report referred to, states that he has found the galvanic current the more effective, and Shoemaker also claims better results from the galvanic than the faradic currents.

There are two methods by which the electricity may be applied, whatever form of current be selected:

- I. The percutaneous method (where both poles are without, upon the external surface).
- II. The internal method (where one or two poles are within the rectum).

These methods have a further subdivision as regards application.

- (a) Unipolar method (where one pole is placed over the seat of disease, *i.e.* the bowels, the other over an indifferent point).
- (b) Bipolar method (both poles over region or point affected).

In the abdominal application of electricity the patient should always be in the horizontal position.

FARADIC CURRENT

A. Percutaneous Method. *Procedure of Erb.*—The anode¹ (large electrode 10 to 12 cm. long, 5 to 6 cm.

¹ Anode, positive pole.

broad) is placed stabile¹ over the upper lumbar vertebræ; the cathode² (medium-sized electrode, plate 5 to 6 cm. square), labile,³ is moved over the whole abdominal surface. Over the region of the cæcum it is pressed in more deeply and firmly⁴ and retained there, stabile, for a few moments; it is moved over the colon, down over the sigmoid flexure, where it is again pressed in and held stabile for a few seconds. Then the electrode is moved in circles around the navel, and spirals or circles described with it over the whole length of the abdominal surface. Then the electrodes are placed in the opposite loins, stabile, and the current allowed to flow between them, with occasional reversals of current direction.

The current should be sufficiently strong to call forth strong contractions of the abdominal muscles. In one way, however, it may be better to avoid these contractions, as they prevent the deeper penetration of the current. The motor points must then be avoided. Duration of sitting, from three to ten minutes.⁵

In my own experience I have learnt to prefer the bipolar application, for the reason that I believe the desired result is obtained more quickly in this way than otherwise.

The cathode (small electrode) is placed stabile over the cæcum, and the anode moved over the tract of the ascending, transverse, and descending colon over on to the sigmoid flexure, where the electrode is held for a few

¹ Stabile, when the electrode is held fixed, immovable.

² Cathode, negative pole.

³ Labile, moving, when the electrode is kept moving around.

⁴ Firm pressure increases the conductivity of the skin; it is better moistened and in better apposition with the electrode.

⁵ Erb, loc. cit.

moments pressed down more firmly; then it is moved downward and inward to about the region of the annulus of the rectum, where it is again held stabile and firmly for a few moments. Whilst the anode is thus held stabile, the current direction is occasionally changed. This whole movement is repeated, beginning again at the cæcum, and then an interval of rest allowed. (If the battery have no "reverse" attachment, the repetition is made with the poles changed.)

Then beginning again at the cæcum, the two poles, both labile and both stabile, are carried over the tract of the large bowel in this wise: The cathode is placed over the cæcum at its lowest point, and the anode in advance of the former about a hand's breadth, and they are continued in this relation to each other throughout the whole movement. The two poles are held stabile for a moment, then a slight advance about two fingers' breadth slowly made and the poles again held stabile, and this alternation of movement and rest continued until the whole gut has been gone over with both poles. This is repeated, and then an interval of rest allowed. To close the sitting, the anode (large electrode) is placed over the lumbar vertebra stabile, and the cathode (small electrode) moved in circles around the navel, smaller, and then larger, and finally spirals and circles described with it the whole length of the abdominal surface.

The strength of the current used: sufficient to produce strong contraction of the intestine at the anode.

The current of the primary coil with rather long interruptions is to be preferred, according to Sperling.¹

¹ Pierson-Sperling, *Elektrotherapie*.

The duration of the sitting, at the outset of the treatment, should not be longer than four minutes; gradually it is increased in length for subsequent sittings to ten minutes.

B. Internal Method. Procedure of Erb.—Later on (after proceeding first as above), to obtain, as he says, a stronger effect, Erb resorts to this procedure: A metallic electrode, insulated up to its olive-shaped point (anode), is introduced six to eight centimetres deep into the rectum.

This, usually, causes no pain or disagreeable feeling; at most, when the cathode is in the rectum, a slight tingling, or pricking, or a feeling of heat.

The other electrode is moved over the abdomen as already described above.

The current should be occasionally reversed (or the electrodes changed when the apparatus is not provided with the necessary contrivance therefor) so as to allow the cathode to act upon the rectum, *i.e.* more directly upon the bowel.

The measure of intensity of the current is, here also, strong contraction of the abdominal muscles.

Duration of sitting: three to ten minutes.¹

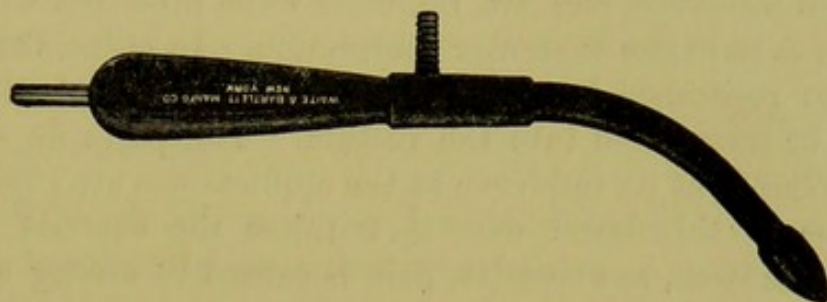
*De Watteville*² proceeds in the same manner; so also does *Rockwell*.³ The latter also favors the bipolar internal method by means of a double electrode.

This latter procedure is only made use of with currents of quantity. His reason therefor is this: Induction currents of tension, when applied to mucous surfaces, act very mildly, both on the motor and sensory nerves. The parts become rapidly

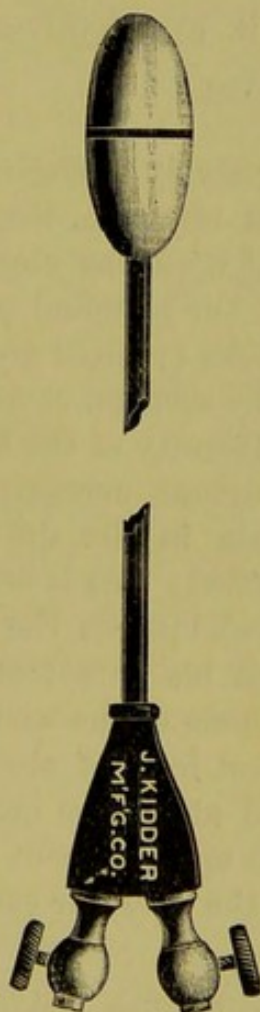
¹ *Loc. cit.*

² *A Practical Introduction to Medical Electricity.*

³ *Loc. cit.*



RECTAL ELECTRODES.



BIPOLAR-RECTAL ELECTRODES.

tolerant, so much so that even currents of great strength may be passed, and the patient remain totally unconscious thereof. Induction currents of quantity, however, applied to surfaces that offer little resistance to their passage, have a much more powerful influence, and are therefore to be preferred when the purpose is to excite muscular contraction. In order, therefore, that the resistance be reduced to the minimum, both poles should be introduced into the rectum. The parts do not become tolerant of its influence as the applications are continued. The use of this latter current requires the exercise of the greatest caution, as excessive pain is caused by strong applications.

In addition to the local treatment, and as often surpassing it in effectiveness, Rockwell recommends **general faradization**.¹

It consists in sponging the whole or the greater part of the body, first one arm, then the neck, then the thorax, then the abdomen,² with one electrode, whilst the other is held stable at one of the terminal points of the body, as a plate beneath the buttocks (patient sitting on it³), as a plate pressed or held against the sacrum, or as a plate on which the feet rest.

The difficulty of the application lies in the proper regulation of the current necessary to stimulate fully without causing actual pain in the different parts over which the sponge is being carried; this is best learnt by experiment upon oneself.⁴

Rockwell⁵ places the patient in the sitting posture upon a stool with his bare feet upon a copper plate attached to the negative pole of the battery.

The best form of electrode that is applied over the body is a brass ball about one inch in diameter, and this is enveloped in a soft wet sponge about six inches in diameter. The moistened hand of the operator can be used as the labile electrode, and is

¹ Loc. cit.

² Pierson-Sperling, *Elektrotherapie*, Leipzig, 1893.

³ *Ibid.*

⁴ De Watteville, loc. cit.

⁵ Loc. cit.

the most agreeable to the patient, and next to it is the electrode just described. The sponge can be folded tightly over the brass ball so as to make a small electrode, or loosely, so that almost its entire surface may be applied.¹

The duration of the sitting should not be over ten minutes at the outset of the treatment, giving the abdomen four minutes and distributing the remaining time over the other parts. Gradually the length of the sitting may be prolonged, and the other parts (except the neck, for which two minutes suffice) given equal time with the abdomen.²

As regards the strength of the faradic current to be used in the various methods, the views of Erb have already been given. Rockwell³ says that it may be left to the sensations of the patient. "Whatever is borne without great discomfort is safe to use."

According to Lehr, the faradic bath is of benefit in constipation.⁴

GALVANIC CURRENT

A. Percutaneous Method. — The anode is placed upon the back over the lumbar vertebræ stabile; the cathode, both stabile and labile, over the whole abdomen, making numerous closures and frequent reversals over the whole extent of the intestinal tract.

Then the splanchnic nerves are galvanized along the thoracic sympathetic, thus: The anode is placed over the

¹ Rockwell, loc. cit.

² Pierson-Sperling, loc. cit.

³ Loc. cit.

⁴ "Ueber elektrische Bäder," *Verhdl. des II. Congress. f. innere Medizin*, Wiesbaden, 1883. Die hydro-electrischen Bäder, ihre Wirkung, etc., Wiesbaden, 1883. See also "A New Electric Bath," Gärtner, *Wiener klin. Wochenschrift*, 1893, 34.

lumbar vertebræ stabile, and the cathode stabile and labile on either side of the spine from the fifth to the twelfth dorsal vertebra.

Duration of the sitting, three to five minutes.¹

Erb, in obstinate cases, uses the galvanic current for a few moments as described, and follows it with faradization.²

B. Internal Method. — One pole is placed in the rectum and the other (indifferent pole) upon the abdomen.

Rockwell teaches that with the galvanic current the cathode should invariably be placed within the rectum.³ Leubusher⁴ also advocates this. Shoemaker places the cathode in the rectum, and the other pole is pressed against the perineum.⁵

The strength of the galvanic current should not exceed, according to Rockwell,⁶ two to three milliamperes even when used with constant interruptions; but when it is used continuously, without interruptions, one to two milliamperes will amply suffice.

Shoemaker advises that the strength of the current be about one milliampere, rather less than more, so that at the outset the patient will not feel any current at all passing. However, in the course of fifteen or twenty seconds he will begin to feel the cold electrode in the rectum growing warmer and becoming gradually heated to the point of painless tolerance.

Shock or even abrupt transitions in the strength of the current are prejudicial to success.⁷

¹ Erb, loc. cit.

² Ibid.

³ Loc. cit.

⁴ Loc. cit.

⁵ *Medical Bulletin*, June, 1890.

⁶ Bigelow, *International System of Electrotherapeutics*.

⁷ Shoemaker, loc. cit. *International System of Electrotherapeutics*.

When currents of greater strength are used with the internal method, the closure¹ of the current must not be of too long duration, as otherwise an eschar might be produced. It is better, then, to make frequent reversals, and to have the several closures of the current of short duration.²

Method of Boudet (de Paris).—A litre of salt water is first thrown into the rectum; then the electrode, best in the form of a stylet in a thick rubber sound, is introduced. The other electrode (400 cm. square) is placed upon the back. Currents of ten to fifty milliamperes from five to twenty minutes, stable, or (when the stronger currents are used) frequent reversals and interpolated pauses.³

GALVANO-FARADIZATION

Erb⁴ recommends very highly galvano-faradization as introduced into electrotherapeutics by De Watteville, a method of treatment in which, as the name indicates, both currents, the galvanic and the faradic, are sent simultaneously into the body.

De Watteville's procedure in constipation is this: A very large electrode (plate) is fixed to the back, whilst another is made to rest first upon the umbilical region and then carried round the whole course of the colon.⁵ Erb places the anode upon the back and the cathode upon the abdomen. Strong currents are used with numer-

¹ Both poles in contact with the body and the current flowing between them.

² Rockwell, loc. cit.

³ *Progrès Médical*, 1887, No. 67. Erb's Handbuch, loc. cit.

⁴ Erb, Handbuch der Electrotherapie.

⁵ De Watteville, loc. cit.

ous voltaic alternatives.¹ When the subject is very fat, the electrodes should be pressed down firmly so as to diminish the resistance between them and the viscera.

Duration of the sitting, eight to ten minutes.²

Broese³ uses very large electrodes, 400 sq. cm., both for the back and the abdomen. The strength of the faradic current of the secondary coil is raised to its utmost, whilst the galvanic current is gradually increased to fifty or seventy-five milliamperes. Duration of sitting, usually seven minutes. He occasionally resorts to massage in combination with the electrical treatment.

Courtade:⁴

Instruments necessary: a large tin plate covered with chamois skin; one cylindrical carbon electrode 4 cm. long and 8 mm. in diameter, firmly attached to one extremity of a semi-solid insulated conductor; one circular carbon electrode 4 cm. in diameter, covered with chamois skin; a faradic battery with two coils, one of fine, the other of coarse wire; a galvanic battery; an induction (influence) machine.

His procedure is divided into two parts (*a*) Introductory treatment; (*b*) Treatment proper.

A. Introductory treatment: General franklinization. The patient receives a static bath, of a quarter of an hour's duration, with the generalized breeze and the application of static sparks to the abdomen.

¹ Reversal of the current by means of the commutator—the pole previously negative becomes positive, and the previously positive becomes negative.

² De Watteville, loc. cit.

³ Festschrift z. Ehren d. 25 jährig. Jubiläums des Geh. R. Prof. Dr. Meyer in Göttingen. Pierson-Sperling, loc. cit.

⁴ *Journal des Practiciens*, 1896, No. 47. *Journal of Electro-Therapeutics*, April, 1897.

B. Treatment proper: The cylindrical carbon electrode is introduced into the rectum as high up as possible and the large (tin) plate placed over the Sigmoid flexure (if the trouble is supposed to be located in the cæcum, it is placed over this). The cords are connected with the faradic battery, and an induced current from the coarse wire coil allowed to pass through for three or four minutes. The two electrodes are now disconnected from the faradic and attached to the galvanic battery and a current allowed to flow in; not a continuous current, but one, now in the form of rapid waves, now with quick interruptions. The waves are created by running up rapidly from zero to 20, to 40, M.A. and back again. The current is interrupted by rapidly making and breaking it. As to the intensity of the current, though this should depend in a great measure upon the sensibility of the patient, it should not in any case surpass 40 M.A., especially not when interruptions are made. Though the carbon electrodes are less apt to produce eschars, nevertheless a too prolonged contact should be avoided; the position of the electrodes should be changed from time to time. It is immaterial to which pole the rectal electrode is first attached, for the current should be frequently alternated. Duration of treatment with galvanic current: eight to ten minutes.

The treatment is concluded in this wise: the large (tin) plate is placed over the dorsal or over the lumbar vertebræ (according to the indications in the case); the rectal electrode is withdrawn, removed, and the circular carbon electrode attached to the pole and promenaded over the abdomen. The cords are now detached from the galvanic,

and connected with the faradic battery, and a current from the fine wire coil allowed to flow in, — this makes a sort of electrical friction of the abdomen.

Three sittings per week.

The rectal electrodes as commonly found have already been figured. Leubusher thinks that they are but ill adapted to the purpose, and prefers to use a conically pointed sponge electrode. I use an ordinary olive pointed electrode for the rectum, and externally an ordinary electrode, plate or cup, covered with absorbent cotton, and moistened. Absorbent cotton is by all means a much more desirable covering for electrodes than sponges.

Frequency of Treatment. — Ordinarily, when the constipated state is but of a few months' duration (four to eight months), a sitting every other day will suffice. In very obstinate cases of long duration (one year and over) a sitting should be had every day at the outset of the treatment, and then, later on, as improvement manifests itself, a treatment every other day will be all that will be required.

When the sittings are had daily, I confine myself on the alternate days to rather feeble currents.

Movements of the bowels may set in already after the second or third sitting; at other times not until after very many applications. Again, with some the bowels will move shortly after the application, two or three hours or even a briefer period; with others it will be ten or fifteen hours after the sitting.

The Duration of the Treatment. — The time required for the treatment of constipation with electricity is from two to six weeks. Cases have been reported where two or

three applications permanently relieved the patient,¹ and others again where it required many sittings, nineteen or twenty, or more, to obtain the desired effect.²

Though it is not the purpose here to go into the physiological action of the electric current, there is one point that must be mentioned here, one to which Leubusher, I believe, first called attention, and which is of some clinical importance. It is this: Leubusher observed in the series of cases treated by him that the intestinal secretion, which previously was seemingly deficient, was greatly increased by the stimulus of the current.³

Special Indications and Selection of Current.

1. The constipation dependent upon chronic spinal diseases and chronic cerebral affections (other than those of an apoplectic character), *galvanic current*.

2. Constipation dependent upon cerebral apoplexies, *faradic current*.

For other forms of constipation :

In constipation dependent upon atony, or paralysis of the intestine, the *faradic current*.

In constipation concomitant with neurasthenia, the faradic current and general faradization.

In constipation with hysteria, and in spasmodic constipation, the galvanic current and central galvanization.

In hysteria we may also resort, for the general condition, to franklinization in the form of bath⁴ or douche,⁵ a method of treatment with which some success has been reported.⁶ Locally, for the constipation, the galvanic current is employed.

Scheme of electrical treatment of constipation due to atony :

¹ Rockwell, loc. cit.

² Erb, loc. cit.

³ Loc. cit.

⁴ The patient upon the insulated stool.

⁵ By means of the crown-like electrode.

⁶ Pierson-Sperling, loc. cit.

- First sitting.* Percutaneous application (unipolar or bipolar method).
- Second sitting.* Percutaneous application.
Internal application (unipolar method), the time divided equally between the two forms of application.
- Third sitting.* Internal application (unipolar method) two-thirds of the time.
Percutaneous application (unipolar method), and so on.

We will avail ourselves, in connection with the electrical treatment, of the benefits to be derived from a properly regulated diet, as described above, and from dietetic exercise.

CHAPTER XX

MEDICINES

THE remedies that we can call in to our assistance are but few in number, the whole group of cathartics being, as already said, excluded. They are **nux vomica** and its alkaloid *strychnina*, and **physostigmatis faba** (Calabar bean), of two different groups of medicinal agents. Both provoke peristalsis, though their mode of so doing differs.

NUX VOMICA (*Strychnos Nux-vomica*). GROUP: EXCITOMOTORS.¹

Tinctura Nucis Vomicae (tincture of nux vomica). — This may be administered in doses of five to ten drops three times a day, just before meals. If there be symptoms of dyspepsia, especially pressure after eating, I give it after meals, — immediately thereafter, or from one-half to one hour later. I have obtained very excellent effects with very small doses frequently repeated, guttæ i in a teaspoonful of water every two hours. I generally begin with a small dose, guttæ iii in a teaspoonful of water three times daily, before meals, and increase by two drops every other day, until the maximum dose of fifteen drops is reached. I then descend the scale, diminishing the dose by two drops every other day, until the initial dose is

¹ H. C. Wood, *Therapeutics, its Principles and Practice*, 1894.

reached. Then the administration of the remedy is suspended, to be resumed again in two weeks or ten days, if the indication therefor still exist. If there be much flatulence, it will be well to combine the nux vomica with Fowler's solution :

℞	Tinct. Nuc. Vomic.	ʒ iii
	Solut. Fowleri	ʒ i
M. Sig.		

Arsenical preparations, especially the one named, have apparently a marked influence in inhibiting the development of flatus.

Strychnina (strychninæ sulphas; strychninæ nitras).—Some prefer to administer strychnine. It may be given in pill form, in doses of one-sixtieth to one-thirtieth of a grain, three times daily, after meals. I have had very good results with doses of one one-hundredth of a grain, well triturated with sugar of milk, taken every four hours. If there be indigestion due to insufficiency of hydrochloric acid in the gastric secretion, the strychnine can be combined with the acid, thus :

℞	Acid. Hydrochloric. dilut.	ʒ ss
	Strychnina. Sulphat.	gr. $\frac{1}{3}-\frac{1}{2} = (\frac{1}{72}-\frac{1}{48}$ per dose)

M. Sig. Ten drops three times daily, after meals (it can be given, if thought preferable for any reason, before meals).

As a rule, it is more convenient for this class of patients, who generally follow their vocations as usual, to take their medicine three times daily; a more frequent administration necessitates the carrying of the medicine, and that is very inconvenient.

2. **PHYSOSTIGMATIS FABÆ** (*Physostigma venenosum*, CALABAR BEAN). GROUP: DEPRESSO-MOTORS.¹

Tinctura Physostigmatis Fabæ (tincture of Calabar bean) can be administered in doses of ten drops three times a day. I prefer to begin with a smaller dose, five drops, and gradually to reach the maximum dose of twelve minims three times daily.

Extractum Physostigmatis Fabæ (extract of Calabar bean).

Dose (gr. $\frac{1}{15}$ – $\frac{1}{4}$)

℞	Extract. Physostigmat. Fab.	grs. $1\frac{1}{4}$
	Glycerinæ	3v

M. bene Sig. Three to six drops, three to four times daily.

It can be given also in pill form.

Some combine the physostigma with belladonna and nux vomica,² others with belladonna and ergot, thus:

℞	Extract. Physostigmat. Fab.	gr. $\frac{1}{2}$
	Extract. Belladonna.	grs. ii
	Extract. Ergota.	grs. xii

M. ft. Mass. et divid. in pillul. æqual. No. VI. Sig. One pill at bedtime.³

I myself never give belladonna in this form of constipation and never combine the remedies mentioned; I prefer to give them individually and alternately, believing that a better result can be thus obtained.

Physostigmine, Syn. **Eserine** (alkaloid of Calabar bean), **Physostigminæ Salicylas**, can be rubbed up with sugar of

¹ H. C. Wood, Therapeutics, its Principles, etc.

² Brunton, Text-book of Pharmacology, Therapeutics, and Materia Medica, Philadelphia, 1888.

³ *Treat's Annual*, 1890.

milk. The dose, according to Brunton,¹ is one-sixteenth to one-twelfth of a grain. Helbing, in his *Modern Materia Medica*, gives as the dose for administration one one-hundredth to one-fiftieth of a grain.

The sulphate is used in veterinary practice only. It is there given hypodermatically in colics.

Ergot has also been warmly commended for use in atonic constipation.² Dr. Granzio reported two cases of atonic constipation, resulting from the prolonged abuse of purgative medicines, in which excellent results were obtained with ergot. Three doses, of ten grains each, were given at intervals of two hours, and were followed by a full and free evacuation. The next day an evacuation occurred spontaneously. The ergot was now administered in smaller doses, and after a few days the patients were discharged well.³

It may be given alone or in combination with belladonna, with Calabar bean or with nux vomica.

Zinc Sulphate was recommended by older physicians for obstinate constipation. It has been used as a tonic in flatulence and flatulent distention of the colon.⁴

It is best administered in the form of a pill made with bread crumb, or it can be made into a mass with some indifferent extract like *Gentian* or *Taraxacum* and put into a capsule. Dose, two to five grains, three times a day. It is said to be of service in those suffering from want of tone, in the weak and debilitated.

¹ Loc. cit.

² Brunton, loc. cit.

³ *El Siglo Medic.*, November 4, 1883. *Allgemeine mediz. Central-Zeitung*, May 24, 1884. *New York Medical Record*, 1884.

⁴ Brunton, *Pharmacology, Therapeutics, and Materia Medica*, 1888.

CASE 39. Mr. Baly reported the following case to the London Medical Society : A young lady came under his care in the autumn of 1853, anæmic and of feeble constitution ; had been troubled with habitual constipation from childhood ; from the age of fifteen had constantly had recourse to large doses of aloëtic aperients, and for many years had not had any action of the bowels without their aid. Latterly, she had frequently used injections, but these now fail frequently, and, at the present time, she generally obtains relief every three or four days by a dose of blue pill and colocynth at night, followed by an enema in the morning ; the latter frequently repeated. She complains of great debility ; inability to make exertion, mental or bodily ; temper irritable ; spirits depressed ; pulse feeble ; catamenia regular, but pale ; frequently suffers from cold extremities ; appetite small. When the bowels have not acted for three or four days, she *suffers* from a *sense of fulness and distention of the abdomen* ; she frequently, after an evacuation, suffers for some hours from severe prostration. In this case he revived the treatment proposed by Dr. Strong in 1842, it being evident that the continued employment of any form of aperient would be hurtful. Having, as a preliminary measure, cleared out the bowels with a dose of blue pill and colocynth, followed by an enema, he ordered *sulphate of zinc*, five grains, bread crumb sufficient for a pill, to be taken three times a day immediately after each meal. This was continued for ten days without causing sickness and with decided relief to the abdominal distention ; the appetite improved, the listlessness decreased. No evacuation occurred from the second day till the tenth, when the following was administered : Calomel, four grains, extract colocynth co., six grains ; make a pill to be taken at bedtime, to be followed by a black draught in the morning. On the day following this the bowels acted spontaneously, and, from that time until now, nearly twelve months, have been relieved daily without aperients or enemata. The use of the sulphate of zinc was continued for three weeks, and then gradually exchanged for sulphate of quinine. A curious fact deserves notice in this case. For some time after the discontinuance of the enemata,

the patient was not sensible of the action of the rectum during the passage of the fæces.

Other cases were cited in support of the treatment, the use of which he would limit to cases dependent upon a want of tone.¹

Ammonii Chloridum (*Ammonium muriaticum*; *Chloride of Ammonium*). — The muriate of ammonia will be found of much service in those cases where, the fæces continuing hard and dry and lumpy, there is evidently a deficient secretion of mucus as a result of glandular atony (from prolonged pressure of the accumulated fæces upon the mucous membrane, from general debility), or even perhaps of glandular atrophy, to a certain extent (from protracted intestinal disease, as enteric fever, acute or chronic inflammations).

That it stimulates the action of the muciparous follicles of the mucous membrane is a matter of long observation as regards the bronchial mucous membrane, and that it acts in the same way upon the intestinal mucous membrane, I can affirm from my own clinical observation. Brunton makes mention of this action in his *Pharmacology and Therapeutics*.²

Dose and Administration. — It may be given in doses of five to ten grains three times a day. It is best administered in the intervals between the meals.

It can be given in the form of a tablet, or in powder to be dissolved in water or milk.

¹ *Lancet* (London), 1854, Vol. II., p. 381.

² A Text-book of Pharmacology, Therapeutics, and Materia Medica, by T. Lauder Brunton, M.D., etc., Philadelphia, 1888.

CHAPTER XXI

I EFFECTS OF TREATMENT. II. COMPLICATION

I. **Effects of Treatment.** — These various methods of treatment can be employed singly or combined, as already indicated. However, it will be found, I believe, that a combination of two or more of these methods will greatly enhance the efficacy of our efforts. Thus we may combine massage with electricity as recommended by Nothnagel,¹ or with electricity and medication; or massage and hydropathy, adding thereto the administration of certain medicines as may appear to us indicated. We may combine hydropathy with electricity, or with medication, or with electricity and medication. No doubt, in many instances, we will be governed in our selection of the method or methods of treatment by the surroundings and conditions in life of the patient. Much, also, will undoubtedly depend upon the familiarity of the physician with one or the other plans of treatment, or his ignorance of them; this last factor should be eliminated. The physician should be acquainted, and equally well acquainted, with all the mechanical measures employed, in so far, at least, as the treatment of constipation is concerned.

No matter what plan of treatment we select, this one important fact must always be borne in mind: that the

¹ *Wiener mediz. Presse*, loc. cit.

dietary regulations and the rules as to exercise are indispensable to success. In fact, we may, with these alone, not infrequently achieve astonishing results. I have seen quite a number of cases of constipation of long standing that presented themselves at the dispensary completely cured by diet and exercise alone. By means of these various regulations and measures we will be able to restore to the intestinal muscles their lost vigor; we will be able to reduce dilated or dilated and hypertrophic intestines to their normal calibre, or nearly so.

We will be able to overcome the unpleasant head symptoms frequently produced by constipation and already described above. In this respect massage of the abdomen, with faradization of the head and nucha, will prove of the greatest benefit. Even before we have succeeded in restoring the normal intestinal function, we may have effected a disappearance of the head symptoms, as I have seen in a number of instances, and for which relief alone patients are very grateful.

II. Complications. — In a number of cases of atonic constipation I have discovered a marked atony of the stomach.

This can be recognized by the splashing sound (*plätschern*) obtained on palpating the stomach from the epigastrium downward, and from the cardia to the pylorus. It may also be obtained by shaking the patient from side to side. In severe atony the region of splashing sound extends as far down as the navel.

This is a complication that is exceedingly troublesome, as it interferes very much with the treatment, in so far that the dietary regulations required for the one are diamet-

rically the opposite of those necessary for the other. My plan of treatment here is to secure first the regular action of the bowels, not paying any attention to the condition of the stomach in the regulation of the diet, but of course treating its atony by massage, electricity, hydropathy, etc. Then, when the bowels are acting fairly well, the dietary regulations requisite for the relief of the stomach (and without which much cannot be accomplished) are prescribed and enforced.

CHAPTER XXII

TREATMENT OF CONDITIONS RELATED TO ATONY

I. **Ileus**; *with special reference to the forms named in the chapter, "Consequences of Constipation."* For illustration, see Case 25. *Most frequently seen in old people.*

If the rectum be loaded, the first step will be to empty this by means of the finger or scoop, if the fæcal matter be very hard; if not, by the use of rectal injections, cold or hot.

When this has been accomplished, or if the rectum be empty, the accumulation being located higher up, we will resort to large injections, allowing a quart of water, at a temperature of 80° F. to 90° F., to flow in at a time. Where there is much flatus, as indicated by the marked tympanitis, we will add to the water either spirits of turpentine (℥ i to the quart of water) or milk of assafoetida¹ (℥ ii-iii to the quart of water). These two agents I have found most effective for the removal of flatus.

For the administration of these injections the patient lies down upon his back upon the bed or couch, a pillow or two is placed beneath the hips, so as to give the lower half of the trunk the form of an inclined plane with the downward inclination to the diaphragm, and the reservoir is elevated to a good height,² — three or four feet, — so

¹ Made from the fresh gum and not with the exsiccated powder resorted to so frequently by apothecaries.

² There need be no fear of injury from a reasonable amount of pressure. This is clearly demonstrated by the investigations of R. E. Muller, "Entero-

as to obtain sufficient force to break down the impacted and obstructing mass. We can add still further to the effectiveness of the clyster by increasing the length of the rectal point of the syringe (which are all too short, as has already been said) by means of an O'Beirne rectal tube or a section of a stomach tube.

The patient should be persuaded, coaxed, or even begged to retain the injection as long as possible, so that it may exercise its softening and thinning action upon the indurated mass to the largest extent.

The injections should be repeated at intervals of three or four hours. When the accumulation is not very large, the ileus being rather of the paralytic form described, we may give two or three injections with the water at a higher and lower temperature alternately, as already set forth, at intervals of fifteen to thirty minutes, and then rest for three or four hours.¹

In the intervals we may administer small doses of olive oil, ʒ i-ii every two hours, with an equal quantity of glycerine or honey. (This makes the oil more palatable and more readily taken.)

In the place of water we may use oil for the injections, according to the method of Fleiner.²

clyses in the Summer Diarrhœa of Children, etc., with the Results of Laboratory Investigations," *Therapeutic Gazette*, 1893.

¹ This procedure can and should be resorted to in obstruction from intussusception volvulus, etc., upon the basis first laid down in my paper on this subject in the *American Journal of the Medical Sciences*, January, 1886, and reiterated in an editorial in the *Archives of Pediatrics*, November, 1895, namely, either that the injection will quickly relieve the obstruction or its failure be a positive indication that operative interference is necessary and should not be delayed.

² See chapter, "Oil Injections."

We may further aid our efforts, and add to the vigor of the peristaltic movement excited, by the administration of strychnine, preferably in small doses, or the tincture of nux vomica, two drops every one or two hours.

II. **Intestinal Paralysis**, due to the exhaustion of muscular vigor in the large bowel by reason of over-excitation or over-stimulation by strong cathartics.¹

In persons of constipated habit, we may have at times a paralysis of the intestinal tract come on very suddenly. The bowels refuse to act. The remedies which have usually provoked evacuation are inefficient, even in increased doses. Still more powerful agents are equally without effect. The condition resembles very much *intestinal obstruction*.²

Treatment. — **Electricity**, external or internal method, or both combined.

Hydropathic measures: the douche to the abdomen; the general rain-bath; the clysters, hot or cold.

Medication, addressed to the nervous system, or to both the nervous and muscular system; nux vomica or strychnine or physostigma, alone, or combined with ergot or with other agents having a similar action; I have sometimes given it with quinia. In the condition described (or in analogous conditions from chronic central lesions) I like to give the strychnine in small, but frequently repeated, doses, one one-hundred and twentieth to one one-hundredth of a grain, well rubbed up with sugar of milk, every four hours.³

¹ Other forms have been already referred to.

² See *Des Pseudo-Etranglements*, by Dr. Henri Henrot, Paris, 1865. Treves, loc. cit. "Pseudo-Intestinal Obstruction," by H. Illoyay, M.D., *Medical News* (Philadelphia), August 28, 1886. Rosenheim, loc. cit.

³ The trituration must be very thorough.

III. **Atony of the Rectum.** *Atony of the Pouch of the Rectum.*¹—It has already been stated that the various segments of the large bowel can be distended as a result of atonic constipation, and that the rectum forms no exception thereto. The whole rectum is then involved in the distention, and usually the parts above it as well.

Under the term *atony of the rectum*, however, we have described to us a condition wherein the ampulla of the rectum alone is distended, the rest of the rectum, as also the parts beyond, retaining their normal character.

Constipation of an obstinate character is a feature of this condition.

As to the causes of this dilatation, I may say that I am not of the opinion that the most frequent etiological factor is a neglect of the calls of nature. I do not believe that ordinarily, even with a marked degree of atony, the fæces, once so low down, can be held there, and this for reasons already set forth in the chapter on the physiology of defecation. The most frequent causes, in my opinion, are such pathological conditions of the rectum as tend to make defecation exceedingly painful, strong contractions of the sphincter being then provoked and the fæces forcibly held back. These conditions are :

Fissure of the anus.

Hæmorrhoids.

Hyperæsthesia of the lowest segment of the rectum.

Painful conditions of the genito-urinary tract.

It may also result as a consequence of the great debility

¹ See the various works on Diseases of the Rectum, Kelsey, Mathews, Cripps, Van Buren. In most works under the head of "Impacted Fæces."

following protracted exhausting diseases, as typhoid fever, long-continued remittent fever, etc., when the patient does not possess sufficient strength to force inspissated and scybalous fæces through the sphincter. Here, the rather concentrated character of the aliment, containing but very little residual matter, is also, no doubt, an important factor. Furthermore, the greatly lowered nervous irritability, and the fact that such patients pass most of their time in the lying or sitting posture, greatly favor the retention and the accumulation of fæces at this point.

An anæsthetic condition of the rectum as may occasionally be met with in the neurasthenic, and more frequently in the hypochondriac and the melancholic, tends to its development.

It is very much favored by the constant use of tepid or warm injections to which so many persons, especially females, are addicted.

Old age, with its debility, its obtunded sensibilities, and the tendency to sit or lie down a great part of the time, favors the production of atony of the rectum.

It can thus occur at all periods of life, and in persons of every condition. Most commonly, however, it is met with in delicate females with lax muscular fibre, and in persons of very advanced age. It is said to be met with in delicate children.

The dilatation of the ampulla may reach an enormous extent. Generally the pouch will be found to contain large masses of fæces indurated to stony hardness.

The pressure made upon the mucous membrane of the rectum may set up a catarrhal irritation with the characteristic discharge.

The **symptoms** of this condition have especial reference to the rectum. A sense of fulness or weight therein, with sometimes a sensation as if a weight were pressing down the parts. Frequent desire to go to stool which, when gratified, results in the discharge of a few small, hard, scybala, or of a little fluid fæcal matter which may lead us to a wrong diagnosis. Pain, due to spasm of the sphincter, frequently attends the stool.

With these we may have symptoms of irritation of the various organs of the genito-urinary tract, excited by the pressure made upon them by the indurated and hardened fæcal mass.

Sometimes we have only constipation, without any other especial manifestation to indicate to us the seat of the difficulty.

Examination of the rectum with the finger will disclose the presence of a large quantity of hard, firmly packed fæces, and when this has been evacuated, the finger will sweep about in a large, sometimes immense, pocket, as it were.

Examining with the speculum, the pocket will be found filled sometimes, with enlarged folds of loose mucous membrane which have a tendency to pass downward, with the efforts at stool, between the two sphincters, and thus narrow and even block up the exit against the fæcal bolus.

For the relief of this condition we will firstly remove or render innocuous the cause or causes that have produced it. If *fissure* of the *anus* be present, we will incise it as advocated now by the majority of writers, or we may treat it with forcible dilatation. Hæmorrhoids will receive the proper attention ; etc.

We will cleanse the rectum thoroughly of all scybala or faecal accumulations. We will then see to it that the patient has daily a full and free evacuation. To accomplish this we may resort to the rectal injection of glycerine $\bar{3}$ ss-i, or to the glycerine suppository (which I do not think as effective), or to the injection of a small quantity of very cold water.¹ This latter has this additionally in its favor, that it stimulates both nerve and muscle of the part, and thus tends to invigorate it. It will also aid in dispelling the turgidity or congestion which is almost always present in atony of the rectum.

To this may be added the cold douche to the abdomen or the general rain-bath. We will further tone up the general abdominal vigor by massage, and for the special condition under consideration, we will "beat the sacrum," as already described.²

We can employ electricity both percutaneously and internally. The faradic current should have the preference.

In addition to all this, we will resort to the proper medication to give tone to the system. We may give nux vomica in extract, one-half to one grain in a pill once daily, or after the fashion already described. Strychnine is, I think, specially indicated, alternating with physostigma where the condition seems to require it. Bark (compound tincture of cinchona) with nux vomica or strychnine or the hypophosphites with strychnine will be given, according to the indications.

With these measures all can be accomplished that is requisite, and astringent injections and the use of purga-

¹ See section on "Hydrotherapy."

² See section on "Massage."

tives, as were formerly advocated, can generally be dispensed with.

* * * * *

Bretonneau recommended as a local injection to induce contraction of the part :

℞	Extract. Rhatanix (Kramerix)	ʒ ii	
	Spirit. Vin. Rectificat.	ʒ v	
	Aqu. Pura.	ʒ iv	Misc.

This prescription is also highly commended by Trousseau¹ for the treatment of anal fissure.

Bodenhammer claimed good results from

℞	Acid. Tannic.	ʒ i	
	Claret Wine	ʒ iv	Misc.

He has also used with success decoctions of white-oak bark and alum, as also the decoction of galls.

With these astringent injections the use of purgatives, as already mentioned above, is combined. Bodenhammer gives a pill composed as follows :

℞	Extract. Aloe	ʒ ss
	Extract. Nuc. Vomica.	ʒ i
	Extract. Hyosciam.	grs. xv
	Ferr. Sulphat.	grs. x
	Ole. Caryophyll.	gtt. v

M. ft. pillul. No. XXX. Sig. Take one at dinner or at bedtime.

Van Buren prescribed this pill :

℞	Ferr. Sulphat. Exsiccata.	
	Quinia. Sulphat.	āā ʒ ii
	Extract. Nuc. Vomica.	
	Extract. Aloe	āā grs. xii

Misc. ft. pillul. No. XL. Sig. One pill three times a day.

¹ Clinical Lectures.

Or a prescription, as follows, is given :

℞	Extract. Aloe	
	Extract. Hyosciam.	āā ʒ i
	Extract. Nuc. Vomic.	grs. iv
	Ole. Anis.	gtt. iv

M. S. A. et ft. pillul. No. LX. Sig. One pill after dinner.

Where there is too great a redundancy of the mucous membrane of the pouch so that, in the act of defecation, its folds obstruct the passage, an operative procedure may have to be resorted to.¹

Atony of the whole intestinal tract may result from atony of the rectum.²

¹ Kelsey, "The Surgical Treatment of Constipation," *New York Medical Journal*, May 16, 1896.

² "Atony of the Rectal Pouch," etc., by William Bodenhammer, M.D., *New York Medical Record*, April 6, 1889. Van Buren, Lectures on the Diseases of the Rectum, "Atony of the Rectum," 1882. Mathews, loc. cit., "Impaction of Fæces." Kelsey, The Diseases of the Rectum. Curling, On the Diseases of the Rectum. Trousseau, A., *Gazette Médicale (de Paris)*, Tome VIII., No. 36, 1840.

CHAPTER XXIII

TREATMENT OF ATONY OF THE INTESTINE DEPENDENT UPON MORBID PROCESSES

I. CONSTIPATION DEPENDENT UPON CHRONIC INTESTINAL CATARRH

CONSTIPATION is frequently due to a catarrh of the large bowel. In fact, it is laid down as one of the characteristic features of chronic catarrh of this section of the intestinal tract that the patients are constipated the major part of the time. This constipation alternates with diarrhœa, in this wise: the patient may go three or four days without an evacuation, and then a diarrhœa will supervene which may last a whole day or cease with two or three very thin discharges following each other in rapid succession. An examination of these discharges will show undigested matter in considerable quantity, and will also disclose to us (by the odor) that fermentation or putrefactive processes have therein developed.

The **treatment** of this form of constipation is in reality the treatment of the intestinal catarrh.

I. Of the utmost importance is the regulation of the **diet**. All vegetables and all raw fruits are strictly prohibited; all meats, whether fish or flesh, are banished from the list of edibles. The diet list is made up of the following articles: rice, barley, farina, fine ground hominy,

sago, cornmeal, oatmeal. Occasionally, *vermicelli* or grated noodles¹ are well borne and can be permitted.

Cocoa, milk, black tea.

Chocolate can be eaten.

A little syrup (maple or cane) or honey, as an addition to the farinaceous articles, may generally be permitted.

All food must be boiled or baked (with the addition of a minimum quantity of sweet butter). Anything fried is absolutely hurtful, and must therefore be strictly forbidden.

No alcoholic liquor of any kind.

Later on, as the case progresses favorably, a soft-boiled, or a hard-boiled, cold, (so-called railroad) egg can be permitted. Meats and fish are not allowed until the patient has fully recovered.

II. **Massage.** — At the outset, the mild introductory effleurage and manipulations 3 and 4 of Group *C*, gently made. Later on these are executed more vigorously, and the various other manipulations as the case progresses.

III. **Hydrotherapeutic Measures.** — First of all the large clyster to effect a daily evacuation, and thus prevent accumulation of fæcal matter and subsequent irritation of the intestinal mucous membrane.

The injection has also a curative effect upon the irritated intestinal mucous membrane, and therefore can be made, if desired, of decoctions of aromatic herbs, as chamomile or peppermint — the latter has a remarkably soothing and quieting effect upon the bowels. Or strong infusions of these herbs may be added to the cold water.

The cold moist-abdominal bandage applied as described.

IV. **Medication.** — I have generally found that these

¹ See formulary.

measures, of which I consider the dietary regulations as of the first and foremost importance, succeed in relieving the ailment without any medication. Sometimes I have thought it advisable to prescribe small doses of phosphate of soda, where there seemed to be an insufficient quantity of lubricating mucus secreted. When too much was secreted, I have found the decoction of cortex simaruba of the greatest value in modifying it, and bringing it within normal limits. There is, for this purpose, nothing superior to it in the pharmacopœia.

II. ATONY FROM MORBID PROCESSES ELSEWHERE

1. **Neurasthenia** (*Nervous Exhaustion*).—As a result of the physical depression characteristic of neurasthenia, we have, not infrequently, constipation, alone or combined with other dyspeptic phenomena, as one of the manifestations.

In the diagnosis of neurasthenia, this very important point must be borne in mind, that constipation or indigestion may give rise to symptoms much like those found in neurasthenia, and may thus lead to error.

The **treatment** here must be essentially that of the neurasthenia. With its relief or improvement the constipation will also be improved, or disappear.

We may send our patient to the mountains.

We may advise a sea voyage.¹

But best of all² we will institute a hydropathic treatment which is superior to other methods of treatment in the permanency of its benefits.

¹ Osler, *Practice of Medicine*, 1892.

² Löwenfeld, *Pathologie u. Therapie d. Neurasthenie u. Hysterie*, 1893.

The measures particularly indicated here are :

The *cold moist-rubbing*.

The *cold tub-bath*.

If treatment can be had in a hydropathic institute :

The *hot-air bath*, of short duration, followed by

The *cold rain-bath*, or by

The *cold fan-douche*, or the alternately *hot and cold fan-douche*.¹ It will be best, especially where the depression is very marked, to begin with the cold moist-rubbing, having the temperature of the water in which the sheet is soaked at 90° F. to 85° F., and gradually reduce it, in the course of the period in which the patients are under treatment, to 75° F., to 70° F. Then we may substitute for it, for a time, the cold tub-bath or, where the patient can avail himself of the advantages of a hydropathic institution, the hot-air bath and douches as described.

Sea bathing is beneficial.

General massage, including the abdomen, may be resorted to.

We may employ electricity, galvanic or faradic. Galvanization of the head is apparently of much benefit. In very apathetic individuals general faradization will be useful.

We will carefully regulate the diet. It should consist mainly of milk, meat, and eggs. Milk is a very important factor; one and one-half to two quarts per day should be taken. All alimentary articles, tending to produce flatulence, which is doubly distressing and doubly irritating to the neurasthenic and tends to make the constipation more obstinate, must be avoided.

¹ See chapter on "Hydrotherapy."

As to the special feature that concerns us here, the constipation, we will direct in the diet of the patient certain articles which favor peristalsis: buttermilk, two or three glasses per day (replacing the same quantity of other milk). This I have found especially beneficial. Then the fruits: baked apples, apples baked in syrup, prunes, etc., as described.

In the course of the hydropathic treatment we will have the fan-douche directed particularly to the abdomen, to the tract of the large bowel. We will resort to large injections of water, as already described.

We can employ the electrical current as already described above.

It may become necessary in the course of treatment, either for the purpose of securing a more thorough emptying of the bowels, or for the general revulsive effect upon the abdominal organs, to resort to a purgative. A compound cathartic pill, U. S. P., one of the various aloëtic pills, or, if the bitter taste be not objectionable, the mixture described in the formulary as a "tonic laxative," one teaspoonful every three or four hours until the desired effect is obtained, can be directed.

In the neurasthenia of sexual origin, with persistent irritability of the sexual organs, we will resort, in the male, in addition to the measures already described, to the **psychrophore** (*Kühlsonde*, cooling sound), described in detail further on. In women, I have derived marked benefit from the wet pack as employed by me in the treatment of summer complaint.¹

A sheet is wrung thoroughly out of cold water; the patient,

¹ "Summer Complaint," a clinical contribution, etc., *New York Medical Journal*, 1892.

naked, is wrapped therein, and then covered with blankets. As soon as the sheet is warm, it is removed, and a fresh one applied. This is continued for two hours, during which time from four to six sheets are used,—more in summer, less in winter. In the cold months, the room must be thoroughly warmed.

I have also, at times, applied the wet sheet folded so as to reach from about the upper border of the liver to the knees.¹

The administration of some tonic, as strychnine with bark, strychnine with acid, strychnine with hypophosphites, according to the particular indications presented, will add efficacy to our other measures.

2. **Debility after Protracted Maladies.**—The general debility, consequent upon long febrile processes, as typhoid fever, remittent or intermittent fever, may involve, to a marked degree, the intestinal tract; and constipation, sometimes very obstinate, results.

It is, however, of but little importance otherwise. As the general system gains in vigor, the bowels become stronger and more active. To secure their action meanwhile, we can resort to electricity, which is especially indicated for the permanency of its benefits; to the large clyster; to the injection of oil;² to the glycerine injection or suppository; occasionally to an aloëtic pill; to a dose of the compound rhubarb powder or other mild and stimulating cathartic. I have obtained very good results with the preparations of malt regularly administered, both as to tonic and laxative effects.

3. **Disease of the Heart.**—In the course of organic disease of the heart, when the normal functioning thereof becomes

¹ For further details, see Beard, *Nervous Exhaustion*, 1888. Löwenfeld, *loc. cit.*

² See chapter "Oil Injections."

impaired, a state of congestion of the whole intestinal tract may supervene, and constipation result.¹ This constipation is not really due to atony, but rather to change in the intestinal tissues, and to insufficient oxygenation of the blood.

For the relief of the constipation we will make use, for reasons known to all, of the hydragogue cathartics ; of the compound powder of jalap ; of the compound infusion of senna ; of epsom salts, etc. ; or we may resort to the active mineral waters, as Hunyadi János, Friedrichshall, or Pullna.

At the same time we will attend to the heart, which will also be greatly benefited by our hydragogue cathartics properly and discreetly used.

¹ Walshe, Walter Hayle, Diseases of the Heart, 1862. Strümpel, Text-book of Medicine.

CHAPTER XXIV

TREATMENT OF SPASTIC CONSTIPATION; ENTEROSPASM

It is the general experience that the measures, so fruitful of good in atonic constipation, are of no avail when the retention of the fæces is due to a spasmodic contraction of the intestinal muscle.

The indications for treatment here are twofold:

First. The relief of the spasm.

Second. The removal of the cause that provokes it.

I. **Belladonna.** — For the relief of the spasmodic state, belladonna is the remedy *par excellence*. Trousseau¹ extols it highly, and it is, undoubtedly, in the constipation dependent upon enterospasm, that it achieves its greatest successes.²

It may be given in the form of the tincture, guttæ 5–10 every four hours (about three or four doses per day). Rosenheim gives gtt. x per day. It may be given as extract in pills one-sixth to one-fourth of a grain, three or four times daily.³

℞ Extract. Belladonna. (English) grs. ii
 Extract. Gentian.
 Extract. Taraxac. āā grs. iv–vi
 M. ft. Mass. et divid. in pillul. æqual. No. VIII–XII.

¹ Trousseau, Clinical Lectures. Translated, Philadelphia, 1873.

² Phillips, Materia Medica and Therapeutics. H. C. Wood, loc. cit.

³ I have found this to be a sufficient dose when the English extract is used.

Trousseau¹ prescribed the following pill :

℞ Pulv. Folia. Belladonna.
 Extract. Belladonna. āā 0.01 = (gr. $\frac{1}{7}$).
 M. make one pill.

The directions are: "One of the pills is taken, by preference, fasting in the morning, on an empty stomach. The number of pills may be increased from one daily to two daily within the first five or six days; they ought seldom to exceed four or five in the course of the twenty-four hours. Whatsoever number of pills are taken, they ought always to be taken at one time."²

I have myself made use of this formula, ordering the pills to be taken in accordance with the directions above given, and have always been very well satisfied with the results obtained therefrom.

It can be ordered in the form of a suppository with *Oleum Theobromæ* :

℞ Extract. Belladonna. (English) gr. $\frac{1}{5}-\frac{1}{3}$
 Ole. Theobroma. ℥ i
 M. ft. Suppository No. I.

One to be introduced into the rectum night and morning.

For suppositories it is perhaps better to prescribe the alkaloid atropia; for greater safety, and perhaps even greater effectiveness, a little morphia may be added :

℞ Atropia. Sulphat. gr. $\frac{1}{50}$
 Morphia. Sulphat. gr. $\frac{1}{8}$
 Ole. Theobroma. ℥ ss

M. ft. Suppository No. I. Sig. Introduce one at bedtime.

¹ Loc. cit.

² Trousseau, Clinical Lectures, Philadelphia Edition, Vol. II., p. 493.

I have found it advantageous to combine with the internal administration of belladonna, and more especially when it is directed in the form of suppositories, the external application thereof. I prescribe for this purpose the unguentum belladonnæ, and direct that a piece about the size of a pea or white bean be rubbed in over a section of the large gut morning and evening, varying the locality each application.

In this way a much quicker effect is obtained than with the internal administration alone.

Hyosciamus, belonging with belladonna to the same group of remedies, is also said to be useful in relieving enterospasm. It may be given in the form of tincture, gtt. v to xv every three or four hours (three or four times daily), or as extract, in pill form, from one-half to one or two grains every three or four hours.

It may be combined with belladonna, a smaller dose of each of these remedies being then given.

It has been recommended by some¹ to combine a mild laxative with the antispasmodic. When this is done, but the mildest of purgatives should be used, and in very small doses: extract of taraxacum, extract of rhubarb, extract of cascara sagrada, extract of rhamnus frangula, extract of butternut (*Juglans cinerea*). Occasionally very small doses of the compound extract of colocynth, one-twenty-fifth to one-thirtieth of a grain, may be given with the belladonna to great advantage.

The minute doses of the purgative correct the abnormal peristalsis, and thus, with the antispasmodic, relieve the enterospasm and the tendencies thereto.

¹ H. C. Wood, loc. cit.

Valerian, Assafœtida. — These remedies will be of advantage in pronounced neurasthenic and hysterical cases.

The *valerian* can be given as the simple tincture of valerian or as the ethereal tincture, in doses of fifteen to thirty drops every three hours. I prefer to give it in the form of valerianate of zinc. Various elegant elixirs of valerianate of zinc are made, and I have used them with great benefit in neurasthenic cases, the remedy combining tonic and antispasmodic properties.

The *assafœtida* is best in the distinctly hysterical cases. It must then be given in large doses, ten grains four times a day.¹ It is best given in pill form.

Oil. — Fleiner recommends as sole treatment the injection of oil. For details see the special chapter further on.

If there be much pain with the spasm, we will relieve the same by the administration of opium in some form, alone or in combination with the belladonna. I generally prefer the suppository of atropia and morphia (the latter, of course, in larger doses than in the formula given above, from one-fourth to one-third and even one-half a grain per suppository), as giving better results and with less disturbance to the general economy than any other mode of administration.

If opium be for any reason contraindicated, we may give camphor with our belladonna, or we may resort to sulphuric ether. Hoffmann's anodyne is a convenient form of administering the latter.

Where there has been a long retention of fæces, I have occasionally found a pill of morphia and belladonna, with minimal doses of colocynth (compound extract) or of podophyllin, one-thirtieth of a grain, to afford rapid relief.

It may be necessary to provoke a rapid evacuation of the

¹ Dr. Louis Stromeyer, *Erfahrungen über Lokal-Neurosen*, Hannover, 1873.

bowels. This we will effect by means of injections of very warm water (90° F. to 100° F.), or very warm infusions of some aromatic herb, as chamomile.

I prefer the addition of milk of assafoetida,¹ prepared as already described above, ℥ ii–iii to the whole quantity of water. It has always acted exceedingly well for me. Besides the rapid emptying of the bowels, an abundant discharge of flatus, which is frequently the cause of the pain, is provoked by the assafoetida, and the spasm is allayed.

Injections of cold water are decidedly objectionable and aggravate both the pain and the spasm.

External applications, as hot poultices, hot-water bags, and such like, I consider of but little value in the condition under consideration.

Electricity. — The galvanic current may be of great value here, more particularly in that form of enterospasm which is dissociated altogether from pain.

II. The spasmodic contraction overcome, and the function of the bowel re-established, we will turn our attention to the etiological factors and endeavor to banish them.

If a catarrhal condition of the large bowel exist, as shown by the evidence derived from the fæces, and catarrh is a not infrequent cause of spasm, we will seek to cure the same.

If a neurasthenia be responsible for the condition, we will treat the same upon the lines already indicated, resorting at first only to the gentlest measures of the various methods of mechanical treatment.

Occasionally, the enterospasm may be due to the exaggerated use of sharp condiments, as pepper, — especially the red, — ginger, etc., or combinations of these in the

¹ The milk has seemed to me to act much better than the tincture.

form of the various sauces. A return to a plain diet will be the first requisite for a permanent cure.

Spasmodic Stricture of the Rectum. — All lesions being excluded, the line of treatment just advocated for enterospasm is well adapted to the treatment of spasmodic stricture of the rectum. I believe, however, that here *assafœtida* will do more good than any other of the group of antispasmodics; for the reason that these cases, with rare exceptions, are found in persons with hysterical tendencies, or, at least, with an inclination to disturbance of the nervous equilibrium.

The wonderful success of Stromeyer¹ with this remedy should certainly encourage us to give it a thorough and conscientious trial in those rather mysterious troubles of the rectum where nothing can be found locally to account for the great suffering. I can myself bear witness to the remarkable effects of very large doses of this drug.

The *assafœtida* should be administered in massive doses, ten to fifteen grains, four times a day. With it we can give some tonic according to the indications that the patient presents.

From its well-known beneficial action in spasmodic affections elsewhere,² the application of the galvanic current seems certainly indicated. The mode of application might be in this wise: A medium-sized electrode, **cathode** over the region of the solar plexus, and another and somewhat smaller electrode, **anode** over the sigmoid flexure at its lowest reachable point. Duration of application, about three minutes. The cathode is then placed over the

¹ Erfahrungen über Local-neurosen, Hannover, 1873.

² Erb, Elektrotherapie, loc. cit.

cæcum and the anode about a hand's breadth in advance upward; the two poles are thus carried gradually over the whole large bowel down to the farthest point, possible, of the sigmoid flexure; or the cathode may remain stable and the anode alone be labile. Then the cathode is replaced over the cæcum, the anode retained at the S. flexure, and the continuous current allowed to flow through. Duration, four minutes. The internal method (unipolar or bipolar) may be tried.

Spasm of the sphincter without local lesion (spasmodic constriction of the anus).

Spasm of the sphincter without local lesion is chiefly an affection of hysterical or neurasthenic persons, and in its treatment this must be taken into consideration.

For the hysterical, large doses of assafoetida will be prescribed, and for the neurasthenics, those remedies that give tone and vigor to the system according to the indications presented, as given more in detail in the next chapter.

For the local manifestation, the topical application of belladonna, in the form of ointment, to the sphincter, with suppositories of belladonna or of atropia for the rectum, or belladonna administered internally, is here also in place.

Hyosciamus and cannabis indica may take the place of belladonna; but they are, as a rule, not as effective.

They may be given in combination with belladonna.

A cathartic will sometimes act very nicely and break up the spasm.¹ When these measures fail to bring relief, we will have recourse to a mechanical measure which is always effectual, namely, **forcible dilatation.**²

¹ Kelsey, loc. cit.

² "De la Dilatation Forcée dans le Traitement de la Constipation Opi-

Forcible dilatation may be made with the *hands* alone, or with the aid of instruments. When made with the hands, the *modus operandi* is this: "Both thumbs are introduced into the rectum [first one, then the other], back to back, well beyond the sphincter; then, taking a purchase from the buttocks with the outspread fingers, carry the thumbs gently and slowly, but forcibly, apart until their palmar surfaces are arrested by the ischial tuberosity."¹

When the sphincter muscle has become large and hard from this unnatural exercise, — the strong and long-continued contractions, — we will, after having stretched it in one direction, turn the thumbs and stretch the sphincter in the other direction. We will then, with some pressure, massage the sphincter all around, making petrissage between the thumb and forefinger, and again pull the anus apart with four fingers, two on each side. Under this treatment the sphincter will give way completely, and feel like a well-beaten steak, or like putty.² If it be preferred to do this instrumentally, one of the various anal specula, where the separation and holding apart is accomplished by means of screw power, may be used therefor. Van Buren, as do most of the modern rectal surgeons, preferred the manual method.

As the procedure is a very painful one, it is best done with the patient under the influence of an anæsthetic (ether, chloroform). This is more particularly so in weak and nervous patients (usually women), or when the pro-

niâtre," Championnière, L., *Journal de Médecine et de Chirurgie Pratique*, 1877. *Gazette Médicale d. Hôpitaux*, 1877.

¹ Van Buren, loc. cit.

² Allingham, *Diseases of the Rectum*.

cedure is necessarily a more prolonged one, as when the sphincter muscle is unduly thickened.

In strong and vigorous persons, when dilatation alone is necessary, anæsthesia may be dispensed with.

Where no general anæsthetic is administered, a local anæsthesia by means of cocaine, ten to fifteen per cent solution, should be produced.

The patient is placed in the knee-elbow position, and the buttocks being well drawn apart, he is asked to press down; the anus and sphincter being thus unrolled, they are painted thoroughly with the solution and repainted; then a little wad of cotton-wool, moist with the solution, is placed in the ring of the sphincter, and the anus permitted to retract and the buttocks to fall together. After a few minutes the wad is removed and replaced by a fresh one. In about ten minutes a decided anæsthesia of the parts is effected.

If the spasm be due to reflex irritation from the urethra or the neck of the bladder (and this is a point that should always be inquired into in spasmodic troubles of the anus and rectum), we will have to attend to these before we can expect permanent relief. In the meanwhile we will be able to allay the spasm with the suppositories of atropia or belladonna (alone, or combined with morphia according to formulæ above given). I have in this way succeeded in affording rapid relief from spasm of the sphincter ani coming on in the course of a severe gonorrhœa.

CHAPTER XXV

TREATMENT OF CONSTIPATION DUE TO IRRITABLE RECTUM

UNDER the terms of **Irritable Rectum, Hysterical Rectum, Nervous Rectum**, has been described a derangement of the lowermost segment of the large bowel, characterized seemingly by a hyper-irritability of the rectal mucous membrane, or of sections thereof (the hyper-irritability is frequently confined within circumscribed patches), or of the nervous filaments distributed thereto, and an absence of all apparent local lesion that might account therefor.

We must exclude from this category those cases in which well-defined disease of the urinary tract is found, as this may, as has already been stated with regard to spasm of the sphincter, produce other disturbed conditions of the rectum.

That the nervous system is mainly at fault, is demonstrated by the fact that the trouble is met with only in persons with a well-marked tendency to hysteria or already hysterical, and in persons in whom the nervous equilibrium has been disturbed by exhaustion of the nervous and general systems.

This derangement presents itself to us with diverse phenomena. Sometimes it is a sense of uneasiness in the rectum, a sort of nagging feeling, as it were, that makes the person afflicted aware that he has such an organ and

keeps his mind constantly upon it, until he can think of nothing else and becomes morose and melancholy. At other times it is a marked pain on defecation, so great as to almost fill the patient with terror at the thought of an evacuation, and cause him to go as long as possible without one. Or the pain may come on at regular or irregular intervals, even with a marked periodicity of almost malarial correctness. At other times it is characterized by a general collapse, that comes on with the stool, though there may be no pain at the time; nothing but an indescribable sickening sensation, as one patient expressed himself. A cold sweat breaks out upon the person affected, the hands become cold, the pulse feeble, there is a sense of nausea and a feeling as if one's last hour had tolled.

In the treatment of this most annoying, and to the patient sometimes terrible, derangement much tact will be required and careful study of the individual case.

In the hysterical, large doses of assafoetida are certainly indicated, and promise success. What this large dose is has been already stated. If, for any reason, assafoetida cannot be taken, the valerianate of zinc in pill,¹ or in the form of elixir (to which also an addition of the tincture of valerian can be made), will prove of decided benefit.

In cases of nervous exhaustion (neurasthenia), of general debility, it will be our first care to build up our patient, to invigorate him. Abstention from mental

¹ ℞	Zinc. Valerian.	grs. ii
	Extract. Valerian.	grs. ii
	Extract. Gentian.	q. s

M. ft. Mass. et ft. pillul. I. Sig. One pill three times a day.

work; abstention from the usual pursuits, if possible; moderate exercise in the open air; diversion of the mind (*Zerstreuung*), — will be advised. The diet will be carefully regulated, and such tonic medication as may appear indicated, prescribed.

Iron (for the anæmic), in the form of **Blaud's pill** (one pill three times a day, and increased every fourth day by one, until three pills are taken three times daily¹), or as the syrup of the iodide of iron and manganese. A good preparation of a similar character is Gude's pepto-manganate of iron (pepto-mangan). We can also give the iron in the form of a **valerianate**.

Arsenic.

Phosphoric acid, with bark (especially good in cases of nervous prostration).

The **hypophosphites** with strychnine. If the digestion is impaired, we will be greatly aided in our restorative efforts by the administration of hydrochloric acid with some bitter infusion, as of gentian or cascarilla, or with nux vomica or strychnine.

Several of these remedies may be combined in one prescription. Goodell² prescribed a pill as follows (*Pillul. Sumbul. Comp.*):

℞	Extract. Sumbuli	gr. i
	Assafoetida.	grs. ii
	Ferri Sulphat.	gr. i
	Acid. Arsenios.	gr. $\frac{1}{40}$

M. make one pill. Sig. One pill three times daily.

The quantity of assafoetida is rather too small to be of much benefit.

¹ Goodell, loc. cit.

² Loc. cit.

Or we may prescribe a pill like this :

℞	Zinc. Valerianat.	grs. ii
	Ferri Valerianat.	gr. i
	Strychnina. Sulphat.	gr. $\frac{1}{40}$
	Extr. Cannab. Indic.	gr. $\frac{1}{4}$
	Extr. Gentian.	q. s

M. make one pill. (If preferred, the mass can be put into a capsule.) Sig. One pill three times a day.

℞	Zinc. Valerianat.	
	Ferri Valerianat.	
	Quinia. Valerianat.	āā gr. i

M. ft. Mass. et ft. pillul. No. I. Sig. One pill three or four times daily.

Goodell also prescribed the following :

℞	Aur. Chlorat. Natron.	gr. $\frac{1}{8}$
	{ <i>Auri et Sodii Chloridum</i> }	
	{ <i>Chloride of Gold and Soda</i> }	
	Zinc. Valerian.	grs. ii
	Extract. Hyosciam.	gr. i

M. ft. Mass. et ft. pillul. No. I. Sig. One pill three times a day.

In addition, we may resort to the various hydropathic procedures already indicated above. I have seen very good results in building up a broken-down nervous system, from a properly arranged hot-air bath of very short duration, followed by the cold rain-bath or the Scotch douche to the vertebral column and body generally.

For the sudden paroxysms of pain, nothing is so effective, according to Goodell, as antipyrin in doses of five to ten grains, or hyoscin, grain $\frac{1}{28}$, administered every two hours until the suffering is relieved. A Spanish-fly plaster

of the size of a quarter or half dollar, applied over the coccyx, has done me good service.

Local applications of ointments or anodyne injections are of no benefit; rather harmful than aught else.

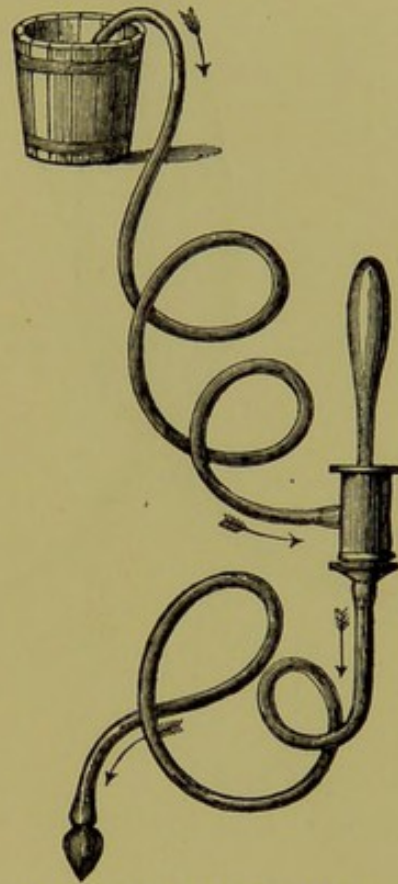
Of the greatest benefit, however, both in a curative sense and for the relief of the immediate suffering (better even than the remedies above named for this last purpose) is the local application of cold. It may be applied by means of the Atzperger apparatus.

This apparatus consists of a short metal cylinder to which are attached an affluent and an effluent pipe. To the cylinder is fixed a hollow, pear-shaped, metal stem, without any openings, which, well oiled, is carried into the rectum. The arrangement of the apparatus is as shown in the cut. The water flows in from an elevated vessel, and flows out through the effluent pipe into a vessel on the floor.¹

By the constant inflow of cold water and the outflow of the warmed water, the parts are kept refrigerated.

Or it may be accomplished by means of Winternitz's device.

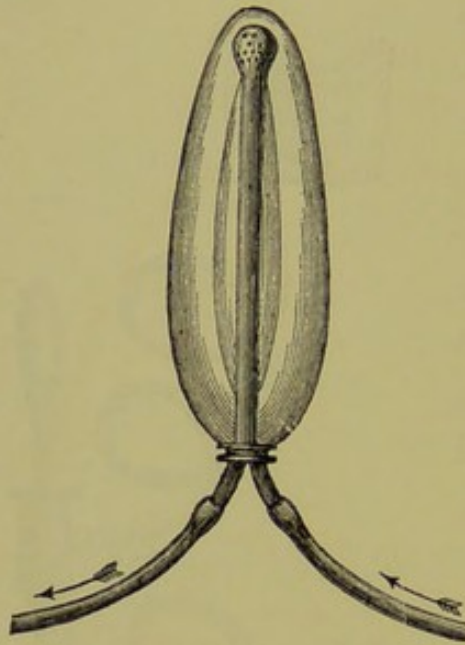
This consists of a hollow metal staff, six to twelve centimetres in length, ending in an olive point which, as well as the tapering neck, is provided with numerous small orifices. This staff,



ATZPERGER APPARATUS.

¹ Winternitz, loc. cit.

at its lower extremity, divides into two branches like the double-current catheter. To one of these branches is attached an affluent pipe, carrying water from a vessel placed at an elevation, and to the other branch, an effluent pipe, which carries off the warmed water to a vessel on the floor. Just above the point of union of the two branches, a metal disc with a grooved border is fixed. The staff is covered with a rubber bag (ice-bag) or a thin fish bladder, and its open end attached firmly to the grooved border of the disc. The bladder or bag is wound snugly around the staff, well oiled and introduced into the rectum. The water being allowed to flow in through the affluent tube, whilst the effluent one is shut off (by means of clasp or cord), the bladder is filled and becomes distended. This distention can be carried to any required extent, and we may thus have compression with refrigeration.¹



WINTERNITZ'S DEVICE.

The water being allowed to flow in through the affluent tube, whilst the effluent one is shut off (by means of clasp or cord), the bladder is filled and becomes distended. This distention can be carried to any required extent, and we may thus have compression with refrigeration.¹

If the sensitiveness of the parts be too great to tolerate the apparatus (which is not often the case), we can first anæsthetize them in a measure by the application of a ten to fifteen per cent solution of cocaine, by means of the applicator or by the aid of small wads of cotton introduced gently into the rectum. Or we can resort to the application of carbonic acid (CO_2), which the investigations of Brown-Séquard have shown to have a marked anæsthetic effect upon the tissues.²

¹ Winternitz, loc. cit.

² Comptes Rendus des Séances et Memoirs de la Société de Biologie, 1882. *Progrès Medical*, 1882.

We can do this readily with the contrivance devised for this purpose by Dr. A. Rose of this city. He describes it as follows:

“It consists of a bottle holding a pint or more with a wide mouth and a rubber stopper, the latter perforated so as to admit a glass tube which, at the external end, is connected with a rubber tube to which is attached a nozzle to be introduced into the rectum.”

The bottle is filled with water about one-third full, not quite up to the inner extremity of the glass tube. Into the water six drachms of bicarbonate of sodium are put, and when everything is ready for the application, one-half ounce of tartaric acid, in large crystals, is added, and the vessel quickly closed.¹

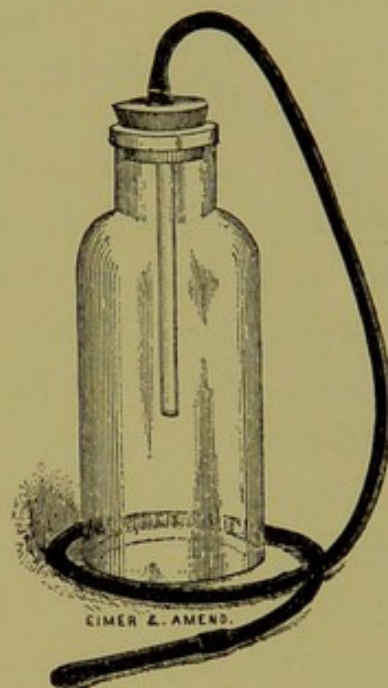
The cooling apparatus can be left in the rectum for an hour or two, and the application can be repeated on the same or on the following day.

The injection of cold water into the rectum sometimes suffices. Mathews² relates a rather remarkable case of this character which, after innumerable measures and things had been tried in vain, was promptly cured by an injection of cold water.³

¹ *New York Medical Journal*, March 9, 1895, “Therapeutic Effects of Carbonic Acid.”

² Mathews, loc. cit.

³ See on irritable rectum, Goodell, Mathews, Kelsey, loc. cit.



CHAPTER XXVI

TREATMENT OF CONSTIPATION DEPENDENT UPON GENITO-URINARY TROUBLES

THIS form of constipation has already been alluded to elsewhere. It remains only to be said that chronic affections of the genito-urinary tract, and more particularly in the male, may be the exciting cause of a chronic form of constipation.¹ They do this, sometimes, by provoking a spasm of the sphincter ani, as has already been said; at other times an irritable condition of the rectum is developed, and then again, as in spermatorrhœa, we cannot account for it except on the grounds that the nerve filaments of the lower segment of the rectum and the nerve centre in the lumbar section of the cord are obtunded, or that the irritability of the whole nervous system is lowered.

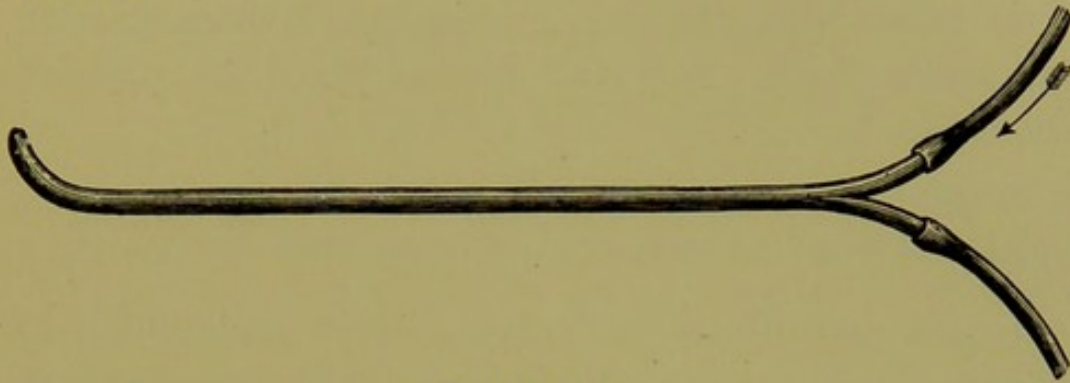
As will suggest itself at once, the etiological factor must be promptly attended to, to permanently cure the constipation. Here, also, the Atzperger cooling apparatus or the device of Winternitz will be of great service. Winternitz² regards it as highly efficacious in spermatorrhœa, as well as in cases where a chronic inflammatory condition persists. Its value in cases of seminal weakness has but lately received additional confirmation.³

¹ Peyer, loc. cit.

² Winternitz, loc. cit.

³ *New York Medical Record*, April 13, "A New Treatment of Seminal Weakness," etc., by Alfred Wiener.

The introduction of the cold sound will be resorted to where indicated. We may, in place of the sound, have recourse to the **psychrophor**, a cooling apparatus for the urethra.



PSYCHROPHOR.

It needs no long explanation. It is a closed double-current catheter, dividing, as that instrument does, at its lower extremity into branches. To one of these is connected an affluent, and to the other an effluent pipe. The arrangements for the inflow of water are the same as for the other cooling devices already described. It is introduced into the urethra, and allowed to remain for the length of time that may seem proper.

In cases of chronic inflammation it will be introduced so that the point passes just beyond this locality. In cases of spermatorrhœa the point should pass the pars prostatica of the urethra, reaching up to the sphincter of the bladder.

The instrument should be used methodically, but not too frequently. The temperature of the water should not be too low; from 57° F. to 54° F. generally suffices. It should not be lower than 50° F.

Duration of application, about eight minutes; at most, twelve minutes.¹

I have obtained excellent results in cases of sperma-

¹ Winternitz, loc. cit.

torrhœa with the use of the cold pack, from the umbilicus to the knees, as described in Chapter XVIII. I direct that the patient be put into the cold pack every morning for two hours.

At night, before retiring, a warm bath is taken to relax the tonus of the small ring muscles about the vesiculæ seminales.¹

Where the psychrophor is used, the other cooling devices mentioned above are, of course, dispensed with.

In the meanwhile, the bowels will be kept soluble by means of cold-water injections, of mild and tonic laxatives, as the tonic laxative of the formulary, or by means of laxative mineral waters, as Hunyadi János, Pullna, Carlsbad, Saratoga.

If, after the ailments of the genito-urinary tract have been cured, there remains a weakness, a torpidity of the bowels, we will treat this in the manner already set forth for atonic constipation.

¹ Illoway, "Hydrotherapeutics," *Cincinnati Lancet and Observer*, 1877, and other papers on the Summer Diarrhœa of Children.

CHAPTER XXVII

FISSURE OF THE ANUS

FISSURE of the anus may be the cause of the spasm of the sphincter ani or even of the rectum. The treatment therefor will be found in detail in the various works on the "Diseases of the Rectum." As to forcible dilatation, which with many is a favorite mode of treatment, this has been already described in full.

Fissure of the anus may, as has been said, result from constipation. It occurs in those cases where the fæces become very much inspissated and indurated and aggregated together into large masses which then require much force and much violent dilatation of the sphincter for their expulsion. Under these conditions it will be found that despite the best and most thorough treatment there will be a tendency to a return of the fissure. To obtain a permanent cure, it will be necessary to treat the atony of the intestine with the various mechanical measures.

We will employ massage; this will break up the large lumps and will stimulate the secretion of mucus, and thus effect a better lubrication. We will avail ourselves of the benefits to be derived from the clyster, and direct the use, daily, before going to the closet, of a small injection, one half to one pint, of cold water to still further soften the fæcal masses.

These injections can be continued for a time (two or three weeks) even after the fissure is entirely healed.

In this way abrasions of the delicate mucous membrane lining the sphincter ani will be inhibited. I have succeeded in healing, in this wise, fissures that have recurred again and again, without resort to any operative procedure or local treat-

ment other than the light application of the solid stick of argentum nitricum.

The further precautions to be taken, are these :

In all cases of fissure or abrasion the use of paper as a cleansing material after defecation is strictly and absolutely prohibited. Cotton-wool, absorbent cotton, is prescribed for this purpose. As long as the fissure is open, the parts are to be cleansed with a mild solution of boracic acid (two tablespoonfuls of the saturated solution to a glass of water). After it is healed, I direct that there be applied to the sphincter (after it has been cleansed with a wad of dry cotton) the following solution :

R	Acid. Tannic.	ʒ i
	Glycerin.	ʒ ii

M. ft. Mixt. Sig. Use as directed.

The patient presses down again (unrolls the sphincter) and applies the above solution on a wad of cotton, holding it against the sphincter for a few minutes.

This is continued for two or three weeks, and is for the purpose of hardening the parts and at the same time closing up and healing at once any abrasion or fissure that may have been then produced.

The prohibition against the use of paper, even toilet paper, must be carefully observed for a long time, at least six months.

CHAPTER XXVIII

HÆMORRHOIDS

IT is not the scope of this work to go into the details of the surgical treatment of piles, of their treatment by the injection method (injection of carbolic acid or of admixtures thereof into the body of the tumor), or of their treatment with acids. These can be found in the excellent works of Kelsey, Mathews, Bodenhammer, Ball, and Van Buren. This chapter here is only intended to direct attention to certain other measures, not so well known to the profession in general, that are available for the treatment of hæmorrhoids, when the more radical methods are refused or cannot be resorted to for one reason or other. That these measures, primarily intended to relieve the constipation, the congestion, are not infrequently very effective in causing the dispersion of the tumors has been shown by much observation, and has been verified to me in my own clinical experience. A number of ladies in my clientele were invariably, after every confinement, troubled with hæmorrhoids which caused both constipation and suffering. By prompt treatment after the method described here, without recourse to any forcible measures, the hæmorrhoids disappeared not to return again till after the next labor. In two cases, where pregnancy did not recur, there was no recurrence of the piles. These measures are:

A proper regulation of the diet.

Exercise.

Massage.

Hydropathic treatment.

I. *A Properly Regulated Diet.* — What has been said above, under this head, with reference to the treatment of atonic constipation, applies here as well. All things that tend to promote the activity of the intestines, to invigorate their various structures, must contribute to the cure of hæmorrhoids. Only this need be set forth more particularly that the use of spices, as black pepper, ginger, cinnamon, must be very much restricted; that highly seasoned foods and condiments are to be altogether avoided, and that alcoholic liquors, especially red wines and brandies, must be absolutely prohibited as directly and positively injurious.

II. *Exercise.* — All that has been said before holds good here. The supposition that horseback riding is productive of piles is fallacious.¹

III. *Massage.*

(a) Abdominal massage as already described.

The introductory effleurage is an important part of the treatment, and is made, as already stated, from the periphery to the centre, *i.e.* from the symphysis of the pubis to the navel.

Beating of the sacrum is especially indicated and, according to Reibmayer, of much efficacy.²

If not inflamed, the hæmorrhoidal tumors themselves

¹ In addition to the authorities quoted, see "Equitation and Cycling," etc., by Bodenhammer, *New York Medical Journal*, November 2, 1895.

² *Loc. cit.*

can be massaged (effleurage and light petrissage). To subject inflamed tumors to such treatment is not alone barbarous, but very dangerous.¹

Massage of the hæmorrhoids is made within the rectum. The patient is placed on his side, or in the lithotomy position, and the tip of the finger, well oiled, first introduced, and then gradually and slowly the whole finger pushed up as far as required.

For the effleurage, light strokes, as long as possible, are made. For petrissage, the tumor is slightly compressed between the tip of the finger and the rectal wall.²

(b) Gymnastics.

Active Exercise, Figs. 8, 9, 10.

Resistance Exercise, Figs. 13, 14, 15, 18 *a* and *b*, 19.

Passive Exercise, Figs. 21, 23, 24.

IV. *Hydrotherapy.*

(a) The injection of cold water into the rectum and bowels, both for its evacuating as well as its tonic effects upon the muscles of the rectum and the walls of the vessels. Van Buren³ believed that a better way is to obtain these two different effects separately, by two distinct procedures; namely first inject a large quantity of water, not cold, — even tepid, if there be much accumulation and induration of fæces, — to soften the fæcal matter and effect its discharge; then follow with a small, cold injection, “about a tumblerful, and as cold as can be comfortably borne,” for its constricting action and tonifying effect upon the tissues of the part involved. This last is allowed to become absorbed.

I prefer the ordinary cold injection as already described

¹ Reibmayer, loc. cit. ² Reibmayer, Die Unterleibs-Massage. ³ Loc. cit.

here; I think the effect of even lukewarm water is prejudicial.

The injection can be given once daily, — best in the morning before rising, or at bedtime before retiring, — or once every other day, according as the stool keeps soft or not.

This is a very effective measure.

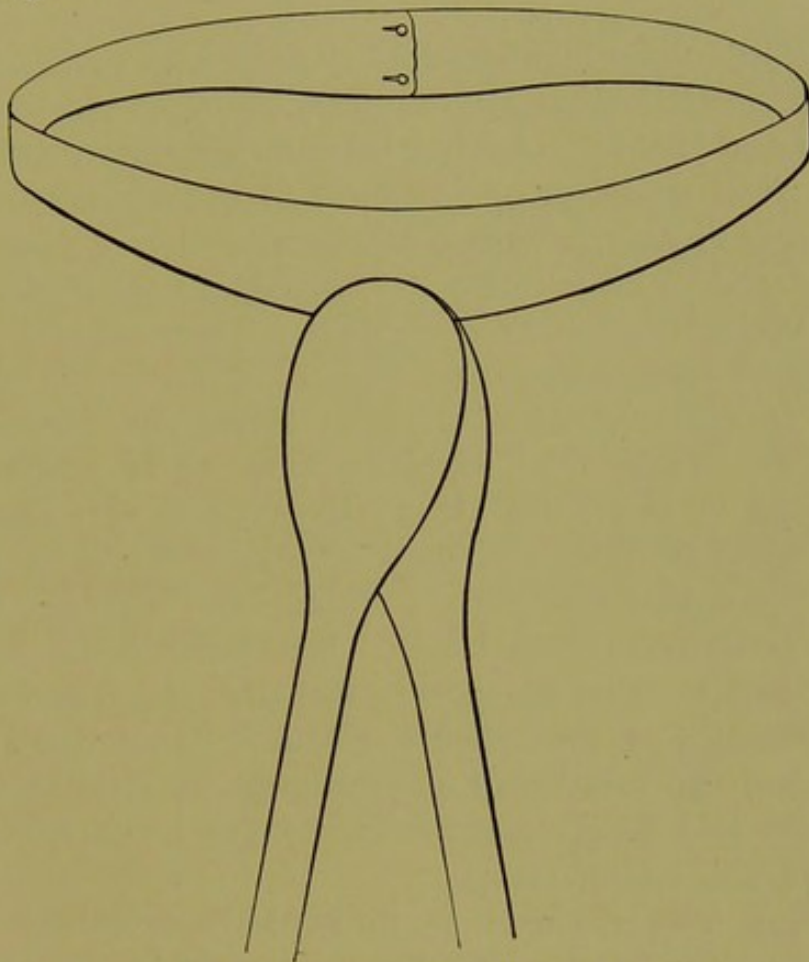
(*b*) The cold douche to the lower part of the trunk, both anteriorly and posteriorly. The Scotch douche is of great benefit, and can be applied to the perineum also.

(*c*) The hæmorrhoidal bandage: This is a sort of **T** bandage. It consists of two parts: a circular part to be applied as a girdle around the abdomen, and a vertical portion, attached to the middle of the girdle and at right angles to it, posteriorly, which is applied along the back downward, drawn through between the thighs, over the perineum, up over the abdomen, to the centre of the girdle in front. This vertical section consists of two separate leaves of muslin.

Its mode of application is this: The inner leaf of the vertical section is placed in cold water, allowed to remain therein for some time, and then wrung out thoroughly. The bandage having been put on (and the vertical section attached to the girdle by buttons), the wet leaf is pressed down upon the vertebral column and upon either side of it, passed through between the thighs upon the perineum, and up over the abdomen to the girdle in front, where it is affixed. The outer, or dry leaf, which, if impermeability be desired, can have oiled silk or gutta-percha paper sewed on to it, is laid over the wet leaf, and covers it completely.¹

¹ Winternitz, loc. cit.

(d) Atzperger's or Winternitz's cooling device for the rectum may be used. With the latter we can get, if we so desire, besides the tonic action of the cold, a compression effect upon the tumors, which is also of some advantage.¹



THE HÆMORRHOIDAL BANDAGE.

The dietary regulations, and those as to exercise, are always appropriate in persons with hæmorrhoidal tendencies, no matter what plan of treatment be followed.

The massage treatment may be employed alone, or in combination with hydropathic procedures.

Of the hydropathic procedures described, one or more

¹ Winternitz, loc. cit.

may be employed, alone, or in combination with massage. The cold injection, as especially efficacious, should always constitute a feature of the plan of treatment.

The combination of massage and hydrotherapy makes the treatment more effective, and gives quicker results.

As regards the administration of medicines, it may be said that, if the mechanical treatment above described can be carried out fully and faithfully, medication is unnecessary; otherwise, we may avail ourselves of certain well-known remedies that tend to tone up and invigorate all the structures of the bowels, and to stimulate their functional activity, to fortify the good results obtained with other procedures. These remedies, which have already been referred to more in detail in the chapters devoted to atonic constipation, are: strychnine, physostigma, and ergot. These may be given alone or in combination. **Nux vomica** or **strychnine** should be given in very small and more frequently repeated doses. It has been my experience that, in this way, a better effect is obtained. Ergot or ergotin can be administered more freely. **Belladonna**, which, in small doses, is said to stimulate peristalsis,¹ may be prescribed with one or the other of the remedies named. The formula above, given for a combination of physostigma (strychnine or nux vomica can take its place, if preferred), ergot, and belladonna, may serve very well here.

We may have recourse at times, with advantage to the patient, to some of the remedies belonging to the group of hepatic stimulants. **Hydrastis**² has been highly commended as a very efficient remedy. It is used both internally and locally. Internally it is given in doses of five to ten drops of the *tincture of Hydrastis Canadensis* in a wineglassful of water three or four times daily. Locally an infusion or decoction of the bark is injected into the rectum; the *tincture* can be used for the same purpose, ʒ ss-i being mixed with one or two ounces

¹ Brunton, T. L., Textbook of Pharmacology, Therapeutics, etc., 1888.

² Phillips, Materia Medica and Therapeutics.

of cold water, and injected into the rectum before rising in the morning or on retiring at night.¹ In conditions of torpid liver or of marked biliousness² we may give with our strychnine or ergot, small alterative, if the term may be allowed, doses of rhubarb, euonymin, juglandin, or of stillingia.

Purgatives should, of course, be avoided. If, however, circumstances compel us to resort to them in order to keep the bowels soluble, the mild saline laxatives, as magnesia sulphate, cream of tartar, Rochelle salts, etc., are to be preferred. These may be combined with sulphur, which at one time was supposed to have some special influence over this affection, or with rhubarb or with jalap or with senna, as in the *Pulveris Glycerrhizæ Co.*, as may seem most appropriate.

℞ Potass. Bitartrat. ℥ iii
Sulphur Flor. ℥ i

Mix thoroughly. Sig. Take two tablespoonfuls of the powder and mix in a cup or glass with sufficient molasses to make a thin batter. Of this take one to two teaspoonfuls every morning and evening, sufficient to keep the bowels easily and painlessly moved.

℞ Magnesia. Sulphur. (F. Barker)³
Magnesia. Carbonic.
Potass. Super Tart.
Sulphur Sublimat. āā ℥ ss

Mix thoroughly. Sig. From a teaspoonful to a tablespoonful in a glass of sugar water every morning.

℞ Pulv. Jalap. (Ellis)⁴
Potass. Bitartrat.
Potass. Nitrat. āā ℥ ss
Confectio Senna. ℥ i
Syr. Simpl. q. s

M. ft. Electuarium. Sig. A bolus of the size of a hazelnut three times a day.

¹ Ringer, Therapeutics. ² Brunton, T. L., Disorders of Digestion, etc.

³ Lectures on the Puerpural Diseases.

⁴ J. C. Wilson, Complete Medical Formulary.

℞ Soda. Sulphat. (Rosenheim)¹
 Pulv. Rhei Radic.
 Sulphur. depurat. āā 10. (= ʒ ii ss)

M. ft. pulv. Sig. About one-fourth teaspoonful (*Messerspitzvoll*) at a dose.

In debilitated or anæmic persons, an aloëtic pill with or without iron will sometimes be better borne than the salines.

℞ Pulv. Aloe Socotrin. (F. Barker)²
 Sapon. Castil. āā ʒ i
 Extract. Hyosciam. ʒ ss
 Pulv. Ipecac. grs. v

M. ft. pillul. (argent.) No. XX. Sig. One pill morning and evening.

In anæmic cases a scruple of sulphate of iron is ordered in the above formula.

Various local applications have been recommended. These may be in the form of fluids to be injected into the rectum (as the fluid extract of ergot diluted with two parts water, ergot ʒ ii, aqua ʒ iv), in the form of suppositories or of ointments which are applied to the tumors directly.³

Dr. J. B. James reports the successful treatment of hæmorrhoids solely by the application of calomel with the finger to the tumors.⁴

The local applications are more particularly indicated when the tumors are extruded and inflamed and painful.

¹ Loc. cit.

³ See "Formulary."

² Loc. cit.

⁴ *British Medical Journal*, February 20, 1892.

CHAPTER XXIX

OIL INJECTIONS

AN application or method of treatment, already referred to in the chapter on "Spastic Constipation," highly recommended by Kussmaul and Fleiner, and already favorably mentioned by older writers, is the injection of oil into the rectum, — the oil clyster.

In all ailments of the intestinal tract not accompanied by motor disturbances, oil injections are indicated. More precisely, its therapeutic indications may be summarized thus:

I. Wherever, from functional disturbance or organic change, the evacuation of fæces is inhibited, so that stagnation and accumulation thereof occurs.

II. In all forms of mechanical obstruction to the discharge of fæces, by compression of the bowel by abnormally enlarged abdominal organs, as liver, spleen, uterus, ovaries, or prostatic gland; by constriction of the gut by pseudo-membranous peritoneal exudation; by stenosis from cicatrices or neoplasms; by sudden bending of a section of the large intestine.

III. In all cases of intestinal irritation; in subjective troubles of diverse forms, colicky pains, circumscribed inflammatory processes; in proctitis, colitis, typhlitis; in ulceration, tubercular or dysenteric, — the oil clyster

is indicated, and even though evidences of involvement of the peritoneum present themselves.

Excepted are all irritative conditions of the intestine accompanied by increased peristalsis, whereby contents of the small intestines, considerable quantities of unchanged bile and natural pancreatic juice, are thrown rapidly into the colon. In these cases an injection of oil would be followed by a saponification of the same as it came in contact with the bile and pancreatic juice, and the setting free of oleic acid and the formation of glycerines. These, having a stimulating action upon the intestine, would aggravate the irritation already existing.

The oil clyster is said to be of exceptional utility in the bowel complaints that accompany ailments of the stomach; also in anæmic individuals and such whose nutrition is much impaired.

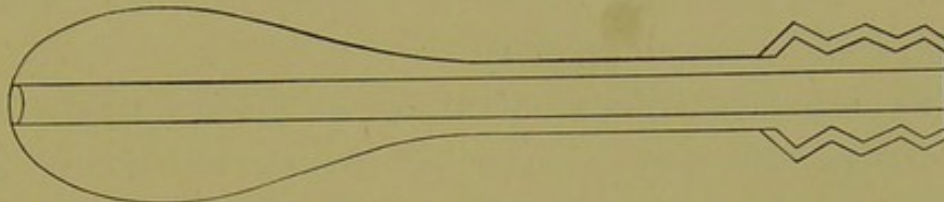
Technic of the Oil Clyster. — The very best of olive oil, — the virgin oil, if it can be obtained, — or the purest of cotton-seed oil, only should be used. The other oils, occasionally employed, as poppy-seed oil or rape-seed oil, are not extant in this country.

To avoid thermic or mechanical irritation of the mucous membrane of the large bowel, whereby peristalsis might be at once excited, the oil should be warmed before it is injected into the bowel.

Oil is warmed by placing the bottle or vessel containing it into a vessel of hot water.

The ordinary fountain syringe (whether the reservoir be a rubber bag or a tin or glass can) answers very well. The rectal point should have a calibre sufficiently large to

be commensurate with the slow outflow of the oil. Its borders should be smooth and well rounded. The following figure indicates what, according to Fleiner, its shape should be.



(Can be made of hard rubber, bone, or glass.)

The patient is placed in the horizontal position on a bed or couch, on the dorsum or on the side. The pelvis is elevated (20 to 25 cm. = 8 to 10 inches), especially if it be desired to reach further portions of the colon, by placing a firm (non-compressible) pillow, or a blanket properly folded, beneath it. In this, as in the knee-elbow position, a negative pressure is developed in the pelvic organs which exercises an aspirating action upon the fluids thrown into the rectum. Over the pillow or blanket a rubber sheet or oil-cloth is placed, so as to avoid soiling by the oil.

The reservoir of the syringe is elevated above the rectum to a height of about 50 cm. (= about 20 inches) or more and the oil allowed to flow in.

After taking the injection, the patient should remain lying down for at least one hour.

In cases of constipation with accumulation and induration of fæces, where the injection should reach up into the colon as far as possible, 400 to 500 c. cm. of oil are required for the injection for adults; for children, 50 to 150 c. cm., according to the age. In conditions other than constipation, in affections of the colon descendens,

of the sigmoid flexure, or of the rectum, 100 to 150 c. cm. (can be injected with a hard rubber syringe); for children, 30 to 50 c. cm. will suffice.

The outflow of the oil is, as readily understood, rather slow. It takes from fifteen to twenty minutes for 400 c. cm. to flow out completely.

The evacuation does not at once follow the injection. Usually several hours elapse before an evacuation occurs. If the gut be very much filled with hardened fæces, it may be necessary, if the required effect is not produced by the oil in three or four hours, to follow it with an injection of warm water.

A single application will not suffice, according to Fleiner, to have the oil reach the cæcum, even by changes of position on the part of the patient. A daily repetition of the clyster is therefore necessary, if any benefit is to be derived from this method of treatment. When the maximum effect has been obtained, it can be recognized by the character of the stool, which will now resemble very much the contents of the small intestines, and sometimes even give biliary color-reactions. Sometimes the maximum effect is obtained in two, at other times it will be three, or even more, days.

After the maximum effect has once been obtained, the clysters are given at intervals of two or three days, or even longer, according to the indications in the case. The quantity of oil is also diminished to 250, to 200 c. cm.

The oil discharged from the bowels shows, very frequently, marked changes; the most striking is the change in color, which may run all the shades from dark yellow to olive green. Besides the fæcal odor, it sometimes

acquires a sour smell, and a chemical examination shows an increase of acidity.¹

If abnormal fermentative or putrefactive processes are to be combated, one or two per cent of salicylic acid may be added to the oil.²

The oil acts both mechanically and chemically. By its mechanical action, which sets in already in the lowest segment of the gut, it loosens and detaches the scybala from the intestinal parietes, penetrates the indurated faecal masses and softens them, and indirectly, through the softened faeces, excites peristalsis.

Its chemical action is this: When it is brought in contact with unchanged bile and normal pancreatic juice, a process of saponification is set up, in the course of which oleic acid is set free and glycerine is formed, and both of these products have an irritating effect on the intestinal parietes, and thereby excite peristalsis.

Summarized, the effects of the oil are:

It detaches the scybala from the intestinal wall.

It softens the indurated faeces.

It has an emollient, soothing effect upon irritated tissues.³

It stimulates peristalsis.

It inhibits the resorption of water (from the faeces) by the mucous membrane.

Usually the oil clyster does not cause any disturbance at all; occasionally, only, the patient experiences an unpleasant sensation, as if something were crawling in him

¹ Fleiner, *Berliner klin. Wochenber.*, 1893.

² Rosenheim, *loc. cit.*

³ T. Lauder Brunton, *Pharmacology*, etc.

(searching out the bowels, some patients described it), that may disturb his sleep. This passes away, however, in a very short time.

It is absolutely necessary to cleanse the syringe thoroughly after each injection. The rubber tube is filled with water and hung up in **U** form; after a time the water is allowed to flow out at both ends. This process is repeated several times. If the instrument cannot be perfectly cleansed in this way, a little absolute alcohol will quickly remove all the particles of oil remaining.¹

¹ Fleiner, loc. cit.

CHAPTER XXX

SOME OTHER METHODS OF TREATING CONSTIPATION (THAT HAVE BEEN RECOMMENDED)

I. **Stretching of the Sphincter Ani for Constipation** (not due to local lesion).

In 1889 Dr. C. Cleveland¹ reported some cases of constipation treated by forcible dilatation of the sphincter ani, and with favorable results. Gant² has likewise reported favorably, though he does not confine himself to this procedure alone, but makes use also of massage and electricity. It is a question, therefore, how much of his success can be attributed to the measure under consideration. Mathews³ expresses himself rather cautiously.

It can be readily understood how forcible dilatation may be of benefit in those cases of abnormal contraction of the sphincter that are occasionally seen in the hysterical and the neurasthenic.⁴ That the cases relieved were of such a character, seems demonstrated by the fact that almost all of the cases reported are females, and all with either well-developed hysteria or neurasthenia, or at least a much-depressed and irritable nervous system.

¹ *New York Medical Record*, March 9, 1889.

² "Non-Medicinal Method of Treating Constipation," by S. C. Gant, *The Medical Herald*, St. Joseph, Missouri, March, 1893.

³ *Loc. cit.*

⁴ See "Spasm of the Sphincter," Chapter XX.

How it could be of any possible benefit in atonic states of the intestine is rather difficult to understand, despite attempted explanations. At the utmost the benefit here would be but temporary and not commensurate with the trouble and the suffering caused, especially when we have other methods that are in all cases certain of success, without any of these drawbacks.

The manner of effecting forcible dilatation of the sphincter ani has been already described in a preceding chapter. It remains only to be said here that there is also a more gradual process, as suitable in the condition under consideration as the more forcible procedure, and much more convenient, both for the physician and the patient.

The gradual dilatation is made by means of soft rubber rectal bougies.¹

II. The Application of Boracic Acid.²

Flatau treats habitual constipation with boracic acid locally applied. His method of treatment is this:

Where, in consequence of marked relaxation or of chronic proctitis, the rectal mucous membrane protrudes more or less through the anal orifice, the nates are separated, the anal parts washed with cold water, well dried, and about ten to twenty grains (a *Messerspitzvoll* = what will go upon the tip of a dinner-knife) of finely powdered boracic acid is either dusted strongly upon the protruding rectal mucous membrane or rubbed into it, with a circular movement, with the tips of the fingers.

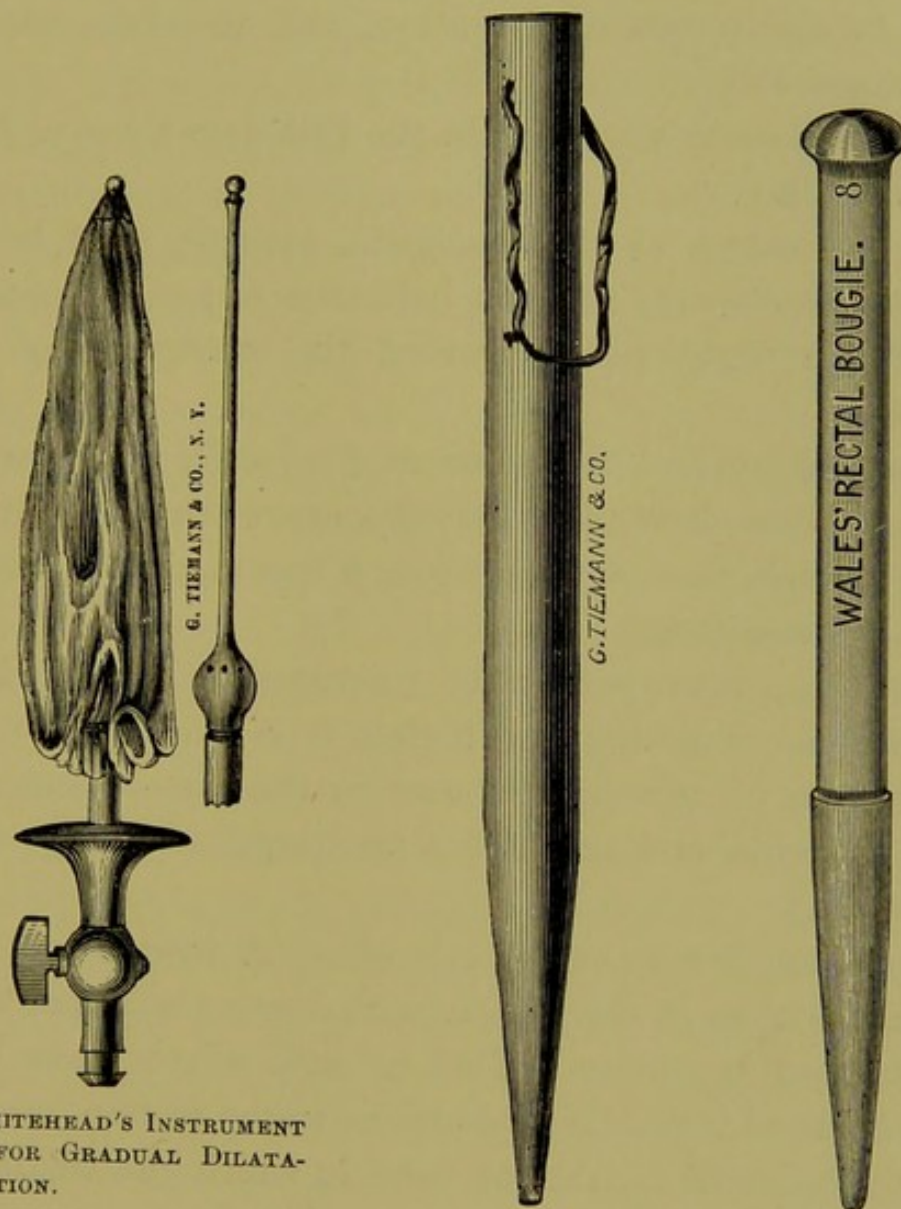
If there be no such protrusion of the mucous membrane, the powder is insufflated into the rectum. For insuffla-

¹ Gant employs this method. Loc. cit.

² Th. S. Flatau *Berliner klin. Wochenschrift*, 1891.

tion a coarser powder, one still somewhat granular, is better and more effective.

The applications should be made by the physician, ex-



WHITEHEAD'S INSTRUMENT
FOR GRADUAL DILATA-
TION.

cept in cases of protrusion of the rectal mucous membrane, where the patient can be taught to apply the powder himself.

After the application, the patient should remain in the

horizontal position for a little time, so as to retain the powder in place.

In from one-half to three hours peristaltic movements, which can be noted upon the abdominal parietes, are excited in the region of the colon, and abundant watery discharges follow.

In some cases there are in the first days three or four stools per day.

At the outset of the treatment patients must be instructed to obey the slightest indication of a call of nature, for if the slight be disregarded the stronger may not follow.

The applications are made at first *daily*; then when the intestines show more activity, every other day; then twice a week, once a week, twice a month, once a month, and then cessation.

The claim is made that the treatment is not injurious.

From the exposition of Flatau, it is evident that the application of boracic acid acts in the same manner as does glycerine, and that it has no special advantage over the latter.

Moreover, it may prove injurious. A case is reported where packing of the vagina with boracic acid produced pronounced poisoning. That no such effects have been as yet noted from the applications to the rectum, may be due to the small number of cases in which the treatment has been tried.

It is also very self-evident that a mere irritation of the intestinal tract, whether by bougies or by drugs, locally applied or internally administered, cannot overcome the fundamental difficulty, the *atony of the intestines*.

III. Treatment by River Gravel (*Flusskiesel*).¹

Kaczorowsky has had success in treating habitual constipation with **river gravel**.

He directs that the patient take a glass of cold water every morning on arising, on a fasting stomach. He regards this as the very best and most efficient way of softening and thinning the intestinal contents. He also directs the use of Graham bread, and gives other dietary regulations such as have been already set forth.

The mechanical measures are the best and simplest, and are not followed by any unpleasant side-effects. From this standpoint he has made use, besides, of the cold-water injections, of river gravel (**Flusskiesel**) or, rather, river sand washed off with hot water.

Of this, a teaspoonful to a tablespoonful is taken twice daily. It is taken plain without any other menstruum or envelope, and washed down with cold water, drunk after it. It is much more effective if the grains of sand are of the size of flax seeds.

From an æsthetic point of view the gravel could be replaced with coarsely ground marble dust; the antacid properties of this might be an additional advantage.

From his rather large experience, Kaczorowsky believes its use indicated in all cases of habitual constipation.

He has had remarkable success with it in the treatment of spastic obstipation in young, nervous persons with hyper-excitation of the genital spheres.

He finds it also indicated in the constipation dependent

¹ Kaczorowsky, *Asrodkach wyprizniajacychjelito, wseczegole o Zwirze-Przeglad lekarski*, No. 15-17, Krakow, 1886. "On the Intestine Evacuating Remedies, more especially as to River Gravel," *Virchow u. Hirsch, Jahresbericht*, 1886.

upon chronic heart and lung affections, with consequent anæmia and debility.

Also in the chronic catarrh of any section of the intestinal tract.

IV. Treatment by Suggestion.

According to Dr. A. Forel, constipation can be readily and quickly cured by the "Suggestion" method of treatment (hypnotization and suggestion).¹

¹ Die Heilung der Stuhlverstopfung durch Suggestion, etc., von Prof. Dr. A. Forel, Director der Irrenanstalt Burghölzli, Zurich, Berlin, 1894.

CHAPTER XXXI

TREATMENT OF CONSTIPATION IN OLD PEOPLE

CONSTIPATION is one of the more frequent troubles of old age. Very often it is only an aggravation of a costive condition of the intestinal tract that has long previously existed, and even where this is not the case it is readily accounted for by the various changes that characterize this period of human existence.

An atony of the whole muscular system with a tendency to atrophy.

A slowing of all the physiological functions.

A diminution of the various secretions.

Moreover, as a result of these changes, less exercise is taken, and there is therefore diminished oxygenation; less food is taken, and what is taken is of a more concentrated character, and there is therefore diminished detritus.

Under these conditions nothing can usually be done toward a restoration to the normal, but very much can be accomplished to make the patient comfortable.

I. First and foremost we will see to the diet. Though we cannot advise much coarse food, we have, nevertheless, several articles that are of great utility, and still compatible with the requirements of old age. These are:

A glass of cold water, the first thing on rising in the morning.

Oatmeal with milk and sugar (milk sugar¹ if it can be had); but preferably, if the patient can eat it that way, with (cane) syrup and milk for breakfast.

Molasses (cane-syrup) or fruit jellies, eaten with bread.

Fruit puddings (see formulary).

Baked apples, stewed fruits, *compots*, morning and evening.

II. Exercise. — It is important even for the old to take some exercise, both for the reason that it prevents the muscular system from relapsing into a state of lethargy by thus constantly arousing it, as, also, because it effects increased oxygenation of the blood and this more vigorous assimilation and greater excitation of muscle. I believe it can be maintained as an undeniable fact, that the characteristics of old age, in so far as loss of vigor is concerned, are less marked in those who continue to work, to keep up a state of activity, than in those who, naturally indolent, fall into a state of almost absolute inertia.

The exercise should be taken, as already indicated, in the open air; a good walk, keeping well this side of the limits of fatigue; horseback riding, carriage riding, in the park or open country, — all commensurate with the remaining degree of vigor.

III. As regards the treatment, more properly speaking, it may be said that, as a rule, the more forcible measures of the mechanical method will do no good; massage is of no benefit, and of hydrotherapy, only the clyster (hot or

¹ Boas believes that sugar of milk has some laxative properties. Routh (on "Infant Feeding"), however, holds that it tends to allay intestinal irritation, and to check diarrhœa.

cold) and the cold bath (with persons accustomed thereto) are available and also advantageous.

Here the well-regulated administration of drugs will be of service. The milder of the purgative medicines only should be resorted to. Moreover, when a certain article of this group has ceased to be effective in a proper dose, we should not keep on with it, increasing the quantity administered, until it is inordinately large, or until the system ceases to react to the agent altogether, but rather change it, — take up another remedy and lay this one aside. By doing this, we prevent a greater exhaustion of the intestinal tract and aggravation of the constipation, and also reserve a remedy; for it will regain its power at a later period, when the system will cease to respond to this one as it did to the other.

A well-regulated dinner-pill, for which there are a number of formulæ all more or less alike, taken an hour or two after the midday meal, or just before retiring at night, will be all that will be required with many persons. When this ceases to be effective, or at the outset, if we so prefer, we may prescribe cascara sagrada (as cordial, elixir, or pill) or the confection of senna (dose ʒ i–ii, once a day), or some other lenitive electuarium.¹ A good pill, that acts both kindly and efficiently, is composed as follows:

℞	Extract. Jugland.	grs. ii
	Extract. Rhei	gr. i
	Extract. Nuc. Vomic.	gr. $\frac{1}{5}$
	Extract. Hyosciam. (Engl.)	gr. i
M. ft. Mass. et ft. pillul. I.	Sig.	One pill at bedtime. ²

¹ See "Formulary."

² For other formulæ, see "Formulary."

If no distress is caused thereby, a purgative need not be taken but every other day, or even twice a week only.

In cases of marked sluggishness of the intestinal tract, it may become necessary, after a longer or shorter period of time, to effect a more thorough clearing out of the bowels. We can accomplish this by means of the decoction of rhubarb, the Infusum Laxativum Viennensis,¹ the liquor magnesiæ citratis, a laxative mineral water, or with any of the more active formulæ known to physicians.

This must be borne in mind as a rule governing the use of purgatives in the aged, *that no agent or formula that will gripe must be prescribed*; old people stand such suffering very badly.

It should be our aim in all cases to maintain the intestinal function by means of the dietary regulations and the use of injections, reserving our medicines for those periods when the measures named will cease to be effective, and for those occasions when a more thorough emptying may be required. In many cases we will succeed so well that the bowels will act almost normally. When, however, for one reason or another this cannot be done, or when such treatment is not effective, then we will direct the regular administration of medicines in the manner already indicated.

¹ Same as Mixtura Sennæ Co. The addition of Syr. Rhei Aromat., in the proportion of one to three or four of the Mixture, will correct any tendency to gripe that it may have.

CHAPTER XXXII

FORMULARY

AN evacuation, though not always a satisfactory one, may be obtained by means of an injection of glycerine. *One-half to one* ounce of glycerine is injected into the rectum with a hard rubber syringe. Or the glycerine can be introduced into the rectum by means of a suppository.

It is applicable more especially in those graver cases of acute intestinal disease where an evacuation of the rectum, at least, and a discharge of flatus would be desirable, but where the use of even mild laxatives is contraindicated as fraught with possible danger.

Mild and useful laxative preparations and formula.

Elixir or Cordial of Cascara Sagrada.

℞	Extract. Fluid. Cascara. Sagrad.	ʒ vi
	Tinct. Nuc. Vomic.	ʒ ii
M. Sig.	x-xv drops three or four times daily.	

℞	Extr. Cascar. Sagrad. fluid. ¹	ʒ i
	Tinct. Nuc. Vomic.	gtt. x
	Tinct. Belladonna.	m v
	Aq.	ʒ i
M. ft. haustus	Sig. (this dose) to be taken twice a day.	

¹James D. Staples, *Hospital Gazette. New York Medical Record*, 1892.

Tonic laxative (formulary East Side Dispensary).

℞	Extr. Fl. Cascar. Sag.	25.	= ʒ vi $\frac{1}{4}$
	Tinct. Cinchona.	15.	= ʒ ss
	Tinct. Nuc. Vomic.	5.	= ʒ $1\frac{1}{4}$
	Aq. et Glycerine q. s. ad	60.	= q. s. ad ʒ ii

M. Sig. Dose one to two teaspoonfuls, repeated every three or four hours.

Pulv. Jalapæ Co. very useful in hæmorrhoidal conditions.

Infusum (aut *decoctum* = frequently prepared as such)

Rhei.

U. S. Pharm. ʒ ii to the O ss ; dose, half to one wineglassful. British Pharm. 1:40; dose, one to two ounces. Germ. Pharm. 1:12 ; dose, one to two tablespoonfuls.

Very useful in various hepatic ailments. Alkalies or acids, as may appear indicated, can be added thereto.

Tinct. Rhei: dose, one to two ounces.

Tinct. Rhei et Gentian.

Pulv. Rhei Co. ʒ i to ʒ i every three or four hours. A very excellent formula for all those conditions wherein a laxative would be very useful, and where yet the greatest care must be exercised not to excite but the very mildest of peristalsis.

Infusum Laxativum Viennensis. (*Mixtura Sennæ Co.*, senna, manna, Rochelle salts, etc.), a very pleasant, and, at the same time, effective purge. Its action can be regulated by an increase or diminution of the dose. For a mild effect give one to two tablespoonfuls every hour or two; for a more energetic action, one-half wineglassful every two hours.

Pulv. Glycerrhizæ Co. (*Pulv. Liqueritiæ Co.*), grs. xv-xx

every two or three hours. Useful in catarrhal conditions of the respiratory tract.

Pills

℞	Resin. Podophyllin	grs. vi
	Extr. Colocynth. Co.	grs. xii
	Extr. Hyosciam.	grs. xii
	Ole. Tiglii	gtt. i
	Ole. Menth. Pip.	gtt. i

M. ft. pillul. No. XII. Sig. Dose one pill (usually taken at bedtime).

℞	Extr. Colocynth. Co.	gr. i ss
	Pulv. Rhei	gr. i
	Extr. Alcoh. Nuc. Vomic.	gr. $\frac{1}{5}$
	Podophyll. Res.	gr. $\frac{1}{8}$
	Extr. Belladonna. (Engl.)	gr. $\frac{1}{3}$
	Extr. Hyosciam.	gr. $\frac{1}{2}$

M. ft. Mass. et ft. pillul. No. I. Sig. One pill at bedtime ; repeated in the morning if necessary.

℞	Extr. Colocynth. Co	ḍi (Fordyce Barker) ¹
	Extr. Hyosciam.	grs. xv
	Pulv. Aloes Socot.	grs. xv
	Extr. Nuc. Vomic.	grs. v
	Podophyllin, p.	
	Ipecachuan., p. āā	gr. i

M. ft. pillul. (argent.) No. XII. Sig. Two pills to be taken at one dose.

℞	Podophyllin	grs. iii
	Extr. Colocynth. Co.	
	Sapon. Castiliens. āā	grs. iii
	Extr. Alcoh. Nuc. Vomic.	grs. v
	Extr. Hyosciam.	grs. vi

M. ft. Mass. et divid. in pillul. No. XII. Sig. One pill every morning.

¹ Loc. cit.

Formula for protracted use, as in the constipation of the old:

Confectio Sennæ. Dose, 3 i-ii (not to be prescribed when dyspepsia complicates the constipation).

Electuarium Lenitivum Wintheri. — Manna, 2; syrupus limonis, 10; pulpa tamarindorum, cassia præparata, āā 2; folia sennæ, cremor tartari, āā 1½. Dose: one teaspoonful.

Electuarium Mannæ. — Manna, saccharum, aqua fœniculi, āā 2; pulvis rad. iridis, ⅛; oleum amygdalarum dulcium, 1. Dose: a heaping teaspoonful.¹

A more energetic preparation of this character, and adapted to cases of extraordinary lethargy of the intestine, is the confectio scammonii of the German or British pharmacopeia.

These formulæ, though old-fashioned and rather forgotten, are, nevertheless, very useful for the persons and purpose that they have been here recommended for.

Pillulæ Aloes et Assafœtidæ (U. S. P., dinner pill).

Pillulæ Aloes et Mastiches (U. S. P. = Lady Webster dinner pill).

℞	Podophyllin	0.3 = grs. iv ss	(Nothnagel) ²
	Extract. Aloes		
	Extract. Rhei āā	3.0 = grs. xxxvi ss	
	Extract. Taraxac. q. s.		
M. ft.	pillulæ No. XL.	Sig.	One pill at bedtime.

¹ Strumpf, Allgemeine Pharmakopoe.

² Wiener mediz. Presse, loc. cit.

℞	Pulv. Rhei	℥iv	(Dr. B. Lee) ¹
	Pulv. Aloes	℥iii	
	Pulv. Myrrh.	℥ii	
	Sapo. Hispanien.	℥ii ss	
	Olei Cajeput.	℥i	

M. The powders are to be rubbed together, and the soap then worked in, afterward the oil. The well-mixed mass is kept in a tight-stoppered bottle. The fresher the powder, the better it is. Three grains make an effective dose which does not irritate.

℞	Extract. Jugland.	grs. ii
	Resin. Podophyllin	gr. $\frac{1}{10}$
	Pulv. Rhei Rad.	gr. i
	Extr. Hyosciam. (English)	gr. i
M. ft. Mass. et ft. pillul. No. I.	Sig.	One pill at bedtime.

℞	Podophyllin	gr. $\frac{1}{10}$	(Brundage) ²
	Extract. Belladonn.	gr. $\frac{1}{10}$	
	Extract. Nuc. Vomic.	gr. $\frac{1}{4}$	
	Extract. Hyosciam.	gr. $\frac{1}{4}$	
	Pulv. Capsic.	gr. $\frac{1}{4}$	

M. ft. pillul. No. I. Sig. Take at bedtime. Dose: one to two pills.

It is directed that the pill be taken nightly for a week, then every other night, until natural evacuations follow.

For Constipation with Flatulence

℞	Extract. Colocynth. Co.	gr. $\frac{1}{3}$
	Terebinth. Veneta.	gr. i
	Pulv. Aloes Socot.	gr. i ss
	Extract. Nuc. Vomic.	gr. $\frac{1}{4}$
	Extract. Hyosciam. (English)	gr. i

M. ft. Mass. et ft. pillul. No. I. Sig. One pill two to three times a day.

¹ *New York Medical Record*, 1894.

² Lilly, *Handbook of Pharmacy and Therapeutics*.

Ointments

*For all Forms of Rectal Pain*¹

℞ Succus Conii ℥ ii boiled down to ʒ i ss
 Lanoline q. s. ad ℥ i
 M. ft. Ungt. Sig. Apply locally.

For Hæmorrhoids

℞ Cerat. Simpl. ʒ vi
 Vaseline. ʒ iii
 Pic. Liquid. ʒ i ss
 Extr. Belladonna. ʒ i ss
 Acid. Gallic. sive Tannic. Ⓣ i
 M. ft. Ungt.

℞ Ungt. Gallæ Co. ʒ i (F. Barker)²
 Extr. Opii Aquos. Ⓣ i
 Solut. Ferri persulphat. ʒ i
 M. ft. Ungt. Sig. Apply to the tumors.

℞ Tinct. Hamamel. ʒ xii
 Lanolin. ʒ vi
 Petrolat. ad ℥ xvi
 M. ft. Ungt.

℞ Extract of Garlic 1 part³
 Olive Oil 2 parts
 M. to be applied to the tumors, or, if they be concealed, a drachm of the mixture is injected into the rectum.

℞ Pulv. Opii ʒ ii (Ellis)⁴
 Unguent. Pic. Liquid ℥ i
 M. ft. Unguent.

¹ *Medical Standard*, Chicago, 1888.² *Loc. cit.*³ H. Kinnard, *Pacific Medical and Surgical Journal*. *New York Medical Record*, 1887.⁴ Wilson, *Complete Medical Pocket Formulary*.

℞ Hydrarg. Chlorid. Mit. (Calomel) ʒ ii (Bartlett)¹
 Unguent. Petrolei (Vaselin.) ʒ i
 M. ft. Unguent.

Suppositories (for concealed hæmorrhoids)

℞ Acid. Gallic.
 Extract. Ergot. āā gr. i
 Extract. Belladonn. (English) gr. $\frac{1}{3}$
 Extract. Hyosciam. (English) gr. i
 Ole. Theobrom. ℥ i
 M. ft. Suppositor. No. I. Sig. Introduce one into the
 rectum night and morning.

℞ Extract. Kramer. ℥ ii (Pancoast)²
 Pulv. Opii grs. v
 Ole. Theobrom. ʒ ss
 M. ft. Suppositor. No. X. Sig. Use one morning and
 night.

℞ Acid. Tannic. 0.06 = gr. i (Rosenheim)³
 Chrysarobin. 0.1 = gr. iss
 Extract. Belladonn. (seu Opii) 0.02 = gr. $\frac{1}{3}$
 Ole. Theobrom. 2.0 = ʒ ss
 M. ft. Suppositor. No. I. Sig. Introduce one once or twice
 a day.

Ointment (for external piles)

℞ Chrysarobin. grs. xvi (Kossobudski)⁴
 Iodoform. grs. vi
 Extract. Belladonn. grs. xii
 Vaselin. ʒ vi

M. Sig. A small quantity to be applied to the tumor sev-
 eral times a day, the parts having been previously washed with
 a solution of carbolic acid 1 to 50, or of creolin 1 to 100.

¹ Wilson, Complete Medical Pocket Formulary.

² Complete Medical Pocket Formulary.

³ Loc. cit.

⁴ Complete Medical Pocket Formulary.

Wash for Bleeding Piles

℞	Alum. pulv.	℥ ii
	Acid. Tannic.	ʒ ss
	Aqu. Destill.	ʒ v

M. Sig. One-half to be injected at a time, and to be retained as long as possible.

℞	Acid. Nitric.	f ʒ ss — i	(Ringer) ¹
	Aqu. Destill.	f ʒ viii	

M. ft. Lotio. Sig. Apply as a wash.

Schmey reports that he has had great success in the treatment of hæmorrhoids (protruding) with the daily applications, by means of a camel's-hair pencil, of a two per cent (2%) solution of silver nitrate. The applications are altogether painless.²

Formulæ for Injection — Method of Treatment (of piles, extruding)

℞	Glycerin.	ʒ ii ss	(Meniere's) ³
	Acid. Phenic. (Carbolic.)	gtt. xx	
	Morphia. Sulphat.	grs. v	

M. Sig. Inject five to ten drops into the tumor.

℞	Acid. Salicylic.	ʒ i
	Glycerin.	ʒ iss

M. rub the two well together, and add

Acid. Carbolic.	ʒ ii
-----------------	------

M.

then rub together

Borac.	ʒ i
Glycerin.	ʒ i ss

Now mix the two mixtures thoroughly together, and allow to stand until clear.

Sig. For small tumors three to five drops, for large tumors five to eight drops, to be injected.⁴

¹ Complete Medical Pocket Formulary.

² *Allgemeine medic. Centralzeitung*, 1895, No. 73. *Therapeut. Monatshefte*, October, 1895.

³ *New York Medical Record*, 1886.

⁴ A Shuford, *New York Medical Record*, 1887.

DIETETIC PREPARATIONS

Apples.

Baked Plain. — Procure some highly flavored apples (others, except as to aroma and taste, will answer as well), — hard winter apples are to be preferred, — take the core out at the centre by boring, and fill the cavity thus created with sugar. Put into a dry pan, and place in a good hot oven. Ordinarily the apples will be thoroughly baked in about sixteen to twenty minutes. To make certain that they are well done, they can be tested by thrusting a fork into them.

Baked Plain. — Take apples as above, cut them in halves, remove the core, etc., refit them together, and tie them somewhat loosely in pieces of very thin paper previously smeared with good fresh butter; then place them in the oven at a moderate, steady heat for twenty-five minutes. Remove the paper; grate some fine loaf-sugar over them, set aside to cool, and serve when cold.¹

Baked with Syrup. — Take of the finest loaf-sugar half a pound, and of soft, filtered water eight tablespoonfuls; boil down together at a gentle heat in a small stew-pan for a quarter of an hour. Then pare three good, well-flavored apples (others will answer), removing the core by boring (as with a slicing blade), place them in a shallow tin pan, pour over them the syrup just prepared, add a wineglassful more of water, and acidulate with ten drops of lemon-juice. Place in the oven at a moderate, steady heat for thirty minutes. Remove into a dish, set aside to cool, and serve when cold.²

¹ Morgan, *Indigestion, Constipation and Hæmorrhoids*, London. ² *Ibid.*

Stewed. — Pare and quarter three or four or more fine apples, — having first prepared a syrup as above directed, — add a teaspoonful of lemon-juice and three very thin strips of lemon-peel; put all these ingredients into a shallow stew-pan, and place over a very gentle fire, so that a barely simmering heat is maintained; after they have stewed thus for fifteen minutes, pierce the apples with a fork from time to time to ascertain when soonest they become thoroughly softened; as soon as this is the case, pour them off with the syrup; set them aside to cool, and serve when quite cold.¹ Or, pare the apples, cut them in quarters, and put into a stew-pan with enough water to reach half the height of the apples; close the stew-pan tightly, and let them steam until they have been well done (ordinarily one-half to three-fourths of an hour). They are then taken off, allowed to cool somewhat, reduced to a pulp, and seasoned with sugar and lemon-peel (the lemon-peel can be omitted if desired) to suit the taste; then put in the oven again for three to five minutes to allow the seasoning to become thoroughly incorporated therein. Pour off into a cold dish, and serve when quite cold.

If preferred, the seasoning can be put in at the outset.

Stewed with Raisins, Prunes, or Figs. — Prepare the apples as above, and add to them about one-fifth the quantity of raisins cut into halves, or one-eighth the quantity of prunes opened and stoned, or one-eighth the quantity of figs sliced up into smaller pieces. After the completion of the boiling, when the apples are well done, mash the fruits together to a pulpy mass, and season with sugar and lemon-peel as above directed.

¹ Morgan, loc. cit.

Marmalade (can be eaten as soon as cold, or preserved in jars for a length of time). — Take eight moderate sized and well-flavored apples, — such as will boil down to a smooth pulp are required, — pare and remove the core, place in a basin, and squeeze over them the juice of a lemon. Then prepare a syrup by boiling down a pound of the finest loaf-sugar with a tumblerful of water for twenty minutes. When this is done, add the apples and lemon-juice — if cane syrup or molasses is used, pour this over the apples — and keep at a barely simmering heat until the apples are all reduced to a pulp. When this object is obtained, submit the stew-pan to a greater heat; add a little grated lemon-peel, stir briskly and incessantly until it becomes thoroughly consistent, when it may be stored in jars, and set aside to cool.¹

For the constipated [cane] syrup or molasses is much to be preferred in the preparation of the various dishes described.

Grated Apple-Pudding (*a most delicious dish*). — Grate six large tart apples — of good flavor if they can be had — into a large bowl; add half a cup of sugar, raisins, a few pounded almonds, the yolks of three eggs, and the whites thereof, after having been beaten into snow. A pinch of salt must be added. Mix all these together, put into a pudding-dish, and bake in a hot oven for thirty minutes. It can be eaten warm or cold. For the constipated it is best served cold.

Prune Butter. — Besides in the common way as a stewed dish, prunes can be prepared as a butter or a paste which can be eaten with bread or with various farinaceous dishes,

¹ Morgan, loc. cit.

as grits, macaroni, vermicelli, grated noodles, etc., for which it may serve as a top-dressing. It is prepared thus: Take one cup of stoned prunes and one cup of water; boil in a stew-pan until soft, mash into a smooth pulp, and add the grated rind of half a lemon.

Fruit Beverages. — A good substitute for alcoholic liquors when sweet cider cannot be had.

Apple Tea. — This drink, which is very pleasant, is best made with fruit previously roasted or cooked dry by open exposure to the heat of the fire, as on the edge of the hob or bars. Four fine apples should be used for every quart of tea required, and the best granulated sugar — about two ounces — should be added.

The whole of these ingredients — to which a table-spoonful of lemon syrup may be added or not, according to the taste — should then be placed in a cylindrical porcelain jar sunk in a basin of boiling water, — and boiling water should be quickly poured upon the fruit and stirred briskly for a few seconds, — covered, and set aside to cool; strained through four folds of muslin, and served as desired.

Apple Drink. — Another kind of drink may be made by slicing six full-sized apples into a basin, stoning a quarter of a pound of raisins, and bruising down two ounces of loaf-sugar; the whole of these ingredients should be thrown together into three pints of boiling water, and kept boiling for thirty minutes. After this the whole should be set aside in a capacious covered jar to cool, and should be strained through a fine hair sieve, and served when cold.¹

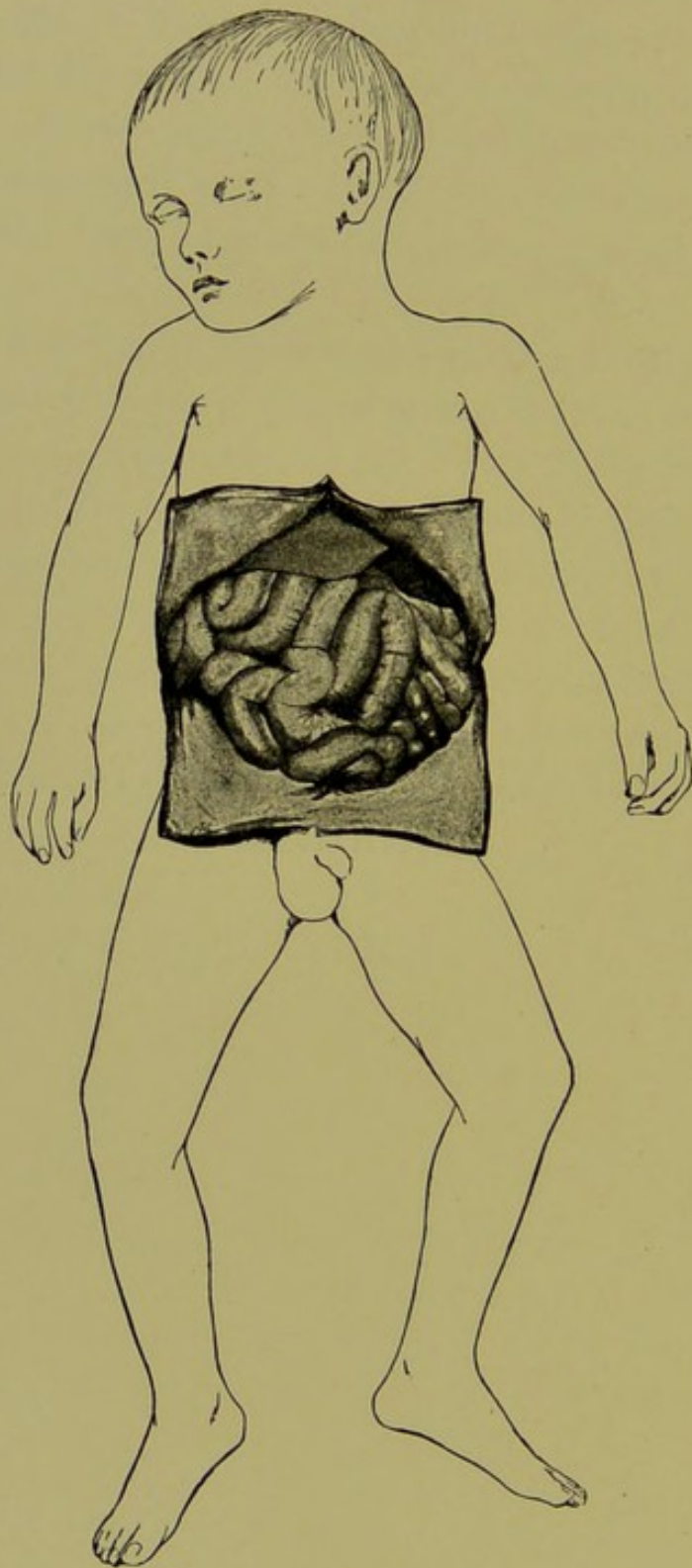
¹ Morgan, loc. cit.

Lemon Tea. — Take a large, juicy lemon, cut it in two, and remove the seeds; put it into a pot with two ounces of water and two to four pieces of loaf-sugar (the sweetening to be regulated by the taste), and boil down to a cup and a half. Can be taken warm as a tea or cold as a drink.

Grated Noodles. — Make a stiff noodle dough and grate the same on a coarse grater, dipping in flour occasionally so that it may grate more easily. Put in the oven to dry, being careful not to allow them to brown. Rub to crumbs. Have ready boiling salt water in which to throw the crumbs. Boil thirty minutes, then strain off. Melted butter may be poured over if desired, or any fruit—butter, marmalade, or jelly can be used as a top-dressing.

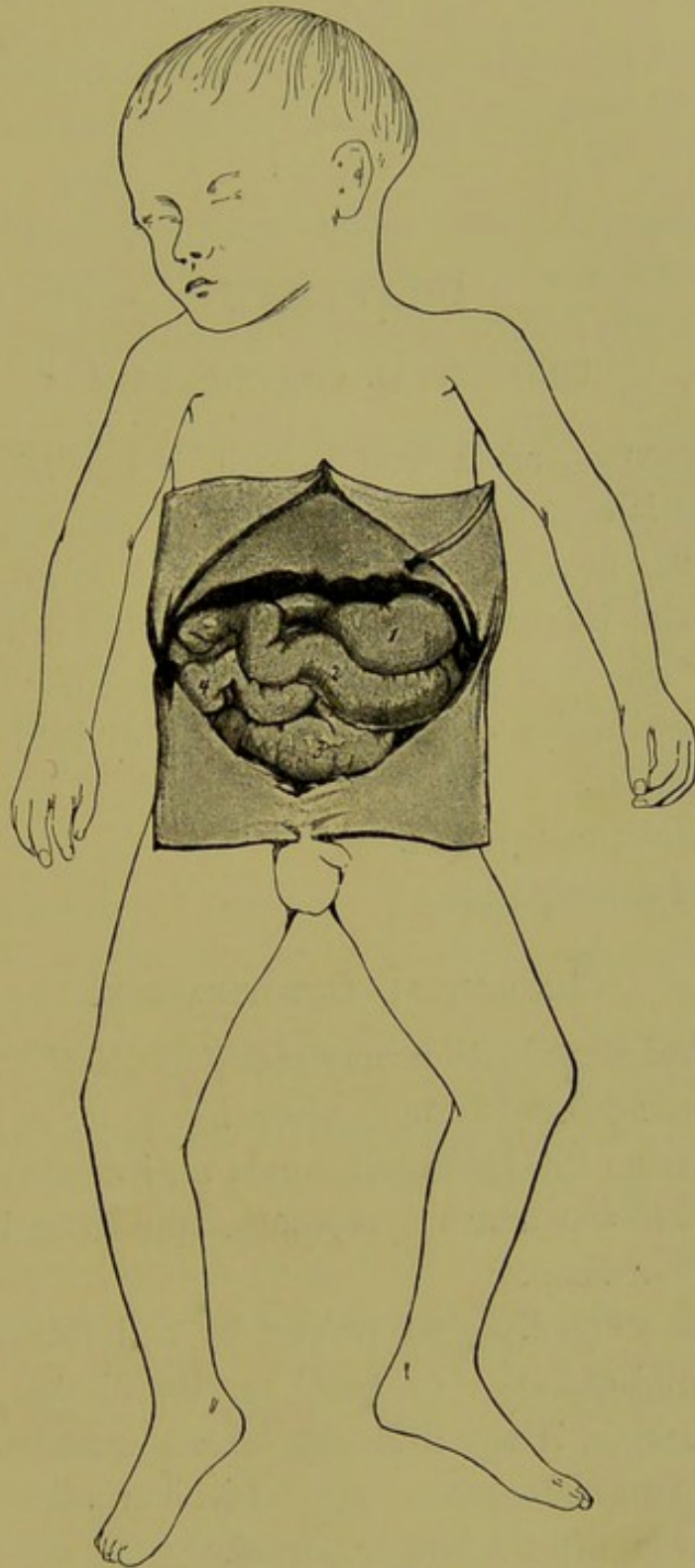
PART II

CONSTIPATION IN INFANTS AND
CHILDREN



FRONTISPLATE I.

Arrangement of small intestines in situ in infant twelve days old.



FRONTISPLATE II.

Infant twelve days old. Small intestines removed. 1, Stomach. 2, Transverse Colon. 3, Sigmoid Flexure. 4, Cæcum and Appendix Vermiformis.

CHAPTER I

CONGENITAL CONSTIPATION

CONSTIPATION, as is well known, is one of those ailments that is common to all classes of society, from the palace to the hovel, and that is met with at all periods of life, from the infant "mewling and puking in the nurse's arms," to "the lean and slippered pantaloon."

The constipation of infants can be divided into two great categories :

Congenital constipation.

Acquired constipation.

CONGENITAL CONSTIPATION

Congenital constipation may manifest itself

(*a*) At once, immediately after birth, by a failure of discharges from the intestinal canal ; an intestinal obstruction, with all the acute symptoms, appearing in a very brief period of time.

(*b*) Or, as a constipation proper, by a deficiency in the frequency and quantity of fæcal matter discharged from the bowels, with, if the difficulty be not remedied by nature or by man, consequent complete obstruction with all its phenomena, after a longer period.

(*c*) Again, it may manifest itself by occasional paroxysms of obstruction with complete cessation of evacua-

tion, whilst in the intervals between these paroxysms the alvine discharges may be fairly regular and sufficient in quantity.

It depends upon some malformation, malposition, or other abnormality of some portion of the intestinal canal, of the small intestines, of the colon, of the rectum, of the anus.

A. Malformations of the Rectum and Anus. — The malformations of this portion of the gut which are apparently the most frequent, or, at least, have been most frequently noted, have been thus summed up by Bodenhammer in his classical work on this subject.¹

1. The anus may be more or less preternaturally narrowed at its margin, and sometimes for a short distance above.

The contraction is not always limited to the anus, but extends occasionally up into the canal itself. This narrowing of the rectum is sometimes found to be due to numerous folds which project from its inner wall into the lumen of the cavity, and obstruct more or less, according to their degree of development, the performance of its physiological function. The anal opening and the cavity of the rectum may present all the different degrees of stricture, from that into which the smallest probe cannot be introduced to that which opposes but little obstruction to the passage of a small-sized catheter. According to the degrees of stricture, we will have either intestinal obstruction or one or the other forms of constipation.

Sometimes the marginal integument of the anus extends over the border of the sphincter muscle, and produces thereby both contraction and deformity.

2. The anus and rectum may be normal, but the simple,

¹ The Congenital Malformations of the Rectum and Anus.

thin, and delicate membranous septum of foetal life may still exist, and thus produce a complete occlusion of the anal orifice. The anal aperture is sometimes completely closed by a thick and hard membrane, or a substance analogous to it.

3. The anus may be entirely absent, no sign whatever indicating where it should be, the scrotal raphe being continued without interruption back to the coccyx. In such cases the rectum may also be partially or entirely absent, and the sphinctores ani may or may not be present.

4. The rectum, at some point in the pelvis, more or less distant above its natural outlet, may terminate in a cul-de-sac, and either hang loosely or be attached to some of the surrounding parts. The anus may or may not be wanting.

5. The cavity of the rectum may be interrupted at a variable distance above a well-formed anus by a thick or thin membranous septum projecting into it like a diaphragm. Sometimes there are two or more of such membranous septa. These may form complete or incomplete partitions (as they are perforated or not, or do or do not reach fully to the opposite side) between the various sections of the rectum.

Where there are two complete septa, the part between them remains narrow and undistended, like a cord. Where the septa are incomplete, the calibre of the part of the rectum lying between them may attain the normal size.

With the exception of these septa the canal is usually perfectly natural.

CASE 40. *Complete closure of the rectum.* Lannelongue (Observation I, Microcéphalie et Hydrocéphalie), (Bulletins et Mémoires de la Société de Chirurgie, 1884).

January 11th, 1884, there is brought to us to the hospital a new-born child, five days old. . . . The father of the child is twenty-two years of age, small and rather puny in appearance; he claims never to have had syphilis; he is in good health; he has a father and a sister living, both enjoying good health; his father had been rachitic. The mother of the child is eighteen years old, and is rather sickly; had typhoid fever at the age of twelve. One of her sisters, it was said, had inverted viscera, the heart being to the right. Besides, she has two phalanges missing on the right hand.

The Infant. — He is very vivacious; he has had no stool since his birth. Furthermore, he is microcephalic. . . .

Examination of the anal region shows that the anus is well formed, and that the anal portion of the rectum has a little over three (3) centimetres in length; I could introduce the finger, although a little difficulty was experienced; but, leaving the finger in the infundibulum I felt no sort of impulse, despite the efforts and the cries of the child. It was justifiable, therefore, to conclude therefrom that, in a measure, the terminal portion of the rectum was wanting. The distance between the ischii was normal.

An artificial anus was made after the method of Littré.

An incision is made with the bistoury in the region of the left iliac fossa; the skin and subjacent muscular layers are divided, and we come upon the small intestines which come up and out through the opening made; they are pushed back, the large bowel is seized, and fixed with numerous sutures to each lip of the wound. It is incised; but very little matter escapes. A dressing of boracic acid is applied.

* * * * *

The child grows weaker and weaker, and on January 16, at 4 A.M., it expired. It had lived ten days.

January 17: Post-mortem examination.

Abdominal cavity opened.

The peritoneum shows plainly traces of peritonitis; there are bands of false membrane causing adhesions between various

loops of intestine, and there is a manifest redness of the intestinal structure.

No effusion of fæcal matter into the peritoneal cavity.

The artificial anus had been made in the sigmoid flexure, and its borders were adherent to the abdominal integument. Immediately below this anus, the flexure pursues its course to the level of the sacro-iliac symphysis; here, this part of the intestine is dilated, and there succeeds to it rather brusly a round, cylindrical rectum, whose dimensions are not greater than those of an ordinary penholder. The rectum follows its ordinary course into the concavity of the sacrum without increasing in size, and, arrived at the coccyx, it continues on with the anal section of the gut. The last portion is about three (3) centimetres in length, and has a calibre superior to that of the other portions of the rectum. Thus the rectum between the sigmoid flexure and the anal section presents a contraction so great that, if flattened down, its calibre is less than one (1) centimetre; it has the form of a solid cord.

* * * * *

Opening the sigmoid flexure above the rectum down to the dilated portion, we are struck by the fact that at the point where the rectum so brusly succeeds to it, the cavity is impermeable. In a word, the sigmoid flexure terminates in a cul-de-sac, and from this cul-de-sac, without communicating with it, the rectal cord starts. Likewise below, the anal section of the bowel is separated from the rectum by a complete partition, which we could not force during life, even after considerable manipulation with a stylet and with a female sound.

After death we vainly injected liquids; we could not pass the inferior partition; we now broke the valvule with a stylet, which then passed readily into the rectum up to the ampulla of the sigmoid flexure; there the stylet pushes forward a thin mucous membrane which forms a horizontal and convex plane, from the side of the sigmoid flexure, without presenting the slightest orifice. For greater precision, we injected fluid into the rectum; it elevated the mucous membrane, but it did not penetrate into the sigmoid flexure. There existed, therefore,

in this part of the bowel two distinct and perfect diaphragms, the one situated between the sigmoid flexure and the rectum, and the other between the anal and the pelvic portions of the rectum. The *lowest* diaphragm is located three and a half ($3\frac{1}{2}$) centimetres from the anus; the *highest* is eleven (11) centimetres from the anus, or seven and a half ($7\frac{1}{2}$) centimetres from the lower diaphragm.

Between these two partitions the intestine could not become distended by the meconium, for the reason that no meconium could pass into it; and although it looks like a solid cord, it is nevertheless a canal lined with mucous membrane. This explains also why, during life, the finger placed in the rectum felt no shock or impulse; the meconium did not get there.

6. The anus being normal, the rectum for a greater or lesser distance above it may degenerate into a solid mass resembling a cord; or this degeneration may be confined to its superior portion only, the part reassuming its cylindrical shape again as it approaches the anus, forming, as it were, a pouch at its inferior extremity.

7. The rectum may be obliterated throughout its whole extent by a thickening of its coats, its walls being approximated and firmly adherent, as if they were glued together; or this obliteration may take place at one or two points only in the course of the rectum, the canal at these places appearing as if tied together with a tape, the anus and intervening space being natural.

8. The rectum may be present in its proper cylindrical form, whilst its cavity may be blocked up with a substance of cellulo-fibrous character; an anus may be present or may be altogether wanting.

9. The rectum may terminate in the bladder or in the urethra, in the vagina or in the uterus, or in a cloaca in the perineum with the urethra and the vagina. In these

cases there is generally no sign of an anus ; yet sometimes, though rarely, it does exist, and permits the introduction of a probe to the extent of four lines.

10. The rectum may terminate in the sacral region by an abnormal anus ; it may be prolonged in the form of a fistulous sinus and terminate by an abnormal opening at different points in the perineum, at the glans penis, labia pudendi, etc. The normal anus is generally absent.

11. The rectum may be altogether wanting, and its place taken by a fatty cellular tissue. In these instances the colon ends in a cul-de-sac, with or without a ligamentous appendage in continuation. No normal anus exists, but sometimes an abnormal one does.

SYNOPTIC TABLE

THE CONGENITAL MALFORMATIONS OF THE ANUS.	}	1. Preternatural narrowing.	}	Atresia orificii ani.
		2. Occlusion by a thin membrane.		
		3. Occlusion by a thick, hard membrane.		
		4. Partial or complete absence.		
		5. Abnormal.		
THE CONGENITAL MALFORMATIONS OF THE RECTUM.	}	Occlusion of the rectum.	}	1. By one membranous septum.
				2. By two or more membranous septa.
	}	Obliteration of the rectum.	}	1. By an agglutination of its parietes.
				2. By the puckering of its parietes.
				3. By thickening and induration of its parietes.
	}	Preternatural termination of the rectum.	}	1. In a cul-de-sac.
				2. In the bladder.
				3. In the urethra.
				4. In the vagina.
				5. In a cloaca in the perineum with the urethra and the vagina.
6. In the ano-perineal region at different points.				
7. In the sacral region.				
}	Absence of the rectum.	}	1. Partial.	
			2. Complete. ¹	

¹ Cases illustrative of these deformities are given *in extenso* by Bodenhammer in the work quoted, and numerous others have since been reported.

B. The Colon may be the seat of the difficulty. This may be in the form of a malformation of the colon, of a malplacement thereof, or of an obstruction in any part thereof.

1. **Malformations.** (a) *A part of the large bowel may be wanting.* — The rectum and anus may be wanting, as already stated.¹ The colon may be absent in its entirety. For illustrative cases, see Bodenhammer, *The Congenital Malformations of the Rectum and Anus*.

(b) *The colon, or any section thereof, may be rudimentary.*

CASE 41. Charles Atkin, F.R.C.S. (*Lancet*, London, 1885, 1, 203).

A male infant two days old was brought to the infirmary, not having passed any motion since its birth. On examination, a small depression was found at the usual situation of the anus, but it would not admit even a small probe. The abdomen was distended, hot, redder than normal. . . . Mr. Atkin explored the ischio-rectal region, but failed to meet with any bowel, so an oblique incision was made above and parallel to Poupart's ligament, on the left side; not finding the colon, a piece of small intestine was stitched and opened in the usual manner. Meconium and flatus came freely from the wound. The child was evidently eased and took some milk. . . . After a quiet night, during which the temperature was never elevated, it began to sink, and died during the evening of the following day.

At the autopsy, the whole colon and rectum were found to be rudimentary, being about the diameter of an ordinary quill; at first sight the tube seemed to be a solid cord, and it was not till after the removal of the whole alimentary canal that it was found that firm meconium could be pressed along with the aid of considerable force. The cæcum and vermiform appendix were differentiated from the main canal, but corresponded in degree of development.

¹ In addition to cases quoted by Bodenhammer, see case of Hurd, *Boston Medical and Surgical Journal*, 1888.

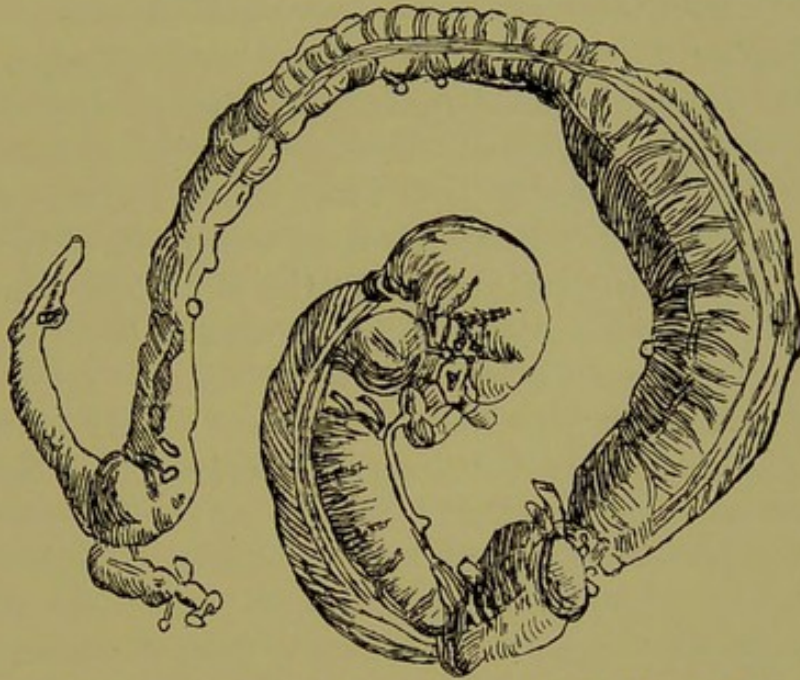
(c) *It may be abnormally contracted.*

CASE 42. Arthur H. Dodd (Lancet, London, 1892, 1, 1299).

In this case unusual straining at stool was the earliest symptom which attracted the attention of the nurse, but the infant, notwithstanding, thrived noticeably during the first three weeks. At first there were one or two actions of the bowel each day, but very shortly only every other day. About the end of the third week sickness commenced, occurring from five to ten minutes after taking the breast, and at that time only, which was then thought probably due to too frequent suckling. This symptom, however, increased in severity, the amount rejected at first being only slight; but in a few days from its commencement, the mother thought the whole meal, or nearly so, was returned. I should mention that the character of the sickness was peculiar, the vomited matter not only rolling over the edges of the mouth, but "shooting out" (if I may use the expression) beyond the mother's lap into the room. There was evidently a great deal of pain, the child lying curled up, with the thighs flexed tightly against the abdomen, the feet crossed, and crying at very short intervals night and day. At the fifth week there was a cessation of all symptoms for about seven days, but the sickness, constipation, and pain returned. Throughout, there was never any distention of the abdomen, but double inguinal hernia was produced at a later stage, as a result of the perpetual crying and straining. At the seventh week Dr. E. G. Whittle saw the case with me, and chloroform was administered, but nothing was revealed by the examination. No localized enlargement, tumor, or anything could be detected, and we came to the conclusion that there was some congenital deformity existing in the bowel and thought that no operation was justifiable. Constipation increased, . . . the child gradually sinking from exhaustion at the end of the twelfth week.

The necropsy . . . revealed congenital contraction of the ascending and transverse colon, which was throughout but little larger than an ordinary lead pencil. The head of the cæcum was normal; the vermiform appendix was about two and a half inches in length; the descending colon, sigmoid

flexure, and rectum were distended, but normal, with the exception of partial contractions, of an annular character, of the sigmoid flexure. The small intestine was abnormally narrowed; the ileum, for a few inches before its junction with the cæcum, was very much contracted; the stomach was peculiar in shape, resembling an hour-glass contraction near the cardiac end. All the other organs were normal.



CONGENITAL CONTRACTION OF THE ASCENDING AND TRANSVERSE COLON. ANNULAR CONTRACTION OF THE SIGMOID FLEXURE.

2. Obstruction.

CASE 43. Gould (Lancet, London, 1882).

A child aged three days suffered from the usual symptoms of intestinal obstruction. The belly was opened above Poupart's ligament on the left side. A coil of distended small intestine presented, and as no distended large intestine could be found, it was carefully stitched to the edges of the incision and opened. A large amount of meconium escaped. . . . The child died twenty-one hours afterward. At the autopsy there was no evidence of peritonitis. The cæcum, the lower four inches of the ileum, and the first four inches of the colon were filled with a firm whitish plug of inspissated mucus of the con-

sistence of cheese, which was firmly applied but not adherent to the mucous membrane. Beyond this, the colon and rectum were empty and contracted to the size of a clay pipe stem. Above it the small intestines were distended with meconium and gas. It was pointed out that there was no fault in development, but obstruction from a plug.

CASE 44. *Congenital occlusion of the colon at the ileo-cæcal valve.* Weiland (Medical News, January 11, 1896).

On October 26, 1895, at 2 P.M., Mrs. Wr., primipara, aged thirty-four years, of Philadelphia, gave birth at full term to a boy of apparently perfect development. Nothing unusual was observed in the infant until October 27 at 1 A.M., when the child began to vomit a darkish fluid which left only a light-colored stain on the clothing. As the child had been given some tea of a similar color, it was supposed to be that; at any rate, no pathognomonic odor could be detected. This vomiting occurred on that day whenever the child was given some nourishment. As towards evening the bowels had not moved, in spite of a little piece of soap that had been put into the rectum, an injection of lukewarm water with a little soap was given, which returned immediately and brought small cylindrical masses of white mucus about 5 mm. in diameter. This, of course, aroused suspicion at once; but the next morning, conclusive evidence of an internal pathological condition was furnished by the vomited matter, which now was distinctly fæcal in odor, and had the appearance of meconium. As the first thought was that of intussusception, a soft rubber catheter was introduced into the rectum, which could be pushed up about eight inches. Then the nates of the child, who was already very weak, were raised, and plain lukewarm water was injected with a Davidson syringe. As the injection returned at once, the anus was gently compressed, and about two ounces of water were again injected. This procedure increased the vomiting of fæcal matter very much, and so was stopped at once; but the vomiting continued, respiration became embarrassed, and soon the child died, about forty-eight hours after birth. The post-mortem examination showed the following condition of the intestinal tract: the

small intestine showed great vascular injection, and was much distended with gas, especially near the ileo-cæcal valve. Here the diameter of this viscus was about 18 mm., the same as that of the caput cæcum, with which the small intestine was continuous, as the lower fold of the ileo-cæcal valve was absent, or rather very little developed. The upper part, however, of this valve, the ileo-colic fold, was developed too much; for it stretched across the whole lumen of the bowel and formed a complete septum between the colon on the one side, and the cæcum, with the vermiform appendix and small intestine, on the other side. There was not the slightest chance for a communication between these two parts. Below this anomalous diaphragm, the cæcum and small intestine showed well-developed villi, and the entire mucous membrane was stained brown with biliary pigment, and showed a small amount of meconium. Above the abnormal septum, the large intestine was very much contracted, having a diameter of only 5 mm. It had also no ascending part, but the transverse colon turned back at once to the posterior aspect of the abdominal cavity, and ran transversely as far as the usual position of the splenic flexure, where the descending colon commenced. The whole colon and rectum, about ten inches in length, contained only soft white mucus, and not the slightest trace of meconium. Its surface looked white compared with the color of the small intestine, and its walls were thin, having apparently been arrested in its development.

3. Malplacement.

CASE 45. A. Jacobi (American Journal of Obstetrics, 1869).

Twelve to fourteen hours after birth no meconium. . . . On the third day, the left iliac region in front, and a little above the anterior superior spine, appeared to fill up and yield a somewhat duller percussion sound. . . . Operation made in this spot; it resulted in our finding a pouch of the descending colon, filled with a large amount of meconium, which was readily discharged through the artificial opening. . . . The patient did well for a short period, but died of peritonitis on the fifth day after the operation.

Necropsy.—The part of the colon fastened to the abdominal wall was no longer dilated. . . . Besides the consequences of peritoneal inflammation, nothing was abnormal in the immediate neighborhood. All the parts above the incision, and all the other viscera, were not diseased. Below the point of incision lay the colon turned three times upon itself; three flexures covering each other in such a manner that the subjacent one was always about half an inch longer than the one above it. The lowest of the three, crowded down into the pelvis, was entirely compressed, contracted, and contained nothing but a little hardened mucus; the middle flexure contained the same mucus, and a small amount of meconium; the upper one was filled with meconium as far as the contracted lumen of the bowel would allow, and its outer left portion was the one which had appeared dilated by the meconium crowding down from above. The inferior flexure reached beyond the median line, stretched upward to nearly the anterior superior spine of the right side, and from there the intestine turned back in an acute angle into the pelvic cavity, doubled upon itself, and reached the median line on the right side of the empty bladder, and terminated as the rectum in the normal place. When the bowel was removed, it measured, from the point of incision in the left hypogastrium to the anus, nearly fourteen inches. The ascending colon was of normal length; the transverse colon was not in the normal position, but stretched from the right hypogastrium to the left anterior superior spine, diagonally, in an almost straight line, forming an acute angle with the uppermost curvature we have described, and giving rise to the pouch we found dilated before and during the operation.

C. The malformation leading to the constipation or obstruction may be located in the **small intestines**.

1. *The small intestine may be almost entirely obliterated.*

CASE 46. *Congenital obliteration of the small intestine.*
John Thompson (Edinburgh Medical Journal, 1892, Vol. 2).

Infant, two and one-half days old, seen on November 12

(1890), on account of complete obstruction and constant vomiting, along with my friend, Dr. Home Ross.

* * * * *

Present Condition.—The child is well developed, and of natural size. The skin is bright red with a strong orange tint. The conjunctiva are only slightly yellow. The lips, the vertex of the scalp, the palms and soles, and the neighborhood of the anus are all markedly cyanosed, and there is a bluish tinge over some other parts of the body. The tongue and gums are quite free from this. The child cries constantly, as if from hunger.

No external malformation. . . . Abdomen not distended, but its walls are very tense. On percussion, a tympanitic note is got over the region of the stomach, but all over the lower part of the belly the note is absolutely dull. The liver and spleen cannot be felt. The anus seems small, but admits the little finger without much difficulty, and is felt to contain a few soft rounded masses. These, when removed by an enema, are found to amount to rather more than a teaspoonful in bulk. The matter is absolutely without odor, and of a whitish color, with no tinge of green or yellow.

November 20, child died at 7 A.M., aged ten days and four hours. On opening the abdomen, a large tumor of purplish-red color is found to occupy the greater part of the left half of its cavity. This is found to be the distended portion of the gut just above the seat of the obliteration. The rest of the bowel is found to be contracted to its fullest extent, and is of a pale yellowish color.

Intestines.—At the very commencement of the duodenum the gut becomes enormously dilated. The dilated portion measures ten inches in length, and from one to one and one-half inches in diameter, and is of a dark purplish-brown color. It comprises the whole of the duodenum, and probably also a few inches of the jejunum. Its lower extremity is an abruptly rounded end; it is perfectly closed, and there is a gap between it and the next portion of bowel. The mesentery belonging to it also comes to an abrupt end, there being a deep fissure between it and that of the succeeding pieces of intestine. The blood-vessels in the

mesentery are very unusually large. When the distended duodenum is opened, it is found to be full of a turbid yellowish-brown fluid,—evidently the food swallowed mixed with bile and other secretions. A short distance from the dilated portion of the bowel is a small bit of gut one and one-fourth inches in length, and one-sixth inch in diameter. It is blind at both ends (which are rounded), and is fixed in the shape of a horse-shoe by a little tongue-like flap of mesentery.

When the mesentery is followed to the right, its free margin is found to be thickened in places by what appears to be fragmentary remains of obliterated bowel, and it is prolonged into a peaked flap lying horizontally. From the point of this flap a small rounded fibrous band passes in among the neighboring coils of intestine, and after encircling the mesenteric attachment of a large portion of the bowel is fixed by a fan-shaped end into the middle of the upper surface of the mesentery of a coil of jejunum, about seven or eight inches below the lowest point of obliteration. The fibrous band is one inch in length; it is very dense in texture, and resembles fine silkworm gut in size and appearance.

The small intestine becomes pervious again about two and one-half inches below the horseshoe-shaped fragment. During the rest of its course it varies in diameter from one-eighth to one-sixth inch. In one or two situations the lumen is seen to be occupied by small masses of green matter; elsewhere it seems quite empty.

The large intestine is similarly contracted, measuring only about one-fourth inch in diameter, and is in a similarly empty state.

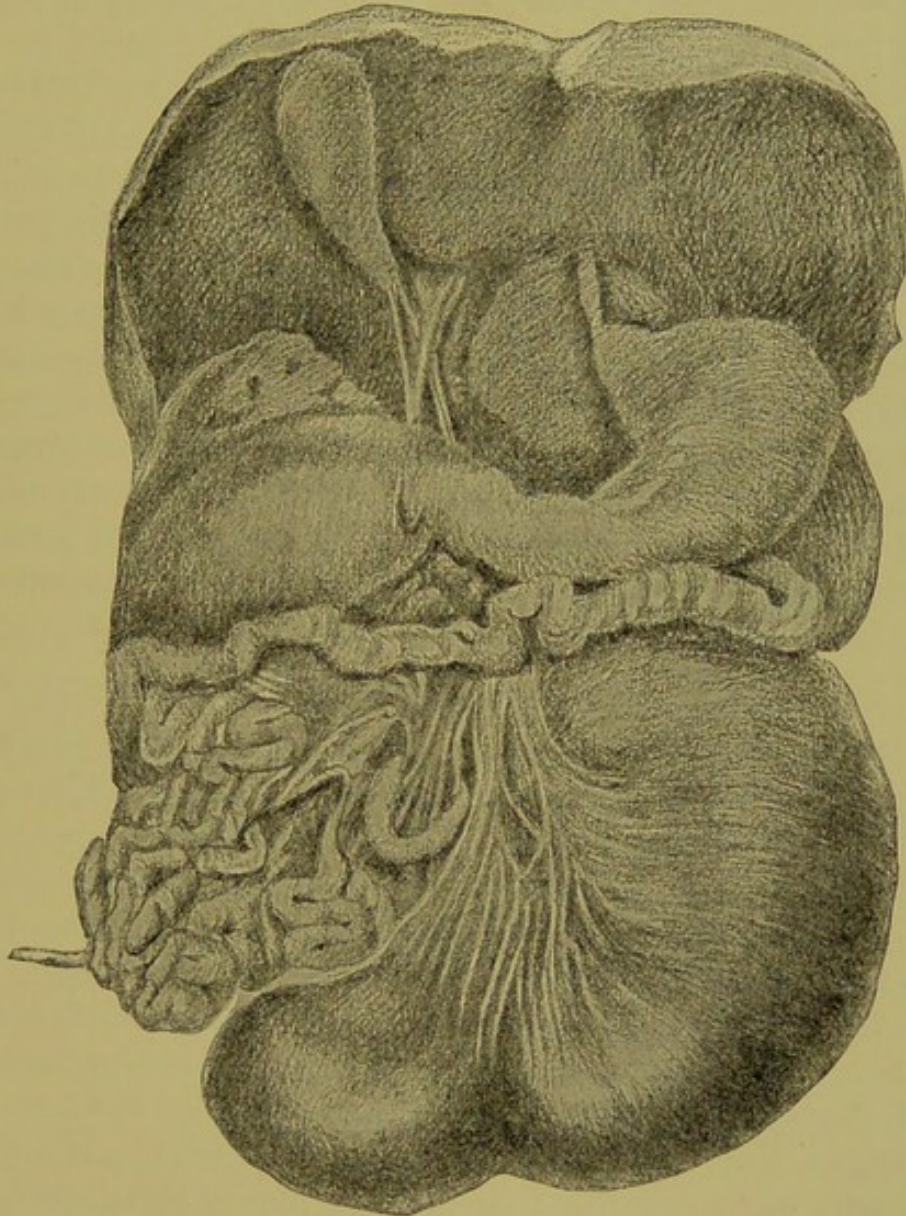
CASE 47. Dr. Greig (Canadian Practitioner, 1892).

Infant lived four days. . . .

The stomach and duodenum were healthy and normally developed. The rest of the small and large intestines were abnormal, and had no connection with the duodenum.

Extending downward from the stomach, there were about two feet of healthy bowel ending in a cul-de-sac. Extending upward from the rectum, there were about three inches of

fibrous cord. It was the size of a lead pencil, firm to the touch, and on section pervious. Two inches from the upper end it dilated, contained faecal matter, and ended in a point. There was no connection between the two sections of the bowel.



CONGENITAL OBLITERATION OF SMALL INTESTINES. *Case 46.*

2. *There may be a gap in the small intestines.*

CASE 48. *Imperforate ileum.* J. Bland Sutton (*American Journal of the Medical Sciences*, 1889).

In June, 1889, my friend, Dr. Maxwell, asked me to see a

baby forty-eight hours old, concerning which he furnished the following history: The abdomen was found distended shortly after birth, and the baby commenced to vomit its food. On examining the anus, the parts were found quite normal, and a catheter could be passed readily into the bowel for many inches. Nothing but mucus passed by the anus. It was clear that we had not to deal either with imperforate anus, rectum, or pharynx, as the infant could swallow easily, and as it retained milk for a time imperforate duodenum was excluded. I therefore came to the conclusion that we had to deal with an imperforate ileum. At the request of the parents I explored the abdomen, and found the ileum imperforate at a spot about eighteen inches from the ileo-cæcal valve. The distal end of the ileum was somewhat shrunken, and separated from the proximal end by a gap an inch across. The upper cul-de-sac was dilated with meconium, and congested; this was removed, and the end of the gut stitched to the abdominal wound. Meconium and flatus passed freely, the child rallied and took food, and the case promised to go well, but about six hours later it suddenly expired.

CASE 49. (British Medical Journal, 1886, Vol. 2, 295.)

Mr. William Thomas exhibited the stomach and intestines of an infant five days old that had been operated on for obstruction. The stomach was of normal size; the duodenum became gradually enlarged as it reached its termination; the jejunum was very large, and formed dilated coils which had distended the abdomen. It had been opened twenty-two inches from the pylorus for the relief of the obstruction, and ten inches further it terminated in a blind extremity. The small intestine recommenced almost immediately between the layers of the mesentery, being about the size of an ordinary pencil; it formed several coils, and extending for thirty-six inches, terminated in a well-formed cæcum, from which a perfect, though contracted, colon could be traced to the anus. The various parts of the intestine were so firmly matted together by well-organized bands of lymph, the result of previous intra-uterine peritonitis, that the relation of the parts could not be made out until the intestine was removed from the abdomen.

The child was somewhat relieved by the operation, and lived for about eighteen hours after it.

3. *There may be no connection between the large and small intestines.*

CASE 50. J. C. Oliver (Cincinnati Lancet and Clinic, August 15, 1891).

A male child, born in the service of Dr. Allen, developed symptoms of intestinal obstruction and died four days after birth.

Autopsy. — The small intestine was distended so as to occupy the entire abdominal cavity. This bulged out as soon as the abdomen was opened. Upon tracing the small intestine downward from the stomach, it appeared normal until the lower end of the ileum was reached, and here we perceived that it ended in a blind pouch. Lying immediately below this was the free extremity of the large intestine, opening into the peritoneal cavity. There was absolutely no connection between the intestines at a point corresponding to the ileo-cæcal valve.

CASE 51. Carini (Internationale klinische Rundschau, Wien, 1890).

A female child four days old was brought to the hospital for outdoor treatment. The child suffered from intestinal obstruction, having had no evacuation since its birth.

* * * * *

The small intestines end in two blind pouches, consisting of thin loops having the macroscopic form of the intestine; they look like two diverticula of the small bowel, and do not communicate with the large intestine. A further loop is connected with the umbilicus; it represents a Meckel's diverticulum. The large bowel is free from feces. It begins in a blind loop, the calibre of which progressively increases until it reaches the normal diameter. The rectum, of normal length, is impermeable at the upper half; the lower half is dilated and of a dark-red color, due to numerous ecchymoses into the mucous membrane.

A slight laceration at the anal extremity.

4. *The whole digestive tract from the stomach down may be disconnected.*

CASE 52. *Total occlusion of the cæcum. Rudimentary pancreas. Absence of duodenum. Jejunum ending in a cul-de-sac. No connection between stomach and small intestines and intestines and gall bladder. Ill-developed colon in new-born infant.* O. A. Fliessburg (Northwestern Lancet, 1891).

The child was in all respects as large as a fœtus of nine lunar months, seemingly well developed, and cried lustily soon after birth. . . . The next day everything seemed all right, but the nurse told me the baby had not yet had a movement. I inspected the child and found nothing out of the way, except that it had a poorly developed mouth and could not nurse. . . . It lived one hundred and eighteen hours before it died.

At the autopsy, eighteen hours after death, the following conditions were found. . . . On opening the abdominal cavity, I found at once the place of obstruction; it is situated at what I think to be the cæcum, or it may be the ileum; the intestines were very strongly matted and glued together into a pyramidal coil. There was no connection to be found between the upper viscera and the smaller intestines. . . .

The condition of the intestines is already described in the title.

5. *There may be a congenital stricture located in any one of the sections of the small intestine.*

CASE 53. *Congenital stricture of the duodenum.* J. H. Emerson (Archives of Pædiatrics, 1890).

Infant born April 24, 1890, after normal labor. It weighed eight and one-half pounds and appeared well until thirty hours old, when it spat up one-half ounce or more of dark blood mixed with mucus. . . .

There was a dark, tarry stool. The child evinced no desire for food; there was no evidence of suffering except when raising blood, which caused some gagging. There was no cough, no fever, no disturbance of respiration, nothing found on physical

examination of the fauces, etc. Another stool contained only meconium, no blood.

Post-mortem examination showed the stomach markedly dilated, the pyloric orifice two centimetres in diameter; the duodenum markedly distended, but terminating abruptly just above the orifice of the common bile duct. Fluid could not be forced from the stomach below this point, nor could air be forced upward from the intestine to the stomach.

CASE 54. *Stricture of the duodenum.* Grimsdale (Liverpool Medico-Chirurgical Journal, 1892).

A few months ago a midwife told me that she was expecting shortly to attend a woman in her confinement who had previously had five children; one of these was still born, and the remaining four had all died on the third day, . . . and it was supposed that they had died because the valves of the heart had not closed. On August the 6th the child was born, and I accordingly went to see it. The child was a well-formed boy and looked healthy and well nourished. I examined him and could find nothing whatever wrong. . . . The child had passed water, and the bowels had acted. All seemed to go well for the first two days, but on the third day the child took a slight convulsion and vomited a little.

* * * * *

I examined the abdomen again and again, and found it quite flaccid, and apparently no tenderness over it anywhere. The bowels were acting frequently, the motions being still meconium. The child had only vomited once, and then only slight, according to the account of the relations. There was therefore nothing on which to diagnose obstruction. . . . On the fourth morning I again saw the child, and found that it had convulsions. It was in almost exactly the same state as on the previous evening, and I was as much in the dark as ever. I ought to mention that the child was taking the breast regularly. On the evening of the fourth day I had a message to say that the child had another convulsion. I went down at once to see the child and found it dead. There was a large quantity of black

vomited matter, which looked like milk mixed with meconium or semi-digested blood. The next day I made a post-mortem.

The stomach and duodenum were much dilated; the rest of the intestines were quite small and cord-like. I removed the stomach and intestines, and found that there was an occlusion of the gut situated about two inches from the pyloric end of the stomach, just above the opening of the bile duct. This entirely obliterated the intestine, the duodenum terminating in a cul-de-sac.¹

6. *The obstruction may be due to a membranous diaphragm projecting into the lumen of the bowel at one or more points.*

CASE 55. F. Charlewood Turner (Transactions Pathological Society, London, 1887).

A female infant died on the fourth day. About the middle of the jejunum a portion of the canal, about an inch in length, was found shut off from the parts above and below by membranous diaphragms. It contains a small quantity of mucous secretion which cannot be pushed past either boundary. The bowel above is greatly dilated; that below is contracted.

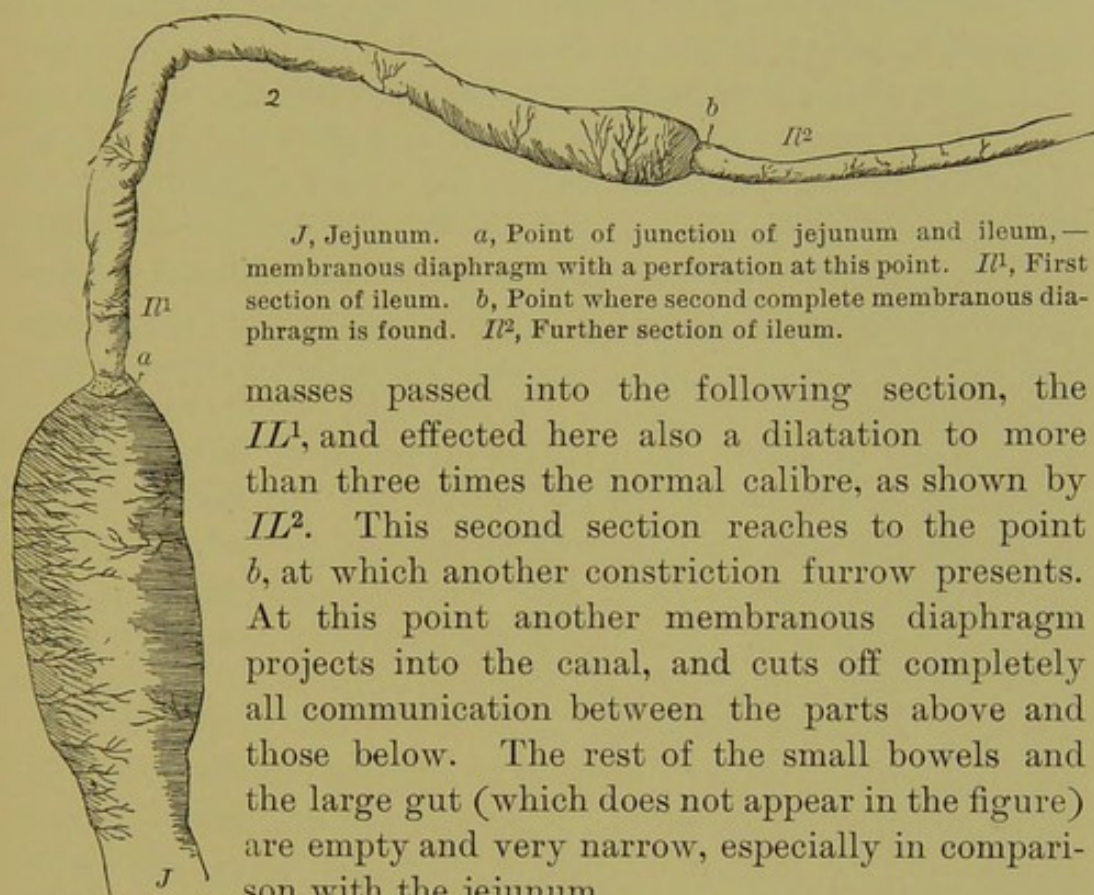
CASE 56. Grawitz (Virchow's Archiv, Vol. 68²).

Child died eight days after birth. The jejunum is dilated to almost colossal dimensions (see cut) by the accumulation of masses of meconium and gases. It extends to the point *a*, a point of constriction, and which presents the appearance as if the adjoining and narrower section of the *IL*¹ (ileum) were a strange body soldered on to the larger; nevertheless the walls are continuous, and the constriction furrow at *a* denotes the point at which a membranous diaphragm projects into the lumen of the tube, and cuts off to a considerable extent the free inter-

¹ See also Rosenkranz, Max, Ein Fall angeborener Stenosirung des Dünndarms u. Dickdarmes nebst defekt einer Niere, Königsberg in Prussia, 1890. Index Medicus, 1890.

² Dr. Paul Grawitz, Ueber den Bildungsmechanismus eines grossen Dickdarmdivertickels.

communication between the parts, the opening remaining not being larger than a lentil. This membrane, which shows through on the dry preparation, is exactly like the diaphragm of a microscope. Through its round central opening, meconium



J, Jejunum. *a*, Point of junction of jejunum and ileum,—membranous diaphragm with a perforation at this point. *IL¹*, First section of ileum. *b*, Point where second complete membranous diaphragm is found. *IL²*, Further section of ileum.

masses passed into the following section, the *IL¹*, and effected here also a dilatation to more than three times the normal calibre, as shown by *IL²*. This second section reaches to the point *b*, at which another constriction furrow presents. At this point another membranous diaphragm projects into the canal, and cuts off completely all communication between the parts above and those below. The rest of the small bowels and the large gut (which does not appear in the figure) are empty and very narrow, especially in comparison with the jejunum.

7. *There may be a stricture at one point and an obstructing diaphragm at another.*

CASE 57. Demme (Wiener mediz. Blaetter, 1884).

Girl four months old. It was not till the fourth day after her birth that she had an evacuation of meconium of brownish-gray color and of mortar-like consistence. From this time on the child had an evacuation only every two or three days, later on only four or five days. May 2, 1882, at the expiration of her third month, a protracted obstruction with progressively increasing meteorism set in. May 9, the seventh day of the obstruction, an icteric discoloration of the skin and conjunctiva

is noted, and she vomits every ten or fifteen minutes a thin watery fluid. The infant refuses all nourishment, and will take nothing but one-half to one teaspoonful of ice-water from time to time. With the exception of warm moist abdominal envelopments, lukewarm baths, and rectal injections, no treatment is possible. May 10, as on the preceding days, three-fourths of a litre of lukewarm water was injected into the rectum by means of the rectal tube, with funnel and elevated position of buttocks. After the discharge of the water, a great mass of thin fæces of grayish color and horribly offensive was evacuated with an abundance of flatus. Three hours later the essential symptoms had disappeared. The temperature in the rectum had fallen to 37.4° C. (99° F.); the abdomen had become soft; the vomiting was arrested. By the daily administration of small doses of castor oil, a daily evacuation of fæces was obtained up to May 20. The mother having lost her milk, the child was fed with condensed milk properly diluted. May 20, obstruction has again set in with vomiting and persistent and harassing singultus. The treatment employed was large injections of water. May 26, no evacuation to date; continuous vomiting of fæcal matter to-day. The little patient died at 6 P.M., after complete exhaustion of her vital forces.

On opening the abdomen, there was found a superficial agglutination of the intestinal loops by thin, yellowish-red fibrous bands. The peritoneal covering of the various sections of the bowels was but moderately injected, and then mainly in the form of little islets. On taking out the bowels, the various sections appeared, as was already seen whilst they were still *in situ*, rather unequally dilated. The duodenum was dilated to sack-like dimensions, and filled with meconium and gases. In the collapsed jejunum there were found at the borders of the duodenum and of the ileum points of constriction from three to five centimetres in length. Laid open, the tissues at these two points were found tough and cord-like, and the lumen so narrowed that only a very thin lead pencil could pass through. The jejunum was furthermore almost completely cut off from the ileum by a crescentic fold of mucous membrane, which pro-

jected like a diaphragm into the lumen of the canal. The cord-like points of constriction, especially the one between the duodenum and the jejunum, were covered with fibrinous exudations. The mucous membrane of the duodenum was discolored blackish-green, was tumefied and soggy, friable, but nowhere torn. The ileum, cæcum, and colon were collapsed and almost empty; the mucous membrane was pale.

Treatment. — The treatment of constipation dependent upon malformations, where treatment is possible, is entirely surgical, and the details thereof can be found *in extenso* in the work of Bodenhammer referred to, in the works on the diseases of the rectum, and in the various treatises on surgery.

Here I would only call attention to these two points:

(a) Narrowing of the orificium ani can be very properly treated by dilatation.

(b) In a case in which the rectum was obstructed by two membranous diaphragms, Lannelongue succeeded in perforating the upper through the artificial anus which he had established, and cut out the lower one by an incision from the exterior and the natural passage for the fæces was thus re-established.¹

CASE 58. Lannelongue (Observation II.).

May 24, 1882, there was brought to the hospital Trousseau a new-born infant of the male sex, fifty-two hours old at the time of the examination. He is the second son of healthy parents, and there is no evidence of any syphilitic antecedents in the parents. The infant is lively, urinated easily, but has not passed any meconium since its birth. It is otherwise well formed. Examination of the anal region: nothing particular

¹ Lannelongue, Sur une Variété Rare de Malformation Congénitale de la Région Ano-rectale. *Bulletin et Mémoires de la Société de Chirurgie*, 1884. Virchow und Hirsch, *Jahresberichte*, 1884.

is seen ; the anus and its folds are normal ; the finger introduced therein passes into an infundibulum two to three centimetres in depth. It is rather difficult to introduce the finger, and when the infant cries or weeps, no sort of impulse is felt. A careful examination excludes the existence of a rectal ampulla. The belly is distended ; the abdominal parietes are not œdematous ; the intestinal loops cannot be seen outlined upon the abdominal wall.

The infant is operated upon after the method of Littré ; the gut is found beneath loops of small intestine. It is stitched to the abdominal parietes ; it is opened, and a great quantity of fæces or meconium flow out. The intervention has been a happy one ; a good nurse is secured, and the child is brought to us at first every day, then every second or third day. The 15th of June : the opening in the abdominal parietes began to be the seat of a retraction process ; there is a simple erythema all around it, provoked by contact with intestinal matters. June 18 : the artificial anus is well constituted ; the cutaneous orifice is rounded, and permits of the passage of the finger. At the bottom there is felt a slight projection of mucous membrane. I took a uterine sound and directed it to the lower end of the opening. It was promptly arrested at about two to three centimetres from the cutaneous orifice ; there was an obstacle which looked to me as if it were the termination of the intestine. As I was endeavoring to discover the distance which separated it from the anus, which was really rather great, it seemed to me that the resistance I had encountered yielded, although I made but very moderate pressure. A little stronger effort, and the sound entered the pelvic cavity ; it was too short to reach the anus, so I took one of Chassaignac's long curved trocars, and with a great deal of care introduced it by its blunt end. It stood out rather prominently at the summit of the infundibulum of the anus, and I could feel it with the finger introduced into the infundibulum from below ; a very slight thickness separated the point of the trocar from the summit of the infundibulum ; it would have been possible by proceeding with some violence to pass this separation.

I concluded, nevertheless, to proceed otherwise. A posterior incision was made, beginning at the anus, down the median line, toward the point of the coccyx, about one and one-half centimetres in length; the skin, the underlying tissue, were successively incised, and finally the obstructing membrane itself was cut on the instrument. A drainage tube of large calibre, reaching from the natural to the artificial anus, was inserted, and allowed to remain. Two sutures reunited the perineal incision. It was also advised that an injection of a weak solution of boracic acid be made daily through the tube so as to cleanse it.

June 19: the child is in excellent health; he has passed fæcal matter through the cavity of the tube. Two days later, June 21, the drainage tube was taken out to be cleansed; a rather large sound is introduced into the rectum, and passes readily beyond the lower obstacle. The drainage tube is replaced; the opening of the artificial anus will barely admit the tip of the finger.

June 23: sutures taken out; no inflammatory engorgement; every day, fæcal matter passes through the large tube. June 26: drainage tube withdrawn and cleansed; rectal sounds of graduated calibre are passed; the drainage tube is replaced, and allowed to remain to the 29th. At this date large quantities of fæcal matter passed out through the artificial anus. The infant is seen again July 2; the mother is advised to pass daily the rectal sounds through the normal anus.

An enteritis with frequent and abundant diarrhœal discharges sets in, and since the night before the child looks bad, very much exhausted. Since then I have not seen our little patient, and I have all reason to believe that it has succumbed.

Chronic Constipation. — Certain congenital malformations (Shelf, perforated or incomplete diaphragm, etc.) may be the cause of a chronic constipation that lasts throughout life. It usually manifests itself first at a later period, at a time when the fæces become firm in consistence and abundant in quantity. See Part I., Chap. VII., and Part II., Chaps. III. and V.

CHAPTER II

ACQUIRED CONSTIPATION

I. ACUTE CONSTIPATION

THE term "acquired constipation" explains itself. It means that this form of constipation is acquired by the little patient through some fault or neglect on the part of the parent or nurse, or as a consequence of some morbid process developed subsequent to its birth, and that, in contradistinction to the form previously considered, it is not due to any inherent vice of anatomical conformation.

The acquired constipation of infants presents itself to us in one or other of two forms already named; viz.,

I. Acute constipation.

II. Chronic constipation.

* * * * *

Acute Constipation.

Acute constipation has been already defined elsewhere and needs no further elucidation here. It is caused in infants by:

Intussusception, volvulus, strangulation through a slit in the omentum.

Strangulation by bands.

Hernia (inguinal, femoral, or umbilical).

Paralysis of the intestine consequent upon traumatic injury of one or more loops.

CASE 59. In January, 1875, I was called to see Mary B. in consultation with Dr. ——. The little patient, *æt.* five years, was in bed, presented an emaciated appearance and a countenance expressive of much suffering. She was ill now four days. The history, as given me, was that she had complained of pain in the belly and about the loins, had had considerable fever, vomited frequently, complained of headache, and was thought to have had some delirium at times. For various reasons the physician in attendance had diagnosed the onset of smallpox (the disease was then prevalent) and had prescribed a laxative. This proved ineffective, and a stronger purge was ordered; this also had no effect. In fact, the child was obstinately constipated, despite all the measures taken to produce an evacuation.

The vomiting had abated since the third day, though the child took nothing more than a little milk and water, and of this but a teaspoonful or two at a time.

Examining the little patient, I found the belly very tender in a limited region about the umbilicus and upward toward the large bowel, and so sensitive was this part that she cried out upon the slightest touch. The thighs were flexed upon the pelvis, and the legs upon the thighs; upon the slightest attempt to straighten out a lower limb, she cried with pain. The temperature was 101° F.; pulse very rapid and feeble. Upon questioning the mother very closely about the onset of the illness (as I failed to recognize any evidence of approaching variola), I learned that on the afternoon of the Sunday previous the child had been sent out to get some beer. In going to the saloon, she stepped upon an iron cellar door, which she had failed to see owing to the snow that covered it, slipped, and fell upon her belly. She complained of some pain on her return home. That evening she vomited rather frequently; the pain grew much worse as the night progressed, but abated considerably toward morning.

My diagnosis was traumatic injury of some portion of the intestinal tract, and most probably of a portion of the small bowels.

The efforts at purgation were at once suspended. Opiates

were prescribed; hot fomentations to the abdomen and small rectal injections of very warm water were ordered.

The child continued to grow worse, and died on the eighth day of its illness.

I was very anxious for a post-mortem view, and by means of a *ruse-de-guerre* I succeeded in obtaining permission to open the belly in the presence of a relative. Post-mortem twenty-eight hours after death. Body almost frozen. The parietal peritoneum presented nothing abnormal; cutting this, and turning it aside, we found right before our eyes a loop of the small bowel that presented a mortified appearance. It was of a dark rusty color with streaks of green here and there. Only this single loop was affected; the other parts of the intestinal tract and other abdominal organs were apparently healthy.

Acute diseases of the small bowels (duodenitis, enteritis).

Acute diseases of the large bowel (typhlitis, appendicitis).

Acute diseases of the liver.

Inflammation of the peritoneum.

Acute diseases of the brain and spinal cord.

The *modus operandi* of these various factors has been set forth in Part I.

Acute constipation may be caused furthermore by:

Foreign substances swallowed in sufficient quantity to obstruct the lumen of the bowl.

Children usually swallow the stones of fruits (as of cherries, plums, etc.), or the seeds thereof (as of grapes), with the fruit itself, and if these be in any quantity they will pack together, and obstruct the passage through the bowel. Occasionally food or the parenchymatous portion of the fruit swallowed insufficiently masticated, in chunks, may cause the obstruction.

CASE 60. A. H. Watkins (Lancet, London, 1885, Vol. I., p. 457).

A boy ten years of age was brought to me by his mother, saying he was suffering from constipation of four days' duration. As the patient walked with difficulty, and complained of a great deal of pain about the anal region, I made a local examination, and found the anus loose and flabby, and occupied by a hard, dense mass of fig pips, of which a good number were adherent to the buttocks. Finding it impossible to introduce an enema tube, I proceeded to remove the mass by scraping away with the fingers, the relaxed condition of the anus readily admitting two fingers, though the acute pain that the patient suffered made it necessary to administer chloroform. I removed in this way half a pound (weighed) of fig pips, besides many which were washed out afterwards by an enema. The whole bowel for several inches seemed quite paralyzed by the distention to which it had been subjected. On the following day the patient seemed quite comfortable, and the bowels had acted. As I have heard nothing of him since, I presume he is well.

The following case reported by Townsend (*Annals of Gynecology and Pædiatry*, March, 1897), is of the greatest interest, as it seems to show that foreign bodies may penetrate through the abdominal parietes into the abdominal cavity and cause acute obstruction. This is really not to be wondered at, when we remember how much children crawl around on the floor and on the ground among the poorer and middle classes, and how frequently needles, pins, etc., are scattered about, and how very often the flooring is of the roughest boards.

CASE 61. For several months past the child had attacks of crying as if in pain, and the mother, supposing them due to colic, paid but little attention to them. Suddenly the symptoms grew more urgent, the abdomen became swollen, incessant vomiting set in, and the now alarmed mother brought the child to a physician, who sent him to the hospital for operation. On examination a tense, painful tumor was noticed just to the left of the umbilicus. From this, in conjunction with the symptoms, a diagnosis of acute intestinal obstruction, due probably to an incarcerated umbilical hernia, was made, and the child was immediately operated upon. On incising over the swelling the knife passed through a dense inflammatory exudate thrown out into the left rectus muscle; upon further incision the abdominal cavity was opened, disclosing the inflamed intestine

adherent for some distance to the abdominal wall. On separating the adhesions a pine splinter, about one inch long, was found — one portion embedded in the abdominal wall, and the other protruding into the intestinal canal. . . .

Worms. — J. Lewis Smith¹ relates the case of a girl four years of age in whom acute constipation developed suddenly, and was accompanied by distention of the abdomen and great suffering. This continued nearly one week, when a mass of intertwined worms was expelled with immediate relief.

A large **gall stone**, which will obstruct the ileo-cæcal valve, may be the direct cause of an acute constipation.

The **diagnosis** of acute constipation is rather the diagnosis of the morbid condition of which it is but one of the symptoms, whether this be some grave pathological process or some foreign body that can be readily removed. So far as the former is concerned, the differential diagnoses can be found in detail in the various treatises already referred to. As regards the latter, a careful inquiry as to the mode of onset of the attack and the conditions of the child and events just preceding it; a history of the habits of the child, its amusements, its diet and manner of eating, its supervision; and a careful examination of the rectum, — may, and in great majority of cases will, lead to its recognition.

The **treatment** will be found in the special books upon the various topics and the large general treatises. I would only call attention once more to what I advocated in my article on "Intestinal Obstruction,"² that in all cases where we may have reason to suspect a sudden

¹ Diseases of Children.

² *American Journal of the Medical Sciences*, January, 1886.

obstruction of the intestinal canal, large massive enemata should be immediately resorted to, for the reason that they have a marked and rapid curative effect, and if they fail we know at once that operative interference is necessary, and that it should be resorted to without delay.

CHAPTER III

II. CHRONIC CONSTIPATION

FOR the purposes of a clearer understanding and a better comprehension of the therapeutic indications, this category of our subject is divided into two groups, namely:

I. Chronic Constipation, dependent upon an abnormal condition of one or more organs or parts of the body.

II. Habitual Constipation, due to functional disturbance.

CHRONIC CONSTIPATION

Chronic constipation may be due to some congenital malformation of the intestinal tract, as has already been indicated, or it may be produced by any of the various pathological conditions which give rise to it in the adult, and which have already been enumerated in a previous chapter.¹

CASE 62. *Cancerous growth pressing upon the rectum.*
Thomas Smith (Transactions Pathological Society, London, Vol. 19).

The specimen was removed from a child, aged fourteen months, under Mr. Smith's care at the Children's Hospital. Two months before admission the mother noticed that the child had difficulty in passing the motions, and soon afterward that it strained when passing water, and that occasionally the urine dribbled away. These symptoms increased in severity,

¹ See Part I., "Chronic Constipation."

and the child seemed at times to have pain in the belly. A month ago a hardness and swelling were noticed in the lower part of the abdomen; they have gradually increased. A month ago retention of urine came on, which was relieved by the catheter. At no time has any blood been seen. . . .

The tumor felt during life proved to be a large, malignant growth springing from the recto-vesical pouch, filling the pelvis, and growing upward into the abdomen behind the bladder, which was greatly elongated, especially about the neck, the fundus lying above the level of the umbilicus. The coats of the bladder were greatly hypertrophied, but otherwise healthy.

The tumor was partly solid, but in the upper part were numerous cysts containing a semi-fluid substance.

Anal fissure is regarded by Gautier,¹ of Switzerland, as a frequent cause of chronic constipation in the new-born. J. Lewis Smith² says that it is of rare occurrence then, and in this, taking the term "new-born" in its stricter sense (to a month or six weeks), my own experience fully confirms him. At a later period, however, in later infancy and early childhood, it is of more frequent occurrence, as was already noted by A. Jacobi,³ and is many times the unsuspected cause of the general fretfulness, of the paroxysms of crying, of the sleeplessness of the child.

Excoriation of the Anus.

CASE 63. Boy, *æt.* three and one-half years, stout, rather robust-looking little chap. His mother complains that every evening at six he begins to cry, and continues to do so almost without cessation until twelve midnight. When the pain or crying spell comes on, he will not sit or lie quiet. He is continually changing his position. There is, according to

¹ Quoted by J. Lewis Smith, *Diseases of Children*.

² *Diseases of Children*.

³ *Intestinal Diseases of Infancy and Childhood*.

her statement, nothing abnormal in the stool; the urine is normal; there is no fever.

He was closely examined, but nothing at all could be found that would account for the crying spells.

Persistent inquiry elicited that the boy did not pass his urine well, that it dribbled away, but that in the morning, on arising, he passed a fairly large quantity.

It was also learned that the boy was costive, and, finally, it was disclosed that the crying spell coincided with the time when the little fellow was placed on the vessel.

Examining now the anus by drawing the nates well apart, I found the sphincter excoriated, sore, inflamed all around, and coated with pus. The excoriations and inflamed condition extended up some distance.

Tubercular Peritonitis may cause Chronic Constipation.

CASE 64. J. Lewis Smith.¹

Charles, *æt.* four years, was returned to the New York Foundling Asylum on April 16, 1877, to be treated for tumor albus of the left knee, and for general ill health. His parentage and early history were unknown. The nurse in the city, to whom he had been entrusted when quite small, stated that he had had no sickness when with her except sore eyes, and that about April 1, 1877, the enlargement of the knee was first observed. The head of the boy was large, and the abdomen much distended, but without any decided tenderness on pressure; its entire lower part had a purplish color. Percussion over it gave a dull sound except upon and near the epigastrium, where there was some resonance; umbilicus prominent; circumference of body over abdomen, twenty-three inches; pulse 128; axillary temperature, 99° F. It was stated that he had no stool without medicine, and that usually one tablespoonful of castor oil was required to produce it. The urine contained no albumen, and was apparently normal. As the appearance indicated struma, a mixture of cod-liver oil, syrup of the lactophosphate of lime, and iron was prescribed to be given three

¹ Loc. cit.

times daily, and directions were given to rub cod-liver oil over the abdomen also three times each day for five minutes each time. Some nodules were felt on pressure upon the abdomen, which was suspected were enlarged mesenteric glands. From the day on which the friction and kneading of the abdomen were commenced, the stools began to occur on the average about twice daily. The kneading proved the safest as well as the most efficient method of producing defecation. On May 4, the circumference of the trunk over the most prominent part was reduced to twenty-six inches. The records on May 11 state, "Same treatment continued; has tolerable appetite, but is pallid, and his flesh flabby and soft." From this time he gradually failed, and died April 11, 1878.

Autopsy.—Lungs healthy, except a little exudation over the summit of right lung; bronchial glands cheesy; numerous tubercles, some of them cheesy, upon the parietal and visceral surface of the peritoneum. Loops of the intestines were united to each other by old adhesions, and the small intestines were generally bound down by bands into a "uniform conglomeration"; mesenteric glands, enlarged and cheesy; a large ulcer upon the surface of the rectum, and numerous small, round ulcers upon the surface of small and large intestines apparently occupying the site of the solitary follicles.

Chronic hydrocephalus is always accompanied by a chronic form of constipation.

Rachitis induces chronic constipation (debility of the muscular coat).

As to the *diagnosis* and *treatment*, what has been said in the preceding chapters applies here also. This may be said in addition, that in the cases of chronic constipation dependent upon congenital malformations a correct diagnosis as to the exact condition present will be almost impossible (diaphragm in the rectum excepted).

CHAPTER IV

HABITUAL CONSTIPATION

THE normal infant has from three to four evacuations, rarely five, in the twenty-four hours. The reason for this frequency is that the simple aliment of the infant is very rapidly elaborated into the proper condition for absorption, and that in order to be quickly absorbed it passes very rapidly over the whole intestinal surface, through the canal.

The discharges, which are made up of undigested fatty matter, epithelial cells, detritus from the intestinal canal, intestinal mucus, and coloring matters from the bile, are yellow in color and of pap-like consistency, thinner in breast-fed, thicker in hand-fed infants; with no peculiar odor; occasionally they have a slightly sour smell.

Under certain influences, by which the peristaltic function of the intestinal canal is disturbed, the discharges are retarded, diminished in number, and reduced to one a day, one every other day, or what is of more rare occurrence, one in three or four days.

The disturbance of peristaltic function may be in the nature of:

(a) An impairment of physiological action, — atony of the intestine.

(b) A perversion of the physiological action, — spasm of the intestine.

* * * * *

HABITUAL CONSTIPATION DUE TO ATONY

An atony of the intestine may result from a variety of causes ; it may be due :

1. To maternal influences.
2. To drugs.
3. To faulty alimentation, to improper feeding.
4. It may be the consequence of a preceding intestinal catarrh.

1. *To Maternal Influences.* — Much observation has shown that the infants of constipated mothers are themselves constipated, or have a marked inclination thereto. In my own experience I have seen infants who from the very earliest period of infantile life (after the third day, when the secretion of the mother's milk properly begins) did not have more than one stool per day, and that of a consistency much firmer than usual. In these cases an investigation as to the habit of the mother disclosed the fact that she was generally constipated.

Whether this is due to an inherited sluggishness of the intestine or is dependent upon the mother's milk is still a question. Vogel¹ states that the milk of the mother was examined, and nothing at all abnormal found therein. In a few cases in my own practice where for one reason or another the mother's breast had to be given up, and artificial feeding resorted to, considerable improvement

¹ Diseases of Children.

followed. In some other cases where the mother was treated for the constipation and relieved, the infant was also much improved. These facts would seem to indicate that it is rather the milk which, partaking of the nature of the person secreting it, is binding.

2. *To Drugs.* — It is well known that brandy, whisky, or gin are given to infants in innumerable cases, and almost from the first hour of extra-uterine life. With many midwives, nurses, and good old ladies it is thought impossible to raise a child without the occasional use of these alcoholic stimulants. In other innumerable instances resort is had to stronger agents, the opiates, which are administered in the form of paregoric or soothing syrups. The purposes of such administration are supposedly to relieve colic, but very much more frequently to put the baby in a stupor, and keep it from crying whilst the mother or nurse are elsewhere, and, for them, more pleasantly engaged.

The result is a constipation more or less obstinate, and a very dyspeptic stomach.

3. *To faulty alimentation.*

To improper feeding.

A. **The Breast Milk.** — (a) The breast milk may contain too great a percentage of casein and too small a quantity of fat.¹ In the early period of infantile life the efforts at digestion of too great a quantity of solid matter and the carrying forward of it soon exhausts the strength of the intestinal muscle, and inertia follows.

(b) The milk may be deficient in the percentage of

¹ Widerhofer, Gerhard's Handbuch d. Kinderkr., Bd. 4, Th. 2, article "Obstructio Alvi."

sugar.¹ It is claimed that lactose, or milk sugar, stimulates peristaltic action, *i.e.* that it has some mild laxative properties; a milk deficient therein would naturally become somewhat binding.

Though one or the other of these defects in the mother's milk may occasionally account for the constipation, still in the majority of cases nothing will be found therein on the most careful analysis, and only the constipation of the mother will explain the constipation of the infant.

B. Artificial Foods. — I. Cow's milk, when given insufficiently diluted, does, in many cases, produce constipation, especially in the *cooler months* of the year. The hard, firm coagulum of the cow's milk taxes all the strength of the intestinal tract, both as to its digestion and transportation, and atony from the stomach down follows.

It may be also that a sort of packing of the canal by the milk coagula causes the constipation.

II. The various infants' foods have all been accused of constipating, more or less, the infants fed upon them.

III. At a later period, the feeding with amylaceous articles — bread, tapioca, arrowroot, potato pap, cornstarch — tends to constipate.²

Improper Feeding. — There is one factor that I hold more responsible for constipation in the cases of children fed with cow's milk (and not infrequently in the case of breast-fed children) than the casein, and that is improper feeding. It is strange, but nevertheless true, that many mothers seem to believe that a baby's stomach is made of some elastic material, that you can put any quantity of

¹ Jacobi, "Constipation in Infants," *American Journal of Obstetrics*, 1869.

² Widerhofer, *loc. cit.*

food into it, and that the more you put in the better it is for the baby. I have already called attention to this point in my article on "Summer Complaint,"¹ and my experience there has been verified here. Infants are fed every half hour; in fact, every time the baby cries the breast or bottle is pushed into its mouth. One hour is really a very long interval. When, however, the physician asks how often do you nurse the baby? he will, as a rule, be glibly answered, "Oh, every two hours"; only after careful cross-questioning will the truth be disclosed that instead of once every two hours, the infant is fed twice (and I have known cases where it was thrice) every hour.

Then as to *quantity*. Others, though they observe the regulations as to time, will disregard those as to quantity. I know of instances where babies two or three months old were given six to eight ounces of food at each feeding.

These sins of omission and commission, to which the general practitioner as a rule pays but little attention, do not pertain to the lowly alone, but are found amongst the most refined and educated of our people, even among medical men in their own families.

This overfeeding, whether of frequency or quantity, produces an atony of the stomach (where proper attention is not paid to cleanliness a catarrhal condition is developed), and as a result we have constipation, just as we have it with atony or catarrh of the stomach in the adult.

Sometimes as a result of the large quantity of flatus developed in these cases of overfeeding, we have portions

¹ "Summer Complaint, A Clinical Contribution to the Etiology, Pathology, and Treatment of the Disease," *New York Medical Journal*, 1892.

of the intestine distended beyond measure, and other parts of it paralyzed, as it were, as already described elsewhere.

Again, we may have a perversion of peristaltic action in consequence of a hyperirritation produced either by the masses of alimentary matter or by the gases; namely, *spasmodic contraction* of the intestine (generally with more or less pain, exceptionally without it).

4. *It may be the Consequence of a Severe Catarrh.*— Severe catarrh of the intestinal tract is frequently followed by constipation. The exaggerated action during the catarrhal period exhausts the normal vigor of the muscular coat, and leaves it in an atonic state. The secretory apparatus in the mucous membrane becomes likewise impaired, and, owing to this impairment and the atony of the muscular coat, the secretion of mucus, so necessary for the proper onward movement of the material in the canal, is deficient in quantity, and perhaps also in quality.

CHAPTER V

HABITUAL CONSTIPATION DUE TO ATONY (*Continued*)

OTHER CAUSES

BESIDES the palpable and clearly recognizable causes which have been set forth, there are others which are counted as among the factors of habitual constipation; some, whose relationship is very questionable, others, not recognizable.

I. Insufficiency of food. This, as has been already explained elsewhere, cannot be regarded as a cause of constipation. The infrequency of fæcal discharges, the result of insufficient food, is not constipation.

II. The too great length of colon cannot, with all due deference to the eminent gentleman who suggested it,¹ be considered a cause of habitual constipation. There is not the least evidence therefor. In the one case reported in support, the constipation depended upon the misplacement, and not upon the too great length of the colon. On the other hand, it may be asserted that there is really no such a thing as too great a length; the colon is of proper length for the period of life, and required to be so for the proper absorption of the necessary quantity of nutritive material; if it were shorter, the food would

¹ A. Jacobi, *American Journal of Obstetrics*, 1869.

pass out too quickly and the infant would be starved. This is clearly shown by the fact that as the absorbent power of the individual portions of the intestinal canal become better developed, greater, the length of the colon diminishes.

III. Too scant a secretion of intestinal mucus. This may depend upon insufficient development of the secreting apparatus of the intestinal mucous membrane. It may be due to the atonic condition of the whole intestine, or it may be the consequence of a catarrh, as already explained.

IV. Congenital hypoplasia of the muscular coat may be a cause of constipation. See Part I.

V. Constipation in consequence of dilatation and hypertrophy of the colon.

Hirschsprung reports the following cases :

CASE 65. A child born in the maternity hospital at Copenhagen presented the peculiarity that, despite different laxatives administered, it had no stool. The same sluggishness of the intestines continued in the following months, and the most diverse remedies were employed. When a discharge was obtained, it was always of normal consistence and appearance. The child was otherwise well, and continued to develop nicely upon breast milk and Zwieback pap. For relief from this trouble it was brought to the polyclinic. When I saw it here for the first time, the child had had but one small stool, a few hard scibala, in the past fourteen days. Nevertheless, the child did not appear to suffer any, and its appetite was always good. In the rectum an accumulation of scibala was felt which was removed by means of the finger and rectal injections. By the aid of different purgatives, the bowels were kept fairly open, and the condition continued good for a while ; when the appetite began to fail, the cheerfulness to disappear, and the skin took on a sickly look, the child was, at the request of the mother, received into the hospital. Age, eight months ; weight, 9000

grammes; state of nutrition, satisfactory. During his whole stay in the hospital, our attention was entirely directed to the abdomen, especially to its evacuation. As a rule, the boy had no fever; vomited only exceptionally; appetite very good; in short he did not make the impression of being very sick. Never an evacuation spontaneously, and all our efforts were directed to effecting this. When a motion was obtained, the belly diminished in size, and the child evidently felt much relieved. The improvement was always of short duration. At the time I had not seen a similar case, and none was known to me from the literature. It appeared to me that a constriction of any part of the intestinal tract was out of question. The fact that a thick elastic tube more than an ell long could be introduced with greatest ease, and that on occasional exploration of the rectum it was generally found filled with faecal masses, spoke very clearly against any stenosis and for an atony of the intestinal tract. The treatment applied to remedy this condition proved futile, but by the daily administration of a purgative combined with rectal injections the bowels were fairly well regulated. The abdomen was rarely distended to any extent, and the child left the hospital; he had lost 700 grammes in weight during his stay therein. He remained at home but a short time. The first eight days the child was very well and even had spontaneous discharges which were rather thin. Then the belly again became very much distended, the discharges were frequent and thin, and he died on the same day that he was again brought to the hospital. His weight was 6900 grammes.

Post-mortem Examination.— On opening the abdomen, several enormously distended loops of intestine present themselves; they are the sigmoid flexure, and the still more markedly dilated transverse colon. The other parts of the colon, with the exception of the rectum, are also dilated. No constriction anywhere. These parts are not alone dilated, but their walls throughout their whole extent are also very much thickened, especially the muscular layer. The mucous membrane of the more or less dilated parts is sown with ero-

sions and ulcerations which present marked differences as to size and depth. There are small superficial erosions and ulcerations barely the size of a pin's head which penetrate the whole depth of the mucous membrane. There are small superficial ones, and larger, formed apparently by the conjunction of two or more ulcers, little bridges of mucous membrane traversing the ulcer being noted. At certain points the superficial surface of the intestine presents a peculiarly figured appearance. All the ulcerations and erosions are of round or oval form with smooth edges as if cut out with a punch. Here and there the borders are somewhat undermined. Nowhere intumescence of the follicles. On the serous surface not a trace of disease. Ligamenta and haustra coli not recognizable; the appendices epiploicæ strongly developed. The mesentery of the sigmoid flexure is high, broad, and markedly thickened with rows of hypertrophied (to the size of a bean) bluish mesenteric glands. At the lower part of the ileum the plaques of Peyer stand out prominently. Otherwise, nothing abnormal in the body.

CASE 66. Waldemer H., nursing, seven months old, received into the hospital April 19, 1888. Suffered with constipation from birth, and only by the daily administration of purgatives could the bowels be kept open. Defecation was painless; in fact, the child but rarely complained; no eructation, no vomiting; developing very well. Occasionally the abdomen became very much distended, and lately it has gained in circumference. Since a month the distention has become so marked that the distressed mother brought the child to the hospital for relief. Punctures were made with a very fine trocar, and flatus evacuated; the abdomen became somewhat smaller. By means of daily doses of castor oil and of rectal injections regularly administered, the bowels were kept open, and the boy left the hospital in a rather satisfactory condition. In a very short time, however, the abdomen again became distended, despite the now numerous fæcal discharges. He vomited but once; he seemed to suffer considerable, cried much, and was therefore brought to the children's hospital. He was

an emaciated, delicate child, with an enormous belly, fifty centimetres in circumference. The loops of the intestine were clearly outlined on the abdominal parietes. Temperature in rectum 38.4°C. (= 100.5° F.). No excrement in the rectum, but a thin discharge follows the withdrawal of the finger. During his stay at the hospital, which was between four and five weeks, the diarrhœa, the distention of the abdomen which ranged from forty-one to fifty-six centimetres, and disappeared altogether toward the close of life, and the marked emaciation were the most prominent symptoms. The microscopic examination of the rectal dejections showed finely granulated detritus, many large and small fat globules, granulated epithelium, and pus cells in great numbers.

Post-mortem Examination: The colon very much dilated (somewhat less than in the previous case, sixteen to nineteen centimetres), but the hypertrophy was more pronounced. On the mucous membrane there are seen the same erosions and ulcerations, round and oval as if punched out with a punch, penetrating the whole depth of the intestinal wall. Besides these, there are found in this case single, large, and deep ulcerations, which penetrate as far down as to the serous covering, and cause it to bulge out like a pocket without the least appearance on the spot of peritoneal inflammation. The cavity is empty, but has, undoubtedly, at one time held fluid contents. We find, indeed, spots where the process has remained at a preceding stage, whereby a better understanding of it is obtained. Not far from the ulcers just mentioned we find an abscess beneath the mucous membrane measuring two centimetres in one and one centimetre in another direction. The incision shows us a whole meshwork of cavities in the submucosa with purulent contents. Like cavities are found at other points; not very many, however. That these abscesses may, in their progress, ulcerate through the mucous membrane, and also penetrate through the intestinal wall to the serous covering, is very apparent.

Hirschsprung regards the ulcerations as secondary to the dilatation and hypertrophy.¹ As regards the development of

¹ See Part I., "Consequences of Constipation."

the latter, he does not care to express an opinion ; only this he would say that, considering the fact that the constipation began almost with the first moment of life, it appears indisputable that the etiological factor must have been of intra-uterine origin, either an anomaly of development or some morbid foetal process.¹

¹ Jahrb. f. Kinderheilkunde, 1887.

CHAPTER VI

HABITUAL CONSTIPATION DUE TO ATONY (*Continued*)

HABITUAL CONSTIPATION IN OLDER CHILDREN

ATONY of the intestine in older children is due to the same causes, in so far as they pertain to this period of life, that give rise to it in the adult. A diet of too concentrated food, a sameness in the dietary, too coarse food long continued, too little exercise, etc., all tend to retard the fæcal evacuations. Two factors, however, merit special mention here, namely :

I. **Too Little Time taken for Defecation.** — It will be found, and I have found it so rather frequently, that very lively, active, playful children become constipated for the reason that they do not take sufficient time to properly fulfil their duty to cloacinæ. They will rush to the closet, and barely has the first portion of fæcal matter been discharged when their mind is upon something else, they are up and away to play. Some may not even wait for this much ; they sit upon the closet for a minute or two with a mind upon a dozen other things, and the discharge not immediately following, they leave to attend to matters more interesting to them. Marked atony of the intestine follows, and constipation results.

Parental inattention plays an important rôle in the constipation of children, especially of the category under

consideration. Many mothers, perhaps most mothers, do not think it at all necessary to see to it that their children have regular motions. The fact that the child goes to the closet, or says that it does, suffices for them. When the physician makes inquiry upon this point, he will be told, "Oh, yes! my child is regular, she goes to the closet every day." Of what value such testimony is, is very well illustrated by Case 4 of my article on "Intestinal Obstruction,"¹ where the mother complained that her daughter was troubled with diarrhoea, whilst in fact the bowels were obstructed. When I receive the above answer, I always ask again, "How do you know that the bowels have moved? Have you gone to the closet to look, or have you inspected the vessel?" Then they seem amazed; "No!" I think too much stress cannot be laid upon this point, and when I am called upon to treat constipated children, I always strenuously insist upon it that the mother or some other trustworthy person shall make it her business to inspect the bowl or vessel after the child has used it, so that she may know by ocular demonstration whether the child has really had an evacuation, whether the fæces are normal in character and sufficient in quantity.

II. **Overstudy.** — The crowding of the young mind with study exhausts the brain and nerves, weakens the muscles, and a general apathy follows. Moreover, children so crowded with mental tasks have no time for physical exercise; their studies keep them in the house, and thus deprive them of that abundance of oxygen so necessary to their well-being. The appetite is poor, and

¹ *American Journal of the Medical Sciences*, 1886.

frequently capricious, and they eat very sparingly and very daintily ; the taste for the coarser aliments, so necessary to the proper functioning of the bowels, is lost. As a result of all this, constipation, very often of a most obstinate character, ensues.

CHAPTER VII

SYMPTOMS AND DIAGNOSIS

Symptoms. — With children, as with adults, the symptomatology of constipation has a very wide range. Whilst with some not the least disturbance of the general economy is manifested, with others symptoms indicative of serious trouble may present.

The symptoms, as already given in the preceding section, are diminution or loss of appetite; coated tongue; more or less foul breath; discharge of offensive flatus; headache. The child loses its cheerfulness, and becomes nervous; it sleeps badly, restlessly; wakes up several times in the night. *Night terrors and grinding of teeth* may be due to constipation. *Colic, very severe colic*, is very frequently one of the manifestations of a constipated state. Occasionally, but not very frequently, we have convulsions as one of the symptoms. They are most likely to occur, however, when some hard substance has been swallowed, and presses upon the rectal nerves or irritates the intestinal nerve filaments.

Fever. — An elevation of temperature is sometimes the result of a constipation. Usually it is indicative of a sharp putrefactive process going on somewhere in the bowel.

Fæces. — The fæces are changed in character and

appearance. The great loss of water is one of the most characteristic features. The fæces are of firm consistency, sometimes very hard, dry, and scybalous in form. Occasionally they may be clay-like and sticky. They vary in color from a dark green to a deep yellow, to an ashy gray in milk-fed infants; in children fed upon a mixed diet the color is the same as that of adults,—a lighter or darker brown according as more or less biliary matter is contained therein.

When the stool is clay-like in character, it has usually a dark, tarry color. There is sometimes found adherent to the hard scybala, bloody mucus or pure blood derived from a superficial erosion of the mucous membrane.

The scybala becoming firmly adherent to the mucous membrane, the separation therefrom, by the powerful peristalsis excited by one means or another, leaves a superficial erosion of said mucous membrane.

Defecation. — The act of defecation is occasionally more or less painful, and generally requires much effort. The face of the child during the act becomes red, turgid, even reddish-blue; it is covered with perspiration. Great downward pressure is made, and finally one or two small, hard lumps are discharged, or, perhaps, nothing more than a little flatus.

Diagnosis. — The diagnosis of retardation of fæcal discharges is one the most readily made. It is apparent. What is more difficult is to differentiate the habitual constipation due to an atonic state of the intestinal tract from constipation, the result of insufficient food, and from chronic constipation dependent upon morbid processes in the abdomen or elsewhere. As regards the first a care-

ful inquiry into the history and life of the infant or child, the quantity and character of the food taken by it, — and as to the latter a careful examination upon the lines laid down in Part I., will soon disclose the truth to us.

In all constipated infants and children who are fretful, given to crying much, the anus should always be examined for a possible fissure or excoriation thereabout.

CHAPTER VIII

TREATMENT OF CONSTIPATION DUE TO ATONY OF THE INTESTINE (*Infants*)

I. WHEN the constipation of the infant is dependent upon the constipated habit of the mother, we will endeavor to remedy this.

In the earliest part of the post-partum period, by the regular administration to the mother of some mild but efficient cathartic, — magnesia, Rochelle salts, the tonic laxative,¹ or some one of the laxative mineral waters, as Hunyadi János, Rakoczy, Villacabras, or Hathorne (Saratoga), all in appropriate doses, just sufficient to keep the bowels soluble. The good effects of this treatment will soon manifest themselves in the greater solubility of the infant's bowels.

It is, of course, absolutely necessary to avoid such remedies as have a subsequent constipating effect, as castor oil or rhubarb, and such as have a tendency to gripe, as otherwise, in the case of the latter, the child will be severely troubled with colic.

At a later period, when the mother has recovered her former vigor and is able to be up and about, we will treat her constipation upon the principles and by the methods laid down in Part I.

¹ See "Formulary," Part I.

Generally, with the relief of the mother the constipation of the infant will be cured.

II. Where the constipation is dependent upon a faulty composition of the mother's milk.

(a) *Too great a Percentage of Casein.*—Whether we are to understand by this an amount beyond what has been found to be the maximum,¹ is not explained. In the sense of an abnormally high percentage of the nitrogenous element, I have not myself seen a case or read one reported.

When we are confronted by such a condition, or where the percentage of casein, though within normal limits, is nevertheless too large for the digestive capacity of the child, we must attempt to correct this by dietary measures. Theoretically, we should be able to accomplish something, and experimental observation seems to verify this to some extent,² by putting the mother upon a diet composed mainly of carbohydrates and fats, with but a minimum of the nitrogenous element, and that only in the form of lean meat.

In addition, we may avail ourselves of the benefits to be derived from a course of mineral waters. The alkaline waters, as Vichy or Bilin, or the milder muriatic waters (alkaline-muriatic), as Selters, Ems, Luhatschowitz, or a bitter water, as Kissingen or Friedrichshall in minimal quantity freely diluted, may be prescribed.³

Where with all these we do not succeed, and the digestive disturbances are prolonged and tend to become seri-

¹ The casein in mother's milk ranges from 0.18 to 1.90.

² Foster, Physiology. See references there.

³ Balneo-Therapie, Handbuch der Allgemeine Therapie (Ziemssen); "Mineral Waters," Dictionary of Medicine, Quain.

ous, the question of a wet nurse or a resort to artificial feeding must be considered.

(b) *Too Small Percentage of Sugar.*—Here, also, we should, at the very first, endeavor to remedy the defect by proper dietary regulations. Such articles of food as are rich in starch—potatoes, rice, tapioca, arrowroot, white bread—should constitute a large part of the diet, with the nitrogenous element and the fat in just proportion. In addition, dishes prepared with an abundance of sugar and sugar itself should be taken freely.¹

Jacobi seeks to remedy the difficulty by administering a quantity of sugar to the infant to make up the deficiency. He directs that the child be given from thirty to sixty grains (2.0–4.0) of loaf-sugar dissolved in tepid water before each nursing.² If, as claimed, lactose or milk sugar possesses laxative properties, it is the better form of sugar to administer. Maltose or malt sugar can also be employed for the purpose.

This latter method is very well as a temporary makeshift until the mother's milk can be brought up to the normal standard, and for the exceptional cases where this cannot be accomplished.

III. In infants fed with **cow's milk** the constipation is due to the greater amount of casein that this contains and its more difficult digestion. To remedy this, the milk must be properly diluted so as to reduce the percentage of casein, and make it conform to that found in breast milk. Ordinarily it may be said that in the early period of infantile life the **dilution** should be one part milk and

¹ Foster, *Physiology*, "Sugar."

² *American Journal of Obstetrics*, 1869, loc. cit.

three to four parts water; after the third month, one part milk and two to three parts water; after the fifth month, one part milk and one to two parts water;¹ after the eighth month, the milk can be given undiluted.

Under the circumstances here considered, oatmeal water, which is perhaps possessed of some laxative properties, will be an excellent diluent. Moreover, it prevents the too firm and too close clotting natural to the casein of cow's milk.

As the dilution will also reduce the fat and sugar constituents below the normal limit as fixed by breast milk, we will have to make good this loss by the addition of cream and sugar (loaf or milk sugar). For further details on this subject see the Cyclopædia of Diseases of Children, American Text-book of Diseases of Children, Diseases of Children, by J. Lewis Smith, and that very excellent little book by Dr. Louis Starr, the Hygiene of the Nursery.

Pap-fed children must be brought back to a milk diet. Condensed milk prepared with oatmeal water will be the most suitable food at the outset.

IV. *Improper Feeding.* — As already stated, so far as my own experience goes I am decidedly of the opinion that the greater part of the difficulties encountered in feeding with cow's milk (and not infrequently the digestive troubles of breast-fed infants) are due to improper feeding; namely, they are fed too often or too much, or both.

¹ The more or less of the water depends upon the digestive capacity of the child. See the tables of dilution of Monti, Uffelmann, and of the Verein der Medicinal Beamten, etc., in *Wie behutet mann Leben u. Gesundheit der Kinder*, by Ernest Brücke, Vienna, 1892.

This point, upon which too much stress cannot be laid, must be regulated in accordance with the well-formulated rules that have been established, and that a large and long experience has demonstrated to be correct.

Breast-feeding.

One breast only is given at a nursing.

For the first week after the establishment of the flow, the child can be given the breast every hour and a half from 5 A.M. to 11 P.M. When the flow is abundant, the breast having a very abundant supply, *every two hours* will suffice.

At this early period one nursing in the course of the night (about 2 A.M.) may be allowed.

After the first week to the end of the tenth week, every two hours from 5 A.M. to 11 P.M.

No feeding during the night after the first week.

From the eleventh week to the end of the fourth month, every two and a half hours from 5 A.M. to 11 P.M.

From the fourth month to the end of the tenth month, every three hours from 5 A.M. to 11 P.M.

The intervals of time between the feedings, as above given, are adapted for the great majority of infants; here and there a child with strong digestive capacity may require either a shorter interval or a larger quantity at each feeding. The former is the preferable to do.

Where mixed feeding is resorted to, *i.e.* breast and bottle (and it is always desirable to retain the breast in function as much and as long as possible, especially in the early period of the infant's life, for the benefit of both mother and child), the breast and bottle must never be given together at one nursing; they should be

BOTTLE FEEDING

AGE	INTERVAL	QUANTITY AT EACH FEEDING
During the first week, and early part of second.	Every two hours from 5 A.M. to 11 P.M. Occasionally once or twice during the night.	One (1) ounce.
From the middle of the second to the sixth week.	Every two hours from 5 A.M. to 11 P.M. No night feeding.	One and a half (1½) ounces.
From the sixth week to the end of second month.	Every two hours from 5 A.M. to 11 P.M.	Two (2) ounces.
At the third month.	Every two and a half hours. (<i>Same hours.</i>)	Two and a half (2½) ounces in the first part, three (3) ounces in the latter part of the month.
At the fourth month.	Every two and a half hours. (<i>Same hours.</i>)	Four (4) ounces.
At the fifth month.	Every three hours. (<i>Same hours.</i>)	Five (5) ounces.
At the sixth month.	Every three hours from 7 A.M. to 10 P.M.	Six (6) ounces.
At the seventh month.	Every three hours.	Seven (7) ounces.
At the eighth month.	Every three and a half hours.	Eight (8) ounces.

used separately; at one nursing the breast, at another, the bottle.

The physician can make himself certain that the regimen he has prescribed gives a sufficient supply of food by occasional and careful weighing of the infant, and noting thus whether it is gaining in due proportion or not.

Children that are thus properly fed are, as a rule (breast-fed infants always), free from that irritability which causes the long and harassing crying spells which are always more or less present in overfed children, and which with them are always an expression of a dyspeptic condition, and not infrequently of a beginning catarrh of the stomach. They will also be free from the frequent attacks of colic to which overfed children are so liable.

With older infants, one and one-half to three years, the dietary errors that demand our attention vary with the station in life of the parents. Among the middle and poorer classes, the children, already at an early age, are fed with gross coarse food such as is furnished for the adults; and dyspepsias, even ectasias of the stomach, and constipations are frequent results. Among the wealthy class the other extreme is the rule, — too bland a diet is provided. These faults of alimentation must be corrected, and a proper dietary for the children prescribed.

For additional information upon the feeding of infants, see *Diseases of Children*, by J. Lewis Smith, the *American Text-book of Diseases of Children*, and the *Hygiene of the Nursery*.

I do not think it necessary, ordinarily, to prescribe the free administration of water to very young infants except in the hot months when the system is continually drained

thereof by the very abundant perspiration. There is sufficient water in their food. The dryness of the fæces is not due to an insufficiency in the quantity of fluid, but rather to the long retardation of the matters in the bowel and their consequent inspissation.

V. *From Drugs.*—It will certainly be admitted that to administer drugs or alcoholic liquors to an infant to stupefy it, so that mother or nurse may enjoy undisturbed their selfish pleasures, is criminal. No physician who has the welfare of his little patient at heart should hesitate one moment to denounce such an abominable practice. What seeds for future evil are thus laid!

But even for those frequent infantile colics (due to flatulence, from indigestion, or to the swallowing of much air in the act of nursing) there is no necessity for a resort to opiates or brandies or whiskies. We have other agents equally, and, indeed, much more effective and withal harmless. These are:

1. First and foremost **milk of assafœtida**. Made as already described here, there is nothing that will so quickly relieve the colicky pains of the infant. Infants take it readily, especially if sweetened by the addition of a little sugar to each dose as administered. One-half to one teaspoonful can be given at a time, and repeated every fifteen minutes until relief is afforded. Usually not more than one or two doses will be required to accomplish this purpose. With a bottle of this preparation at hand, infantile colic loses its terrors, and heartless mothers and worthless nurses are deprived of all grounds for their nefarious drugging.

2. **Star anise** (*Illicium anisatum*, *Fructus illicii*) is also very good, though inferior to assafœtida. It can be used in the form of a tea; three to five pieces of star anise are broken up, and one-third of a cupful of hot water poured over them and allowed to steep for about ten minutes. When cooled down to the right degree of warmth, sufficient sugar is added to make

the tea palatable, and three to five, or more, teaspoonfuls thereof are given at a time.

Essence of anise (*Essentia anisi*): ten to twenty drops in one-third of a teacupful of warm water sufficiently sweetened, and administered as directed above.

3. **Caraway** (*Carum, Kümmel*) is also serviceable. A small quantity of the seeds (one-third of a teaspoonful) is bruised upon powdered sugar and rubbed up with it; four or five tablespoonfuls of hot water are poured over it; a tea is thus made, and administered as directed above.

SPECIAL MEASURES

Besides these more general measures, we will make use of others more especially addressed to the bowels and to their evacuation.

I. Medicines.

A. For the New-born. — For the very earliest period of infantile life, the first month, we can avail ourselves of the laxative action of

Manna. — It may be prepared after various formulæ or simply as a tea, — a solution. A good-sized lump of manna (or two or three smaller lumps) is dissolved in four or five tablespoonfuls of water, and then administered freely to the infant. As the age progresses, from two weeks on, larger doses are required.

It is generally effective.

Syrup of Rhubarb. — One-third to one-half teaspoonful every two or three hours. This has the disadvantage, however, of a rather constipating after effect.

Syrup of Rhubarb and Manna.

B. For Older Infants.

Magnesia (Carbonate or Calcined, *usta*) grs. v-3 ss. It can be given in sweetened water (sweetened oatmeal water).

How to administer the Enema. — When the small, hard rubber syringe is used, a sufficient quantity of water having been drawn in, the tip is well anointed with vaseline (or oil), and the child, lying in its crib or placed upon a couch or on the table, is laid on its left side or on the back with the legs held well drawn up; the buttocks are separated, and the point of the syringe, directed somewhat to the left, gently and gradually insinuated past the sphincter into the rectum. The piston-rod (one with a ring at its further extremity is best) is then pushed forward, not too fast, and the fluid thrown in.

It may also be given with the child in this position:

When the fountain syringe is used, the mother may seat herself in a low chair with the infant placed upon her knees, belly downward, the thighs of the infant just coming over the mother's knee and hanging down. The reservoir of the syringe (the fountain) is placed at a height of about one foot (to a foot and a half) above the infant's buttocks. The rectal point, well anointed with vaseline (or oil), is introduced into the rectum, and the water allowed to flow. Given in this way, the injection is always effective, and never has harm resulted therefrom.

Where the mother is alone, without a nurse or assistant, this last position is the better for the easy and rapid accomplishment of the purpose.

Quantity. — The amount of fluid to be used for an injection varies with the age of the infant; for the newborn, three-fourths to one ounce (one and one-half to two tablespoonfuls); from one month to six weeks, one and one-half to three ounces (three to four tablespoonfuls); at three months, two and one-half ounces (five tablepoon-

fuls); for a child of one year, five to seven ounces (somewhat according to the size of the child).

Fluids. — **Water** is, of course, the fluid most commonly used. Some medicate this, to make it more stimulating, with salt, soap, castor oil, or glycerine. I prefer to use plain water, and have always found that, injected with the fountain syringe, equally as good an effect was obtained with the unmedicated as with the medicated water, with the further advantage of the minus of the local irritation which the various agents employed tend to excite.

The only addition to the water that I occasionally advise is that of lac assafoetidæ, ʒ ii–ʒ ss (two teaspoonfuls to one tablespoonful), in cases where there is much flatulence.

The water should be a little more than lukewarm, — 93° F. to 95° F. This also contributes to its effectiveness.

When (in older infants) the injections are to be used for any length of time, the temperature may be gradually reduced (two or three degrees at a time) until water at a temperature of 78° F. to 75° F. can be injected without discomfort.

Oil. — The technique and details of the oil clyster have already been given. Here it need only be said that the oil injection is equally applicable to the young infant, especially where there is a tendency to marked inspissation and hardening of the fæces. One to four teaspoonfuls, according to the age, of warmed olive oil¹ can be injected into the rectum, and if necessary followed in four or six hours by an injection of water.

Glycerine. — The glycerine injection, *i.e.* the injection of a quantity of glycerine into the rectum, whether pure

¹ See page 354.

or diluted somewhat with water, should not, I think, be used in infants. It is far too irritating to the parts, causes considerable straining, and a prolapse of the rectum, — a not uncommon occurrence in young children, — or even a proctitis may result therefrom.

III. **Massage.** — As with adults so with infants, massage is the most potent remedy for this form of constipation. No matter what the cause that may have primarily produced it, massage will, in almost every instance, prove effective in overcoming the atony, and this frequently in a very short time. This is the consensus of experienced pædiatrists,¹ which my own personal observation confirms.

The following case very well illustrates its effectiveness and the rapidity of the action :

CASE 67. Baby G., *æt* fourteen months ; breast and bottle fed ; stout, healthy-looking boy. In the summer of 1893 he suffered severely with intestinal catarrh, which lasted a long time and reduced him very much. His grandmother brought him to me for relief from constipation, which is said to have supervened shortly after the cessation of the diarrhœal affection, and with which he has been troubled for over five months now, and which is daily growing worse. It requires now larger doses and stronger to give him a free evacuation. The symptoms are very characteristic ; when at stool he strains until he is almost purple in the face ; he cries out, and sometimes utters piercing shrieks. The evacuation, unless the result of a purgative, consists of a few scybala of stony hardness, usually covered with mucus, which very frequently is streaked or tinged with blood. When done, he sinks back exhausted, and it is an hour or more before he has recovered himself.

The time of stool for the infant is an hour of dread for the parents and grandparents.

A physical examination revealed nothing especial.

¹ A. Jacobi, J. Lewis Smith, Troitzky, Baginsky, Hensch, Karnitzky.

Diagnosis.—Constipation consequent upon intestinal catarrh.

Treatment.—The child is to have oatmeal porridge with milk in the morning, and twice a day a tablespoonful of molasses with crumb of bread.

The bowels are to be washed out every third day with a large injection, — a teacupful and a half of water at a temperature of 90° F. at the outset, with a gradual reduction of the same in the course of a few weeks to 80° F.

Being a very intelligent woman, I instructed the grandmother in the technique of the massage, and directed her to apply the same every day for the first two weeks, and then every other day.

In three weeks there was a marked improvement; at the end of the second month the child was reported well. I have seen him since; there has been no relapse; his bowels continue to act with regularity and ease.

It is of inestimable value in those dyspeptic conditions dependent rather upon insufficient development or inefficient action of the digestive organs than upon an indigestibility *per se* of the aliment. Here it will not alone strengthen the intestinal muscles and invigorate the peristalsis, thus quickening the onward movement of the intestinal contents, but it will also, by stimulating the circulation both in the blood-vessels and the lymphatics, forward the development of, or render more energetic, the special digestive apparatus of the intestinal tract, and fortify both the pancreas and the liver in the performance of their physiological function.

It is the most important measure in the treatment of atony due to a dilatation of the bowel or a section thereof, and combined with constitutional remedies it is of the greatest service in the treatment of constipation dependent upon a rachitic dyscrasia.

IV. A measure of secondary importance, but of some

utility in very obstinate cases, is the application of cold to the abdomen. The effects of cold water upon the abdominal muscles and the organs beneath them have been already set forth. In young infants (three months) the only method of application that I deem advisable is this: I direct that in the course of the morning when the child is having its regular bath or wash that its belly be rubbed with a cloth dipped in cold water, temperature 80° F. to 75° F., and that this be quickly followed by frictions with a well-warmed towel.

For older infants (ten months) we may use water at a much lower temperature, 75° F. to 65° F., or if it be the summer months, we may advise the cold bath, accustoming the child gradually thereto after the manner described.

In very obstinate cases we may resort to the cold douche to the abdomen. In infants and young children it should never be given through the showering apparatus connected with the water pipes, but by means of a sprinkling can or the fountain syringe, a nozzle as described on page 279 being fitted thereto.

V. Regularity of Habit. — It is so general a custom that it need hardly be mentioned. Even very young children, from six to seven months, and exceptionally strong ones already after the fourth month, can be accustomed to use the vessel (placed beneath an appropriate chair on which pillows are arranged, so that the child is well supported and perfectly comfortable thereon). By placing them on the vessel at a certain fixed time or times¹ of the day, a regularity of habit is acquired by the child which is certainly of advantage in the treatment of the constipation.

¹ After the fourth month up to the second year many children have two stools per day; many others have but one.

CHAPTER IX

TREATMENT OF CONSTIPATION DUE TO ATONY OF THE INTESTINE (*Continued*)

OLDER CHILDREN

THE treatment of constipation in older children does not differ in any respect from what has hitherto been said. The causes that lead to the retardation of the faecal discharges are very much the same as we find in adults, and their correction must necessarily be after the same methods.

As regards the two factors that have been specially mentioned here :

I. When the child, too playful, does not take sufficient time at stool, the mother or nurse must accompany it to the closet, and see to it that it remain on the receptacle a sufficient length of time. Furthermore, they must not divert the child's attention by gossip on extraneous matters, but rather fix its mind upon the duty before it by reverting to it in conversation, and impressing upon the child the necessity for a full and free evacuation. By such measures, even though at the outset no larger discharges may follow, the habit of taking sufficient time for this important physiological function will be formed, and its good effects will manifest themselves at an early day.

II. When the child is overburdened with studies, it must be released from them. The regulation of this will depend greatly upon the age, the physical development, and the intellectual capacity of the child. For bright, intellectual children it will be frequently found that studies that are a mere matter of memorizing, as geography, spelling, are the hardest tasks, whilst with duller children, it is those that excite and stimulate the thinking power. With some children, bright otherwise, arithmetic and mathematics will be very hard and exhausting studies, whilst with others it will be just the reverse. Sometimes it may be necessary to keep the child out of school altogether. However it may be for exceptional cases, generally it will suffice if we insist upon these two points:

1. That the child shall have ample time to be out and exercise in the open air.

2. That it shall not study after the evening meal.

The special measures to be employed are the same as have been described.

Younger children up to the seventh or ninth year (according to the physical development) will be treated more after the fashion of infants. We will treat them with injections and with massage, and this latter will be that described in the second part, plus a little more force added in our manipulations than would be necessary for infants.

For **older children** the treatment will be the same as for adults. The massage will be as described in Part I., minus a little of the force put into the execution of the manipulations in grown persons.

As regards the measures of **hydrotherapy**, the injections or clysters have already been mentioned as applicable at

all ages, from the very earliest period of childhood (another form of clyster (oil) has also been described). In the summer, the hot months, the cold bath is applicable even in infants;¹ in the cold months children do not bear the cold bath well; very young children not at all; and with older ones much depends upon their physique and their nutrition, and not a little upon the heating facilities of the dwelling. The **cold douche** to the belly may be used even with young children,² and even in the cold months. The long-continued wet applications, as the cold, wet compress,³ are not well borne by young children, and should not be prescribed for them; for older children, from six years on, they are decidedly advantageous.⁴

Electricity. — Children, and more particularly young children, are not very tolerant of its application. In fact, we are so generally successful with the other measures named that it will rarely be required. When its employment becomes necessary, however, the modes of application are the same as for adults, as have been described in Part I.

¹ See "Summer Complaint," etc., *New York Medical Journal*, 1892, by H. Illoyay, M.D.

² As described for infants.

³ See section on Hydrotherapy.

⁴ J. Lewis Smith, *Diseases of Children*.

CHAPTER X

ANATOMICAL

WE find very frequently reference made to the anatomical differences between the abdominal organs of the infant and those of the adult, and from the character of some of these statements one might be led to infer that these differences existed throughout the whole period of infantile life. For a clearer understanding of this important point, it has been gone into in some detail here, more especially as it is of some importance for the practice of infantile massage.

Stomach. — In 1837 Schultze¹ wrote: “The stomach in its earliest developmental stages runs through the cylindrical form of stomach of fishes and amphibia; for we see the stomach, in the early embryonic period, as a slight distention of the œsophagus, of cylindrical form, hanging straight down in the abdominal cavity, so that the cardia is directed upward and the pylorus downward. The transverse position of the stomach is of much later date, established only with the full development of the curvatures. The stomach of the child is rather of the spherical form drawn out lengthwise, and becomes narrower at both ends, — above at the cardia, below at the pylorus.

¹ Schultze, “Ueber Art u. Verschiedenheit des Erbrechen,” etc., *Analecten ueber Kinderheilkunde*, 1837, Bd. II. Quoted by Henschel, “Ueber Magen-erweiterung im Säuglingsalter,” *Archiv für Kinderheilkunde*, 1891, Bd. XIII.

The œsophagus is inserted into the fundus proper, and is at a great distance from the pylorus; the small curvature is thus rather long drawn out. The greater curvature is less developed and almost parallel with the lesser; in one word, the stomach is very much like that of the carnivora."

According to the more exact description of Fleischmann,¹ the stomach of the young infant occupies the left hypochondrium exclusively, and only when very much dilated does it extend into the left epigastrium. The small curvature lies on the left side of the vertebral column, and parallel with it, and only at its lowest part does it assume a horizontal direction, so that the pylorus lies about the middle line; the greater curvature passes through the centre of a vertical line drawn from the xiphoid cartilage to the umbilicus. When the stomach is full, the fundus, extending beyond the cardia, forms the highest, and the pylorus the lowest point; but only when its walls are enormously distended does the pylorus extend beyond the median line to the right.

A careful comparison of this with the description, and more especially with the chart of the adult stomach as given by Luschka,² will disclose the fact that the infantile stomach differs but little in position from that of the adult, and that what little difference there is, is more a matter of size.

The correctness of this is affirmed also by Symington,³ who says: "My own observations are in favor of the view

¹ Fleischmann, *Klinik der Pediatrik*, 1875. Henschel, *ibid.*

² Luschka, *Die Bauchorgane des Menschen*.

³ Symington, *Topographical Anatomy of the Child*.

that the shape and situation of the stomach in children are practically the same as in the adult. In newly born infants the stomach is either empty or it contains only a small quantity of mucus. In them the long axis of the main part of the stomach is directed downward and forward; there is a small fundus which projects upward and backward, and the pylorus lies in or very close to the mesial plane."

It is therefore very evident that the general statement as to the marked differences as to position between the infantile and the adult stomach is only true for a very short period, three or four days, not longer; for Symington¹ refers to the stomach of an infant four days old occupying the same position as that of the child one year old.

The most marked difference between the infantile and the adult stomach (so far as external configuration and position are concerned) is the great extent to which the former is covered on its anterior surface by the liver (left lobe), as shown in our illustrations, frontispieces I. and II.²

Liver. — The liver is of enormous size, and covers three-fourths of the abdominal cavity, the left lobe extending far over to the costal cartilages of the left lower ribs.³ It decreases in volume as the child grows older, and at the close of infantile life and the beginning of childhood, about the fourth year, according to Beneke,⁴ it assumes

¹ Loc. cit.

² See also McClellan, "Anatomy of Children" (in Cyclopædia of the Diseases of Children, Keating).

³ See frontispieces I. and II.

⁴ *Deutsche medizinische Wochenschrift*, 1880.

the position it is found in in the adult. The decrease is most rapid in the earlier months.

It varies so much in size within the limits of health that its boundaries at the various periods of life cannot be given with any exactness; moreover, the extent to which it may project beyond the costal arch (not infrequently one to two centimetres) depends considerably upon the height of the diaphragm and the shape of the thorax.¹

Bowels. — In the new-born, owing to the immense size of the liver, the whole mass of the small intestines, the descending colon, and the sigmoid flexure partly, lie in the left half of the abdominal cavity. The small intestines making many convolutions, the left colic flexure and the descending colon descend from the spleen to the upper border of the pelvis. The remaining abdominal space on the right side is occupied by the cæcum and its appendix² and what there is of the ascending colon.

The sigmoid flexure and the rectum are rather feebly developed in the new-born, and until the second or third month have no fixed position, though they are most frequently found to the right. Boucart, in one hundred and fifty autopsies, found the sigmoid flexure eleven times to the left, six times in the true pelvis, and thirty-three times placed transversely from left to right.³

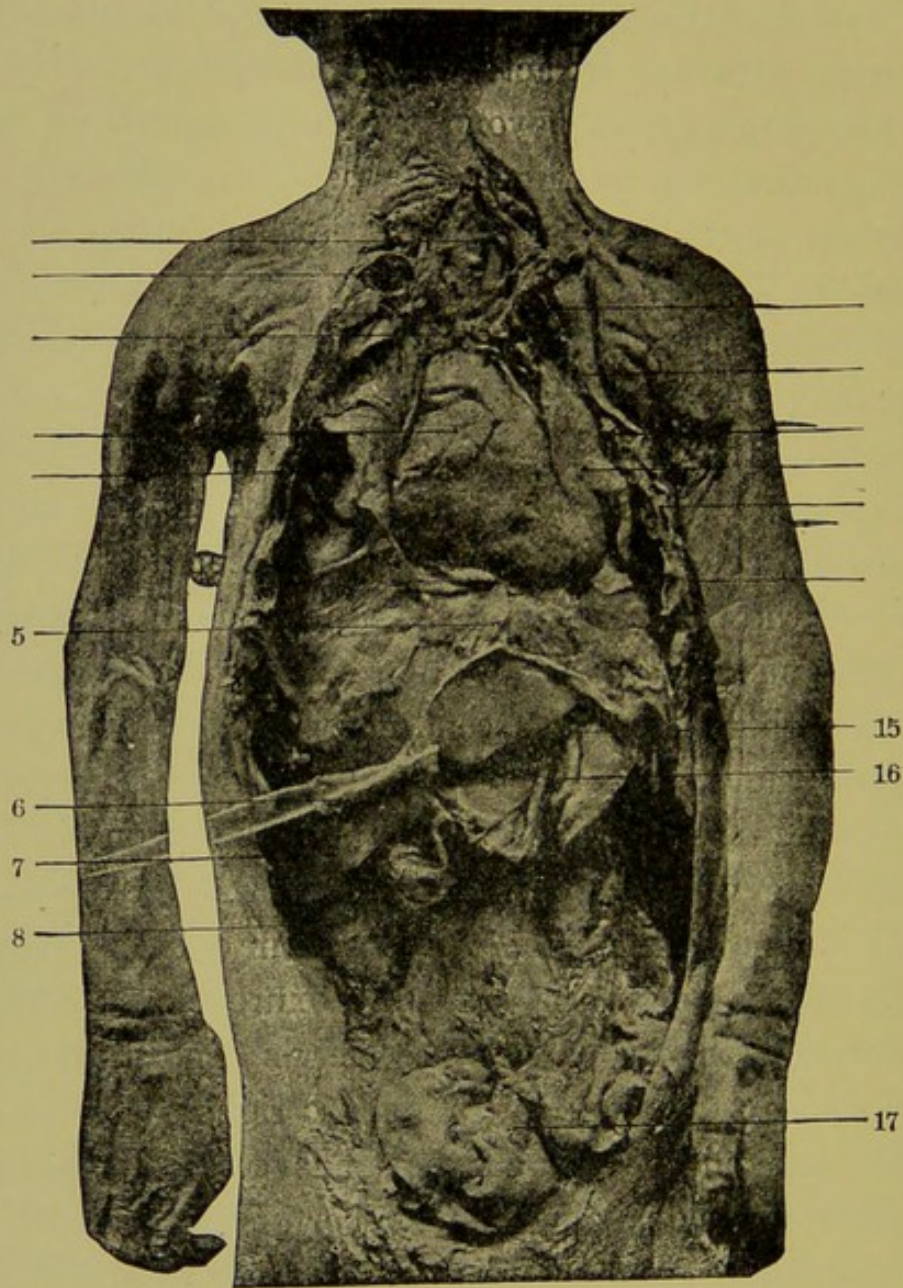
The **ascending** colon and the **transverse** colon are also but feebly developed in the new-born, short, and do not differ in calibre from the rest of the large bowel.

¹ Symington, loc. cit. McClellan, loc. cit.

² Karnitzky, "Bauchmassage an Kindern," *Archiv f. Kinderheilkunde*, 1890-1891, Bd. XII.

³ Massini Viginro, *Fisiologia della infanzia e fanciullezza*, Genova, 1886, and Karnitzky, loc. cit.

Their development is rather slow till in the third month, when they begin to make rapid strides forward.



From the Cyclopædia of the Diseases of Children. (Keating.) Vol. I.

Photograph of a recent dissection in which the viscera were held in position by transfixion with pins; from a new-born child.—5, Central tendon of diaphragm; 6, round ligament of liver; 7, right lobe of liver; 8, right kidney; 15, left lobe of liver; 16, stomach; 17, sigmoid flexure of colon. The small intestines are removed.

The cæcum in the new-born lies very high, almost beneath the ribs.¹

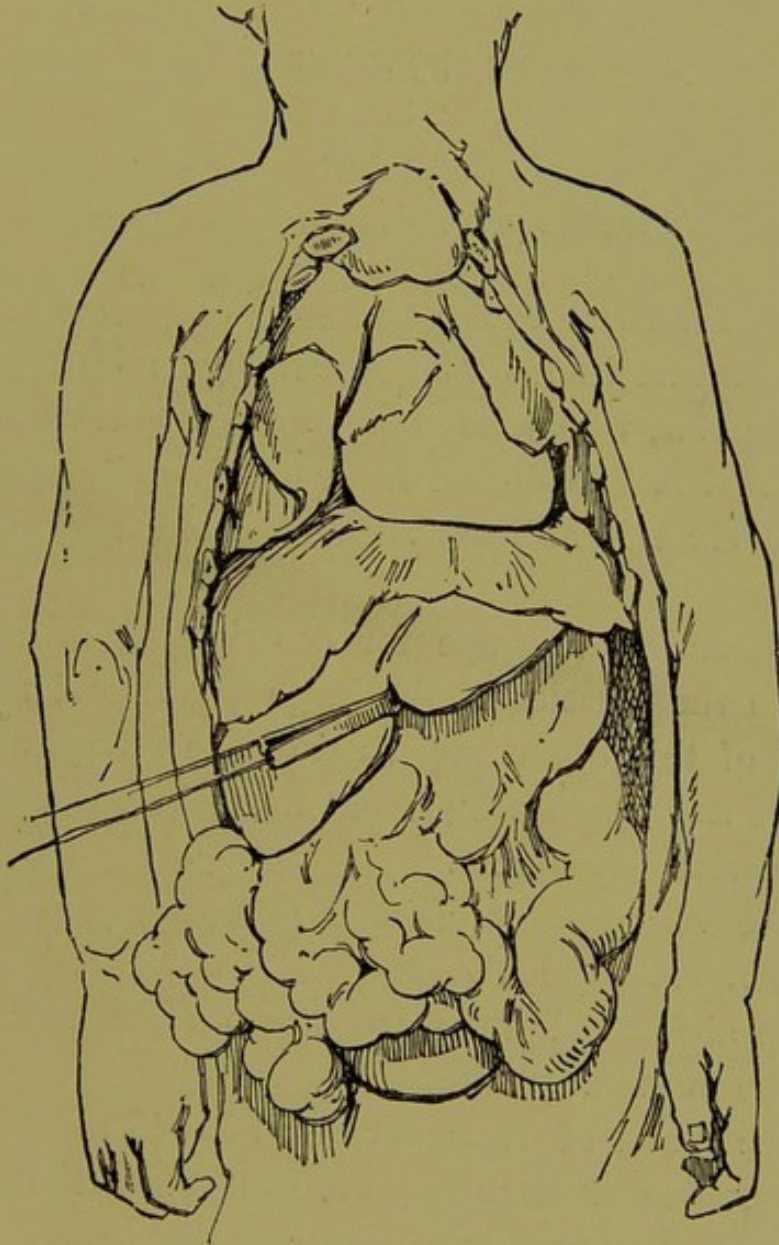


DIAGRAM OF THE FIGURE.

¹ Karnitzky, loc. cit. McClellan, loc. cit.

CHAPTER XI

MASSAGE

PRELIMINARY CONSIDERATIONS

SOME pædiatrists advise the practice of massage even in the youngest infant, and Karnitzky¹ relates the case of his nephew, whom he thus treated a short time after his birth. I myself do not favor or advise its application until the child is at least six weeks old, and for these reasons :

(*a*) Abdominal massage for constipation is addressed mainly to the muscles of the large bowel, and the main portions of this organ are, as we have seen, but feebly developed at an earlier age ; not much benefit can therefore be derived therefrom.

(*b*) The very young infant is exceedingly sensitive to the touch, cries quickly, and at the slightest pressure made its abdominal walls are drawn tense, and all our efforts are in vain.

(*c*) The course of treatment here advised for these very young sprouts of humanity gives results so satisfactory, is so simple, and so readily carried out, that resort to more forcible measures is unnecessary.

The only exceptions I make to this rule are the cases of hand-fed infants, where marked dyspeptic phenomena

¹ Loc. cit.

attend the constipation, where the latter seems to be dependent upon the former, and where the question of insufficient development or inefficient action of the special digestive apparatus arises. Here the massage is addressed chiefly to the small intestines after the method described further on.

1. In young infants massage is best made whilst the child is either nursing the breast or taking the bottle; in this way we may readily obviate its crying, and thereby the drawing tense of the abdominal walls. In older infants (after six months) this precaution is not necessary.

2. All bands around the abdomen and thorax must be loosened.

3. With infants who are easily frightened, uncovering of the abdomen alone may bring on a crying spell that will make massage impossible. Then again, the abdomen being always kept well covered, a sudden exposure of it, especially if it be a cool day, may cause a rapid and strong reaction to the manipulations of the masseur.

The whole belly need not be exposed at the time of treatment; in fact, it need not be uncovered at all if the masseur is expert in the execution of the manoeuvres, and familiar, without sight, with the locality to which the treatment is applied.

4. The amount of the pressure made by the hand will depend upon the degree of tension of the abdominal parietes; it can be greater when these are more relaxed and less so when they are more tense. It is best to proceed gradually from the very slight and superficial to the greater and more profound pressure.

5. A correct measure of the innocuousness of our

manipulations are the abdominal walls; they will remain relaxed and loose if the massage be harmless, as it should be, but will be drawn tense at once if the least pain is inflicted.

To attempt to overcome the reaction of the infant to the application, despite the tenseness of the abdominal walls, by the exercise of still greater and more penetrating pressure, would be to commit a grave and serious error.

When despite our gentlest and most soothing efforts this reaction, this contraction and rigidity of the abdominal muscles, at once sets in, it is best to abandon massage, to give up all idea of its application in such a child.¹

6. Massage must not be applied more than twice per day. In my own experience I have found that all the good effects can be obtained by one application per day.

My practice is to make or have made one application daily for two to three weeks, and then every other day, and lastly, twice a week for the rest of the requisite period.

7. Each seance (session) must not last more than ten minutes; usually six minutes suffice. In mild cases a sitting of four minutes will be amply long enough.

8. Each seance must begin with a careful, gentle stroking of the skin with the well-warmed hand. This procedure is absolutely necessary as a sort of preparation for the more forcible movements which are not so readily tolerated by the little ones; in fact, it would be impossible to make them if we were to begin with them.

In the course of one-half to two minutes the infant is accustomed to the gently stroking hand of the masseur;

¹ Karnitzky, loc. cit.

it does not resist any further; the abdominal walls remain relaxed, and we can proceed to the massage proper.

9. The skin of young infants is very tender and easily irritated; various eruptions, as a result thereof, may be called forth or even a serious infection (to which children are very susceptible) produced. To avoid such unpleasant consequences the masseur shall, before beginning treatment, cleanse his hands thoroughly with hot water and soap, the nails being well brushed, and then dip them into a solution of boracic acid (or mild bichloride) as hot as can be comfortably borne. They are then thoroughly dried with a well-warmed towel.

10. Karnitzky opposes the anointment of the operating fingers, believing that the manœuvres cannot be executed as well. Though agreeing with him fully as regards adults, and even older infants, I rather believe it advantageous in very young infants as furthering the ease with which the movements are made, lessening the tendency to reflex contraction of the abdominal walls, and as a safeguard against any undue irritation from friction. As far as I have been able to observe, it does not detract from the effectiveness of the manœuvres.

I therefore advise that for very young infants the fingers of the operating hand shall be anointed with vaseline kept especially for this purpose, and used for no other.

The parts of the abdomen to be acted upon.

In the **new-born and very young infants** the left side and the lower border of the abdomen from the left to the middle line of the symphysis pubis are the regions mainly to be treated.

Of the right side, that part lying between the costal arch and the crest of the ileum need not be treated at all; the region extending from the middle line of the symphysis pubis to a little distance beyond to the right must be acted upon.

The transverse colon it is rather difficult to affect because it is so small, and because of the immediate neighborhood of the large liver which frequently covers much of it. In this region much pressure cannot be made without immediately exciting vomiting.

In **infants** three or four months old, the left side and the lower boundary of the abdomen to the left are still the principal parts, but the right side has already acquired some importance because the cæcum and ascending colon have already considerably developed, especially in hand-fed children.

In **infants from six months** on the whole tract of the large bowel must be covered in the manipulation as in the adult; it is now the main part to be massaged.

In **very young infants** avoid the umbilicus (so as not to cause any loosening or separation of the parts beneath, and thus produce an umbilical hernia), and do not make any pressure upon the bladder (which, almost always, is more or less full).¹

¹ Karnitzky, loc. cit.

CHAPTER XII

TECHNIC OF MASSAGE FOR INFANTS AND YOUNG CHILDREN

IN the execution of the various manipulations made with a friction movement, the operating fingers must be held closely to the skin of the infant's belly, so that the fingers and the skin shall move as one and act as one upon the parts beneath. This is of much advantage for the effectiveness of the manoeuvre, and readily guards against any irritation or undue excitation of the infantile cuticle.¹

In view of the very considerable length of the mesentery in children, and its great mobility, the deeply impressed skin should not be moved too far out (in the circles described) from the point of outset of the manoeuvre² (so that there may not be any accidental dislocation of bowel).

A most important rule in the massage of infants is this: Never make the pressure so profound or so strong as to cause even the slightest pain. An error thus once made may frustrate all further efforts at treatment on our part, which may succeed at the hands of another and more careful person.

¹ Karnitzky, *loc. cit.*

² *Ibid.*

MANIPULATIONS

Introductory Effleurage. — The operator sits (or stands, whichever is most convenient) to the child's right, with his face to the left. The hand, prepared as already described, is laid upon the child's belly, so that the convexity thereof shall lie in the palm of the hand, gently and slowly, so that the infant or child may not be frightened and strong reflex contractions of the abdominal parietes be called forth. It is allowed to rest there for a few seconds, then a gentle effleurage, a light stroking movement with the whole palmar surface, a petting movement, is made from above downward; when the symphysis pubis, or nearly there, has been reached, the hand is slightly raised, carried back to the point of beginning, and the movement is repeated.

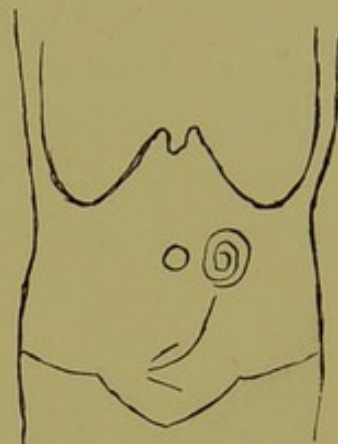
This manipulation, which is a sort of preparation for the child, need not take more time than a minute or two.

It should always precede the massage proper both in infants and children.

Manipulation I. — The operator, in the position described above, places his hands so that the fingers shall reach just beyond the umbilicus (about one centimetre) over on the left side. The index, middle, and ring fingers (if the hand is large, the first two alone will suffice) are flexed somewhat in the second joint, and the pulpy portion of the tip set in firm contact with the skin of the belly. The remaining finger or fingers are held extended and abducted from the others, or they can be closed into the palm of the hand.

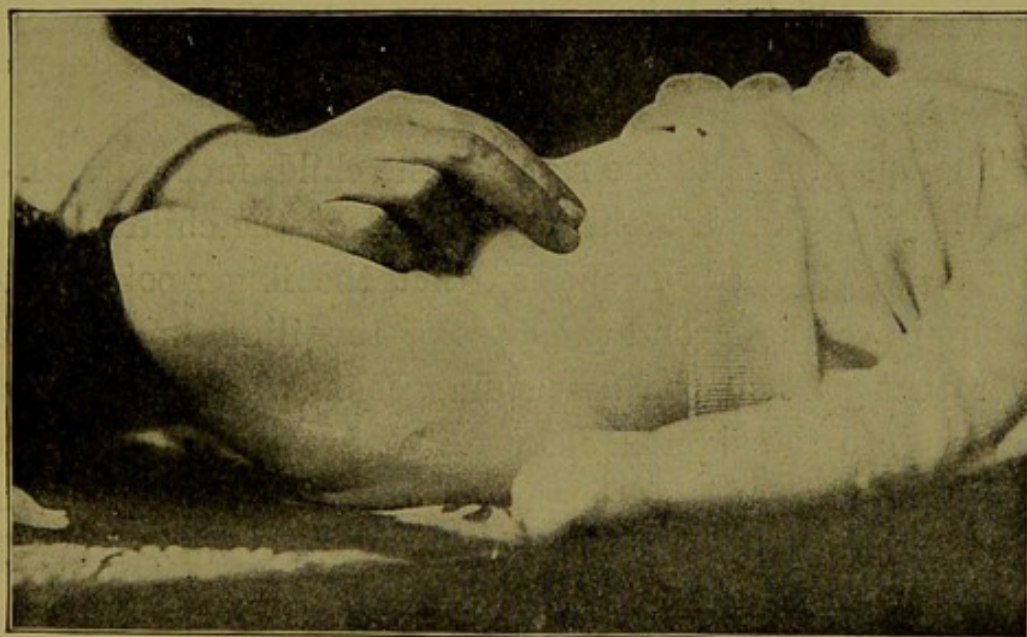
Beginning at a point about one to one and one-half centimetres from the umbilicus (to the left), light frictions

are made, the force of the pressure being gradually increased. Moving from one point as a centre larger and more eccentric circles are described by the operating fingers, the force of the pressure increasing with the enlargement of the circle. Then the radius of the circle, and with it the force of the pressure, is diminished, and the fingers return to the point of beginning.



This manoeuvre is carried out in various directions, the hand and fingers being moved down to the necessary points until the whole left side, from the edge of the tenth rib down to the immediate vicinity of the symphysis pubis, has been gone over.¹

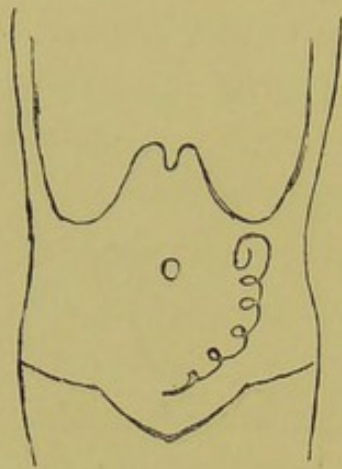
Time required, two to three minutes.



Manipulation II. — The operator is in the position already described. The hand is laid upon the belly, upon

¹ Karnitzky, loc. cit.

the left side, either obliquely from right to left, so that the tips of the fingers shall be close to the spleen, or straight



in a vertical line, fingers pointing upward to the face. The first fingers are flexed in the second joint, and the tips rest upon the child's belly. A friction and kneading (petrissage) movement in very small circles¹ is made. The lines of the manoeuvre run from above downward in a vertical line. The small intestines and

the large bowel (whatever of it is on the left side, but mainly the sigmoid flexure) are acted upon.²

Time required, about two minutes.

Manipulation III. — *For the lower part of the descending colon and for the sigmoid flexure.* (When practised on young infants, it should always be made with anointed fingers.)

The operator is to the right of the child, facing it. He lays his right hand upon the left side of the child's belly, on the lower half thereof, so that the finger-points, extending a little beyond the crest of the ilium upward, lie over that part of the descending colon where it is about to pass into the sigmoid flexure. It is placed in such a way that the ends of the first three fingers only are in close contact with the belly, whilst the rest of the hand rises obliquely therefrom.

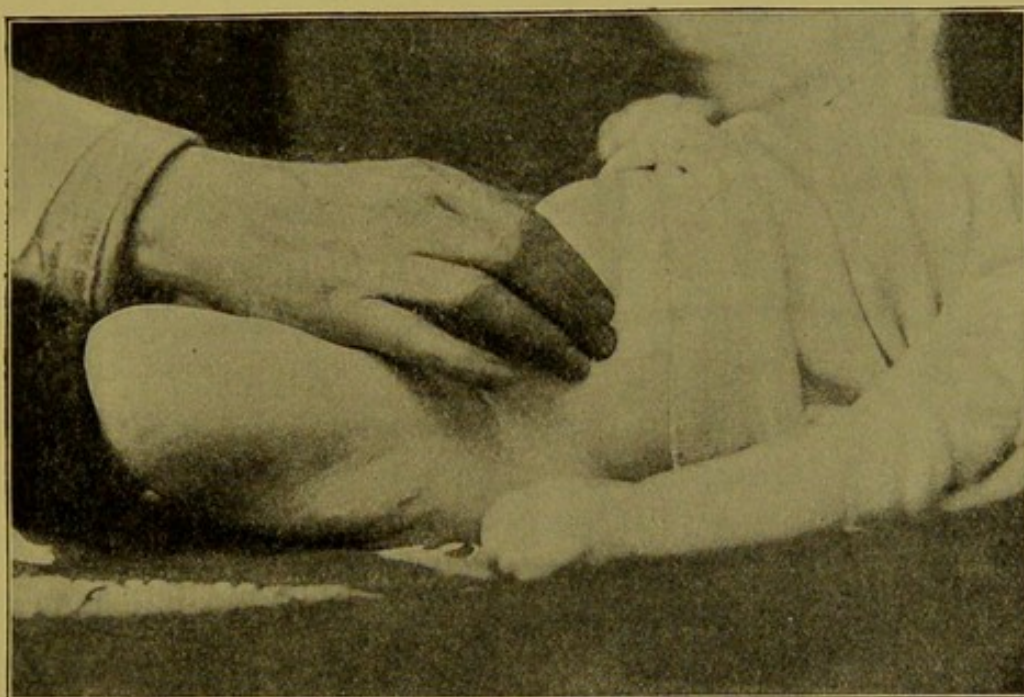
Now a stroking (effleurage) movement is made downward. Then along the crest of the ilium to the symphysis pubis; here, passing over to the right side, the bladder

¹ See Part I., chapter "Massage," page 208.

² Karnitzky, loc. cit.

being avoided, the movement is continued for a short distance in this direction.

Whilst the movement is essentially one of effleurage, it is nevertheless intended that a certain amount of deep pressure, a sort of kneading or rolling (petrissage) movement, shall at the same time be made; all in such a way that the collected and hardened fæces will be broken up and carried down to the rectum.



Karnitzky for the same purposes makes the following manipulations: The thumb of the right hand is placed in the right lumbar region on a line with the upper border of the pelvis, and the two middle fingers of the same hand are similarly placed on the left side. After fixation of the skin, as in all preceding manipulations, small circular friction and light kneading movements are made on the left side, in the course of which the force of the pressure is gradually raised, the operating fingers being pressed in more profoundly. Moving the finger-tips from point to point, the masseur brings them from upward and

outward, downward and inward, into the hollow of the lesser pelvis, all irritation of the bladder being thus avoided.

Manipulation IV. — (In the execution of this the operator can be to either side or at the feet of the child.)

The right hand is placed upon the right side of the child's belly, on the lower part thereof, in such a manner that the points of the first three fingers, flexed at the second joint, shall rest upon the beginning of the cæcum in the right inguinal region. A combined friction and petrissage movement is made; the circles, at first small, are gradually enlarged until they cover the whole width of the cæcum and beyond, and then are again diminished; without interruption of the circular movement, the fingers are carried upward, somewhat outward, and again inward, until the whole cæcum and ascending colon to the costal arch have been manipulated.

Or it can be made in this wise. — The operator on the left of the child, facing to its right. He lays his hand upon the child's belly, palm down, so that its ulnar border shall touch or slightly cover the right half of the costal arch, whilst the two middle fingers, flexed in their last joint, turn outward toward the upper border of the pelvis, the crest of the ilium, of the same side. Circular frictions are made along the line of the large bowel, downward and outward, upward and downward.¹

Manipulation V. — The operator at the feet of the child, facing it. The tips of the operating fingers are placed over the transverse colon on the right side, and the movement described in Manipulation IV. made over the whole length of the transverse colon.

¹ Karnitzky, loc. cit.

Manipulation VI. — The operator to the right of the child with his face to its feet. The left hand, palm downward, is laid upon the belly in the right lumbar and inguinal regions, so that the tips of the finger, looking downward, shall reach almost to the symphysis pubis. The hand is laid so that only the ends of the fingers are in immediate contact with the belly, whilst the rest of the hand is raised obliquely therefrom.

The movement, an effleurage, with something of a petrissage, is now made from below, upward along the course of the cæcum and the colon ascendens.

Manipulation VII. : Continuation of VI. — The operator now turns around and faces the child. The operating fingers are placed, in the manner already described, over the beginning of the transverse colon on the right side, and with the same effleurage movement are carried over to the left side, to the spleen.

Manipulation VIII. : Continuation of VII. — Same as Manipulation III., with this difference, that the point of outset for Manipulation VII. is from beneath the lower border of the twelfth rib, over about the point of beginning of the descending colon.¹

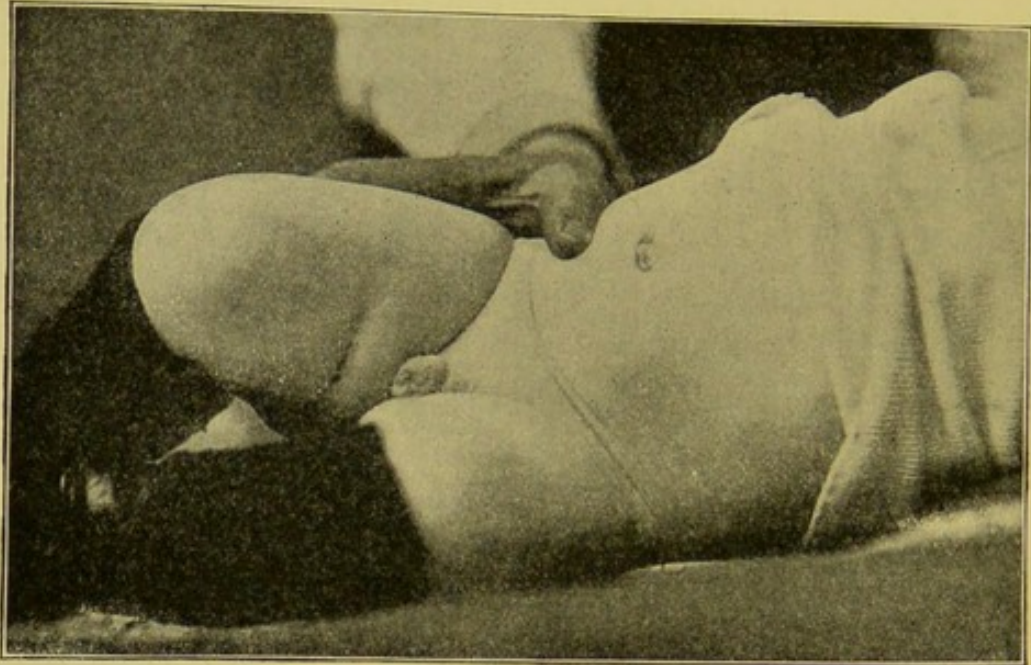
Manipulation IX. — The operator stands to the left of the child. The thumb of the right hand is placed upon the right side of the child's belly, on the lower part thereof, about the beginning of the cæcum, the radial surface of the thumb in contact with the skin of the belly.

From here it is carried with a combined effleurage and petrissage movement over the cæcum, colon ascendens,

¹ See Part I., page 226, Manipulation 3, *a, b, c.*

transverse colon, descending colon, and sigmoid flexure to the beginning of the rectum.

By this movement faecal accumulations and indurations



are broken down and carried upward and over and downward; the intestinal parietes are stimulated and aroused to more energetic action. Thus, all the good effects of massage are realized from it.

Manipulation X. (rather irritating to young infants; especially applicable to very obstinate cases). — The operator stands to the right of the child, facing its feet. The left hand is placed upon the abdomen in the inguinal region in this way that the tips of the fingers (the first three; little finger abducted) shall rest about over the beginning of the cæcum. Then a short, quick, effleurage movement is made that carries the fingers forward, but raises them from the skin after they have travelled a short distance, after the manner of the carpenter's plane. Then the fingers are replaced about the mid-

dle of the region travelled over, and the movement is repeated.

This movement is continued until the whole cæcum and ascending colon have been acted upon. Then the operator faces around; the fingers of the right hand are placed, in the manner described, upon the left side, so that the tips are just at the border of the twelfth rib; the same manipulation as already just described is made from above downward until the whole descending colon and sigmoid flexure are gone over.

Karnitzky also makes *tapotement* in children over a year old, beating or clapping the belly. I do not find this at all necessary. If the manipulation is practised at all in children, it should be made with the hand partially flexed, and holding an air-cushion as it were, as described in Part I., chapter on "Massage," Group *E*.

Punctation is not to be practised on infants and young children; they bear it badly.

Application.

In the early part of the infantile life, up to four months, massage of the transverse colon should not be made for the reason, already set forth elsewhere, of the immediate neighborhood of the stomach, and because, being covered in great part by the very large liver, it cannot be readily reached.

For the **new-born**, *i.e.* infants a few days old, on whom it is desired to practise massage for any of the reasons mentioned, to the age of six weeks:

- (a) Introductory effleurage.
- (b) Manipulation I. — mainly.
Manipulation II. (in children under three weeks this can be omitted).

For infants from six weeks to four months old:

- (a) Introductory effleurage.
 - (b) Manipulation I.
 - (c) Manipulation II.
 - (d) Manipulation III.
- Close with (a).

For infants from four to ten months:

In the earlier period,—

- (a) Introductory effleurage.
 - (b) Manipulation I.
 - (c) Manipulation IV.
 - (d) Manipulation III.
- Close with (a).

In the later period,—

- (a) Introductory effleurage.
- (b) Manipulation I.
- (c) Manipulation IV.
- (d) Manipulation VI.
- (e) Manipulation VII.
- (f) Manipulation VIII.

From ten months to two and one-half years:

- (a) Introductory effleurage.
 - (b) Manipulation IV.
 - (c) Manipulation VI.
 - (d) Manipulation VII.
 - (e) Manipulation VIII.
- } alternating with {
- (b) Manipulation IX.
 - (c) Manipulation X.

From two and one-half years on:

- (a) Introductory effleurage.
 - (b) Manipulation II.
 - (c) Manipulation IV.
 - (d) Manipulation V.
 - (e) Manipulations VI., VII., VIII., alternate with Manipulations IX., X.
- Close with (a).

In children over three years old, *tapotement*, beating of the belly (with the hand partly closed, so as to hold an air-cushion, as already described), may be made as a closing movement.

Where, for any reason, the massage must be made by the mother or nurse, I teach her :

For young infants { (a) Introductory effleurage.
(b) Manipulation I.
(c) Manipulation II.

For infants a year old and for young children { (a) Introductory effleurage.
(b) Manipulation IX. (of first importance).
(c) Manipulation X.

OLDER CHILDREN

As regards older children, from the age of eight years and upward, we will be governed as to the manipulations to be practised in their treatment by massage, by the state of their physical development. In the *strong* and *robust* the manipulations made in adults will be employed, whilst for the *weak* and *poorly* developed the movements just described for younger children will be selected.

CHAPTER XIII

SPASTIC CONSTIPATION

THE nature and character of spasmodic constipation have already been fully set forth in a previous chapter. Fleiner, who more particularly called attention to this form of constipation, reports also the cases of children thus affected.

It is the same in children as in adults, and manifests itself by the same symptoms.

The treatment has already been given in detail.

It need hardly be said here that if belladonna is prescribed, it must be directed in doses appropriate to the age of the child. As to what the dose should be, writers vary considerably. Whilst some obtain very satisfactory results with small doses, others have found that, most frequently, only full doses produce the desired effect. Ringer¹ has prescribed as much as ten and even twenty minims of the tincture (English) three times daily for children with incontinentia urinæ, and Phillips has done likewise.² I myself believe, from careful observations, that not infrequently very good results are obtained with very small doses regularly administered at sufficiently frequent intervals. As a rule the dose will be :

Of the Extract, from grain $\frac{1}{40}$ to $\frac{1}{4}$, three to four times daily.
Of the Tincture, from \mathfrak{m} iv to x, three times daily.

¹ S. Ringer, Handbook of Therapeutics.

² Materia Medica and Therapeutics.

The extract can be prescribed in a fluid mixture ; thus

℞	Extract. Belladonna.	gr. $\frac{1}{2}$ -1
	Syrup. Rub. Id. aut Syr. Rhei Aromat.	℥ i
	Aq. Destill.	℥ ii

M. Sig. 1 teaspoonful 3 to 4 times daily.

Fleiner has obtained the best results with the oil clyster.

Treatment of Fissure of the Anus

To treat the fissure of the anus is to treat the constipation dependent upon it.

The treatment will depend upon the question whether the pathological condition that confronts us is really an "irritable ulcer" of the anus, or whether it is a mere fissure or crack that does not involve the sphincter.

The *irritable ulcer* is the form generally seen in children.

The most appropriate treatment is "forcible dilatation." This is readily applied, and gives immediate relief. The procedure is very brief for young children, and does not require the administration of an anæsthetic.

It is done in this wise :

The child is laid on its back upon a high couch or table, or it is placed upon the knees of the mother or nurse on its belly, with its thighs hanging down. The physician introduces, carefully, into the anus the index-finger or thumb of one hand, then of the other hand, the fingers being back to back, as already described, and stretches the sphincter fully and quickly ; a grating, crunching noise is sometimes heard¹ when this has been accomplished.

¹ Jacobi, *Intestinal Diseases of Infancy and Childhood*.

Fissures or **cracks** are most usually seen in young infants,¹ and are generally associated with redness and excoriation of the integument immediately surrounding the anus. They are readily visible when the nates are fairly separated. These fissures or cracks occasionally get well without any treatment; generally we can bring about a cure without any resort to forcible measures, simply by local applications. According to Wharton,² even true irritable ulcer in the young infant can be successfully so treated.

To *fissures* or *cracks* a solution of silver nitrate, twenty grains to the ounce (of water), is applied with a brush, or with the applicator and cotton-wool, until a white film forms on the surface. Van Buren has always succeeded with a solution ten grains to the ounce (of water).

The *irritable ulcer* of the young infant will be touched with the solid stick.

The parts are then dusted with aristol or dermatol. Some recommend the application of an ointment of iodoform, but the odor of this is suggestive of so many things and so abhorrent to most people that I do not advise it, especially as we can accomplish all the desired good with the benzoated ointment of the oxide of zinc.³

Furthermore, to hasten the healing we must see to it that the fæcal discharges are soft. To accomplish this, we may resort to various medicines administered internally (see "Formulary"), or to rectal injections. Van Buren advises, as the best measure known to him, an enema of

¹ Van Buren, loc. cit.

² American System of Diseases of Children, edited by Starr.

³ Van Buren, loc. cit.

warm, even hot, water just preceding each stool, with the addition of melted vaseline or sweet oil just before the tube is withdrawn.¹ I direct the daily injection into the rectum of ʒii-ʒss of the best olive oil. For this purpose I find that a hard rubber syringe, of an ounce or two capacity, is the best.

In addition, the various dietary articles that tend to loosen the bowels, as stewed prunes, prune juice, prune paste, molasses, syrup, etc., are ordered for the child.

After defecation the parts must be carefully cleansed; absorbent cotton (not sponge, or diaper, or other cloth) and a mild solution of boracic acid are to be used.

A careful compliance with these directions will be followed by a rapid cure.

¹ Van Buren, loc. cit.

CHAPTER XIV

FORMULARY

Laxatives for the Youngest Infants

¹	Manna. crystalliz.	10.00	(= Ⓢ viii)
	Aq. fervid.	100.00	(= ℥ iii ʒ iiss)
M. Sig.	In tablespoonful doses.		

	℞ ²	Manna. Optim.	ʒ ii
		Aq. Anethi	℥ i
M. Sig.	Teaspoonful (ʒ i) doses.		

	℞ ³	Manna. Optim.	ʒ ii
		Syr. Rosar.	℥ i
M. Sig.	Teaspoonful (ʒ i) doses.		

	℞	Syr. Manna.	ʒ vi
		Syr. Rhei Aromat.	ʒ iii
M. Sig.	In doses of ʒ ss-i.		

For somewhat older infants (after second or third month):

	℞ ⁴	Magnesia. Carbon.	Ⓢ i
		Manna. Optim.	ʒ ii
		Tinct. Rhei Co. ⁵	ʒ i
		Syr. Rosar.	ad ℥ iss
M. Sig.	In doses of ʒ i-ii.		

¹ Gerhard, Handbuch der Kinderkr., loc cit.

² Ellis, Diseases of Children.

³ Ibid.

⁴ Ellis, loc. cit.

⁵ Tinct. Rhei can be used instead.

℞	Magnesia. Usta.	Ⓣ i-ii
	Syr. Rhei Aromat.	ss
	Syr. Rosar.	℥ ss

M. Sig. In teaspoonful (℥ i) doses.

For infants (from six months on) and young children:

Pulvis Puerorum Hensleri,¹ Pulvis Rhei Co.

℞	Sapo. Medicata.	
	Magnes. Carbon.	
	Rhei rad. pulv.	
	Sacchar. Alb.	āā 60 parts
	Ole. Fœnicul. Æth.	1 part

M. triturat. bene et ft. pulv.

Sig. Dose, five to fifteen grains.

℞ *Pulvis puerorum Hufelandi*, Pulvis pro Infantum Hufelandi.²

℞	Magnesia. Carbon.	15 parts
	Rad. Glycerrhiza.	20 parts
	Rad. Rhei pulv.	10 parts
	Valerian. Rad.	5 parts
	Croci	1 part
	Semin. Anis.	15 parts

M. triturat. bene et ft. pulv.

Sig. Dose, five to fifteen grains.

℞	Podophyllin	grs. viii ³
	Iridin.	grs. v
	Spirit. Ammon. Aromat.	℥ i

Digest for several days and then filter.

Sig. Dose, one or two drops on a piece of sugar or mixed with any syrup. For a child a year old.

¹ Strumpf, Allgemeine Pharmakopoe.

² Strumpf, loc. cit.

³ *New York Medical Record*, May 7, 1887.

℞ Podophyllin gr. i
 Spirit. Vin. Rectif. ʒ iss
 Syrup. Altha. ad ʒ iv
 M. Sig. A half-teaspoonful daily.¹

For Children

℞ Fruct. Tamarindi
 Sig. ʒ ii at a dose.

℞ Mannæ ʒ vi²
 Magnes. Carbon.
 Sulph. loti āā ʒ iss
 Mellis f ʒ vi
 M. Sig. Dose, one-half to two teaspoonfuls according to age.

℞ Infus. Laxativ. Viennens.
 Syr. Rhei Aromat. āā ʒ i
 M. Sig. One teaspoonful every three hours. For a child
 two and one-half years old. *Pleasant and effective.*

℞ Soda. Phospat. ʒ i³
 Syr. Limon. ʒ ss
 Decoct. Hordei ʒ vi
 M. Sig. Dose, two tablespoonfuls. *A pleasant aperient.*

℞ Magnesia. Sulphat. ʒ ii⁴
 Acid. Sulphur. dilut. gtt. v
 Syr. Aurantii ʒ iii
 Aq. Carui ʒ v
 M. Sig. ʒ ii every hour till bowels act. *A more active purge.*
 For a child three years old.

¹ Bouchut, E., also in Wilson, Complete Medical Pocket Formulary.
² Ferraud, Wilson, Complete Medical Pocket Formulary.
³ Ellis, loc. cit.
⁴ West, Diseases of Children.

Emulsion of castor oil (Trousseau) ¹

R	Ole. Ricini	℥ i
	Vitel Ovi	semissem ($\frac{1}{2}$)
	Tere simul et adde	
	Aq. Flor. Aurant.	
	Syr. Simpl.	āā ℥ i
	Aq. Destill. aut Fœnicul.	℥ vi ²
M. ft. Emulsio. s. a. Sig.	℥ i at a dose.	

Alterative Aperient :

R	Mass. pillul. Hydrarg.	grs. i-ii
	Syr. Rhei Aromat.	℥ i
M. Sig.	℥ i every two to three hours till bowels move (or till stool is changed in appearance).	

Oatmeal Water

First prepare an oatmeal porridge ; take a heaping teaspoonful of this, put into a quart of cool water, heat with constant stirring to the boiling-point, and strain.³

Take a large tablespoonful of fine oatmeal, put into a saucepan with a quart of water, allow it to boil down to three-fourths of a quart. Strain.

Soap Suppository

Must vary in strength according to the age. For a child of two months, one grain of soap with ten grains of *Oleum Theobrom.* will be sufficiently strong ; at one year, five grains of soap can be put into the suppository.

Or in place of the suppository we may use the **soap stick** ; commonly, the ordinary brown soap is used for this purpose. Starr directs that Castile soap be employed. It is prepared

¹ Clinical Lectures.

² For other formula for emulsions, see "National Formulary."

³ Starr, Hygiene of the Nursery.

thus: Cut from a bar of good Castile soap a piece two inches long and half an inch thick. Scrape this into a cone, pointing one end like a sharpened pencil, but with a blunter point and more gradual slope; make it quite smooth by rubbing the surface with a wet rag. When the soap stick is to be used, anoint the pointed end with vaseline, and gently insert into the rectum until the sphincter closes over it.¹

¹ Starr, loc. cit.

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