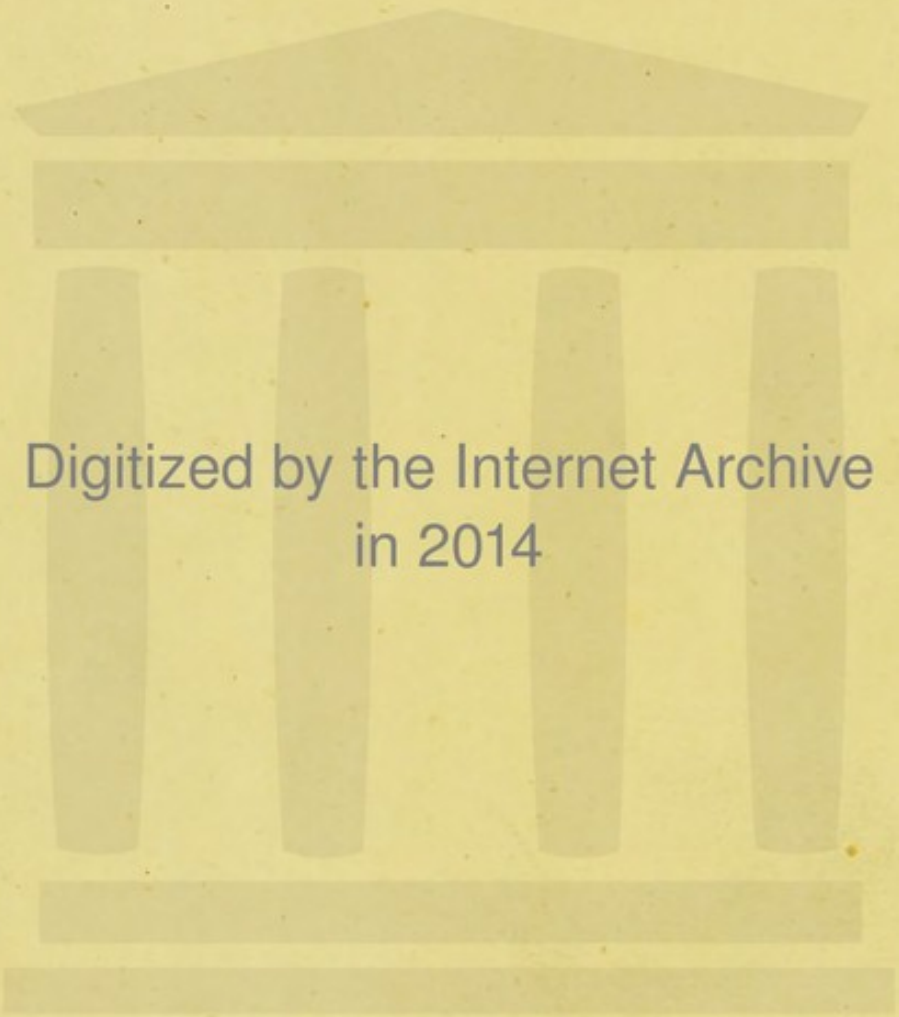
Intestinal obstruction : with an appendix on the action of remedies / by Hugh Owen Thomas. Abdominal hernia / by Rushton Parker.



INTESTINAL OBSTRUCTION

WITH AN APPENDIX ON

THE ACTION OF REMEDIES

BY

HUGH OWEN THOMAS, M.R.C.S.

ABDOMINAL HERNIA

BY

RUSHTON PARKER, B.S., F.R.C.S.,
PROFESSOR OF SURGERY IN UNIVERSITY COLLEGE LIVERPOOL.

H. K. LEWIS,
GOWER STREET, LONDON.

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TO THE READER.

SINCE my first contribution to the literature of the subject matter of this volume, seven years have elapsed, and as the two previous editions have been exhausted, this, combined with my having noticed that my teaching has already influenced practice in the treatment of intestinal lesions, induced me to rewrite and remodel the present editions. In hopes that I might succeed in further demonstrating the need of reform and of perceiving still greater amelioration in treatment, so that I shall not continue an isolated advocate, even though, as hitherto, my efforts may be ignored by writers who have adopted my teaching, these have been my incentives to return into the arena.

May, 1883.

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PREFACE.

Among all the infirmities that the practitioner may be called to for the purpose of exercising his skill, certainly there is none of which the treatment so urgently needs reformation, as this painful and dangerous class of maladies. Although varying modes of treatment have been handed down to us through many generations and elaborated by many eminent authors, yet hitherto actual non-interference has afforded a better chance of recovery than the treatment commonly adopted. In truth no principle has been laid down for our guidance, and the methods commonly employed are supported neither by reason nor experience.

Judging from public clinical records, those gentlemen who have had superior opportunities as teachers or representative men, seem to be farthest astray. It may be that the timidity of the less favoured class amongst us has, to some extent, had a wholesome influence upon practice.

During twenty-seven years' experience of these cases, I have many times witnessed painful and fatal results from them which I cannot help perceiving to have been in many instances avoidable, and recollections of the earlier years of my own practice give me only too much reason to lament the errors arising from routine and blind tradition. It is observation of clinical occurrences alone which has slowly forced me to adopt the principles of treatment here advocated.

By way of introduction, I shall offer, in the pages immediately following, a brief sketch of the methods commonly in use for the relief of these maladies from the epoch of Hippocrates to our own times.

If the reader should think that I have commented too freely on the views of the eminent persons who have handled this topic; if he should think that I rudely "rush in where angels fear to tread," I can only plead from what I have seen, and from information to be found everywhere in the literature of the subject, that the angels have by no means trodden too gently when traversing these regions.

HUGH OWEN THOMAS.

11, Nelson Street, Gt. George Square,
Liverpool.

CHAPTER I.

A REVIEW OF PAST AND PRESENT TREATMENT.

Surgical literature furnishes us with many illustrations of the treatment of these affections adopted by eminent men both formerly and now. Hippocrates refers to ileus and its treatment, but he does not appear to have distinguished between a loaded rectum and the condition which has been termed ileus in later times. It is also evident, that when he treated a genuine case of ileus his mode of procedure was hardly more happy than that of his successors, for he records the seventh day as being usually the limit of the sufferer's endurance.*

His treatment consisted chiefly in inflating the intestines and giving enemata. This mode seems to have been followed by Celsus, by Paulus Ægineta, and also by Aretæus, who, in Book ii, Chap. v, (Sydenham edition,) on the cure of ileus, graphically gives us his prognosis, which probably was also that of his medical contemporaries.

"In Ileus it is pain that kills, along with inflammation of the bowels, or straining and swelling. A most acute and most disgusting form of death. For others, when in a hopeless state of illness, fear nothing except their impending death; but those in ileus, from excess of pain earnestly desire death. The physician, therefore, must neither be inferior to the affection, nor more dilatory; but, if he find inflammation to be the cause, open a vein at the elbow by a large orifice, so that blood, which is the pabulum of the inflammation, may flow copiously; and it may be carried the length

* Dr. Adams' Hippocratic Treatises, page 85.

of deliquium animi, for this is either the commencement of an escape from pain, or of a torpor ending in insensibility. For in ileus a breathing-time though for a short space, even loss of sensibility, will prove an interval from pain; since, also, to persons enduring these pains, to die is happiness, but to impart it is not permitted to the respectable physician; but at times it is permitted, when he foresees that present symptoms cannot be escaped from, to lull the patient to sleep with narcotics and anæsthetics."

The perusal of this relic of the second century recalls, only too vividly, sad recollections of my earlier experience, and the latter lines of the paragraph quoted, show that though such was not a frequent custom, yet medical etiquette permitted in those days the administeration of a toxic dose of medicine, in order to relieve the patient's sufferings. Although the ethics of surgery had long ceased to tolerate this form of perverted charity, it lingered to a late period outside the profession, and we meet with an extreme example of it in Ambroise Paré's account of his services during the expedition to Turin in 1535. He tells us that some wounded soldiers were killed by a friend, because the surgeons gave an unfavourable prognosis of their cases, against which outrageous conduct the great surgeon warmly protested.

Until we come to so recent a period as the seventeenth century, these complaints seem to have been regarded as almost always terminating fatally. For instance, John Woodhall, surgeon to St. Bartholmew's Hospital in his book, "The Surgeon's Mate &c.,"—1639, p.p. 194 and 195, says:—

"So that many which are oppressed with this disease doe perish, and dies a very miserable death, ending their daies with their feyces or their owne excrements issuing out at their mouthes, AND IT IS MANY TIMES NOTED FOR A DISEASE INFECTIOUS. In the cure of this disease, no physician or

chirurgion, respecting his credit, will take upon him absolutely the cure thereof, especially, if the scurvy be confirmed in the patient, but with protestation of death if the patient due vomit the feces or excrements upwards."

He gives a hopeless prognosis, which the mode of treatment fully accounts for, and indeed justifies.

It is true that in the works of some of the older medical authors, there are prescriptions for the cure of the iliac passion, which would do no harm; but perhaps their remedies were supplemented with the Hippocratic method of inflation, enemata and so forth, otherwise their prognosis might have been more hopeful and their treatment less unsuccessful.

No advance was made in the mode of treating these ailments until the advent of Sydenham, who appears to have gained his knowledge from experience of the intestinal lesions of Typhoid, and to have perceived that the same principles of treatment were applicable to intestinal ailments arising from other causes.

Sydenham's method was a great improvement upon the practice of his predecessors. He reformed the dietetic treatment, a matter of fundamental importance; he also detected the value of sedatives: but I do not find that, up to our own day, the reforms which he taught have widely influenced practice. He had not wholly given up purgatives—this may be noticed in the paragraph entitled* Iliac Colic—nor had he cleared his presciptions from the absurdities of his contemporaries. For example, he had great faith in the efficacy of a "live kitten" applied to the stomach during the continuance

* Vol. ii., chap. xxvi., page 208, Dr. Latham's edition of Sydenham.

of vomiting, and he insists on the importance of not removing her until the vomiting has ceased. In contrast to this it is refreshing to notice, as an indication of his independence and careful clinical observation, the following remark on the effects of enemata.

"Hence I have, more than once, remarked, that the repetition of even the mildest clysters has introduced a continuous series of fresh symptoms." (Med. Observations).*

The two following cases show that he was enabled, in some instances, to treat pleasantly and successfully sufferers that otherwise might not have been relieved.

"In the month of August, 1671, the most noble Baron Annesly, who was suffering some days from bilious colic, accompanied with intolerable pain, and frequent desire to vomit, sent for me to see him at Belvoir Castle. He had already tried all kinds of clysters, and other remedies to boot; and these had been ordered him by the most learned medical men of the parts around. I made no difficulty in prescribing the repeated exhibition of narcotics after the plan described. By the use whereof he mended every day, and returned along with me to London a healthy man."

"A poor neighbour of my own, who is still living, was, during the years in question, afflicted with a most violent bilious colic, which he had tried in vain to subdue by purges, clysters, and by swallowing leaden bullets. I ordered him to use narcotics frequently. This he did, and as often as he did so, found himself relieved. The disease, however, was only palliated, not cured. It returned when the virtue of the anodyne was spent. So I took pity on the poor man, and lent him a horse out of my own stable, in order that he might take a journey after the manner prescribed. After having travelled a few days, his bowels grew strong enough to enable him to throw off the relics of the disorder. In this way he was thoroughly cured without the use of anodynes."†

Notwithstanding the great value of the reforms which

* Op. cit., vol. i., page 200.

† Id., page 197.

Sydenham introduced in the treatment of these affections, his teaching, as I have already stated, had little or no influence upon his successors in medicine. For example, in 1711, three large folio volumes were published, entitled, "Bibliotheca Anatomica, Medica, et Chirurgica," the compiler of which, at page 542, vol. iii., refers to "Sydenham and other practical physicians," and professes to give their treatment of the "iliac passion." He urges the use of all the vile materials employed as remedies in past ages; among the rest, the perpetual pill of antimony. This learned editor draws the reader's attention to the kitten, but he quite fails to understand or appreciate the essential points of Sydenham's treatment. In fact, up to the publication of Dr. Brinton's Lectures, the treatment of intestinal lesions distinctly retrogressed, an assertion which is sustained by the medical periodicals of the present century. One exception only have I been able to discover. The LONDON MEDICAL AND PHYSICAL JOURNAL, vol. xlii, p. 258, (1819,) gives an acconnt of the treatment adopted by V. B. Brundis of Copenhagen. This consisted of a selected and suitable diet, ice-cold water, with small doses of opium; but also enemata occasionally, mild purgatives, with cold cloths to the abdomen, the rest of the body being protected by warm clothing. He reports having treated successfully ten cases of ileus, and that other physicians, De Ilaen, Chavasse, Stoll and Van Swiefen had followed his plan, with success, in similar cases. He mentions that he had learned this treatment from Naboth. I can find no trace

of any such practice having been adopted in this country.

In the fourth volume (1792) of "Medical Observations &c., by a Society of Physicians in London," we have, at page 223, the particulars of a case of ileus reported by Dr. Garthshire and Dr. Huch, physicians to St. Thomas's Hospital. The treatment consisted of

> Bleeding, anodyne embrocations, fomentations, warm baths, laxatives, oily and purgative medicine by the mouth, stimulating emollients, tobacco-smoke and clysters. "She died on the sixteenth day after extreme suffering, particularly six hours before death."

Examination, *post mortem*, showed that it was probably impossible for the patient to have recovered under any treatment, as there was "found a cord which formed a circle with the mesentery, in which noose there had been included a doubling of almost two inches" of the lower end of the ileum. This circle embraced the bowel so tightly, that it not only prevented the passage of anything through the gut, but had also brought on gangrene of the strangled part. The bowel was perforated to the extent of an inch, and in the abdomen were found traces of the remedies employed.

I have selected this case from its being the first of the kind which I have found reported in the modern style of clinical records; but it happens to have another point of interest, as John Hunter was called in to assist in the management of the treatment.

The next case I shall report is to be found in the 7th volume of the MEDICAL AND PHYSICAL JOURNAL, (1802,) the

gentlemen in charge being Sir Walter Farquhar, Mr. Chilvers and Mr. Thomas.

Mrs. R.———She was unmarried, of rather spare habit, about fifty years of age, and had been subject to costiveness, she had been twice attacked with vomiting, violent pain in stomach and bowels and great constipation ; on both occasions, after the disease was removed, she continued for some time extremely weak. The attack which terminated fatally, began about the 1st of November, 1795. She had violent pains of the stomach and bowels, more especially in the left side, accompanied with vomiting and obstinate costiveness. Evacuations from the bowels were produced by powerful purgatives. About three weeks before her death, she voided a substance resembling gut, about a yard in length. For ten days before the passing of this substance, and always after that time, till she died, she could have no evacuation from the bowels, unless held up in nearly an erect posture. During a great part of the time, she could scarcely keep anything in her stomach.

Here we have an illustration of the treatment adopted by eminent persons at the end of the last century ; yet, though nearly a hundred years have elapsed, there has been but slight alteration. For instance, we find in the LANCET, for 1872, vol. 2, a case of Intestinal Obstruction.

The patient, F. G. H———, aged forty, was attacked September 22nd, 1871, with pains and vomiting ; on the 23rd he sent for medical aid, having then all the symptoms indicative of Intestinal Obstructions. The treatment commenced with chloral hydrate, carbonate of soda, tinct. opii, hydrocyanic acid, æther. chlor., hot fomentations, enema of castor oil and turpentine. On the second day he had two enemata, with ice and opium. The third day there was a consultation with a gentleman of high repute ; belladonna and opium were ordered, with ice, beef-tea, and milk. On the fourth day he was much better, but the treatment is not reported ; probably it was a continuation of that followed on the third day. On the fifth day he had an enema of gruel and castor oil, and became much worse. On the sixth day a long rectum tube was inserted up the bowel, and through this, castor oil and turpentine were injected,

and forcibly retained in the bowel while a presumably sane man kneaded the abdomen; this was persisted in for a quarter of an hour. This injection of turpentine and castor oil was retained five hours, when he passed fæces. On the morning of the seventh day this genuinely original treatment was repeated, and the patient passed fæces at intervals until he recovered.

Both of the artists in charge of this case appear proud of their achievement, yet a comparison with the case treated in 1792, is certainly in favour of the former.

In the MEDICAL TIMES AND GAZETTE, for 1872, vol. 1, p.p. 3 and 64, four cases of intestinal lesion are reported; the treatment was as follows.

In the first case the treatment followed was giving brandy by the mouth, and passing up the bowel, *per rectum*, a long flexible tube, which was soon followed by syncope and death. In the second case castor oil was prescribed, calomel, purgatives, warm enemata, brandy and opium. The patient died, after extreme suffering. In the third case the treatment began with opium, and solid food was almost omitted. The patient was soon relieved and recovered with very little pain. In the fourth case slight restriction of diet was ordered. The medical interference consisted in enemata of turpentine, with belladonna, nux vomica, and opium, by the mouth. The patient died on the fifth day. The treatment followed in the fifth case was, poultices, opium, warm bath, enemata, strychnia and nitric acid, with restricted diet; on the fifth day recovered.

The reporter of these cases appends some of the most irrational comments that were ever committed to paper. Regarding the remedies employed, he wishes the reader to understand, that—

"The action of belladonna is not fully ascertained, it appears in small doses to allay pain (like opium), and in large, to increase the energy of the intestinal motor nerves."

"Brinton, however, speaks of its reducing (in small doses) peristalsis

to a zero. It does not seem impossible to conciliate these apparently opposite opinions. To speak of these drugs as stimulants or sedatives, describes, I believe, their action imperfectly: they are rather re-creators of nerve-fore, and the primary result of their successful action will not be any evident exertion of force, but the return of a capacity for exerting force efficiently on the application of suitable stimuli."

To teach that medicines are "re-creators of nerve force" is ridiculous; nerve force is derived from food, and it must already exist before it can be called forth. To assert that any stimulant can "re-create nerve force" is as unreasonable as it would be for a depositor in a bank to affirm that every cheque he drew on the bank increased his capital.

In the BRITISH MEDICAL JOURNAL for the same year (1872, some cases are given, but they are so imperfectly reported that they afford no precise information regarding the treatment followed. Again, in the same year, a case of intestinal obstruction is published in the EDINBURGH MEDICAL JOURNAL, at page 971, vol. xvii.

The usual painful symptoms were present. On the first day, opiate fomentations were used and castor oil was given, 'guarded,' it is said, by thirty minims of tincture of opium. Second day—opiate fomentations, enemas of castor oil and soap suds, morphia under the skin. Third day—croton oil and morphia; the later as a guard, I suppose, to the former; and afterwards calomel. The fourth day a professor of world-wide reputation was called to assist in the treatment. He advised a hand basin-full of soapy water to be introduced into the bowel by means of O'Beirne's tube, then morphia by the mouth, with brandy and egg. On the fifth day no interference. The sixth day another consultation was held; but again there was no interference, and the patient appears to have improved during these two days of grace. On the seventh day the intestinal distension was relieved by tapping; patient much better, but no medical treatment, "and not a symptom of obstruction except the obstinate con-

stipation." Eighth day—patient again tapped at his own solicitation, found much easier afterwards, fancying himself much better, not a trace of nausea or vomiting; "his intellect clear, so that he reasoned with us as to the possible variations in the temperature of the body, and as to the effect of foods of various kind upon the temperature." He died in the night of the eighth day.

Examination *post mortem* revealed the cause of death to be rupture of the bowel; but gave no information as to why a case of constipation should retrogress to obstruction and rupture of the intestine. The cause, however, may perhaps be inferred, if we consider the treatment. This case is interesting beyond the fact of its being treated in Scotland in 1872. We see that as soon as there was a pause in the treatment, the symptoms improved, and we may also notice the very sensible comments of the patient regarding his dietary. No great instruction seems to have been gleaned from the case, for those in attendance inform the reader, that:—

"The castor oil and calomel which were administered on the third and fourth days of the illness, did harm, from the fact that they were given too late."

The lesson, which experience has taught me, is the very reverse of this. The later purgatives are given the better, and it is best never to give them at all.

I have now given illustrations of the treatment adopted in the latter part of the eighteenth century and the corresponding years of the nineteenth century. Yet, though the later cases were under the treatment of recognised leaders in our profession, there was certainly no improvement in method; nay,

in one case, treatment was worse than any that I have found recorded in medical history.

Among the reports of discussions at the Medical Societies, where advanced men have dealt fully with this subject, there is to be found no hint of any clue to a coherent method of treatment. For instance, at a meeting of the Royal Medico Chirurgical Society of London, reported in the LANCET of the 18th December, 1875, papers relating to three cases of intussuception were read and discussed. In these cases, abdominal section was performed with success. In two of the cases the operation was undertaken because symptoms which appeared to imperatively demand operative interference had arisen; but the treatment these patients had undergone previously, was that "known of old." The discussion which followed was opened by the editor of Dr. Brinton's volume on Intestinal Obstructions, yet even he gave no indication of dissent from the medicinal treatment which had been adopted. Ten of the members, including the president, followed; but none spoke as knowing anything of any clear principles that could with certainty be followed in the management of these cases.

Another discussion, on a case of obstruction, before the Clinical Society of London, is reported in the LANCET, October 21st, 1876.

This case was, at the beginning of the illness, diagnosed as one of Intestinal Obstruction, and yet the treatment consisted of daily enemata, hot fomentations, castor oil, croton oil, turpentine, passing a long tube up the bowel, kneading, inverting, and shaking while in the inverted position,

trocaring, kneading and manipulation, galvanism per rectum, to excite peristaltic action, enemata of extract aloes, and continuation of enemata and kneading—death 59th day."

There was no want of Medical and Surgical talent during the treatment, as four able men were in attendance. When the case was debated before the Clinical Society, eight members spoke, including again the editor of Dr. Brinton's volume; but the discussion was as barren of any knowledge of a theory of treatment, as was that at the Medico-Chirurgical Society in the previous year.

The *post mortem*, in this case, showed that a permanent cure was not possible; but it did prove that temporary relief might have been afforded, considering that the patient was able to hold out for fifty-nine days against a combined medical and surgical attack of the character detailed in the report. The sufferer seems to have had an exceptionally good store of vitality, which perhaps might have tided him over several attacks, had the faculty permitted.

This case recalls the treatment practised upon Madame Dudevant, (George Sand), as given in the BRITISH MEDICAL JOURNAL. In her case, there was injected into the bowel a liquid, *while in a state of effervesence.* To this most painful, irrational, and useless procedure, the *élite* of the profession in France were consenting parties. The routine of treatment throughout differed in nothing from that which was acquiesced in, as we have seen, by the members of the Metropolitan Medical Societies. Madame Dudevant would have had a

far better chance of recovery had no medical aid been sought for her.

There is one particular Society which, beyond all others, is accepted by our profession as a representative body; I refer to the British Medical Association, composed of practitioners from all parts of the United Kingdom. At the meeting of this society held in Bath, in 1878, the most important paper read was one relating to intestinal obstruction. This paper does not give the slightest clue to any principles for our guidance in the management of such cases. It rather conveys the impression that great experience, and skill in differential diagnosis, are necessary to success. I, myself, cannot see the aid differential diagnosis would give in the absence of therapeutical principles applicable to the actual or impending symptoms resulting from obstruction.

Other more or less important contributions to the literature of this subject have been made during the last few years, but it would answer no useful purpose to discuss them here *seriatim?* There is however one common feature to be traced in them all. They decline to classify, as intestinal obstruction, cases not presenting urgent symptoms, yet they include precisely similar cases as soon as the usual train of suffering has supervened, or perhaps been induced by the routine treatment.

The history of medecine informs us that even the intestinal lesion of typhoid was so mismanaged in times past that all the

urgent symptoms of obstruction were developed. We have evidence of this in the quotation I have given from Woodhall,

"It is many times noted for a disease infectious."

This is further confirmed in the writings of Sydenham, edited by Dr. Latham, vol I., pages 66 and 67.

"Perhaps we may enumerate ileus, as the last of the symptoms which supervene upon fever; since the violent vomitings which occur in its early stages frequently gave rise to it.

Very formidable is this affection; and deadly does it appear to almost all who have contemplated it. How should it be otherwise? The fibres of the intestines, which ought to contract from above downwards, reverse the action; so that the contents of the bowels are passed on into the belly, and not towards the rectum. They make towards the throat, and regurgitate. Purgatives taken by the mouth are suddenly disgored by vomitings, and sharp clysters become emetics. In my mind, too, that exquisite and intolerable anguish which supervenes upon an attack of ileus has no other cause than the same inverted action of the bowels, the manifold circumvolutions of which are intented by Nature as a winding passage for the regular descent of the fæces; and when these are constrained to act against the proper motion of their fibres, the torments of colic are the result. These become circumscribed to a single part, with a boring pain. when either the valve at the head of the colon, which prevents the regress of the excrements to the ileum, or any other membrane of any of the circumvolutions, has to bear single-handed against the force of this inverted impulse. To this inversion, as the cause of the pain, we may assign two causes, viz. obstruction and irritation."

To Sydenham is due the credit of having improved practice so that the urgent symptoms of obstruction are not now witnessed during the treatment of typhoid, but here is an example which shews that the valuable reform which Sydenham introduced is not universally accepted even in these days.

For instance there appears in the DUBLIN JOURNAL OF MEDICAL SCIENCE (1877) a paper which was read before the Medical Society of King's and Queen's Counties, by a physician to a fever hospital, entitled "On the management of the bowels in Enteric fever."

The writer commences by deploring the "serious mishaps" that arise from an unwise use of therapeutic agents in fever, and gives the advice of Dr. Todd: "restrain diarrhœa and hæmorrhage in typhoid fever, and when you have fairly locked up the bowels, keep them so; a patient may pass four or six days, or even longer, without suffering inconvenience from the state of constipation."

This gentleman strongly condemns the practice of administering purgatives, yet his method is "castor oil muzzled with opium;" the diet—chicken broth, then chicken, afterwards mutton with milk. He expresses the opinion, that the bowels should be moved more frequently than when in health, and that the motions should be plentiful; he says "I consider that the bowels may be moved, with advantage to the patient, four times in twenty-four hours, so long as any pain or symptoms of distension are present; if diarrhœa should set in, boiled milk is to be given with, or without, lime water; if this does not succeed, acid. sulph., opium, or lead and opium are to be given, and linseed poultice, turpentine and mustard stupes to be applied."

Dr. Todd's advice, relative to restraining diarrhœa and hæmorrhage, is the most rational instruction ever given in the treatment of these complications of typhoid; but there are important dietetic conditions attached to it, which Dr. Todd must have known and applied when treating this fever.

The diet given by the writer lays the patient open to a serious and avoidable complication. As to the bowels being emptied four times daily and plentifully, such coarse food as he recommends would certainly cause irritation in an unhealthy intestine, and ought to be removed. To use

means in order to clear the excrementitious residue of such diet four times a day, would no doubt be necessary, but yet extremely dangerous

"So long as any pain or symptoms of distension remain."

Again, the excessive excreta resulting from so unreasonable a diet would be detained in the bowel by the use of lead and opium. As for the turpentine and mustard fomentations, they would probably cause less mischief than some other items of the treatment.

It may possibly be said that the above sample is derived from a quarter that does not fairly represent current medical opinion; let us, then, take another.

There is in the LANCET for November 15th, 1879, "An address on the treatment of Typhoid fever" by one who is deservedly admitted to be the highest living authority in Great Britain on Medicine. The address, though not entirely confined to its treatment, is yet mainly devoted to its elucidation, and the management of the bowel lesion is very fully discussed. The paragraph which first arrested my attention, as bearing on the point herein discussed, is the following:—

"The natural duration of a well-developed case of typhoid fever is from twenty-eight to thirty days, hence subsidence of the fever before this date, should be regarded with suspicion, and the patient not treated as if the specific disease had ended, while the continuance of febrile disturbance after that date should lead to repeated and most careful examination of the patient, in order to ascertain if any local lesion is keeping up the febrile excitement."

This paragraph is an excellent illustration of the necessity there is of always bearing in mind that secondary lesions may continue after the original mischief has passed away. It should warn the practitioner against any relaxation of vigilance, as the latent pathological condition, if neglected, may give rise to serious results. We see, for instance, in these, and other cases, of diseased bowel, that merely removing fœcal accumulations is of no avail without prolonged attention is paid to the diet, so as to prevent their renewed formation.

The lecturer introduces the subject of treatment by indicating the errors often committed by the patient; and amongst them the too frequent practice of early purgation. This preliminary purge in fever, the late Professor Bennett of Edinburgh used to characterize ironically, as "clearing the field for future operations."

Both the dietary and the therapeutics are set out in this lecture with unprecedented precision.

"The patient should be restricted to liquid diet with farinaceous food and bread in some form, if the appetite requires it. It is better to vary the broths and to add to them some strong essence of vegetable—little strained fruit—the value of milk as an article of diet in fever is generally admitted, but it requires to be given with the utmost caution; the indiscriminate employment of milk in almost unlimited quantities as diet in fever, has led to serious troubles."

This formula of diet is certainly an advance upon what is generally allowed; but it can be still further improved upon by the omission of two of the forms of aliment advised. As regards one of these, milk, we have evidence in the same paragraph, which describes the calamities that may arise from

the use of milk as an article of diet in typhoid fever. If it is so dangerous in this disease, why recommend it? Milk, to be useful, should only be poured into the healthy intestine.

Indeed, the whole of the paragraph, which follows that wherein milk is recommended as an article of diet, is devoted to the enumeration of the evils that arise from its use in fever; the objections to it are stated with clearness, and their correctness admitted, but its discontinuance is not advised, though excellent reasons are given for its omission.

The lecturer has already informed us of the patient, that

"He is weak because of the presence of fever, and not from lack of food."

Would it not be better, in view of the admitted and real dangers arising from the use of milk, to omit it altogether from the scale of dietary? There exists, in the present day, no difficulty in feeding the sufferer without this admittedly dangerous ingredient. It would take a long period—perhaps it would be impossible—to starve any one with the food really suitable for a patient suffering from typhoid.

The lecturer further says:

"If the bowels be confined in the early stage of the disease, a simple enema should be given."

"Hard stool retained in the bowel will produce irritation, and it may be catarrhal inflammation of the intestinal mucous membrane, and so induce troublesome diarrhœa."

At the onset of the fever, a simple enema may do little or no harm, and, no doubt, it is well to make sure that the patient does not take to bed with him a loaded rectum or sigmoid flexure. But, before administering it, the physician should be very certain that no intestinal lesion already exists, as sometimes the patient has been ill for many days before placing himself under treatment.

Attention is next directed to the relief of frontal headache and sleeplessness. For the former, cold or warm applications are advised, whichever may happen to agree with the patient; to secure sleep, henbane, or bromide of potassium with chloral is recommended. If opium is administered, great caution is counselled. Never having seen opium given in typhoid for this purpose, I am unable to offer an opinion; but why is there more need for caution with opium than with other sedatives such as chloral or alcohol? Taken in relative doses, what difference is there beyond that they vary in bulk and duration of effect? All these are remedies attended with some risk when given in fever in doses large enough to produce a decidedly narcotic effect. The same caution applies to them all, which the lecturer gives to his readers, when warning them of the danger of opium only; for they may all arrest excretion so as to seriously affect the brain. Of course, we are here discussing the effect of sedatives when given to produce sleep; when given for the relief of pain, there is less need for caution.

Next follows an examination of the causes of diarrhœa.

"The chief causes of diarrhœa in excess of that due to the intestinal specific changes in typhoid fever, are—1. Error in diet, *e.g.*, the use of solid food, the presence of particles of undigested food in the bowel, abuse of milk, pure animal broth. * * * Excess of fluid when there is inability to absorb the quantity drunk, passes through the bowel and simulates excessive secretion from the intestinal mucous membrane. 2. Catarrhal inflammation of the mucous membrane and irritability of the bowel; these conditions are frequently the consequence of, or are greatly increased by, the unhealthy intestinal secretions and contents."

A large portion of the alimentary canal is in an unhealthy state in these cases, and is, consequently, unable to absorb its usual measure of fluid; and this rejected portion passes downward, provided there is no obstruction from unsuitable diet. This state of things is, of course, aggravated, if much liquid be taken, while the frequency of the intestinal discharges is increased by any undue excitement of the healthy portions of the bowel, and so diarrhœa occurs, as indeed it does from a similar cause in many forms of obstruction. A number of the symptoms that require medicinal interference arise from this over-excitement of the healthy portion of the intestine; the unhealthy portion being in most cases as disordered and helpless locally, as the patient feels himself to be.

Next in order comes the management of the diarrhœa.

"So long as the stools do not exceed three or four of moderate quantity in twenty-four hours, the looseness of the bowels is rather advantageous than injurious; but when, from their number or from their quantity, there is a risk of the strength of the patient being reduced, to a dangerous degree, then it becomes necessary to restrain diarrhœa; then the treatment varies with the pathological condition which induces diarrhœa. It is often

sufficient to examine the stools to detect the cause and remove it, *e.g.*, curds of milk. Should this not prove efficacious, from 3 to 10 drops of laudanum in one ounce and a half of starch water may be thrown up the bowel night and morning after the passage of stool. When very offensive, correctives of fœtor should be given. A teaspoonful of charcoal may be given two or three times a day."

I am compelled to take exception to portions of this paragraph. I believe that three or four stools a day ought to excite suspicion. I fail to perceive what advantage can arise from looseness of the bowels so long as the diet is correct, and this must have been Dr. Todd's view of the question, judging from his advice.

If the diet has been ill-chosen, the bowel must no doubt be emptied frequently in order to get rid of irritating ingesta; but, if the diet is correctly selected, I can confidently endorse the dictum of Todd:

"Restrain diarrhœa and hæmorrhage, and when, in Typhoid fever, you have fairly locked up the bowels, keep them so; patients may go from 4 to 6 days, or even longer, without suffering inconvenience from this state of constipation."

For the therapeutical treatment of the diarrhœa laudanum is recommended—injected *per rectum*. The respected author of this paper appears to have a great predilection for medication by the rectum; but on this point, again, I am obliged to enter a protest. The intestines are more liable to be disturbed by even slight rectal interference, than by medication by the mouth, because I suppose the latter is both adapted for, and well accustomed to, being tickled, and I have myself

seen patients in such a condition that rectal feeding or medication would be a great risk, and indeed cases where that risk was incurred with fatal results. The lecturer informs his audience that :—

"Carbonate of bismuth, in 20 grain doses every 4 or 6 hours, is one of the best remedies I know for the catarrhal inflammation of the bowel itself. If the fluid poured out be very excessive, then a vegetable astringent, as catechu and kino, may be given with the bismuth ; and, should these means fail, 3 to 4 drops of laudanum must be added to each dose of the mixture."

"The use of opium, even in this dose, by the mouth should be avoided if possible, as by interfering with the action of the excreting organs, and by its other effects on the nervous system, it may do more harm than the symptoms for which it is prescribed ; the administration of opium should, if possible, be limited to the bowel."

There is nothing in medicine more certain than that sedatives, whether given by mouth, or skin, or rectum, produce the same physiological results ; it is the degree of action only, and not its nature, that is modified by the special mode of administration. Opium, for instance, acts in the same manner, but about twice as powerfully when given by the mouth as when administered by enema. It is thus a question of quantity, not locality, whether the effect of the dose is detrimental or useful to the patient. I give here a "counter blast" or parody on the last paragraph, which will further illustrate my views.

In typhoid, opium or any sedative should always be given with caution, by mouth, or rectum, or skin, as by curtailing too much the

action of the excreting organs, and by affecting the nervous system, it may do more harm than would occur even if the baneful symptoms were not prescribed for. The administration of opium in fever must be always in small doses, seldom over 3 to 5 drops every 4 hours by the mouth; the dose to be gradually increased, as the dose of opium requisite to secure the desired effect in Typhoid fever is usually small. At a later stage, the patient may become more tolerant of the remedy, and may require larger doses. Individual cases vary so much, even when the exact principles of treatment are known, so that caution must be exercised in the selection of such a dose, so as to start and work up to the dose equal to producing the desired effect, and no more so that the remedy, if it be not an antidote, shall be the lesser of two evils.

I maintain that this better represents what is known experimentally and clinically of the action of opium, than the opinions I am now criticising.

The lesion of typhoid fever requires the same diet and remedies as intestinal lesions in general. The only difference observed is, that smaller doses of opium are required for obvious reasons; for, in the first place, we have not the intense pain which is one of the antidotes to opium; whilst, again, the septic condition of the blood is another danger it is liable to increase.

To teach that the physiological action of opium, when given by the rectum varies, or that the drug is safer than when given by the mouth, is wrong. Danger can only be avoided by a knowledge of the effect that follows the mode of administration. With opium, the rectum requires double the dose necessary to produce the same action as when given by the mouth, while the subcutaneous method requires only one-fourth the quantity that can with safety be placed in the rectum. This is the rule as regards opium.

In typhoid fever, the sub-cutaneous method will seldom be required; but conditions requiring it do occasionally arise; and it has often been adopted with perfect safety. I do not deny that remedies exist that act locally or upon special tissues; yet here, even if opium did act locally only, its action on the rectum would not specially benefit the other portions of the gut.

The perusal of this paragraph reminded me of the days when bleeding from the chest wall was supposed to specially relieve the pneumonic lung, whereas, it is now admitted, that the local bleeding is only a general depletion. The next paragraph which appears to me to require comment is this :—

"In place of being relaxed, the bowels are occasionally confined. Inaction of the bowels in typhoid fever may be due to torpidity of the large bowel, with free absorption of fluid contents or diminished secretion of fluid by the mucous membrane of the bowel. Under these conditions, the stools become hard and dry; and, if long retained in the bowel, may produce considerable irritation and even catarrhal inflammation of the mucous membrane of the bowel with diarrhœa.

"The most important, and a not infrequent, cause of inaction of the bowel in typhoid fever is *deep* ulceration of one or more Peyer's patches. Large superficial ulcers favour the occurrence of diarrhœa, and are often accompanied by catarrhal inflammation of the mucous membrane. A single *deep* ulcer will paralyse the action of the bowel, and so cause constipation, and this has to be kept in mind as a fact of the highest practical importance when it is proposed to relieve the bowels by an aperient. A deep ulcer is usually produced by the separation of a deep slough, and is often unattended by any *catarrhal* inflammation of the small intestine, or by any affection of the large intestine.

"At the same time that solid stool accumulates in the rectum and colon, which may require removal, there may be extensive or deep ulceration in the ileum. A small-sized enema of thin gruel, repeated every other day if

necessary, is safer than a large enema at longer intervals. Laxatives, however mild, by the mouth, are liable to irritate the ulcerated surface of the bowel, and, if sloughs are separating, may forcibly hasten the detachment, and so produce hæmorrhage and turn the scale between recovery and death."

The difference between the small and large enemas is one of degree; and it is the better practice to avoid enemata entirely after the initial period.

But this is an example of "remedies for the remedy rather than for the disease itself;" for, if a correct dietary is prescribed, the physician need have no anxiety about the quantity or quality of what is in the gut. A correct fever dietary is both food sufficient to maintain life during the disease, and a mechanical remedy that will best keep in abeyance those evil symptoms which indicate the existence of the principal lesion in this fever. The term "*torpidity of the large bowel*," or any other bowel, used when discussing the treatment of unhealthy intestines, is not only incorrect, but, I know, has led to sad errors in practice. Indeed, I have evidence, which justifies me in affirming, that a healthy gut has—under the supposition that it was obstinately torpid—been stimulated until sufficient mischief has resulted to permit of a *post-mortem* examination.

Dr. Sydenham, in his "Medical Observations," warns us of the danger of this practice. He says—

"Hence, I have more than once remarked, that the repetition of even the mildest glyster has induced a continuous series of fresh symptoms."*

* Vol. i., page 200.

"It is worthy of observation that occasionally the patient, at the decline of the disease, and after ill-timed administration of clysters and other cathartics, may appear to have been slightly benefited—nay, at times, there is a perfect cessation of the fever. Wait, however, for a day or two. It will be seen, NOT that the original fever has taken strength, but that a fresh one is lit up."†

To resume our criticism. The explanation given by the lecturer of the "why and wherefore" of confined bowels in typhoid fever, is not based upon close enough appreciation of the conditions present. For, if the contents of the bowel are free from an avoidable quantity of excrementitious matter, we have simple, harmless constipation, that can be tolerated until it passes spontaneously away, due to all the conditions wished for being present. But there may be constipation, with tympanitic swelling, and local irritation, and pain —due either to errors of diet, or inflammation, or ulceration at the portion of intestine diseased, causing temporary obstruction and accumulation—which may end in a curative diarrhœa; the first may require no treatment; the second may demand the opiate. The "*hard and dry*" stools will not remain long, if they are doing harm, as the extra thirst induced and liquid imbibed and obstructed, accumulates and soon macerates, and expels these foreign settlers.

No solid accumulation at or above the locality of the lesion can remain, except for a short period, "hard and dry." Scybala, when present, form below the diseased area, under special circumstances.

What is meant here by "torpidity of the large bowel?" Is it a healthy bowel with pure atony—a condition we have no

† Vol. i., page 54.

knowledge of, nor reasons for suspecting—or an unhealthy gut? or only either of these, with unsuitable contents? A healthy bowel will not remain quiet, if its contents are of an irritative nature; and an unhealthy one cannot be safely goaded by stimulation to part with its contents, and this the lecturer warns us against attempting.

Again, the cause of "inaction of the bowel in typhoid fever," is attributed to "deep ulceration;" but "superficial ulcerations" are said to favour "the occurrence of diarrhœa."

This distinction is not in accordance with the etiology of the lesion. I hold that ulcers, whether deep or superficial or the condition antecedent to ulceration, may cause constipation, while either of them may exist, and diarrhœa may set in. The extent of the inflammatory action in and around the ulcerated area is the most important factor in determining the symptoms. If the inflammation is slight, fatal ulceration may exist; although normal action of the bowel is performed, as indicated by daily passage of fœces of ordinary consistence; while, even in the absence of ulceration, inflammation of a segment of the intestine may give rise to serious symptoms.

There is one item that has much influence in further developing or restraining the symptoms of the intestinal disease of typhoid, *viz.*, the quality of the contents of the gut.

The causes which induce the accumulation of gas in the bowel are next discussed; and the means of relieving this complication are given.

"In all cases of typhoid fever there is some distension by flatus of the abdomen—the belly is more or less blown. The distension is sometimes so great as to interfere with the free play of the diaphragm, and so, by preventing the full expansion of the lungs, favour congestion of those organs and impede the circulation. Fluid will run through the bowels with little effort; air requires expulsion. Excess of flatus in the bowels may have its origin in deficient power of expulsion or excessive generation of gas. Sufficient paralysis of the bowel to cause accumulation of flatus may be the result of loss of nerve energy, or of local injury of the bowel. A single *deep* slough-formed ulcer will paralyse the action of the bowel, and lead to such an accumulation of flatus as produces enormous distension of the abdomen; the weaker the abdominal muscles the greater, *cæteris paribus*, the accumulation of flatus. Want of power to expel the flatus, and excess in the quantity formed, reach their maximum as a rule about the latter half of the third and during the fourth week of the fever, for then the sloughing and ulcerative processes of the walls of the intestine are at their height, the nerve-power is at its lowest, and the contractile energy of the abdominal and intestinal muscles is consequently at its minimum; while, from the state of the stomach and the secreting glands generally, the antiseptic digestive processes are in a great degree arrested, and the food that finds its way into the intestines mingling with the fetid secretions from the diseased intestines, and with the sloughing particles separating from the solitary and agminated glands and from the floors of the ulcers, readily undergo gas-generating decomposition. Of all the remedies proposed for the relief of flatulent distension of the abdomen, turpentine applied externally is the most extensively employed in practice. Now, I must say, with reference to the external application of turpentine, that I have never seen a diminution of the distension which seemed to me to be *propter hoc*."

"The brief outline I have sketched of the pathological conditions causing the distension gives the key to what has seemed to me to be its most successful treatment. If the stools be fetid, and the distension is in part due at least to the excess in the gas formed, then to destroy this fetor and to arrest putrefaction and gas-generating decay of the contents of the intestine is for me the first object. Charcoal has proved a most efficient agent for effecting this purpose. It is of importance to select as food-substance, which leaves no solid residue to undergo decomposition in the intestine. The administration of pepsin and acid at the same time as the food, and also the partial digestion of the food before it is taken, is often

advantageous. The large intestine is occasionally so greatly distended as to lose from stretching its contractile power ; the introduction of a long tube into the bowel, and the mechanical removal of some of the gas will occasionally be sufficient to enable the bowel to regain some nerve-energy, and so increases temporarily the muscular power of the intestinal and abdominal walls."

The physiological and mechanical reasons given here, in explanation of the retention of gas in the bowel, are far from conclusive. For we know that gas does, in most cases, follow fluid through an obstructed part, and after it has passed over the abnormal portion it precedes the gut contents in their passage downwards. As soon as this occurs, the contents of the intestine above the inflamed or ulcerated part, can progress towards the rectum, and then only may we have diminished distension of the abdomen by gas. For instance, in enteritis, before the intestinal contents are ejected, gas may have been preceding some hours. As regards the assertions—

"Deficient power of expulsion, loss of nerve-energy, &c."—

The latter is not one of the causes of gas accumulation, but rather the arrest of peristalsis in a section of unhealthy gut. There is no deficiency of nerve-energy, but the absence of the state which permits the utilization of nerve-force. I cannot perceive what the weakness of the abdominal muscles has to do with causing flatus, or in delaying its expulsion; the weaker they are the better; so as to enlarge the abdominal cavity and distribute the volume of gas over a great area of gut, thus easing pressure in the intestine, and interfering less with the play of the diaphragm. Thus time is

given to help the process towards completion, which enables the semi-fluid and the gaseous accumulations to find their way to the rectum. As to the application of turpentine as a remedy in this condition, the lecturer doubts its utility; in fact, here as elsewhere, there are indications that the days of counter-irritation are "passing away."

The dietary now advised is both a preventative and curative of the tympanitic condition. But why not have counselled this earlier, so as to prevent or minimise this difficulty if it should occur? As to

> "The introduction of a long tube into the bowel, &c.,"

to relieve distension, this would be no small risk, as the gas, in most cases, is beyond the reach of any tube. Is this one of the "heroic measures" referred to in the latter part of the lecture? Except enemata, and the tube introduction, I failed to find anything that could be entitled heroic. Following this, the writer discusses the principal remedies used in fever. Of alcohol, he says:—

> "Alcohol, in fit doses, improves the nerve-energy, and so increases temporarily the muscular power of the intestinal and abdominal walls."

This explanation of the physiological action of alcohol has had a long run of popularity; and, being a household remedy, most of us have been anxious to believe that this drug could with safety be used in all diseases, and not wisely omitted even in health. Even to-day its virtues are thought to be preservative—preventative in health, and therapeutical in disease. And in consequence

of the very general confidence in this elixir, men of rare ability have bestowed special attention to the investigation of its properties, and have been able to give facts that indicate its true sphere and mode of action. Some there are who still hold to the ancient views, despite evidence of almost mathematical precision contrary to their opinions. But granting that the drug possesses stimulating properties, it cannot act upon the muscular coat of a diseased intestine any more than a diseased joint can be stimulated into action; but, even granting this to be possible, the writer has already warned his readers that exciting the canal is to be avoided as dangerous practice.

Next, the question of hæmorrhage is entered into, and precautions taken, which up to this calamity were disdained—a calamity due, perhaps, to admitting into the dietary materials liable to cause avoidable symptoms. Until hæmorrhage is noticed, the care that should have been exercised at the commencement is not insisted upon.

"All movement of the bowels should be restrained as far as possible and for as long as possible. An ounce of starch-water with ten or fifteen drops of laudanum may be given at once as enema, and then a dose of acetate of lead every two or three hours by the mouth, with three to five drops of laudanum, or fifteen grains of gallic acid in a wineglass of iced water every two or three hours with the laudanum. I think I have seen benefit from small doses of turpentine. It is a point of the greatest moment to keep the bowels empty, and therefore nourishment should be given in the most concentrated and absorbable form—e.g., essence of meat in tablespoonsful doses frequently repeated. All nourishment which leaves solid residue—e.g., milk—should be avoided. Lumps of ice should be sucked, and all essence of meat, &c., be iced. When the loss of blood is sudden and copious, or is frequently repeated, the subcutaneous injection of ergotine may be employed, and an ice-bag applied over the region of the ileum. The faintness due to considerable sudden bleeding from the bowel should not be removed by stimulants, unless it immediately threatens life."

From this quotation, it is obvious that the teacher, when this difficulty is met with, throws overboard milk, gives laudanum

by the mouth to make more certain of its effect, but still holds on to the notion that the rectum is a harmless locality to medicate by; and we are advised to give opium, not in limited doses, and with less caution, to secure a special effect.

"Opium, in sufficient doses, to stop all action of bowels and to subdue pain, if pain be present,"

After treating of hæmorrhage, the lecturer discusses the means to be employed in the reduction of the high temperature. These consist of cold, alcohol, quinine, and salicylate of soda. Concerning the latter two, he confirms what I have observed myself, that if they sometimes reduce the heat, they also cause much distress. Other means, pleasanter and more efficient, are at our service—such as alcohol, opium, cold, &c., which so excellently suit this condition.

But as alcohol and opium are the remedies the lecturer prescribes as the principal aids to the treatment of typhoid and its special lesion, I will confine my remarks to them. Alcohol he regards as a stimulant. From this, I emphatically dissent; and I maintain that, from the time when Mr. W. Ward of the Manchester Infirmary published his conclusive experiments on the effect of alcohol, up to the present day, the most reliable evidence has been against the theory that this valuable medicine is in any way a stimulant.* Indeed, in the address I am now analysing there is ample evidence to confirm my view.

"A free use of stimulants removes all the graver symptoms; the temperature falls, and the heart's action becomes steady – falls in frequency and in power."

* Medical and Physical Journal, vol. ix., 1803.

These are rather the indications of a sedative than of a stimulant. In other portions of his address, there are such remarks as follow :—

1. "To avert death from failure of heart power, alcohol is the great remedy." 2. "In cases of tremor, alcohol should always be given to increase nerve-energy."

I believe the advice given in this quotation will be useful in practice, but the theory of its action is wrong. However, as I purpose to discuss this fully in another chapter on the action of alcohol, it is not necessary to enter into further details now. Regarding the remedial effects of alcohol, the lecturer says :—

"I may sum up my experience in regard to the use of alcohol in the treatment of typhoid fever thus. Its influence is exerted primarily on the nervous system, and through it on the several organs and processes ; for example, the heart and the general nutritive processes—changes on which the rise and fall of temperature depend. In judiciously-selected cases it lowers temperature, increases the force and diminishes the frequency of the heart's beats ; it calms and soothes the patient, diminishes the tremor, it quiets delirium, and induces sleep. It should never be given in the early stage of the disease, or with the hope of anticipating and so preventing the occurrence of prostration and debility, but should be prescribed only when the severity of special symptoms, or the general state of prostration, indicates its use. Hence a large number of cases of typhoid fever end favourably without alcohol being prescribed from the beginning to the termination. It should not be prescribed when a sudden gush of blood has induced faintness, unless the faintness is so great as to threaten life immediately. Nor should it be given when, after the first few doses, the temperature rises, the heart's action becomes more frequent or more feeble, delirium increases, sleeplessness supervenes, or drowsiness deepens, so as to threaten to pass into coma. When the urine contains a considerable quantity of albumen, alcohol should not be prescribed, unless absolutely necessary for the relief of some symptom immediately threatening life, and then it should be given with the greatest caution, and its effects on temperature, the circulation, and on the urinary and other secretions, both as to quantity

and quality, be carefully and frequently noted. The quantity of alcohol prescribed should be as much only as may be necessary to effect the object for which it is prescribed. In the fourth week, to tide the patient over the concluding days of the disease, it may, as a rule, be given more freely than in the second or the beginning of the third week of the disease, but it is in exceptional cases only that more than twelve ounces of brandy in the twenty-four hours can be taken without inducing some of the worst symptoms of prostration. Nearly all the good effects of alcohol, when its use is indicated, are obtained by four, six, or eight ounces of brandy in twenty-four hours. Taken in excess—even when in smaller quantities it would do the patient good,—it dries the tongue, muddles the mind, or induces delirium or drowsiness approaching to coma, and diminishes the action of the secreting organs, on the healthy action of which the elimination of the materials destroyed by the action of the fever poison depends. For the last thirty years I have made it the rule of my practice in the treatment of typhoid fever to abstain from giving alcohol if, in the case before me, I *doubted* the wisdom of giving it; when in doubt I do not give alcohol in typhoid fever, and when there is a question in my mind of a larger or smaller dose I, as a rule, prescribe the smaller. The reverse of the rule I laid down for myself in the treatment of typhus fever."

In this summary of the effects of alcohol, there is not one item of information relative to its advantages or drawbacks, nor in the instructions for employing or abstaining from it, which does not equally apply to opium; but of the two remedies, alcohol possesses one advantage over the other—it is easier to control; for, if an excess should be given, it will be sooner eliminated; and indeed it is often selected in preference to others of its class, as a necessary concession to popular prejudice; for the unprofessional critic would look upon a case, which terminated fatally, without the giving of some form of alcohol, much in the same light as if he had been debarred from "the benefit of clergy."

This lecture is a valuable contribution to our knowledge

of the course and treatment of typhoid; and I have reviewed it, hoping it may aid in hastening the advent of that time when, to borrow again, from this interesting address:—

"Each special act of treatment would be based on firm grounds, instead of being, as it now is, an experiment performed by the medical attendant. The sum of his own experiments constitutes each man's experience, to which—in proof of the correctness of his practice—he appeals, as to a judge, whose decision is final and infallible; and yet, how different are the conclusions, all based on experiences drawn by different observers, in regard to the effects on any given disease or symptom of any given remedy."

This lecture is evidence of great progress. Undoubtedly the treatment of enteric fever has never been given so lucidly; but, while it possesses unprecedented merits, it reproduces some of the fallacies of the past—for instance, the incorrect classification of remedies, and it does not recognize the superior value of a preventative method. These two faults may not affect injuriously any case treated by this gentleman, who, whatever reasons can be advanced against his theory, may perhaps, successfully use his remedies empirically; but the acceptance of his theories by others may lead to demonstrable errors in treatment.

Indeed, we have an example of this in the LANCET, published December 24, 1881, where six cases of enteric fever are reported. These are examples of treatment based upon the theoretic faults to which I have just alluded.

Of these cases, No. 3 is here selected; inasmuch as it is more fully reported, and appended to it are the remarks of the physician. It is typical of the treatment followed in the remaining five.

"CASE 3. *Perforation; peritonitis; death.* — John W——, aged twenty-one, a tall delicate-looking young man, was admitted September 12th with rose spots, a temperature of 103·4°, diarrhœa, and all the other concomitant symptoms of enteric fever. He was apparently early in the second week of the fever on his admission. Some remission of his fever took place on the ninth or tenth day of his illness, when his morning temperature was 99·5° and his evening maximum only 101·4°. Between the ninth and seventeenth days the morning remissions were well marked each day, his diarrhœa was slight, easily controlled, and his pulse, although somewhat feeble and dicrotous, improved under stimulants. Between the seventeenth and twenty-first days the highest temperature reached appeared to be only 99·5°, his respiration averaged 20 a minute, his pulse ranged between 84 and 96. There were no serious symptoms. His motions were semi-solid, and he took his nourishment well, beginning with custard, bread-and-milk, and eggs for a couple of days. On October 1st, that is the twenty-sixth day of his illness, he was allowed some boiled fish, which he took eagerly, for his tongue was clean and he craved for solid nourishment. Coincidently with this improvement in his diet, unfortunately his temperature began to rise again between the twenty-sixth and twenty-ninth days; it did so gradually, moving slowly upwards a degree and a-half to two degrees each day, until on the twenty-ninth it reached a maximum of 106°. Of course, when his temperature was observed going up, the fish was stopped at once; he did not take it more than twice, but the bread-and-milk and puddings were given and taken with appetite by him. The high temperature indicated further or deeper ulceration of the bowels, or some complication, and in the alternative of our being able to detect no complication, was fairly attributable to deep intestinal lesion. The bowels, however, were neither loose nor confined; his pulse was 108, and respiration not above 24. On the thirtieth day his temperature fell 5°, and for the next three days oscillated between 100·5° and 103·4°. On the thirty-fourth and thirty-fifth days, although he expressed himself as feeling better, his countenance changed for the worse. The abdomen became tumid and tender. His temperature had fallen, varying between 100·5° and 98°; respiration 18; pulse 92, feeble. The following day (thirty-sixth) his pulse, by its sudden rise in frequency and extreme thread-like feel, indicated some serious complication. Peritonitis had, it was thought, begun two days ago; now it had evidently either extended or actual perforation had taken place. His respiration was shallow, 36 per minute, but his temperature rose to 103·8°, a circumstance

which led to the hope that the peritonitis must be circumscribed as yet, since when there is extension the temperature generally falls below normal. The patient was placed under the influence of morphia without delay, and nothing but an occasional teaspoonful of iced water or brandy-and-water was allowed to pass his lips. He appeared to suffer no pain, and for thirty hours there was neither nausea nor any vomiting. Gradually, however, his eyes became more hollow and deep-set, and his face more Hippocratic. On the thirty-eighth day his bowels began to act, and loose, offensive motions passed from him, and vomiting of green bilious fluid began. On the thirty-ninth day the vomiting continued, and the patient described ominous symptoms of extending peritonitis, pain upon micturition, extending upwards over the abdomen and downwards over his thighs. He spoke, too, of a sensation of bubbling in his interior. He lived, or rather lingered on, for five days more, maintained by sips of iced champagne, brandy, and beef-essence, and by occasional nutrient enemata; and he was kept nearly, if not wholly, out of pain under the influence of morphia. For two days before he died his motions were voided involuntarily through the sphincter ani, and his abdomen became much less hard and tumid. Latterly he vomited very little, and even craved for some toast and butter twelve hours before his end; but he had a severe rigor, and his temperature rose to 103·6° shortly before death.

The necropsy showed deep ulceration and perforation in more than one place near the ileo-cæcum, and peritonitis with considerable glueing of the intestines.

Remarks.—The feature of interest was the prolongation of life for ten days after the commencement of the peritonitis, for death usually follows within forty-eight hours of its occurrence. A question which it would be very important to answer, is the effect of more solid nourishment in determining this complication. Solid nitrogenous food in enteric fever is allowed as soon as it can be safely given—*i.e.*, when the tongue is clean, appetite has returned, and the temperature is normal. It is far more reasonable to suppose that complete healing aud sound cicatrisation of ulcers in the intestines will be promoted by a return to solid food than by a starvation diet. Fish and sweetbreads, eggs, custard puddings, and even mutton which has been twice cooked—first boiled and then baked—are very easily soluble and assimilable articles of food. The physician must steer his craft between the Scylla of starvation and the Charybdis of over-feeding; above all things let him ward off flatulent distension of the intestines."

I am not prepared to affirm the curability of this patient, but certainly his chances might have been increased.

It is to be noted that on about the ninth and tenth days his temperature ranged from 99 to 101—pulse, feeble and dicrotous. It is said "stimulants" were given—the remedy is not mentioned; but, supposing genuine stimulants were given, there would have been an increase in the frequency of pulse and a rise of temperature, otherwise it would not be a stimulant. But the reverse result was desired by the practitioner; consequently, if the pulse and temperature improved after its administration, it is clear proof that according to him the remedy was not a stimulant. Further,

"Coincidently with this improvement in his diet, unfortunately his temperature began to rise ——— until it reached 106."

By "improvement in his diet" the use of coarse food is no doubt here meant; but the patent clinical sign which followed did not lead to the required change in the diet; and on the thirty-fourth and thirty-fifth days symptoms of perforation appeared, with slight reaction on the thirty-sixth day. After this "without delay," a dietary was prescribed permitting the safe use of opiates, which delayed the fatal termination.

The comments attached to this report are interesting, as showing, that in this era the management of the disease of typhoid in a large metropolitan hospital, coincides with the treatment antecedent to the time of Sydenham.

Surprise is expressed by the reporter that the patient lived ten days "after the commencement of peritonitis." But

during these ten days all the details so favourable to prolonging, nay, saving life, were strictly enforced. This treatment would also have been the best preventative of perforation.

When the tongue is clean, temperature normal, and some time has elapsed, solid food may be tried, but its effect requires watching, for, while the restricted Sydenham fever dietary is sufficient food in enteric fever, the ordinary food means starvation, and often death.

The symptoms presented by the latter stage in this case were indicative of ulceration of the intestine with unsuitable contents traversing it. There is another contagious form of disease, in the latter stages of which are found lesions and symptoms simulating those of typhoid fever; which bring it within the category of those intestinal maladies I purpose to discuss—I refer to cholera in its later stage.

Two treatises have been published, containing valuable information on the treatment of cholera, written by well-known physicians. In these we have facts stated, which demonstrate further progress; their teaching harmonizing closely with pathological and therapeutical facts; indeed, if all the varieties of impending and actual intestinal lesions were treated with the rationalism taught by these artists, there would not be much need for reformation in the management of intestinal maladies.

One of these treatises is written by one, who has left behind him a reputation that places him among those worthies, who have

successfully laboured to advance medicine towards the goal of an exact science. Dr. Felix von Niemeyer published in 1872 his volume on "The Symptomatic Treatment of Cholera," translated by Dr. Latham. No criticism of mine can do justice to its merits nor to the trenchant manner with which he brings conviction to the mind of the reader. The translator truly remarks—

"Amid the doubt and uncertainty which prevail, it is refreshing to find a pamphlet in which the connection between the symptoms and the pathology of the disease is so explained as to carry with it a strong conviction of correctness."

The author regards as the acme of treatment the successful management of the intestinal symptoms.

"And it is on this I base my conclusion, viz., that until we possess such a specific as shall be able to paralyse the influence, whatever the agent may be, which the prevailing epidemic exerts upon the organism, we must in cholera confine ourselves solely to the treatment of symptoms, and principally of those which arise from the intestinal lesion."

The second treatise is by Dr. J. Murray, who was forty years Inspector-General of Hospitals, in Bengal. This author marshals his remedies with the confidence of one who well knows the results that ought to and can be obtained by medicine in this malady. It is remarkable, that the summary of his clinical experience tallies closely with experimental therapeutics.

There is a very notable difference apparent between the "Address on the Treatment of Typhoid" and these, viz., that, in the lecture on typhoid, symptoms indicative of retrogression are prescribed for as they arise, while in these volumes on the

treatment of cholera, the treatment is directed to be anticipatory from the beginning, so as to escape or minimise the evils likely to occur during the later stage.

I have culled, from this estimable contribution, those paragraphs which independently confirm the plan of practice I had myself arrived at; but they are not selected as isolated examples of harmony between the author and myself. The author gives no theory explanatory of his remedial effects, but bases his rules of treatment upon an extended period and field of clinical experience, which I take to be correct, inasmuch as they agree with the deductions gained from experimental therapeutics, pathology, and the mechanics of gut lesions.

Concerning the action of remedies on diseased parts, at pages 20 and 47. He says :—

"Many individual remedies have been recommended to promote the action of the paralysed organs; but they labour under the disadvantage of their ordinary influence being suspended by the diseased state of these organs; whilst their favourable action on one of these may be of an injurious character on the other equally important eliminating organs."

"Still the changes in the nervous power and the composition of the blood, which are now present, must materially influence the action of the kidneys, and also the ordinary action of remedies on that organ."

He refers to the use of alkaline chlorides which I have found very useful in many forms of intestinal lesions. He advises their administration by the rectum, though I prefer them given by the mouth. At pages 29 to 31, the dangers of chlorodyne, chloroform, ether, alcohol, and opium are stated, and their evils are asserted to be identical.

"Opium has been most extensively used in all stages of the disease. I have already mentioned its beneficial action in small doses in the earlier stages; but in this stage of collapse its employment in small doses is questionable, and in large doses most dangerous. It has no action on the paralysed intestines, and is often accumulated to an extent that would prove fatal to a healthy person; whilst here the flickering vitality is extinguished in the commencing struggle for life as reaction comes on, even by small quantities. Besides, should reaction succeed, the ordinary action of opium is not required to promote recovery; and it tends to suppress the secretions of the liver and kidneys.

"The use of chlorodyne, chloroform, or æther is very highly praised by many whose experience has been limited. The immediate action is generally very favourable, in arresting the vomiting and easing the pain or cramps; but in those cases where reaction comes on after their free use, the head symptoms are often violent and uncontrollable. The simple stoppage of the active symptoms is valuable in preventing exhaustion and allowing time for the restoration of the secretions of the internal organs. The tendency of chloroform and opium is to arrest these secretions, and thus allow the disease to advance unchecked, and the effete parts of the blood to accumulate in the circulation and induce subsequent dangerous symptoms, of which the worst are those of uræmia and asphyxia. A temporary relief may be obtained; but involving a risk of permanent danger which may counterbalance the advantage of even a moderate use of these remedies, and which renders their continued use in large doses dangerous, if not fatal.

"The same danger applies to the use of alcohol in the various forms of wine, spirits, or ale, which are frequently, and in such large quantities, poured down the throats of collapsed patients, as a last chance in hopeless cases; and certainly there is little hope for the poor victims of professional ignorance who fall into such hands. Not that in all instances the greatest skill can save life; but many have died who might have lived had they not been drenched with brandy, and compelled to swallow it as long as consciousness remained. This practice is now strongly condemned by the most intelligent medical officers in India; but still sometimes persisted in."

The author in one notable item of treatment differs from me by giving enemas. That they can do no good I am con-

vinced—neither could they have done much harm, as it is highly probable that they never reached the seat of disease, or so acute an observer would have detected it. As the advice given at page 52 to medicate the ulcerated portion is certainly highly dangerous, were it possible to reach it, which I doubt.

"Where ulceration of the intestines has taken place, the recovery is slow; enemata of acetate of lead or nitrate of silver are here advisable. The existence of ulcer is shown during convalescence, by detached patches of mucus, sometimes streaked with blood, attached to consistent stools.

To reach the disease, an enema would have to be in bulk, at least, one quart; and, if it did happen to arrive at the ulcerated part, it would probably be followed by collapse.

The phases of cholera was so imperfectly known thirty years ago that diverse classes of remedies were given for its cure. Some few physicians of eminence in our profession energetically maintained that purgatives were the proper aids to remove the disease. If the contents of the intestines in the early stage had not lost their stercoraceous character* the vomit of cases thus treated might have informed them of their mistake, although this symptom when it appeared in the maltreatment of typhoid fever by our forefathers, had no reforming effect on their practice.

In 1881 Dr. C. Hilton Fagge, by means of chemical analysis, demonstrated that the disease known as lead colic is a lesion of the intestinal tract, and not, as was supposed

* Dr. Murray informs me "that the contents of the colon in cases that rapidly prove fatal consists of a watery fluid like rice water, with a peculiar mawkish odour, the natural odour returns when reaction takes place, but the state of the colon may be modified by dysentery having supervened.

by many, a spasm of the intestine, or, as some have asserted, an affection of the abdominal wall. Indeed, before the publication of this fact by Dr. Fagge, in the lxiv chapter of the "Medico-Chirurgical Transactions," there was even enough in clinical records to justify its being included in the class of those maladies involving obstruction. There is a striking example of this in the LANCET, published in 1879, page 86, which contains a case of lead colic, where, as the result of questionable treatment, fœcal vomiting was brought about, which led to a serious but futile operation, from all of which fortunately the patient recovered.

This discursive sketch is sufficient evidence, that as yet very little progress has been made in reducing the mortality in these complaints; and, though I have almost entirely culled my evidence from the records of practice in Great Britain, yet, if the literature of medicine in other countries were searched, the information there found would indicate no improvement. For instance, if a continental authority be selected, Dr. F. von Niemeyer, in vol. i., sec. 5, cap. 3, page 569 of his Text-book of Practical Medicine, graphically depicts the sufferings of the patient and the ignorance of the physician.

"The symptoms of closure of the intestines, which subsequently become terrible, and very dangerous, are often slight, and apparently free from danger at the outset. The patients feel puffed up, have colic, periodically appearing and disappearing, think they have made some error in diet, and take some camomile-tea, or a slight laxative. The physician is not usually called till these remedies fail, and, in spite of them, the pains increase, and the bowels do not move, or when nausea and vomiting occur. A careful and experienced physician always con-

siders this combination of symptoms as disagreeable and threatening. The first thing to do is carefully, without over-modesty or forbearance, to examine those parts of the body where hernia may occur. Woe to him who trusts that the patient will, unquestioned, tell him he has a rupture, or who rests contented with his simple denial of the question! The rectum and vagina should be explored just as carefully as the inguinal regions, to find if there be any obstructions to the evacuation of the bowels. In spite of the anxiety that the case causes him, the physician, of course, hopes, at this time, that the symptoms are excited by a retention of fæces, somewhat obstinate, perhaps, but one which may, nevertheless, be overcome. He prescribes enemata, and large doses of castor-oil, with the addition of a little croton-oil. After a few hours he returns, uncalled for, to the bedside of the patient, for the purpose of satisfying his own anxiety. Meanwhile, the enemata have occasionally brought away a little fæces from the lower part of the intestine, but, in most cases, they have had no effect, or it has been impossible to give the patient an enemata. In spite of the addition of croton-oil the castor-oil has remained ineffectual; after taking it, the patient has had great pain, and frequently vomited green masses. At the same time, his appearance has changed; his face is distorted and pale, the skin, particularly on the hands, is cool, the pulse small. Now the sorrowful conclusion becomes more and more certain, that the intestine is closed, and, perhaps, is so obstructed that medical aid can give no relief. The abdomen gradually becomes more prominent; there are severe, straining, bearing-down pains, which the patient calls cramps. These paroxysms of pain are usually followed by nausea, and, to the terror of the patient and those around him, the vomited masses constantly become browner and more discolored, and the smell more distinctly feculent."

Yet at page 513–14 of the same volume we find the random advice so generally persisted in, causing the aggravation of symptoms and the high mortality known to-day.

In the elucidation of this subject, I will not attempt to lay the whole of the etiology of Intestinal Obstruction before

my readers, for Dr. Brinton in England and subsequently Leichtenstern in Germany, have so thoroughly gone over this ground, that very little has been left undone. Where I judge that their teaching admits of correction, there, I will record my dissent. A careful perusal of the treatise by Leichtenstern, must convince the reader that it is only an historical elaboration of Dr. Brinton's lectures, and it is obvious that he was unable to proceed in the pathology or the therapeutics of this lesion a step further than Dr. Brinton had led him. The shortcomings of Brinton are that many of his anatomical, pathological and clinical data illustrate the signs of an inefficient treatment. Brinton's treatment is wanting in precision and consistency. These are also the faults of his follower Leichtenstern. These defects, I hope to show, are remediable, and with that object in view, the causes, signs and consequences which accompany a special treatment I will argue in the following pages, and consequently some phases, supposed to be inseparable from this complaint, will be missed by the reader, for the obvious reason that with a correct theory and practice of treatment they will not be met. Since the Sydenham period no improvement was made in the treatment of these affections until the advent of Dr. Brinton, who died while his interesting volume was in course of publication. Since his death no useful information has been acquired, but rather the lectures, papers, and discussions relating to these diseases have all indicated retrogression.

CHAPTER II.

THE SYMPTOMS OF OBSTRUCTION.

By Intestinal Obstruction, I mean any condition of the intestine, its surroundings or contents, which retards, or completely arrests, in their progress towards the rectum, the matters contained within the gut. For the purpose of discussion, these conditions may be divided into two classes, viz.:—obstructions caused by disordered function and those arising from mechanical agency.

In the first class I include enteritis, peritonitis, typhlitis and peri-typhlitis, ulceration, perforation, painter's colic, paraplegia, the intestinal lesion of typhoid fever, and Asiatic cholera.

In the second section, I place hernia, stricture, intussusceptions, volvulus, strangulation from adventitious bands, or by rents in the mesentery, tumours, gall stones, and loaded rectum.

The symptoms of the former division are generally mild at the commencement, consisting of a sensation of weight and tension within the abdomen, perceptible to the patient only, accompanied by slight thirst, acceleration of pulse, and rise of temperature, followed by tenderness of the abdomen when manipulated, loss of appetite and constipation. If the treatment tends towards a cure, these symptoms decline in intensity; but if the case retrogresses, then graver signs appear, such as frequent vomiting, high temperature, quick pulse, distension, continued constipation, and collapse.

The symptoms of the second class are, in most subjects, serious from the beginning—early vomiting, thirst, distension of the abdomen, much pain and collapse. Any, or all, of these signs may be present within forty-eight hours from the occurrence of any of the conditions included in this class, and any one of these symptoms may be the initial indication of the disease.

This classification of symptoms is of etiological, rather than of practical value, as all forms of obstruction, sooner or later, develope signs akin in detail.

ANALYSIS OF GENERAL SYMPTOMS.

FAVOURABLE COURSE.	UNFAVOURABLE COURSE.
Unusual weight and distension of the abdomen, with or without pain.	Unusual weight and distension of the abdomen, with pain.
Thirst.	Thirst.
Pain.	Pain.
Dry and furred tongue (varied).	Profuse perspiration.
Accelerated pulse controllable by medicine.	Furred, dry tongue (seldom varied), acceleration of pulse, not controllable by medicine.
Rise or fall of temperature in response to remedy.	Early rise of temperature, with fall at a later stage, the temperature slightly improved by medicine.
Vomiting, not oftener than four times in 24 hours.	Frequent Vomiting.
Scanty urine.	Scanty urine.
Tympanitic Abdomen.	Tympanitic Abdomen.
Constipation.	Constipation sometimes relieved.
Collapse and reaction.	Collapse and death.
Passage of gas per rectum.	
Discharge of intestinal contents per rectum.	
Slight recurrence of constipation.	
Convalescence.	

These are the general symptoms indicative of occlusion,

and, when compared separately or collectively, become guides to treatment.

"Unusual weight and distension of the abdomen, with or without pain."

This sensation the patient is cognizant of, in most cases, during the early stage of those occlusions which arise from functional derangement, such as I have relegated to the first division, and is very frequently present in the more chronic forms of obstruction of both classes. By chronic forms of the second class I mean the defects long remaining after the primary obstruction and urgent symptoms have passed away, a condition at times erroneously attributed to an atony or a torpid condition of the bowel, but one actually caused through some lesser degree of the original difficulty still remaining.

This sensation of weight and distension of the abdomen, while it may be the initial sign of a rapidly developing occlusion, may also be the only sensation, none other succeeding. It then forms the type of a chronic abnormality of intestinal function, designated by the sufferer "costive habit," "wind," "sluggish bowels," &c. But if the patient is carefully cross-examined, the practitioner will probably find out, viz:—that the mildest aperients rather increase these unpleasant feelings, and that a drastic purge much aggravates the uneasiness, and sometimes brings away casts of the bowel. Enemata, also, do not give the relief expected, though they do not give rise to so much distress as aperients. If the physician is consulted early, it becomes very important to detect these symptoms, and to recognize their value as guides to treatment, so as to avoid hastening the development and increasing the intensity of the suffering which the patient may have to undergo.

"Thirst."

This is a variable phenomenon in this disease. In the more chronic forms it may be absent, but in the acute condition it is always present and greatly depends upon the frequency of vomiting. Vomiting again, is much influenced by treatment. Where remedies act beneficially on it, the thirst is moderate, and this sign should tend to improve our prognosis, as when the act of vomiting occurs only once or twice in twenty-four hours, fluid is retained a reasonable period, and will be absorbed to supply the system, thus diminishing thirst. When intense thirst long-continued is felt, despite the administration of remedies, the prognosis is not hopeful.

"Pain."

At the commencement this may be very slight, but may so increase as to be agonizing. Sometimes however, the onset of those occlusions which I have placed in the second class is first indicated by intolerable pain, so great that for a short time symptoms of collapse appear. The practitioner can by palpation, combined with the information derived from the patient, detect which is the most painful spot, and thus the region probably implicated. There is one exception to this, viz:—when the obstruction exists anywhere below the ileo-cæcal valve, for as soon as the accumulation is sufficient to strain the valve, pain is felt here, until the fluid in the small intestines has accumulated in bulk sufficiently to open the valve by pressure on its upper side when this symptom passes off. When the patient has sudden and total cessation of pain during primary relief of accumulation, careful watching is advisable lest collapse should follow; again, if this cessation of pain, accompanied by a low temperature and a small quick pulse precede collapse, without a fæcal evacuation, the chance of recovery is highly improbable.

"Dry, furred tongue."

During the first twelve hours of the initial period, the state of the tongue may not vary much from that of health, until pain arises sufficiently acute to exhaust the sufferer. When frequent vomiting sets in however, the tongue becomes dry and furred, and the patient thirsty. In favourable cases, the tongue and thirst are improved by medicine, which acts by allaying the excitement accompanying acute pain, and also by moderating the vomiting so that fluid may be retained in sufficient quantities to supply the physical requirements. If the tongue during the first week, appears persistently dry and furred, although the treatment has been well managed, one may expect a form of occlusion of the second class, a condition which may require surgical interference, or it may be one hopeless in character—*i.e.*, of malignant origin. In such cases the condition of the tongue, is of all symptoms that which can be the least improved by medicine.

"Pulse and Temperature."

In the pulse and temperature we possess the most reliable indicators of improvement or deterioration. If, at the commencement of the disease, the pulse slowly increases in frequency, and is easily corrected by medicine, while the temperature appears to follow the same course, the case may be prognosed as doing well. But should it be noticed that

while the temperature is improved the pulse is reduced only slightly, or not at all, and its volume not increased, or should a sort of discord exist between the pulse and temperature, the prognosis becomes doubtful; for instance, a pulse of 130, with a temperature of 101°, or a pulse of 120, with a temperature of 97° to 99°. As soon as this latter combination happens, sedatives are contra-indicated, as fatal collapse may be at hand. When collapse is accompanied by a slow, nearly imperceptible pulse and a low temperature, permanent reaction may be brought about by stimulants.

"Vomiting."

In most cases vomiting is preceded by one or more of the other signs appertaining to obstruction, and its advent can be delayed, prevented, or on the other hand, prematurely induced by interference. In all acute cases it is a constant symptom, and when frequent, is very distressing to the sufferer. If moderated however, it becomes a very necessary evil, being, when well managed, a valuable aid to recovery. This harassing act, combined with persistent pain, were the principal factors in bringing about a fatal result within the very limited period assigned to these maladies in times past. (1.) The vomiting can and ought to be moderated, so as to disturb the sufferer less often, and so decrease his sufferings. (2.) Thus a longer retention of liquid within the intestine is secured, and thereby thirst is allayed. (3). This extra retained liquid macerates, and reduces to a semi-fluid state the contents of the intestine above the part involved, and when vomiting occurs, some of the reduced matter is ejected. (4.) This liquefaction enables any collection of matter to slip through the diseased or contracted gut before the completion of cure. The required reduction will always bear a relation to the diminution of calibre at the point diseased. For instance, if there be, as in intussusception, much contraction of the intestine, a greater reduction of the solids above the obstruction is required than would be necessary in a case of enteritis before relief in the direction of the anus is to be expected. (5.) Again, as Dr. Brinton pointed out, this liquid collecting at the point of occlusion, acts as a fluid dilator, gradually enlarging the narrowed part. (6). Medicine cannot totally arrest vomiting before the contents of the bowel are sufficiently reduced, and the intestine sufficiently pervious to admit of some fæcal transit. Indeed could medicine attain that end, it would be dangerous to call in its aid; for so long as the primary difficulty exists, periodical relief by vomiting prolongs life, during which aid can be administered; if in obstruction this symptom were absent the patient would die from the ever-increasing distension by fluid.

During vomiting, two forms of material are ejected, the one possessing a stercoraceous odour, the other not. The first is generally held to be a certain sign of obstruction, while the second is deemed equally conclusive of its absence. I believe the opinion entertained regarding the second condition to be as far wrong as that referring to the first is right. But this division does not in my opinion, give a useful clinical classification of the fluid vomited during all the varied forms of obstruction. The division would be better for the purpose of instruction if three qualities were recognized—1, stercoraceous (colour and odour); 2, stercoraceous (in colour); 3, non-stercoraceous. These three appearances are met with in practice, and the presence of any one of them may aid the physician in coming to a conclusion regarding the locality of the ailment. Any of the three qualities of vomit may be observed, and the case may terminate in recovery or death. When the vomited matter is neither stercoraceous in regard to colour nor odour, the difficulty is in the upper portion of the small intestine. When stercoraceous in colour only, then the obstruction is found in the lower portion of the small intestine, or where there is nearly complete occlusion of the ileo-cæcal valve. When decidedly stercoraceons both in colour and odour, then the ileo-cæcal valve is partially obliterated, or the obstruction is in the great intestine and the valve is floating. Of the three characteristic features here attributed to the fluid vomited, the last named is the gravest, inasmuch as it points to a longer tract of distended bowel, and involves greater difficulty in easing the distension by periodical vomiting. Yet the continuance and frequency of vomiting is a far graver symptom than any character which the fluid vomited may possess. If the obstruction is very far down, the vomited matter may appear sometimes non-stercoraceous, at other times stercoraceous, as each act of vomiting does not always empty the whole tract above the obstruction. Stercoraceous vomiting is so prominent a sign in most forms of acute obstruction that several writers have attempted to explain its cause. Up to the time of Dr. Brinton, its occurrence was explained upon the supposition that reversed peristalsis was excited. Dr. Brinton (the must reliable authority I know of) dissented from this doctrine, and for some years after I studied his writings, I had no doubt as to the correctness of his conclusion. Clinical and pathological observations, however, together with some experiments I have instituted, have changed my views.

Against the possibility of the existence during total obstruction of any anti-peristalsis, or that which I have designated retro-peristalsis, Dr. Brinton advances six reasons. First.—That no writings substantiate this action

of the constricting muscles of the intestines. Secondly.—This movement has not been observed in experiments where artificial obstruction has been brought about. In answer to the first and second objections, my reply is that modern physiologists teach that retro-peristalsis can be observed experimentally. His third argument is that as retro-peristalsis is supposed to be caused by extra irritation, why is not fæcal vomiting present in other conditions of irritation of the bowel? He says, "hence, the mechanism of the process must be sought not in any chain of causation beyond mere irritation, but in a single fact obstruction," *i.e.*, total occlusion. My reply to this postulation is that fæcal vomiting can and has been induced by irritation, when the form of total occlusion was not present. The practice of our early predecessors shows this as witnessed by Woodhead, and Sydenham, and a recent example is recorded in the *Lancet* of 1879, where fæcal vomiting was one of the symptoms observed in a case of lead colic. This was not a case that Dr. Brinton would term obstruction. The fourth argument advanced by him is that as *post-mortem* examination shows dilatation at the point of obstruction, the current within the tube must have been continuously forward to that point. To this the objection can reasonably be advanced, that probably the combined movement of both retro-peristalsis, peristalsis, and pro-peristalsis at times exists during the hyper-excitement which is always present in these cases, and that combined with the tendency of the liquids imbibed, to gravitate towards the locality of obstruction, this is the principal factor in producing any dilatation at the strictured part. The fifth reason given by Dr. Brinton in support of his theory is this:—that inasmuch as the portion of intestine below the obstruction propels its load towards the rectum, no reversed action takes place above, as both are subject to the same irritation. This admits of being answered by any person who has had clinical experience of these diseases, and who knows that the gut below the obstruction if not specially stimulated is quiescent. The sixth argument given is that in spite of the persistence of fæcal vomiting "castor oil, crude mercury, and other substances easily identified" find their way to the seat of obstruction. But probably no form of peristalsis, during its movements either upwards or downwards, acts so as to completely occlude the calibre of the gut, consequently any fluid, even castor oil, must by gravitation, find its way down.

Dr. Brinton gives the following as his conclusions, and as explanatory of the action of the mechanism of fæcal vomiting.

"The movement proper to the healthy intestine is a circular constriction or peristalsis, which travelling slowly and intermittently down its

muscular wall, propels its contents in a direction from the stomach towards the anus. And when any part of the intestine has its cavity obliterated by an immovable mechanical obstacle, its contents, propelled by such a peristalsis, are stopped at the obstructed point. Here they gradually accumulate, so as first to fill, and then to distend, a variable length of the canal, with a more or less liquid mass. But a peristalsis, engaging the wall of a closed tube filled with liquid, and falling short of obliterating its calibre, sets up two currents in that liquid: one at the surface or periphery of the tube, having the direction of the peristalsis and itself, and one in its centre or axis, having precisely the reverse course. Those particles of the liquid which are in contact with the inner surface of the tube are propelled onwards by the muscular contraction of its wall. And this propulsion is necessarily accompanied by a backward current in those particles which occupy the axis or centre of the canal."

"For example, let pl. 1, fig. 1 represent an inflexible closed tube, filled with liquid, and fitted with a perforated septum, capable of moving freely along its interior. Let such a septum be moved towards the closed end of the tube, and it not only propels some of the contiguous particles of the liquid in the same direction, but also exerts a pressure on the whole mass of liquid contained there. The pressure being equal in all directions, part of the liquid escapes backwards through the central orifice of the septum. This backward current is constantly lengthened as the septum advances towards the closed end of the tube. And the slow successive movement of a series of such septa (fig. 2) would establish two continuous currents in the liquid contents of the tube—a peripheral of advance, and a central of return, to and from its closed (or obstructed) end repectively."

"It is scarcely necessary to say that such a model differs in many respects from a living intestine; and that the substances occupying the latter tube at its obstructed point would in no case be returned towards the pylorus, unmixed and unaltered, along the mathematical axis of the bowel. Many circumstances indeed concur to interfere with the exactness of those two currents in the obstructed bowel. Among such we notify the flexible and elastic character of its walls, the variable intensity, rapidity, and frequency of their muscular contractions, the peculiarities of the mesenteric arrangements, and the continued movements both of the belly and of the body generally. Even in the inflexible model, it would depend upon a variety of details—especially on the length of the column of liquid, the number and width of its septa, and the rapidity and energy of their movements—whether the forward and backward currents would

constitute two distinct streams, separated from each other by a comparatively motionless interval of liquid, or whether they would be broken up in effecting a uniform and intimate mixture of the whole contents of the tube. And of course any considerable approach to a solid consistence of the intestinal contents would *pro tanto* interfere with their circulation; chiefly, however, in the sense of postponing it until the incidents of intestinal obstruction—the addition of liquids effused or secreted by the canal and its appendages, or taken into it by drinking—had diluted the contents to the necessary degree of mobility. But no matter how imperfect, irregular, or confused the two currents might be, it is evident that the tendency to establish them would be so far effective, as that the protracted and energetic peristalsis which is so characteristic an element of intestinal obstruction would of necessity result in that condition which chiefly requires explanation in fæcal vomiting—namely, in such a mixture of the contents of the intestine, as allows some of them to return from a lower, to a higher, segment of this tube (pl. 2, fig. 1 A)."

"The facts and the theory of fæcal vomiting may, therefore, be thus associated. In most cases of intestinal obstruction, the patient vomits matters evidently fæcal. The appearance of these matters, and the subsequent necropsy, often conclusively show that they have traversed a certain length of intestine in a direction towards the stomach; that they have returned, for example, to this organ from an obstruction seated in the lowest part of the ileum, or even in the colon. This reflux is the result of the intestinal peristalsis; which acting on an obstructed and distended bowel, not only effects the ordinary propulsion of its contents towards the obstacle, but also gives rise to what is, theoretically, a backward current in the liquids occupying the centre of the tube; practically, a *tendency* to such a current. However interfered with by other movements, abdominal or intestinal, this tendency has sufficient energy to effect a more or less intimate mixture of the intestinal contents; and to return some of them from the obstructed part, to a higher segment of the canal; generally, indeed, to the duodenum or stomach, whence they can be expelled by vomiting."

"Amongst the circumstances which modify this process are the following:—1. The dilatability of the obstructed bowel; which, on the one hand, by yielding to the pressure of peristalsis, delays and opposes the axial current; while, on the other (since the intestine acquires much of its increased width at the expense of its normal length) it diminishes the length through

which this current has to extend in order to provoke the fæcal vomiting. 2.—The paralysis which, sooner or later, results from increasing distension removes, as it were, to a higher point of bowel, the end of that peristaltic movement, which defines the point of reflection of the superficial current, or the commencement of the axial current in the fluid intestinal contents (pl. 2, figs. 1 and 2). 3.—In the large intestine, the presence of hardened fæces above the obstruction seems sometimes to have a temporary effect of the same kind; the impacted mass forming a secondary obstruction, to and from which the peristalsis, and its reflected current, respectively tend. A somewhat less solid consistence of the matters originally present at the obstructed part, may also suffice to prevent, or at any rate to defer (see fig. 4 A), their transmissions backwards towards the duodenum. Lastly, the vigour, frequency, length, and duration of the peristaltic movements of course influence the establishment of these opposite currents; and the completeness of that mixture which is their chief practical result. From reasons of this kind, the ingestion of frequent and copious draughts of water by an animal with an obstructed intestine, is sometimes associated with a vomiting so immediate and energetic, as to return this liquid from the stomach or duodenum, scarcely altered save in its having acquired a greenish bilious colour; and certainly devoid of fæcal odour, as well as of any considerable admixture with intestinal contents, such as are afterwards found at the obstruction."

The preceding quotation is extracted from Dr. Brinton's volume on "Intestinal Obstruction," pages 11 to 16, and contains the evidence upon which he denies the occurrence of retro-peristalsis, and that this direction of peristalsis is necessary to the production of fæcal vomiting. The physical experiments Brinton gives as favouring his view are shown in pl. 1, figs. 1 and 2. These I repeated, also with modifications, the better to ascertain the existence and direction of the currents within a flexible and an inflexible tube, and with tubes open at both ends, and also open at one end only. In the first experiment the model shown in pl. 1, fig. 1, was used, the piston being a perforated india-rubber disc, thus securing a close fit within the glass tubes, as tubes of this material of more than twelve inches long vary slightly in diameter at different parts of the same tube, but instead of the tubes being filled with water only, calcined magnesia was added, and as soon as the magnesia was deposited at the dependent point—closed end—then the piston was inserted into the open end and rapidly advanced towards the bottom, but was arrested before it reached the sediment of magnesia. No disturbance of the magnesia

could be observed. This showed that the pressure exerted upon the liquid by the descending piston produced only the single current of displacement, as shown in pl. 1, fig. 4 B, a current commencing to ascend at the immediate point of the plunger, and returning to the position behind the piston. This amounts to simple displacement by the india-rubber disc, of fluid equal to its own bulk. The current of displacement which advanced through the central opening of the disc returned as soon as it had passed through the constriction. On rapidly withdrawing the piston, the sediment was much disturbed.

This first experiment shows that any pro-peristalsis in the direction of the cul-de-sac does not produce any current, but simple displacement of fluid by the advancing body. In the second experiment a fresh pig's bladder was attached to the lower end of a glass tube, open at both ends, as shown in fig. 3, pl. 1. This rough imitation of an obstruction was filled with the magnesia and water and the piston inserted and quickly pushed forward, but no perceptible effect could be seen in the contents of the bladder ; but when the piston was withdrawn the sediment was much perturbed. A third experiment was made. Two one-inch bore glass tubes, with open ends, were joined by a rubber tube, an inch and a quarter in bore (as shown pl. 1, fig. 5), and were filled with the magnesia mixture ; and as soon as the deposit of magnesia had formed at the points C and F, with clear fluid from C to D and from F to D, a piston was introduced at the opening B and rapidly passed down towards F. No turbidity was seen at F, but some effect was detected at C. On withdrawing the plunger quickly, there was much agitation and turbidity produced from F to D, but very little from C to D. This experiment was varied by withdrawing the rubber plunger and then suddenly compressing the rubber tube at E—a rude imitation of a spasm or non-progressive peristalsis—when a slight agitation was observed.

The fourth experiment is illustrated in pl. 1, fig. 6, one of the twin tubes was closed at A, otherwise the model was identically the same as in the previous experiment. This model was filled with the fluid mixture used on former occasions, and the piston introduced at B, and rapidly advanced, but no effect was noticed at either D or C. Now the plunger was withdrawn, and the rubber at E compressed. This produced no motion at C, but the deposit at D was diffused throughout the liquid D B. This, again, is a mechanical imitation of spasmodic or general peristalsis with occlusion at one end, but it gave no evidence of the existence of a double current, or of any current of the fluid in the direction of the closed end of the tube. These experiments go to discredit the opinion held by some persons that

retro-peristalsis is not one of the causes of vomiting. There has been in existence, handed down from an ancient period, a mechanical form of water motor, which is theoretically the analogue of progressive peristalsis. I refer to the "chain pump." The difference between active peristalsis and the mode of motion given to fluids by the chain pump is, that in peristalsis, motion is conveyed by a series of discs with central defect, but "true" at their circumference; while in the pump the discs are deficient at their circumference, but "true" at their centres.

A careful examination of mechanical, physiological, and clinical facts has convinced me that the teaching of Dr. Brinton explanatory of vomiting during occlusions of the intestines, is wrong, and that no exceptional means are needful, but that the same conditions are present as in health, viz., the conjoint action of the muscles in the abdominal wall, fixation of the diaphragm by its component muscles, with retro-peristalsis, and the action of the longitudinal muscular fibres of the intestines to rapidly correct the "buckling" or replications of the intestinal tube. The reader might ask, how does the intestine below the obstruction behave itself during the excitement of the portion above the difficulty? After the first few hours, if it is not meddled with, it remains at rest, forming a remarkable contrast to the other portion; it is easily aroused however, and when disturbed, this stimulation of the lower portion of the gut increases the excitement of the upper part from the mechanical annoyance it gives the diseased part, not from any nervous reflex action.

There is one form of obstruction which is not attended with the symptom of vomiting—that arising from a loaded rectum. The explanation of this I hold to be that, in the case of a loaded rectum, as soon as any fluid accumulates in the large intestine, from its great capacity to hold fluid, and its form permitting of more direct pressure, the liquid leaks past the accumulation. Thus, there never is sufficient liquid collected to reach the ileo-cæcal valve. This explanation also accounts for the diarrhœa frequently, but not always noticed when the rectum has been many days loaded with fæces. In most cases this form of obstruction can be easily and early detected, attention being drawn to it by the parturient-like efforts of the patient to defecate.

"Scanty urine."

"Diminished secretion of urine is not a constant accompaniment of obstruction, but in some cases there is a very notable diminution, so that none is passed from the bladder for so long a period as from twelve to

twenty-four hours. But this ought to be confirmed by the passage of a catheter. It has been supposed that the quantity of urine secreted bears some relation to the situation in the intestine of the seat of the difficulty, viz., the lower the obstruction, the more secretion. This appears very plausible, and for a long time I believed it, but clinical watching leads me to believe that even if scanty urine depends in some degree upon the length of the intestine above the difficulty, there are other factors which have a greater influence in lessening the kidney secretion, viz., distension and pressure. It is very obvious that in all that portion of the gut subjected to nearly continuous distension, whether by liquid or gas, absorption, as well as other physiological actions, are in abeyance. Again, this continually distended portion of the gut is never more than a portion of that above the obstruction, as simultaneous distension of all the intestine above the obstruction is not practicable within the limited area of the abdominal cavity. To arrive then at an approximate explanation of the phenomenon of diminished secretion of urine, I request the reader to suppose the alimentary canal to be divided into three sections: the first to be that portion below the obstruction; the second that part comprising the portion of gut distended and dilated by matters accumulated, &c., and terminating at the point of resistance; the third part being the remainder, and through which liquids and solids must pass before arriving at the dilated and distended or middle section. Now as no liquid can get to the first or lower portion below the obstruction, this may be ignored. Through the upper or third portion of gut, the liquid imbibed passes, and accumulates in the second or middle section—the part distended. Then this superincumbent weight, with the combined support gained from the resistance of the abdominal wall, induces no small amount of pressure upon the third or portion of intestine leading to the middle portion, or that of accumulation, and as the area of the abdominal cavity limits that of diffusion, it increases the pressure within that area. The result is that the third portion of the intestine has its absorbent power interfered with in proportion to the distension of, and pressure on and within, the second or middle portion *i.e.*, the locality of accumulation. This, I hold, is the proper explanation of the occurrence of scanty urine in these difficulties. This solution of the question tallies with clinical fact, viz., that in those cases where the obstruction is far down in the bowel, and the distension and pressure have been great and prolonged, are to be observed usually, the symptoms of diminished secretion of urine.

"Abdomen tympanitic."

Tympanitis is another of the very obvious symptoms observed in obstruction. In the chronic state or as a sequent of an acute case, a moderate degree of tympanitis always exists, but rarely ever amounts to painful distension. As, for example, after peritonitis, enteritis, occlusions, &c.—when relief of constipation by itself has been accepted as indicating cure, and all treatment has been set aside on this deceptive ground only, (which is very frequently the practice) the result is, that in most cases the patient is liable to a return of his original difficulty, or indeed continually suffers from a mild degree of malaise, which may be attributed to atony, torpidity, habitual constipation, gas in the stomach, fermentation, &c. When searching for this characteristic form of tympanitis, it is well to place the patient in the horizontal position with his limbs extended. The second stage of typhoid fever indicates its onset by a slight degree of tympanitis in the right iliac region, due to the intestinal irritation which induces some amount of gas and liquid accumulation—hence the gurgling noise on manipulation of this region. During the acute condition of obstruction, the amount of distension varies in each case, and bears no trustworthy relation to its gravity. There may be only moderate distension with recovery or death of the patient; while again, there may be so much distension that the front of the abdomen may be raised high above the level of the ensiform cartilage, indicating much pressure within, and yet the case may terminate in recovery. Tympanitis, by varying the contour of the abdomen, and by distending special parts of the intestine, presents us with one clue towards the elucidation of a a very difficult problem, viz., a differential diagnosis. Thus, inasmuch as simultaneous distension of the whole intestinal tract within the limited area of the abdominal cavity is not possible, tympanitis and its almost invariable accompaniments—liquid and gas—can only collect in a portion of either the small or large intestine. If the disease exists in the small intestine, then the abdomen at the umbilicus assumes the globular form, but if it is present in the large intestine some distance below the ileo-cæcal valve, a broader and more cylindrical swelling is observed, and if the distension is not extreme it may appear flattened at the umbilicus. While some relief of liquid accumulation is attained by periodical vomiting, there occurs only an infinitesimal (if any) evacuation of gas during vomiting. But why is not retro-peristalsis equally effective in discharging gas by the mouth? Again, it is generally noticed that gas precedes the relieved intestinal load on its way to the rectum. Can any explanation of this anomaly be given? I believe that a reasonable explanation, based upon physical

and physiological data, can be given as regards the first. It will be admitted that in the absence of the action of the longitudinal and circular muscular fibres of the intestine, during the retro-peristaltic motion of the intestine, no useful relief could be given to the fluid pressure in the intestine, inasmuch as no amount of compression of the abdominal contents by its muscular wall, conjoined with the aid of the diaphragm, could empty the intestines huddled together in the small area of the abdominal cavity, not even with the addition of extraneous force. Consequently, the cause of the non-expulsion of gas from the abdomen must be sought for in the mechanism of retro-peristaltic action.

In discussing the cause of retention of gas, two facts well known to us must be taken into account viz.—1st the great length of the small intestine in comparison to the large intestine, and 2nd, the lower down in the bowel the defective part lies, the greater and more persistent is the gaseous distension; consequently, in those cases that show extreme distension if they are to be relieved of gas in an upward direction through the mouth, it must traverse, in most cases, nearly the whole length of the small intestine. When the practitioner is anxious about the intolerable degree of tympanitis, this distance of return bars the way to relieving the patient by inducing any physiological action.

With the aid of Dr. Brinton's mechanical model, I will try and demonstrate how this lock is caused. This model is shown in pl. 1, fig. 1 and fig. 2. This I believe to be a fair plan of the intestine and its mode of motion, which latter is capable of driving the normal contents of the intestine either upwards or downwards—provided that the centre openings of the pistons are of a sufficiently diminished calibre to enable them to produce an effect when moving at a certain rate of speed. The rate of motion of peristalsis is equal to propelling the semi-fluid, or even fluid contents of the gut (I include under the term motion of peristalsis the action of its longitudinal and circular fibres). Now, any tyro in mechanics must know that in order to apply a motor of this class, capable of giving motion to liquids, to the propulsion of gas, the speed would have to be vastly increased. The inability of the intestine, even in the normal condition, or when incited, to attain more than a certain rate of motion of peristalsis, is the actual cause of persistent gas distension. Now, the second question reasonably presents itself for solution. Why does gas precede the intestinal load, when it has been relieved and is passing down to the rectum?

In other words, if retro-peristalsis fails to pump up the gas, is pro-peristalsis more efficient? Here, again, a few facts must not be lost sight of. As this special difficulty is low down in the bowels, there is a lesser distance to travel, scarcely ever six feet, whereas retro-peristalsis would here have to traverse three times this distance. Further, retro-peristalsis never occurs in the large intestine. This, its nerve supply makes probable, but its valve and muscle demonstrate; again, it is less tortuous, with no sharp replications, and well adapted to discharge gas, when present, easily and rapidly. To some part of this answer the objection may be advanced, that if no retro-peristalsis occurs in the colon, how does obstruction within the large intestine give rise to vomiting stercoraceous both in odour and colour? The reply to this is, in my opinion very conclusive. As soon as sufficient fluid has accumulated on either side of the ileo-cæcal valve to float it, the regurgitation of the contents of the colon into the ileum takes place, and retro-peristalsis in the small intestine with supplementary assistance from the abdominal wall, &c., soon carries the fæcal contents of the colon upwards, and it becomes obvious in the vomit.

"Constipation and its recurrence."

Persistent constipation is the most prominent sign of obstruction, and the cause of nearly all the concomitant symptoms of this disease, yet is itself, in the majority of cases only a sequence; though at times it is the first cause of the obstruction. In some subjects, constipation will not be noticed during the first few hours, as the segment of the bowel below the obstruction is emptied, by the stimulus of the irritation induced by the onset of the disease; while other cases have been observed where diarrhœa had existed many days before persistent costiveness had supervened; these have all as yet been demonstrated to be cases of intussusception, possibly caused by irregular peristalsis. A "loaded rectum" may indicate its condition by a persistent discharge from the anus, with painful attempts at defecation, these being parturient in character. Diarrhœa is not always observed in this state, but the pain and the special character of the attempts to empty the rectum are constantly present. The cause of this discharge while the rectum is loaded is easily surmised. As the liquids accumulate in the colon, they find their way out by leakage around the collection of scybala in the rectum, thus easily simulating diarrhœa, which has occasionally given rise to a wrong diagnosis. This mild and easily relieved form of obstruction can be readily diagnosed by a digital examination, per rectum, in the male, and also per vaginam in

the female. The period of persistent constipation in well managed cases may vary from five to fifty days; but about thirty-six days would, in my opinion, be close to a correct average. This may be again divided into three periods of twelve days. The first is one of doubtful prognosis. The second, if the case be so prolonged, is a hopeful time; while in the third, should relief have been long enough delayed for it to be entered upon, and should no malignant disease co-exist, permanent cure may be promised. Relief of constipation is possible in most instances, by attention to certain details, though cure may be impossible. Again, relief at the part obstructed may take place some hours before the bowel is emptied *per anum*, gas being discharged for some time previous; this in all cases precedes the collection on its way downwards. While primary relief, with the least risk to the patient, depends upon the strict practice of certain dietetic and therapeutic means, so the recurrence of unpleasant and injurious secondary constipation can only with certainty be avoided by prolonged adhesion to the details attended to in the treatment of primary constipation: otherwise there may be secondary, tertiary or even further accumulations, with symptoms equalling in intensity those of the preceding obstruction, ultimately exhausting the patient, or much delaying the cure. This delay tends to form a chronic diseased state of the bowel—a condition consistent with life, but nevertheless permanent and obvious to the sufferer. The relief of constipation informs us only that the contents above the obstruction have been reduced to a sufficient degree of fluidity to be able to pass through the intestine, now changed in form or crippled in function. It seldom indicates a cure as it is often supposed to do; but it affords a favourable element in prognosis, and is a step to a successful cure. The rational treatment of obstruction necessitates that some of the symptoms should be prescribed for; but constipation is one that requires no direct interference with. Constipation is a sign which, beyond all others, distracts the physician, and which is liable to lead him astray in the direction of active interference, where he is certain to be followed by the patient's friends, who consult together, and soon conclude that this symptom is the cause of all the patient's suffering, and must be grappled with, and even at some hazard treated first and foremost. These amateur, but not the less emphatic opinions, in many cases goad the physician, despite his doubts or better knowledge, to permit the administration of a purgative or some vile concoction in the form of an enema. This treatment much intensifies the disease and increases the

evils previously present. But such aggravation is taken as evidence of retrogression of the disease rather than of questionable treatment, and the *malpraxis* is repeated until the patient either recovers, despite the well meant but injurious meddling of those around him, or perhaps even until he prematurely succumbs.

"Collapse and Reaction."

Collapse is the gravest of all the symptoms attendant upon intestinal lesion. It is often caused by some indiscretion, as by attempting to rise from the horizontal position, or from errors in treatment by those in attendance; also by the sudden diminution of pressure due to the relief of accumulation through the obstruction, perforation of the intestine, the sudden strangulation of a portion of the gut, or by the exhaustion of the sufferer. If it occurs as an initial symptom, it may arise from perforation, strangulation, hernia, or the invasion of the peritoneal cavity by some matter foreign to it. When collapse is the initial symptom, or when it follows the relief of obstruction, a short period of reaction can always be brought on, and in many cases permanent reaction can be secured by judicious management. When collapse is caused by the patient or his attendants, reaction is difficult; and should it occur from the exhaustion of the patient's strength, reaction is still more doubtful. In collapse, from any of the previously enumerated causes, temporary reaction in some cases is not impossible by stimulation. By taking the rate and tension of the pulse, and comparing this with the registration of the thermometer, it is possible to arrive at a fair estimate of what collapse may indicate in all cases, and to predict with some confidence the condition likely to follow this gravest symptom. For instance, if when collapse has set in, the pulse and temperature are in harmony with each other—*i.e.*, if there be a slow, nearly imperceptible, pulse, with low temperature—permanent reaction may spontaneously follow, or more probably, by the aid of suitable means; but should the pulse be rapid, thready, and nearly imperceptible, with a low temperature, the prognosis is highly unfavourable. To these two rules there is an exception in collapse from exhaustion. In this the temperature and pulse may harmonize, and by aid of stimulation some degree of reaction may be established, but it is neither complete nor permanent. This form of collapse is seldom met with previous to the second or third week. Collapse with discord between the pulse and temperature—low temperature and quick pulse—

justifies operative interference, especially if the condition has been developed rapidly (within an hour or two); but this sudden collapse seldom happens sooner than the third day, and not later than the fifteenth day, and at times points to some mechanical cause, capable of being removed by manipulation. But should a collapse attended by a discord between pulse and temperature develop slowly, occupying four to ten hours ere it is complete, and occurring any time after the third week, then invasion of the peritoneum, or malignant disease may be suspected.

"Passage of Gas and Fæces per Rectum."

A downward discharge of gas in all cases precedes fæces during a period varying from an hour to two or three days. Though gas precedes the primary relief of the accumulation consequent upon obstruction, yet this does not indicate that it has passed through the accumulation at the part diseased. It may have followed the intestinal contents until they arrived within the colon, where the conditions, mechanical and physiological, exist, which permit it to get in advance of the excrementitious matters. This early discharge of gas often relieves in some degree the distension hitherto present. The fæces first passed are sometimes hard, sometimes pultaceous. If hard, then the segment of bowel below the obstruction was not entirely empty at the moment the obstruction was formed. If it was (as it is in most cases) empty, the discharge is pultaceous at first, and is followed by more of a semi-fluid or watery consistency, which discharge may continue from one to three days, when secondary constipation may occur.

"Secondary Occurrence of Constipation."

After the relief of primary constipation, a period of relaxation is observed, which may last from one to four days, when secondary constipation may be noticed. After the removal of this again, a third or fourth constipation may happen, each accumulation lasting for a shorter period and being followed by a longer interval of relief. These are attended by symptoms gradually diminishing in intensity and requiring medicine, but of lesser potency, provided certain rules are still adhered to. If these are neglected the recurrences may cause symptoms as distressing to the patient as those which accompanied the primary constipation, and may delay or hinder recovery, supposing the case be curable. If the disease result from a lesion which cannot be permanently cured, recurrence of constipation may take place fre-

quently, and extend over some months, with intervals of freedom from it; the duration of such intervals depending much on the management of the case and the cause of the constipation. The detection and management of the recurrent constipation which follows the removal of the primary constipation are important, for in their absence curable cases may run a course simulating malignant disease, and thus wear out the sufferer. If these recurrences are not correctly diagnosed, then errors of prognosis and treatment will follow. Curable cases will be otherwise judged incurable, and their symptoms ascribed to tumours, malignant disease, palsy of gut, atony, or to adventitious bands impeding peristaltic action. The period of primary constipation is, from its duration and the suffering which it entails, a severe test of the patient's stamina; and if a second or more of such tests be allowed to take place, no matter whether the case be curable or not, life is endangered, as each recurrence of constipation will require the same treatment as the primary one. Again, the non-recognition of the existence or possibility of these recurrences, the importance of diminishing the intensity of the symptoms, also the duration of time and frequence of the recurrence of constipation, must tend to produce permanent defect. The improbability of any chronic condition remaining will be in proportion to the infrequency and shortened duration of these recurrences.*

"Convalescence."

In most cases it is far easier to diagnose the presence of the disease than it is to diagnose the restoration of the intestine to such health as to permit the patient to dispense with care and medical advice, supposing the usual signs to have all disappeared. The absence of the general signs of the disease is not certain evidence that the bowel is fit to perform its ordinary duty, but is of some aid in enabling us to decide whether the patient should be allowed to relax some of the restraints placed upon him. The patient should be placed in a horizontal position, and the contour of the abdomen noticed, whether flattened, or better, slightly concave; then it should be manipulated, to detect if any gurgling noise can be heard indi-

* The American Journal of the Medical Sciences, vol. lxxxii-1881, page 263, contains a report of a case of chronic obstruction with frequent secondary recurrences in which the medical attendant performed gastrotomy and removed six and a half feet of intestine for which operation, the removed portion gave no justification, the case being an easily curable one by medical treatment alone. What is most remarkable in this case is that the incorrect treatment which was practised prior to the operation was repeated immediately after it, yet the vivisected patient lived despite this unnecessary operation but instructive experiment. It would be ironical to term the procedure in this case medical or surgical treatment.

cative of liquids and gas still collecting in the gut; for gas should not be present when perfect cure has been secured. If this examination is satisfactory, then the effect of the removal of certain restrictions hitherto placed on the patient's habit should be noticed, and if no signs of the disease show themselves, gradually all restraints may be set aside. Vigilance, however, must be exercised for some time even after all these precautions have been taken, as no harm will arise from too prolonged a control of the patient's habits; but delay of cure and regaining of bodily strength might result from its not being observed.

CHAPTER III.

GENERAL AND DIFFERENTIAL DIAGNOSIS AND PROGNOSIS.

The diagnosis of intestinal obstruction can be effected easily, yet there are to be met with lesions not connected either with the intestine, or its covering, which induce symptoms simulating it, such as the traversing of a calculus along the ureter, of a gall-stone along the bile duct, or the rupture of abscesses, malignant tumours, and of aneurismal sacs into, or in the neighbourhood of, the peritoneum; but should any of these lesions lead to error of diagnosis, it is satisfactory to know that the treatment is the same in all.

Case 36 is an example of the rupture of a suppurating malignant tumour into the peritoneum. In the *Lancet*, Dec., 31st, 1881, there is the report of a case of hæmorrhage into the mesentery attended with collapse and death. The signs present were those of obstruction, and as the sufferer had an old hernia, this made obstruction more probable. In the same periodical, dated March 18th, 1882, is found the report of a case where an aneurism of the abdominal aorta caused obstruction, but death arose from bleeding into the peritoneum. Such an instance happened in my own practice, March 17th, 1882. I was requested to visit a patient in Hill street, whom I found in a state of collapse. His medical history was that early in the morning he had an uneasy feeling within the abdomen, but not urgent enough to induce him to summon medical aid. Suddenly at the expiration of six hours, he was seized with agonizing pain in, and free evacuations from, the bowels, the pain being so great that he rolled about on the floor of his apartment, where I found him in a state of collapse, no pulse being perceptible at the wrist. His skin did not appear paler than that noticed in collapse from obstruction. He was perspiring profusely. Ten minims of liquor atropiæ were now given by the mouth; but after the lapse of an hour no effect had resulted. Then five minims

were given by the subcutaneous method, and in fifteen minutes the skin was warmer and perfectly dry and the pupils dilated, but the pulse not improved. He died two-and-a-half hours after my first visit. During all this time he was perfectly conscious and complained of pain only. The *post-mortem* revealed the existence of an aneurism, which had burst into the peritoneum. This case closely simulated perforation of the stomach; but the short period which elapsed from the onset of the prominent symptom until death, created in my mind some doubt as to the correctness of my diagnosis.

While acute obstruction is easily diagnosed, chronic, or what has been termed "obstruction with latency of symptoms"* has been hitherto either overlooked or ignored. This is due in some instances to the relief of constipation being accepted as proof of cure. In other instances when there is no history of acute obstruction, and the bowels are occasionally relieved, practitioners are apt to conclude that no degree of obstruction is present, and to ascribe the malady to some "debility of the intestine," "general ill health," the "habits of the sufferer," or to some other indefinite cause. The signs of this chronic state are not special, but are of the same type though lesser in degree than those of acute obstruction; and the faulty practice which increases the symptoms of the latter, also develop those of the former. The signs obvious to the practitioner are, variable tongue—the pulse and temperature remaining nearly normal, The abdomen, if examined while the patient is reclining, will be found slightly tympanitic; and at times, ere he has undressed for examination, the gurgling of the gas and liquids retained in the intestine can be heard.

* *Vide* BRITISH MEDICAL JOURNAL, Aug. 31st, 1878.

If the patient is allowed to state his case without being prompted, he will inform the practitioner that he suffers from "wind in the bowels," with a sensation of weight, or even distension of the abdomen, that certain articles of food increase his distress, and that mild aperients (though he suffers from a costive habit) aggravate all his unpleasant sensations and give rise to colic, even though evacuations result. Again, sometimes when he uses enemata, a portion only of the water used returns, and when the enema has been effectual, still the uncomfortable weight and distension of the abdomen are not lessened; and he may mention that "slime," "pieces of stuff like leather," &c., follow the act of defecation. All these discomforts react on his spirits, and he feels melancholy, &c. In search of cure he has tried varied articles of diet, medicine, change of air, &c., and has been cured several times; but, after a period of apparent health, his trouble returns. Most of the physicians consulted had been able to give temporary relief; but the one thing needful is *permanent* relief. This is the usual information contained in a statement made by the patient.

Case 29 of this treatise is an excellent illustration of chronic obstruction not diagnosed. The BRITISH MEDICAL JOURNAL, Aug. 31st, 1878, and May 2nd, 1881, each contains another As soon as the acute signs appeared the disease was recognized.

The confidence with which the practitioner is able to diagnose that obstruction exists is not felt when he tries to determine its

cause, no matter what means are used or signs observed. There are to be met with two exceptions to this rule, namely, cases of hernia and of rectal accumulation. Differential diagnosis requires time, and can only be attempted when the majority of the signs following obstruction have appeared, the interpretation of which, with the observation of the effect of remedies upon them are the best data upon which to hazard a differential diagnosis. Even with these data it is not possible to get reliable conclusions as regards the form of obstruction, though they are trustworthy grounds for deciding as to the gravity of the case, or in deciding the line of treatment, and settling the question whether the case is medical or medico-surgical. Happily, this difficulty of differentiating is not of vital importance to treatment.

Dr. Brinton asserts, with the same confidence as his successors, the possibility of forming a differential diagnosis. At page 98 of his volume on Intestinal Obstruction when referring to one form of obstruction he says :—

"*Constipation*, properly so called, as implying the delay and impaction of fæces in some part of the large intestine, is not only an infrequent cause of obstruction, but admits of a definite diagnosis. To provoke marked (not to say dangerous) symptoms of this kind, the accumulation must generally be so large and solid, that an examination of the belly and rectum would rarely fail completely to clear up the case, and to show that no such procedure as operation could be thought of."

Here Brinton teaches that constipation admits of a definite diagnosis, &c., and that the accumulation must be large and solid. This is not in conformity with my own experience, for

the *quality* of the *gut contents*, rather than their quantity or consistence, determines the formation of obstruction as distinguished from simple constipation. Again, at page 90 the necessity of a differential diagnosis is insisted on.

> "If the process of mechanical obstruction cannot be distinguished from that of enteritis, the physician may search in vain for principles to guide his administration of food or remedies. And if one form of obstruction cannot be distinguished from one another, the Surgeon can scarcely venture to operate with any reasonable chance of success."

This seems to be universally accepted as correct, and has injuriously affected the treatment of these lesions. Differential diagnosis would be valuable I admit; but as it is so difficult to arrive at, it is satisfactory to know that curative treatment can be practised without. No matter what may have been the cause of the disease, the treatment (dietetic and therapeutical) at the commencement is similar for all forms. The study of the signs alone of obstruction enables us to correctly decide as to the treatment, whether therapeutical or operative, and so long as the difficulty of differential diagnosis exists, necessity compels us to pursue a course of symptomatic treatment. The case previously referred to at page 70, and taken from the *Lancet*, Dec. 31st, 1881, is an excellent proof of my contention. There existed in that case all the signs of obstruction from hernia, yet trusting to the interpretation of symptoms only, and ignoring what appeared to be an obvious cause, no operation was performed, and the *post-mortem* confirmed the sagacity of the surgeon.

It is the habit of teachers, when discussing the question of differential diagnosis, to mention certain signs as precisely pointing to this or that cause; but I maintain that "all forms of obstruction, sooner or later, develop signs akin in detail," Certainly, in most cases it is not difficult to detect a hernia by a proper examination, or painter's colic from the patient's habit, and when obstruction co-exists with paraplegia, the latter may throw light on the cause. The intestinal lesion of fever or cholera can be easily diagnosed. Enteritis, peritonitis, ulceration, perforation, stricture, intussusception, volvulus and strangulation ought to be placed in the category of lesions difficult to differentiate from one another, even when such aids as bougies, enemas, &c., are employed, all of which are hazardous, and their uses have often placed the patient beyond the reach of aid. No writer has omitted to mention special signs as indicative of the existence of intussusception, that less or more blood, or that some of the invaginated intestine will be found in the intestinal evacuations; but these signs are absent in the majority of intussusceptions, and there are good reasons for suspecting that in most instances where blood was observed, the kind of treatment hitherto in vogue is accountable for this as well as for other symptoms. Again, the detection of sphacelus is rare in cases of intussusception, unless the invagination is an unusually long one. My proposition is that, though the various forms of obstruction cannot with anything approaching to certainty be differentiated,

yet the observation and treatment of symptoms enable the practitioner to manage them with a success never hitherto attained.

Dr. Brinton has contributed to prognosis the following axiom :—

"By so much as we can lessen the rapidity, and increase the duration, of his malady, by so much do we therefore multiply his chances of recovery."*

The correct interpretation of which is that if the patient's chance is represented by 7 out of 100 at the end of the first week it stands nearer to 75 out of 100 at the end of the third week, if no malignant disease exist. Dr. Brinton stoutly maintained that a general reform of treatment would result in a lessened rate of mortality, and that cure by therapeutic means only, would be met with even in cases involving total occlusion; as, for example, a volvulus or strangulation.

"One or two such recoveries have to all appearances occurred in my practice. Fortunately for the patients, however, the exact details of the process remain uncertified."†

Subsequent clinical and *post-mortem* reports supply evidence that his surmisings were no exaggeration.

In my analysis of symptoms, I have enumerated signs which point to a state of this disease inimical to a successful termination; these being sometimes defect of function, inflammation, degeneration of tissue, or mechanical hindrance; the latter, in the majority of cases, not being amenable to medicine. Among the difficulties almost inseparable from all obstruc-

* Op. cit., page 103. † Op. cit., page 100.

tion, Brinton places the paralysis resulting from the distension of the section of intestine just above the occlusion.*

"The mere paralysis of the obstructed bowel, once fully developed sometimes renders any subsequent removal of the obstacle of little avail towards the re-establishment of the intestinal functions. The enteritis and peritonitis which generally follow this state are even more directly fatal; and may be regarded as adding to the phenomena of obstruction, those of diseases which are scarcely more deadly from the vital organs they involve, than from the prostration and collapse they produce in the system at large."

Such a prognosis discourages the possibility of correcting this by after treatment. But I believe that by avoiding secondary recurrences of constipation, the physician may confidently hope to cure this complication or sequence of obstruction. Hyper-distension of the bladder from retention of urine is a parallel condition. This viscus, we know, becomes paralysed from prolonged distension, yet by the employment of means to prevent any recurrence of distension it soon regains the power of expelling its contents at will. In the case of an intestine merely paralysed from the same cause, the same principle of treatment will bring about a like result, viz., restoration of muscular power. If the case has been one where there has been frequent recurrence of avoidable obstruction the prognosis is not very encouraging, as these relapses have brought about alterations of tissues, so that the gut has degenerated to a mere passive tube, and the patient cannot expect more than temporary relief.

Some years ago I visited (in conjunction with my friend and fellow-townsman, Dr. Adam) a case of this character. The patient had

* Op. cit., page 20.

been an inmate of a public hospital, and was discharged as incurable. By the advice of Dr. Adam he confined himself to a very restricted dietary—containing a minimum of waste matter. This prolonged his life for many months, but he finally succumbed from exhaustion, and the *post-mortem* showed that eighteen inches of the small intestine had become a passive tube diminished in calibre and circumference.

Even when a portion of the intestine has become a passive tube, life may be prolonged under certain conditions. Cases are to be met with in which the patient suffered long, but lived to an advanced age.

Several such sufferers have come under my observation. One patient, a lady, suffered for many years, and during the early period of her ailment, discharged per anum, casts of the bowel, varying in length from one foot to three yards long. Her medical attendant examined and measured them. Whenever she resorted to the use of aperient medicine, she had to remain in the horizontal position, otherwise the desired effect would not follow, but colic would arise with nausea. This case brought to my recollection another related to me by the late Dr. Banner. A gentleman had a fracture in the lower extremity, which necessitated his being confined in the horizontal position. With no history of previous obstruction, he informed the doctor that evacuation of the bowels was impossible in that position, and that to procure relief he had been for years obliged to assume the upright position. It was decided at a consultation that his so doing would endanger his life, and he remained quiet in the horizontal position. Obstruction arose, and death followed. The *post-mortem* revealed the existence of a tumour, the position and relation of which to the alimentary canal explained the necessity of a certain position at times. This case is an example of permanent mechanical interference with the gut within the abdominal cavity, consistent with years of life without any sign of obstruction.

The risks encountered in enteritis, peritonitis, intussusceptions, and strictures are about equal, if we suppose no errors of treatment to occur. But when mistakes in advice or prescribing are made, life is more imperilled in enteritis or peritonitis than in intussusceptions.

Of the mechanical class of obstructions intussusception is the most amenable to treatment by medicine and other therapeutic means. As operative measures are excluded, the prognosis is much better than in the remainder of this class. There are on record recoveries, even under adverse circumstances, when the invaginated gut varied in length from three inches to as many feet.* With the exception of invagination of the bowels, obstructions of the second or mechanical class, when known or suspected to exist, then from our experience of their nature the prognosis must be discouraging. It is true that during these late years it has been demonstrated that correction has taken place in volvulus, and in volvulus and intussusception combined. Brinton thought that it was probable that many such cases had happened, but does not seem, luckily for the patient, to have had an opportunity of verifying his suspicion. He asserts that, "In scarcely any instance of obstruction is death, strictly speaking, certain."

Case 25 is an illustration of what amount of correction is possible. In that case there was intussusception of the ileo-cœcal valve and a portion of the small intestine isolated as well. My esteemed fellow-townsman, the late Mr. James Long, showed me the notes of the *post-mortem* of a case where nearly the whole intestine was one immense volvulus—isolated, the jejunum being in direct communication by adhesion and an ulcerated opening with the sigmoid flexure at a part just ante-

* *Lancet* vol. 16, page 7.

rior to a cancerous mass which totally obstructed the bowel. In this case a raisin introduced by the mouth reached the anus in seven minutes.

Although I do not know of positive evidence demonstrating that occlusion from fibrous bands can be removed without operative interference, still there are reasonable grounds for believing that this has actually happened. The knowledge which has been acquired of late years regarding the behaviour of the cat gut ligature suggests a possible mode of resolution. Large arterial trunks have been strangulated by this means, sufficiently to arrest the flow of blood for many days; but its transit has been resumed when the ligature has yielded to its opposing force. Cat gut applied as a ligature is a close imitation of those intra-abdominal bands which strangulate the intestine. When the intestine has been grasped by one of these fibrous strings, if the latter is not strong enough to resist the force it is opposed by, it will soften and relax its hold, or even become severed. Should either of these eventualities happen before the vitality of the included intestine has been seriously depreciated, spontaneous relief may follow. But if the cord have sufficient power to resist the intestine and its contents, then death of the included gut and patient would be the termination of the case, except art were brought to its succour.

Dr. Hilton Fagge, in Guy's Hospital Reports, 1869, vol. xiv., page 371, Case 77, reports the case of a man who had been relieved from acute obstruction, and afterwards

died from phthisis. The *post-mortem* revealed the existence of several bands, so attached to the intestine, &c., that they aroused a strong suspicion of internal strangulation with spontaneous cure.

Brinton also held that spontaneous cure did sometimes happen, and based this hypothesis upon the fact, that cases which ended fatally from this type of occlusion often had an antecedent history of having recovered from one or more similar illnesses* Now, if the previous attacks arose from the same band or cord as that which ultimately caused death, then relief must have arisen from the relaxation of such band, or, from some position of the patient having favoured its withdrawal; or again, the cord may have caused symptoms of obstruction without being tight enough to produce complete occlusion of the gut. Herniæ, at times, give rise to fleeting symptoms of obstruction, though there be no strangulation.

In the LONDON MEDICAL RECORD, issued May 19, 1875, is to be found the report of an experiment showing the effect of ligatures upon the intestines. These experiments, I hold, are evidence in support of the probability of spontaneous resolution of some of the mechanical forms of obstruction.

"Sales-Girons on the mode in which the circulation of fæcal matter is re-established after Ligature of Intestine. 'LA REVUE MEDICALE,' for March 22nd, 1875, contains a paper of extreme interest, which in the absence of any name, we suppose must be attributed to the editor. He states, that whilst making experiments on the way in which temperature is affected by ligaturing the intestine, he was surprised to find that most of

* Op. cit., page 104.

the dogs experimented on, after vomiting and refusing their food, and obstruction of the bowels, began gradually to recover after the fifth day; and about the tenth day they resumed their normal appearance, and all the functions of life seemed carried on as before. He thought at first that the ligature was not properly tied. This led him to make fresh experiments—with similar results. He thinks the mechanism of recovery deserves special notice. When a segment of intestine is ligatured with silver wire, so as completely to obstruct its calibre, if the animal survive and be killed after ten days, it will be found the portion of intestine is adherent to the abdominal wall, and to adjacent coils of intestine, by false membranes, which are easily torn, and often circumscribe little collections of pus. If, without disturbing the relations of the parts, sections are made above and below the portion ligatured, we can easily demonstrate by injecting water that the bowel is once more pervious. There is no perforation of the bowel, but a circular cicatrix shows where the ligature was applied—the two surfaces of intestine brought into contact by the ligature are, so to speak, welded or soldered together. The calibre is normal, except that at the level of the cicatrix, there is a slight circular constriction of the mucous membrane. The metal ligature is found attached to one side, and floating loop-like in the calibre of the bowel. It is easy to understand that, under the influence of the peristaltic action of the bowels, the intestine is cut through by the ligature; but during cicatrisation of the external coats, the mucous membranes have succeeded in separating, thus the patency of the bowel is re-established. Two things help to bring about this result. The first is the thickness of the walls of a dog's intestines; and the other, the nature of the mucous membrane preventing the adhesion of two mucous surfaces. This is then a true recovery. The cicatrix is a genuine cicatrix made up of the three tunics, and is demonstrated to be so by a microscopic examination. Similar results were obtained with hemp ligatures. It was once found that one of these was burst by the intestinal juices. An india-rubber ligature was found encysted, its elasticity doubtless causing this result. If, instead of including a loop of intestine, the ligature was simply tied round the bowel, the results were similar, but never rapid, five days sufficing for the process."

CHAPTER IV.

THE PRINCIPLES OF THE TREATMENT OF INTESTINAL OBSTRUCTION.—DIETARY AND NURSING.

Costiveness, constipation, or the retardation in progress of the intestinal contents is an infinitesimal degree of obstruction; this is my opinion. And I also maintain that when we have arrived at a correct knowledge of the natural method of resolution in this trivial ailment, we have grasped the true principles for treating obstructions in general. It is possible, and there exists proof sufficient at hand to show, that simple constipation can be developed into the extreme phase, which is then called obstruction. In all civilized communities it is the practice to relieve constipation by medicines directly or indirectly stimulating the gut, or by the employment of physical aid such as enemata. To the use of these means for relieving constipation no serious objection can be urged, as any slight harm done has, in the majority of cases, passed away before the evil is repeated. But if the repetition be too frequent, or the means too potent, it may bring on an acute constipation—*i.e.*, obstruction—just as the over-exertion or stimulation of other organs leads to deterioration. Case 31 of this volume is an example of fatal obstruction created by the irritation of a healthy intestine from the injections of medicated enemata, given to relieve simple constipation. Constipation is an ailment from which a large percentage of the human family

suffer. We have some evidence of this in the fact of the existence of innumerable patentees who take so much trouble to supply us with remedies for curing this ailment; and I fear we shall not be able to dispense with these intestinal parasites so long as cooks are skilled in the art of flavouring our viands, thus inducing us to consume daily far more than is needful for life and labour. This over-feeding imposes too heavy a traffic of waste material through the canal; and the boluses with the government stamp must, in many instances, be very welcome. The quantity of food consumed is not popularly supposed to bear any relation to the formation or relief of constipation, the term being generally used to denote a feeling of discomfort within the abdomen, or the non-appearance of the gut-contents after the lapse of a fixed time, this time varying in duration in different persons, each individual having a standard of his own, determined by the experience of his usual habit, or from what he thinks is necessary to the continuation of health. But anyone who has acquired a knowledge of physiology and medicine must know that a standard selected from such grounds only would not be a correct one, as the facts from which we are to judge whether injurious constipation is present or not, are these—the quantity and quality of food consumed and the time of its passage. For example, with a sparse consumption of food, containing but little waste, the bowels may remain inactive four to five days without inconvenience, while a hearty eater, partaking daily of a diet composed of much waste material would at the end of four

or five days, feel some discomfort if there had been no evacuation. As this trivial ailment is so frequent in our days, it may with reason be supposed that mankind were not exempt from it at a period so early that he had not the wit to think of means for its relief; consequently, the relief, if obtained at all, could only have been produced by an expectant method—spontaneously. The theory of this natural mode of removal of constipation which I hold is, that the general malaise caused by the constipation tended to alter the proportion between the solids consumed and the liquids imbibed —the imbibition of liquids being increased by thirst, and the consumption of solids being decreased from loss of appetite, the two prominent signs of genuine constipation. This is my theory of the method by which spontaneous resolution of constipation can occur; and if this theory is kept in view in the treatment of obstructions in general, there will be observed during and after treatment unimpeachable evidence in favour of its correctness. In the following paragraphs is given some of the evidence from which I myself deduced this theory, and which I think is so convincing as to approach closely to positive proof. The illustrations are from both surgical and medical practice.

It has fallen to my lot that the major part of my practice has been surgical, and a large portion of it has consisted in attendance upon patients suffering from fractures. When these were compound, acting from the influence of my early training—the common practice with surgeons,—as soon as the

primary "setting," &c., were performed, the next object to be attended to was immobility of the limb, and that this should not be interrupted but as seldom as possible by not disturbing the patient. As soon as instructions with this end in view were given, the sufferer and his friends would enquire, "How are we to manage his bowels?" Then I would advise a purgative on the second or third day, to be repeated at intervals, under the supposition that this was a very necessary item of treatment to prevent ulterior evils. Such was my method for many years, and is now the method followed by many surgeons. To this plan there are several objections—first, the fracture is much shaken by the use of the bed-pan; secondly, the patient is disturbed at a period when he is excited and has much pain, and as he cannot do much to assist his nurse, he is often roughly handled. Now these evils are much diminished or are totally absent in the third or fourth week; consequently, if the bowels were allowed to remain in a state of quiescence until this period, there would be the advantage of less pain, the fracture being slightly consolidated; and the patient having calmed down has confidence in his ability to assist his nurse. These advantages are palpable aids to a cure, and I determined to secure them by following the method that made prolonged constipation harmless during the existence of acute obstruction. From this practice I now never deviate, as it has been an invariable success from the first, now about ten years ago. The occasions on which I

have prescribed this plan must be very numerous, and fractures are accidents the surgeon so frequently meets with that the correctness of my method can be soon and frequently tested. My practice now is the following, in order to secure the utmost rest in severe fractures of the ribs, neck and shaft of femur, knee-joint or leg, viz.—

As soon as I have arranged the injured limb, instruction is given to the patient and those in charge of him to restrict his food to a breakfast of tea, biscuit, and butter. Midday meal : some flesh broth, thickened with arrowroot, sago, or rice. Evening meal : same as that advised for breakfast; And supper : arrowroot and water, with either wine or brandy added to flavour it, milk being especially prohibited, as the prolongation of the constipation to a spontaneous termination cannot be tolerated by some persons if milk is consumed. I also inform the patient that I desire that the bowels should remain undisturbed one month if possible ; but in these cases I have never been able to prolong the constipation beyond the third week, even when an evening opiate has been taken to ease the pain of the injured limb.

I have resorted to the same method on several occasion that I have been called to attend medical cases, and whenever it was important to keep the patient very quiet, especially in cases of hæmatemesis. Of course, this lesion has necessitated a special diet, in fact, one suitable for obstruction ; and no matter how long the constipation lasted, it was always allowed to terminate spontaneously. Here are examples of this practice :—

In July of last year I was called to visit a patient in Beaufort Street, and found him suffering from a shock, after copious and repeated hæmorrhage from the bowels, which had occurred during the two days previous to my visit. Prescribed morphia and ergot ; prohibited all solids ; confined his

diet to beef tea, arrowroot, or sago and water. This treatment was continued four weeks : bowels acted on the 22nd day, and continued to act two to three times a day for a week. At no time was there any abdominal distension.

Some time about the middle of last year I was requested to visit a lady in Erskine Street, who, on the day of my visit, had hæmorrhage from the stomach. I prescribed morphia and astringents, with restricted diet, but as the stomach did not tolerate the remedies, treatment was changed, and gallic acid prescribed. This was continued for some weeks. Diet limited ; tea, arrowroot, and sago water at first being allowed, after which mutton and chicken broth, with and without pea flour, were added to her diet. Spontaneous action of the bowels took place in the fourth week.

Some three years ago I was invited to visit a sick man in a street out of North Hill Street, in this town, and found him suffering from general debility, and among other symptoms to which he drew my attention there was that of constipation. His previous attendant was an herbalist, and had prescribed a decoction of mountain flax to relieve the constipation. The patient showed fæces passed that day after a dose of the flax decoction. They were hard, smaller in diameter than the normal size, and about seven inches long. The abdomen was slightly distended ; no tenderness on manipulation. Morphia and muriatic acids were prescribed, and his diet restricted, and after a few days constipation, the stools became pultaceous in consistence, and were passed about every third day.

About three years ago I was requested to visit a lady some distance from this town, and found her suffering from progressive paralysis affecting the lower limbs, which incapacitated her from taking any exercise. With the exception of the disease of which the condition of the lower limbs was symptomatic her health was excellent, and, the appetite being very good, she consumed daily a greater quantity than is customory with persons of her age, viz., 60 years. Consequently, an aperient had to be given occasionally. This practice was continued for about two-and-a-half years, when as she showed some signs of mental defect, and declined to take any more medicine, podophyllin, in the form of very minute pills, was prescribed. These she took, as they were easily hidden in some dainty specially prepared, when an aperient was thought to be required. Before long, however, they ceased to have the desired effect, and the evacuations became rare

and mingled with mucus, with slight traces of blood, while the abdomen became tympanitic, and the noise of liquid and gas within the intestines could be constantly heard. At no period would she allow enemata to be administered. Now, the difficulty arose as to how the patient was to be relieved of what threatened to become an acute degree of constipation. Enemata could not be given without the use of violent restraint. Purgatives by the mouth had already developed irritation of the bowel, and to persist in their employment would be to induce a serious obstruction, with the effect of shortening life. I explained the method of treatment by a restricted diet to the friends and nurse in charge of the patient, and they adhered loyally to my instructions, with the result that the bowels acted daily, and that the abdominal symptoms rapidly disappeared; and the patient whose life appeared nearly run out, is again in excellent health, minus the neurotic disorder, which has continued to progress. In this case purgatives were gradually producing an obstruction, but a strict adherence to the natural method of relieving constipation resulted in the cure of the injurious symptoms induced and the prevention of subsequent constipation, the only method by which the life of this permanent invalid could have been prolonged. Case 29 is also clinical evidence in support of the correctness of this theory of spontaneous resolution.

The selection of the diet is all-important in the treatment of all forms of obstruction, and food can be restricted in quantity and selected in quality without seriously lessening the sufferer's stamina, as the period of urgency is never very long, seldom beyond six weeks—a time much too short to kill even by semi-starvation, unless other evils were present to try the patient's endurance. As during this time some amount of assimilation takes place, and the patient's vitality is economized by quiescence in bed, protected by warm clothing and the soothing action of medicine, he cannot starve within the period usually assigned to the disease. It is the disease, not temperance, that may kill him. I have known a case in which a lady retained only momen-

tarily any aliment for seven weeks, yet she recovered and lived for eighteen months after, though the cause of the obstruction was malignant disease in connection with the uterus.

The diet I always prescribe for patients under my care for obstruction consists of—

Arrowroot, sago, ground rice cooked with water, with the addition of brandy or wine, and nutmeg, with sugar, salt, and butter; pea, lentil, or bean flour, cooked with water, then carefully strained, when butter, salt, and a little pepper are added. For a change, I permit any of the flesh broths, these being administered in small quantities, as seldom as the thirst and hunger of the patient will permit. All solids and milk should be prohibited. The latter I firmly believe may cause quite as much harm as any solids. Even with this limited diet it is better to underfeed rather than to push the supply, inasmuch as the sufferer, as I have before mentioned, cannot, within the time we are to expect resolution, succumb from lack of alimentation.

As well as the diet, the nursing of the patient should be attended to. He should be instructed to confine himself to the horizontal position, and advised to lie a few hours on the right, and then to change to the left side. The upper and lower limb should be kept warm, and the shoulders and chest covered, while the abdomen ought to remain exposed, and the foot of the bed be elevated ten inches by blocks under the feet, so as to diminish fluid pressure and lessen its tendency to flow towards the locality of obstruction; this elevation also makes the vomiting less frequent but more copious, When the sufferer is asleep, he should never be wakened to take either food or medicine.

The selection of a suitable diet for the patient, is all important in the treatment of obstruction, and is in most

cases of much greater assistance to recovery than any medicinal or surgical aid. It is my opinion that of these three items medicine is the least in value. If the food is not properly chosen, then the drug which otherwise would best suit the case becomes the most injurious—by giving deceptive ease, enabling an unsuitable accumulation to collect, and thus adding much to the difficulty of recovery.* Again, when temporary relief—*i.e.*, of the primary constipation—has occurred and perhaps medicine intermitted, it is upon the dietary we must trust to avoid a relapse, and make permanent what has been gained.

It is notable that the prevailing custom is to relax nearly all restraints placed on the patient's food as soon as some amelioration of the symptoms has occurred.† Such a departure from rational treatment is not usual in other lesions; one who suffers

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* Case 26 is an example of this.

† The case of President Garfield, upon whom was inflicted an injury that gave rise to peritonitis and its concomitant effects, is an illustrative example of this practice, and as he had previously suffered much from chronic dysentery during the time he served in the civil war, there were good reasons for careful attention to his dietary, yet the mode of feeding him during his illness shows all the evils that follow the present neglect in the selection of suitable aliments when the intestine or its surroundings are diseased. It is most remarkable that the four periods of improvement and relapse correspond to temporary restriction and laxity in controlling the quality of his food. As this case was one of cosmopolitan interest, probably the official telegrams sent to this country of his daily condition, from which I collected the data, as far as they go are correct. Even if correct, this report, I admit, is far from complete, but it is the only one ever given. It shows four relapses, three of which were corrected by a return to a restricted quality of food, and that when such restrictions were removed, relapse followed—this restriction being always of a few days' duration, much too short a time to secure any good effect gained. The omission was continued with the use of opiates, and coarse food, a course of treatment open to question.

Shot July 2nd, 1881 (mid-day). Pulse 52 time of accident, but recovered to 63 shortly after. At 3 p.m. pulse 112, *vomiting* 4-30; pulse 130.

from a pneumonic lung, for instance, is not permitted to sing a song or run a race as soon as the prominent signs of the lung disease have much diminished. The physician usually insists upon quietness until the lung is sound; and so with lesion of the intestinal tract, means ought to be taken to make certain that the gut is sound and has been so for some time, before ordinary foods are allowed to be taken. The question may properly arise—Is it necessary to practise so careful a selection of food in all forms of intestinal lesion? There are some forms, as lead colic, typhilitis, enteritis, the intestinal lesion of typhoid, and cholera, in which, so restricted a diet is not absolutely necessary to recovery. It should however be recollected that the physician is invited to superintend disease, that recovery may be at least more probable; and if in any of the above lesions any extra precautions he knows of are

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July. 3.—6 a.m., pulse 140; 11 a.m., pulse 124; 1 p.m., pulse 120; 3 p.m., pulse 124, temperature 98½; 4 p.m., pulse 120; evening 8-30, case looked upon as hopeless; 11 p.m., pulse 144, temperature 99.

July. 4.—8-15 *peritonitis* set in; pulse 108, temperature 99; *chicken broth*, until 4 p.m., *occasional* vomiting.

July. 5.—Less tympanitis and no abdominal tenderness; pulse 114, temperature 100½. Occasional dose of morphia by the skin, and the *chicken broth* retained. 1-45 p.m. natural action of the bowels; no morphia given for 30 hours.

July. 6.—a.m., pulse 98, temperature 99; no tympanitis; takes chicken broth and retains it. At 1 p.m. pulse 100, temperature 99; asked for a beef steak, which was refused, an egg allowed instead.

July. 7.—Opiates occasionally given; pulse 94, temperature 99. 1 p.m. pulse 100, temperature 100; now takes oatmeal gruel and milk every two hours.

July. 8.—Pulse 96, temperature 99 at 8-15. 1 p.m. pulse 108, temperature 101; increase of pulse attributed to heat of room and suppuration; discharge of pus unobstructed: *Rum and milk allowed to-day*; danger of peritonitis supposed to be passing away.

July. 9.—Pulse 100, temperature 99; 1 p.m. temperature 101. 1 oz. of milk every two hours. Evening, pulse 108.

not prescribed, there is an omission, and those who have had even a moderate experience of the progress of disease, must know that a benign beginning may have a fatal termination.

In the treatment of all kinds and degrees of obstruction, the diet is the most important item. The tendency of teachers during late years has been to advise more frequent operative interference. This is supposed to give one advantage, viz., that less care is needful afterwards in the use of both medicine and food; nay, it seems to be supposed by many, that when once the difficulty has been removed by a surgical operation, if this has been performed with means that minimise danger the detailed treatment required for obstruction is superfluous; whereas its continuation if not so

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July. 10.—Pulse 108, temperature 100; evening, pulse 108, temperature 101.

July. 11.—Pulse 106, temperature 99.

July. 12.—Pronounced out of danger. Pulse 100⅛.

July. 13.—Pulse 90. Supposed to be weak from inability to take solid food.

July. 15.—*Taking more solid food.*

July. 19.—Pulse 90, temperature 98½.

July. 23.—*A relapse.* 10 a.m. pulse 110, temperature 101; supposed to be due to suppuration.

July. 25.—Pulse 96, temperature 98. Partook of lime water, milk, and meat juice.

July. 26.—Pulse 102.

July. 27.—Pulse 94, temperature 98. No gastric disturbance.

July. 31.—Sat up in bed much improved.

Aug. 1.—*Beef steak and coffee.*

Aug. 2.—Slight return of fever.

Aug. 3.—*Slight nausea*, which continued during evening, supposed to arise from some operation performed. Pulse 108, temperature 102. Liquid nourishment has been again resumed; and pulse is reported 98, temperature 99.

Aug. 10.—*Solid food resumed.* Pulse 110, temperature 99½.

Aug. 12.—Pulse 102, temperature 98½.

urgently required as previous to the operation, is still of such consequence that the most perfect surgical details fail ultimately if there be omission of proper dietetic restriction.

It has always been to me a matter of surprise that in the treatment of typhoid—to the elucidation of which so many able men have devoted so much time — the dietary is regulated by the symptoms that may present themselves during the disease; while on the other hand the dietetic treatment of the gut lesion of cholera is so regulated as to prevent certain symptoms and in anticipation of lesions that may be expected or may remain after the poison has been eliminated. There would be some justification for the present practice in typhoid if serious intestinal lesion were always accompanied by distinct signs, but serious

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Aug. 14.—A.M., Pulse 104, temperature 100. Evening, pulse 100, temperature 99.

Aug. 15.—*Vomiting, stomach irritable.* Pulse 108, temperature 100. Food: milk, beef extract, whiskey and egg. *Nausea very troublesome.* Evening, pulse 112, Food given by enema. Wound doing well; *the stomach now being the difficulty.*

Aug. 16.—Pulse 120, temperature 98½. The only nourishment taken has been by enema, nothing retained on the stomach.

Aug. 17.—*Vomiting ceased.* Pulse 110, temperature 98. Food: beef-tea with muriatic acid.

Aug. 18.—Pulse 104, temperature 98. *No vomit.*

Aug. 19.—Pulse 100, temperature 98½. Liquid *food only allowed.* Evening, pulse 106, temperature 98½.

Aug. 20.—Pulse 106, temperature 99½.

Aug. 21.—Slight *vomiting.* Pulse 104, temperature 98½. *Taking milk and porridge.*

Aug. 22.—Morning, pulse 100, temperature 98½. Slight improvement in stomach. Noon, pulse 104, temperature 99.

Aug. 23.—Pulse 100, temperature 98½. Evening, pulse 108, temperature 100.

Aug. 24.—Pulse 106, temperature 98½. Evening, pulse 112, temperature 99.

Aug. 25.—Pulse 108, temperature 99. Evening, pulse 108, temperature 100. Case looked upon as without hope.

ulceration, leading to sudden perforation, may exist without any or with very slight indications, and this is a strong argument in favour of always taking early dietetic precautions and continuing them until a period long enough to make certain that precaution is needless, as in cholera. The only explanation that I can give of this inconsistence is, that the signs of cholera are at an early period more alarming, which may cause the practitioner to exercise more circumspection; and also that the disease is more fatal than typhoid. The dietary and the therapeutics of intestinal lesions in general should be selected with the purpose of preventing mishaps instead of enjoining precautions when accidents have arisen. We do not secure the full benefit of our acquaintance with the etiology of typhoid, if we do no more than prescribe for complications as they happen.

Aug. 26.—Liquid food only taken, and enema. Pulse 116, temperature 99; believed to be dying. Evening, pulse 130; stimulative enemata have been given Pulse 120, temperature 98½.

Aug. 27.—Supposed to be dying.

Aug. 28.—Pulse 120, temperature 98½, morning. Evening, pulse 114, temperature 99.

Aug. 29. Stomach retains food and stimulating and nourshing enemata; *took milk and toast.*

Aug. 29.—Pulse 110, temperature 100.

Aug. 30.—Pulse 102, temperature 98½. Evening, pulse 116, temperature 99.

Aug. 31.—Pulse 100, temperature 98½.

Retains a little nourishment; his diet now seems to be *milk and toast.*

Sept. 1.—Pulse 108, temperature 98½, *took chicken* cooked in milk and beef extract.

Sept. 2.—Pulse 104, temperature 99.

Sept. 4.—*Vomited twice* but retained food afterward, pulse 108, temperature 98½.

Sept. 5.—Pulse 102, temperature 98½. Gastric irritation improving.

The careful selection of food is of primary value in treating intestinal lesion, for the three-fold object—to maintain life—avoid relapse—and to securing a sound and permanently healthy condition of the part injured, medicine being a mere accessory. Case 29 is a remarkable illustration of the remedial efficacy of a selected dietary only, this relieving where medicine previously tried had totally failed.

Sept. 6.—Removed from Washington, after removal pulse 110.

Sept. 7.—Pulse 120, temperature 101. Complained of pain in back after journey. Temperature fell after journey to 98½, pulse 106.

Sept. 8.—Pulse 100, temperature 100.

Sept. 9—Pulse 100, temperature 98½. Enemata now stopped.

Sept. 12.—Pulse 100, temperature 98½.

Sept. 13.—Pulse 100, temperature 98½.

Sept. 14.—Pulse 100, temperature 98. Sat up.

Sept. 15.—Pulse 100, temperature 98½.

Sept. 16.—Pulse 104, temperature 98½.

Sept. 18.—Pulse 104, which advanced in the evening to 130. *Enemata* resumed, vomiting and perspiration came on freely.

Sept. 19.—Situation critical; chilled. Pulse 143 feeble, towards evening pulse 104, temperature 91. *Death.*

CHAPTER V.

THE RELATION OF MEDICINE TO THE PRINCIPLES AND TREATMENT OF OBSTRUCTION—REMEDIES—USE OF STIMULANTS.

If the theory of spontaneous cure of constipation advanced in the previous chapter be correct, then the question arises—"Is this knowledge of practical value in the treatment of all forms and degrees of constipation, no matter what may have been the original cause?" My contention is, that this theory is the proper guide to treatment, and that the physician ought so to advise and prescribe as to gain as near an approach as possible to the conditions, which, in mild cases, are equal to bringing about a spontaneous cure—*i.e.*, resolution without the aid of art. As yet, the physician has not discovered any principle or remedy of which it can be said that it aids recovery, and sets aside the natural method. The better we succeed in reducing the intensity of the accompanying symptoms in urgent cases, the nearer the case reaches to the condition of simple constipation, and with this result are invariably associated ease and safety, though it necessitates delay.

Mild cases of obstruction may be trusted to recover without any interference; but in the acute types of obstruction the aid of medicine is very needful, as otherwise, the patient's chances of living would be very

small, indeed. There is always present in the severer degrees of constipation—*i.e.*, obstructions—one symptom which specially indicates the gravity of these cases, separating them from simple constipation—viz., vomiting, if too frequent, is an over-officious or impatient effort of Nature, goaded by irritation, to depart from its orthodox method. Medicine, if rationally selected, will correct the faults, and temper or remove the evil symptoms, so that the extreme obstructions shall present signs more in character with the mild examples of the disease. In the treatment of obstruction, if remedies are selected which tend to bring about a condition within the intestine favourable to the natural method of resolution they will also incidentally diminish pain, improve the pulse and temperature, and moderate or correct thirst and vomiting. Medicine in the treatment of obstructions should be held in reserve, ready to control the disease and to make life tolerable. There exist no reasons for supplementing or supplanting the efforts of Nature in these diseases, they should be restrained within certain limits.

In these diseases, remedies chosen from every class in the pharmacopœia, have been repeatedly tried; and successes, as well as failures are reported to have followed their use. But all these remedies are resolvable into two classes—viz., stimulants (local and neurotic) and sedatives. Remedies of a stimulant nature can only bring about intemperate natural efforts at resolution; while those of the

sedative type must restrain the untimely and injurious attempts of nature to effect a cure.

The local stimulants used are various aperient drugs. The neurotic stimulants most in favour are belladonna, tobacco, and strychnine. The sedatives usually given are—alcohol and opium. The reasons that can be advanced for or against the use of any of these in the treatment of intestinal disease are equally applicable to others of the same classes — stimulants and sedatives. Of therapeutic remedies, those local stimulants termed aperients, cathartics, and drastics, seem to have been in requisition from a very early period in the treatment of these lesions; and until the time of Sydenham there does not appear to have existed any person who had any doubt of the propriety of using such drugs in the treatment of obstruction* It is true Sydenham did not advocate their total disuse in lesions of the intestines, neither did Brinton;† and this is not surprising, for neither Sydenham nor Brinton give any information that might lead us to suppose that they had any knowledge of the mechanism of the spontaneous, or natural method of resolution; consequently, it was not possible for them to totally dispense with purgatives from their armamentarium for attacking this disease. A perusal of page 113 of Dr. Brinton's volume on Obstruction shows this. He says, referring to purgatives

"For there is abundant clinical proof that they may be of service."

* Dr. Latham's Ed. of Sydenham, vol. ii, page 265. † Op. cit., page 113.

Again, in the foot-note to page 120, he says:—

"A better remedy of this kind was mentioned to me by a patient some years ago, as having cured him of an obstruction for which he had been "given over" by his professional advisers. In this desperate state an old woman was called in—apparently from her known success in the treatment of this, or some similar, malady. The nostrum she gave was a soft mass, obtained by boiling down ordinary Zante currants with a very small quantity of water. Here, again, I have no experimental right to a conclusion. But I may point out, that the adminstration of such a remedy would promise many of the advantages expected from crude mercury; if, indeed, the softer and more equable distention it might perchance produce would not be a more energetic (as it certainly would be much safer) mechanical agent to apply to the obstructed part. It is, perhaps, worth trying in lead-colic."

This nostrum would only convey material to a locality when that which was already there required removing.

In my opinion, both Sydenham and Brinton would, in mild cases, venture a purge, but in urgent cases, would firmly proscribe such treatment; as both are equally emphatic in their condemnation of stimulation of the bowels when the general signs are present.

Three years after the publication of Brinton's views regarding the treatment of these maladies, the late Dr. Inman published his volume, entitled, "The Restoration of Health," in which he devotes chapter xxii to the discussion of this subject. Besides being the possessor of many accomplishments, my fellow-townsman possessed a larger share of common-sense than is usually to be found in members of the genus homo; and in his chapter on obstruction, he inculcates a common-sense view of this

question, and comes to the conclusion that aperients ought to be set aside.

At page 333, he says:—

"I have never yet met with an instance in which this treatment has been of service; nor have I met with one in which the aperients did not do positive harm."

Sydenham, Brinton, and Inman are the only practitioners of medicine, of whom we have any record up to this date*, who have emphatically protested against the prevailing use of purgatives in intestinal obstructions. My experience has taught me that their protest against the employment of purgatives requires renewing and extending to the point of insisting on the total omission of purgatives in the treatment of all classes and degrees of obstruction.

The pathology of this disease has been well elucidated, and from the information we have acquired, few gentlemen would be found so wanting in judgment as to give purgatives when obstruction of the second class was known to exist,—intussusception excepted. The question arises then—"On what grounds is the evil practice of giving aperients in any case in this disease based?" In my opinion the answer is, that this injurious treatment is perpetuated from the adoption generally of a purely mechanical classification of intestinal lesions, a division into two classes—lesions with patency of the canal, and those with total occlusion. The first division includes those cases in

* 1882.

which there may exist functional defect only; the patency of the gut being referred to as evidence that no obstruction exists, and the cases contemptuously rejected as not examples of intestinal obstructions, while the bowel is treated as though able but unwilling to perform its duty. This is the teaching to be found in our text books, and heard from the professors of to-day. They do not consider the fact that the intestine is a very long, tortuous and constrained tube, through which matter can only pass by a mode of force known as peristaltic action, and that the arrest of peristaltic action by disease in a portion of it, is followed by the arrest of the matters contained within it, and the formation of a barrier, not so serious as when obstruction is caused by obliteration of the calibre of the canal it is true, but nevertheless an obstruction, which must be accepted and treated as such, otherwise the physician will have no control over the attendant symptoms. This is the explanation of what is so frequently to be noticed in post-mortem reports, viz.:—an examination of the intestine, but no obstruction found, though the patient died with the signs of its existence. Case 37 is an illustration of this. Having been informed that a gentleman, well known to me, had performed the post-mortem examination, I sent to him for information regarding the condition of the bowel, and his reply was that no obstruction was found. No doubt his actual meaning was, that no physical occlusion was noticed. But the history of the sufferer showed that there was physiological obstruction; and, moreover, that its non-recognition in that, as

well as in many other known cases, led to a fatal termination. I hold to the opinion, that to treat these cases by a method of bombardment (purgatives) on account of the apparently favourable condition of the calibre of the gut, has only one ground of justification, viz., that of economizing the "doctor's time," if this can be of more importance than the patient's life, for I admit, that the giving of repeated purges sometimes does succeed,—though at no small risk,—in producing an early evacuation, much earlier than a rational method would. Even then it may not shorten, but prolong the duration of the lesion, as such an evacuation may be brought on at the expense of further injury inducing an early recurrence of constipation, with signs of greater intensity than would have been presented, had a little more patience been exercised by the practitioner. If the safety of the patient depended on the immediate progression of an accumulation, and the method by stimulation involved no risk, or would, when successful, place the sufferer out of all danger, and terminate the difficulty, there would then be some justification for this practice.

The treatment by purgatives of the cases I have placed in the first-class has made the rate of mortality, in these, as high as in those of the second-class. For sufferers who have symptoms indicating but a slight degree of functional defect, if medical aid is summoned, the purge is almost certain to be prescribed. The signs of obstruction are then soon developed, and if the practitioner has diagnosed the case as probably one in which

patency of the gut exists, he mentally and practically refuses to consider it as one of obstruction, and consequently continues his aperients. Should the patient die, and an examination of the abdomen confirm his surmise, he feels satisfied that the treatment was right; yet the case ended fatally from retardation of the intestinal contents and the effect of the attendant symptoms on the patient's stamina; and the mal-treatment was supposed to be right because what is obstruction in the living body, does not appear so at the post-mortem examination.

The literature of this subject abounds with very many cases in which drastics were liberally administered, yet the patients recovered; the relief of constipation occurring in periods varying from a few hours to about fourteen days. A rational method will not relieve the constipation earlier than the third day, and during these days there would be the absence of much suffering, while during the early period of the purgation methods, the patient would have to endure agony of pain, and the third day he might have either relief of constipation, or more probably be dead. This early fatality which has hitherto generally attended the use of purgatives, when placed in juxtaposition with the results which follow the method which neccessitates delay, is the most convincing argument that their use ought to be totally discontinued by physicians in the treatment of any phase of this disease, when it has entered upon the stage beyond what is termed simple constipation.

Some of my readers may think my arguments to be plausible as against the use of purgatives—*i.e.*, direct stimulation—but that they do not apply to neurotic stimulation of the gut.

When purgatives are employed, it appears to be the accepted opinion that they affect the healthy portion of the intestinal tract above the difficulty. But sometimes neurotic stimulants are given under the supposition, that they can through the nerves, excite to action the intestinal muscles of the diseased part; this is impossible, as the muscles of the diseased part are so checked by their abnormal surroundings, that they cannot actively respond to any stimulation, direct or indirect.

There exists on record what appears to be evidence in favour of the good effects of neurotic stimulution in the treatment of acute and chronic obstructions; but a careful analysis of such evidence will show that this deduction has been drawn from facts, the correct import of which the writers did not rightly divine That neurotic stimulation is of use in undoing one of the accidents attendent upon a severe attack of obstruction I will try to prove. But stimulation as a theory of general treatment is certainly wrong. The neurotic stimulants that are mostly used by physicians in the treatment of these lesions are, tobacco, strychnine, and belladonna, Of these three belladonna is the one which has been most frequently used. I am well aware that belladonna is not thought to be a stimulant by some; but all the physiological experiments which investigators have made respecting its action, point to its being, in

physiological doses, a special stimulant of the sympathetic system of nerves—and of the non-striated muscular fibres. Evidence has been offered in proof of its being a sedative, but this does not militate against its being at all times a stimulant, inasmuch as it does not follow that every pain, no matter from what cause, can only be relieved by a drug of the opiate class. Of neurotic stimulants, it will be sufficient, if the effect of belladonna alone be discussed. The most eminent authority on intestinal lesions, Dr. Brinton, refers, in commendable terms, to this drug, as giving ease—and it occassionally benefited these lesions—and lays much stress upon a special case which is reported in the *Lancet*, issued April 11, 1863.*

This case was partly treated with Belladonna. On perusing the report of this case, my attention was first directed to the dietary allowed to the sufferer. "At first, chiefly food of a liquid or semi-liquid consistency" "but soon exchanged for fish, eggs, and mutton chop as well as a moderate amount of diluted wine, brandy, rum and milk." A dietary of this varying quality would much influence the effect of any remedy. For example, during the "fish and chops" period, the remedy (opium) would not appear to benefit, and become discredited, while during any time that a more suitable diet was consumed, a remedy, perhaps not so applicable to the case, would be credited with the improvement, The daily diet of this patient is not reported. In the early part of the treatment opium only was given. This would very probably be the only period when the patient was able, and that his appetite would allow him to indulge in fish and chops. The use of opium with this quality of food would aggravate the general malaise, as the drug would tend to retain the unsuitable aliments, that otherwise would have been returned by vomiting which would have been beneficial. At a later stage of the treatment belladonna in combination with opium was administered, when probably the patient, as he was retrogressing, was

*This case is also mentioned in his volume on Obstruction.

less inclined to the course of food. Thus the conditions favouring spontaneous recovery were induced. The opium also was given in larger doses, while the diet favoured the sedative action of the narcotic. This I hold to be the explanation of what is reported, and not that the beneficial change arose from the use of belladonna, and I am confirmed in this view by the fact that the latter drug was never used in doses large enough to produce even its partial antagonism to opium.

After a careful study of this case, I am convinced that the amelioration of symptoms, which occurred sometime before death, can only be attributed to the diet taken during the last stage, which was more fitting for the disease; and also tolerance of the opium treatment, that drug being given in large doses.

Nearly all the trustworthy information now known regarding the physiological and toxic actions of belladonna has been acquired since the decease of Dr. Brinton, consequently it is not surprising to find that his resumé* of the action of this remedy is at variance with the observations of those who have presented us with indisputable facts relating to its action. The medical experiments—first of Dr. Harley† and subsequently of Prof. Bennett and his assistant ‡ shew that belladonna is a pure neurotic stimulant, acting through the sympathetic system of nerves.

The very general, but in my opinion erroneous, belief that belladonna is a sedative and can relax muscular spasms, is only explicable to me by the well known fact that many therapeutists have drawn most of their conclusions as to its medicinal

* Op. cit., 102. † J. Harley, M.D., on the old vegetable neurotics, 1869.
‡ Researches into the antagonism of medicines, 1875.

value from watching the signs that follow toxic doses;* data of little value, in comparison to observations collected from experiments with physiological doses. It would be just as reasonable to draw conclusions as to the alimentary value of certain foods, from observing the signs that followed a surfeit of any of them. Dr. Harley, for instance, mentions that the subcutaneous injection of atropia is often followed by retention of urine; and he states that from 1-100th to 1-20th of a grain of the sulphate of atropia are medicinal doses.† I have had many opportunities of testing the potency of this alkaloid, and maintain that if its quality is good, the 1-30th of a grain is beyond a physiological or safe dose, unless the subject is a person of exceptional strength and vigour.‡

The administration of belladonna or its alkaloid brings on the signs of special stimulation, viz.:—acceleration of pulse, elevation of temperature, contraction of the non-striated muscular fibres throughout the whole of the body, of which we

* No matter what poisons are taken, and however dissimilar their toxic symptoms, as the lethal condition is approached, the special symptoms become less definite and tend to merge. From watching the lethal tendency of an overdose of belladonna and comparing it with a similar dose of opium, it will be seen that their toxic signs are not so divergent as the symptoms that follow their physiological doses. By observing belladonna when taken in poisonous doses, I would never believe it to possess stimulating properties. The fall of a bulk of timber on the body would prove fatal, but a witness o this would not acquire any information as to the feeling that would result if a walking stick fell on another person.

† See Appendix A.

‡ When discussing the various remedies, I wish it to be understood that by physiological doses, I mean doses that do not endanger lite, and by therapeutic effect or result I always refer to the sequence of physiological action; this therapeutic result being sometimes gained by direct action on the locality diseased, but generally by a secondary action, *i.e.*, through its effects upon healthy structures.

have an obvious illustration in its dilating the pupil, by stimulating the radiating or dilator muscle of the iris,—a contracting and not a relaxing action.*

Yet so recent an authority as Dr. H. C. Wood,† attributes to this drug power to "relax spasm in lead colic," "simple colic," "spasmodic contraction of the bowel," and "spasm of the urethra." As regards lead colic, the view I maintained in my first treatise on intestinal obstruction,‡ viz., that it was not a spasmodic condition is now known to be correct, Dr. Hilton Fagge having since demonstrated that it is a diseased condition of the intestine brought about by lead impregnation.§ As to the efficacy of belladonna in relieving "simple colic and spasmodic contraction cf the bowels," these are very indefinite terms relating to very questionable conditions. Most of the advocates of the antispasmodic action of the drug point triumphantly to its efficacy in "relieving spasm of the urethra." Its administration is followed by this therapeutic result, I admit, but if the anatomy of the part (nervous and muscular) be considered, it will be perceived the dose stimulates both the muscles of the bladder and the muscles of the urethra, but the muscles of the bladder being stronger than those of the urethra, retention is thus relieved. In the case of many persons who suffer from incontinence, it arises directly—though it may not have been the original cause,—from incomplete emptying of the bladder, which the

* See Appendix A. † Treatise on theraputics, 1876. ‡ 1875.
§ Page 45.

stimulant properties of belladonna would benefit, by causing it to better empty itself. The bladder would then receive a greater quantity of urine from the kidneys, and thus there would not be the necessity of its being so frequently emptied. If it possessed a sedative action it would aid accumulation in this viscus, and we should have it constantly full of fluid, and there would be a continuous overflow. This is my explanation of its action, when beneficial in some cases, where an abnormal condition of the bladder and its appendices exists. In the passage of biliary and renal calculi belladonna gives no ease, yet all remedies of the narcotic class are invaluable. The therapeutic effect of this drug upon the bladder and its appendices, is no evidence of its being a sedative or antispasmodic.* All experiments made to elicit the action of belladonna have proved it to be a pure stimulant, and that it is capable through the splanchnic nerves of exciting the muscular coat of the healthy intestine, so as to increase its peristaltic action; and this I consider should be avoided during the treatment of intestinal obstruction, unless the accident of collapse occur, which is a symptom pointing to a constitutional state, and must be treated for a time to the neglect—medicinally—of the local lesion.

If we search into clinical records for information to enable us to decide as to the utility of belladonna in the treatment of intestinal diseases, the knowledge gleaned is seldom of help to us,

*See Appendix A.

as in every case in which it had been employed, several other remedies of diverse properties had also been used. A most instructive example is to be found in the British Medical Journal, Aug. 31, 1878, page 307, entitled, "Treatment of obstruction by large doses of belladonna," but when carefully considered, these cases do not indicate that the drug had any beneficial action on the local lesion.

Five cases are published--

Case 1 appears to have had acute obstruction which had been treated during the first nine days by purgatives. On the ninth day the reporter of these cases was called to attend her. He commenced his plan of treatment "with an enema of warm water, and ten grains of colocynth and hyoscyamus," after which "the patient *was considered hopeless from prostration*." Now he resorted to belladonna in large doses, and after she had taken sixteen grains of the extract "there was copious relief,"—"the patient leaving her bed in seven days thereafter." "Ice, milk and soda water by the mouth, and beef-tea enemata were administered before the alvine evacuations set in."

The only benefit secured by the use of belladonna in this case, arose from its having been given empirically, during a period of collapse; the relief of obstruction occurred about the eleventh day, the time that such an event might be expected in a mild case of retardation treated by purgation. A serious case might have ended fatally early. The purgative method was not at any time totally discontinued, not even after the aggravated symptoms arising from the primary purgative had subsided. From this it may be reasonably concluded, that it originally was a case of obstinate constipation, in which ill-treatment had induced acute symptoms.

Case 2. Obstruction is reported as having existed twelve days ere she sent for medical advice. At that time all the signs of acute obstruction were apparent. The purgative plan had been tried during the onset of the disease, and now "it was thought she was dying"—great depression and distress. "Now the treatment consisted of warm water enemata, hot opiate fomentations, nourishing enemata, and two grains of belladonna every hour for six hours when she had abundant relief"; complete recovery in five days more.

The comments I have made on Case 1, are equally applicable to this—the drug used benefitted the constitutional shock, but had no influence in the release of the accumulation within the intestine; indeed, the reports of both these cases gave me the impression that they were examples of sudden relief of distension by the passage of the obstructed matter through the region of the disease into a further section of the bowels, producing collapse—as this occurrence is sometimes followed by shock.

Case 3 is another in which the disease had existed twelve days before the physician visited the patient. Vomiting had not set in until "the last four days, and had been stercoraceous five hours." The treatment, from the commencement, consisted in giving drastic purgatives; and now when the physician had been called to his aid, the patient was in a state of collapse. Belladonna was prescribed with the usual good effect upon this constitutional condition.

The fact, that although drastic purges were employed during the primary treatment of this case, yet vomiting was not noticed until the eighth day, makes me suspect that this also was originally another example of constipation goaded towards acute obstruction by injudicious medication.

Cases IV. and V. are almost identical with the preceding ones, and the remarks I have appended to them apply with

equal justice to these. What is most notable in all of them, is the fact, that the gentleman who reports them should have been consulted during the period of shock in every case, and although the belladonna was not given with the intention of specially correcting this mishap, yet its administration, owing to its stimulating property, may in some of these instances have saved the patients lives.

In the treatment of all forms of shock or collapse, I know of no remedy equal in certainty or potency to belladonna. It may in a mild case be given by the mouth, in the form of liq. atropiæ, five minims every half hour, or with longer intervals according to the effect that may follow. But in urgent cases of collapse, no matter from what cause, it is better to give it by the subcutaneous method—to save time—as the condition may not brook any delay; for when given by the skin it is more certain, and reaction is earlier. When I give liq. atropiæ by the skin, the first dose is three drops in half a drachm of water, and if none of its physiological symptoms are apparent after the expiration of twenty minutes, then a second dose of five drops should be inserted If this also fails in producing the expected effect after the lapse of half an hour, then I venture ten drops by the subcutaneous method. If the sufferer be possessed of much constitutional vigour and be not under the incubus of any blood contamination previous to the collapse, then from the commencement larger doses of

atropia may be given—five, seven and even fifteen drops.*

The effects that usually follow the use of belladonna given for the purpose of producing reaction from collapse or shock, are these—the pulse previously slow and nearly imperceptible, increases in frequency and force, and the temperature of the body rises while the skin becomes dried and the pupils dilated. These are the signs of hopeful reaction; but should the collapse be attended by a quick scarcely perceptible pulse, and low temperature, then belladonna usually only increases the force of the pulse, raises the temperature, dries the skin and tongue, and dilates the pupil, but seldom saves the patient though it may prolong his life slightly.† If we except the condition of collapse, the employment of belladonna or any other neurotic stimulant in the treatment of intestinal

* Much larger doses have been reported as having been employed without producing any serious results; but it is very probable that in those instances the drug was somewhat impure. I have witnessed the use of atropia that produced only slight effect, but as soon as another sample was procured, the usual effect followed the standard dose,—this upon the same patient. If the atropia is of good quality, then ten drops of liq. atropia sulph. is a large medicinal dose if inserted under the skin.

† In my own practice I have found belladonna a very trustworthy stimulant, and have verified all that Dr. Harley has demonstrated, as to its action, whether given by mouth or skin. Of course its action is developed very rapidly when given subcutaneously. It may not be out of place for me to refer here to a few notable examples of its stimulant effects in my own practice. On one occasion after performing the operation of ovariotomy, the patient, being very much enfeebled by previous suffering, was removed from the operating table pulseless, and in a state of collapse. Several gentlemen assisted me with their advice, one counselled ammonia; another, a half pint of whisky in enema; but I decided to give a subcutaneous dose of atropia. Five drops were given with the effect of making the pulse just perceptible. After the expiration of 20 minutes 7 drops were given under the skin again, which made the pulse easily perceptible; but she succumbed the same day. On another occasion having a case of laryngitis which I thought required operation, I invited an elderly and more experienced surgeon than myself to assist me in deciding whether an operation was required, and we concluded not. This was about 9 p.m. At

obstruction, is as wrong in theory as the use of local stimulants, *i.e.*, purgatives—though in practice it is not nearly as injurious as the latter. Upon any of the component parts of the diseased region, belladonna can have no direct effect, and its indirect action would be to stimulate the muscular portion of the healthy intestine, which is already in a state of injurious excitement. Some of those who prescribe this class of remedies for intestinal diseases, do so under a baseless belief that some physiological action is induced in the diseased area; others, that some indirect therapeutic benefit is attained. Diseased localities cannot respond to the physiological stimulus of remedies, and if we take into consideration the physiological effect of belladonna upon the human subject—that it stimulates through a special system of nerves all the involuntary muscular fibres of the body—

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midnight I received a message informing me that the patient was dead. I partially dressed, and armed with tube and knife only, ran off as fast as I could go, a distance of 300 yards, and, found the patient pulseless and breathless. I at once threw him across the bed with his head dependent, opened the trachea, inserted tube, and, while one of the females sponged the orifice of tube and neck, I practised artificial respiration, and continued to do so for half an hour, when respiration began to return, and only required occasional assistance; at the termination of 2 hours respiration was fully restored, but the patient was unconscious. At 4 a.m. his respiration became worse; his pulse, previously excellent, became almost imperceptible. Previous to this change, my friend Dr. Grindrod had arrived, and now we both thought he was rapidly sinking, and decided to give him 5 drops of Liq. Atropiæ under skin. After waiting 20 minutes without any effect being apparent, we gave 10 drops, and in 15 minutes the pulse began to improve. In 3 hours the patient was conscious, and is alive and well at this date. In another case—a Medico-legal one—where the patient was very evidently dying, a consultation was held, and a stimulant being judged desirable, as a concession to the prevalent prejudice stimulation was attempted by means of brandy (really a narcotic). When this had failed, atropia was tried, and improved the pulse in half an hour after injection, in fact, stimulated the patient, who, however, ultimately died.

then, any attempt by its use to gain an indirect therapeutic effect would fail for two reasons, viz., the muscular portion of the healthy intestine would be further excited to peristaltic action—and as the local lesion is in all cases accompanied with dilatation and stasis of its vascular system, the belladonna by its physiological action in decreasing the calibre and increasing the force and rapidity of the general circulation, would still further aggravate the abnormal condition of the circulation at the diseased part, by diminishing the general area of blood diffusion, and would thus increase the congestion of the part diseased.

CHAPTER VI.

TREATMENT OF OBSTRUCTION—SEDATIVES.

Those drugs which belong to the sedative class are to be employed in the treatment of acute obstruction, but when they are used, certain restrictions have to be made in the items of food given to the sufferer, otherwise their employment may not be followed by ultimate gain. With the selection of a certain dietary their use may become an unalloyed benefit, and their physiological action upon healthy parts may indirectly lead to satisfactory results. To secure our purpose in the treatment of these diseases by means of sedatives, the ingesta must be carefully supervised, so as to eliminate as much as possible avoidable excrementitious matters.

Most probably sedatives, as well as stimulants, have been tried during past times in the treatment of these lesions, but they have always been set aside as either injurious or of doubtful service to the patient. Aretæus advises the "respectable physician" not to give narcotics in these complaints, yet from his writings we are justified in believing that he had seen others give, or had himself given narcotics; but that was not a class of remedy he approved of. This opinion, adverse to sedatives, seems to have prevailed up to the time of Sydenham, for we find that one of his contemporaries—Mr. J.

Cook—has left on record that he believed that "narcotics have no place in colic."

Sydenham appears to have been the first who prescribed sedatives with confidence and success in the treatment of intestinal maladies, but, as he also attached some importance to the selection of the patient's food, the cause of his success and confidence is evident, and it is to the neglect of properly dieting patients suffering from intestinal lesions, that we must attribute the limited and undecided way, in which sedatives have been made use of from the time of Sydenham until now. If when sedatives are given, the Sydenham method of dieting is not adhered to, there is not much difference as regards ultimate results between the use of stimulants or sedatives, the first would probably kill early, while the latter would kill later but as certainly.

Sedatives have hitherto been used with the caution begotten of ignorance; the conditions permitting of the full curative effect of these drugs without countervailing evil not being known. It is not unreasonable to suppose that on innumerable occasions, ancient practitioners did prescribe sedatives; but not being in the habit of selecting a suitable dietary for their cases, they perceived that even in mild cases of obstruction no *ultimate* benefit arose from their employment —and would conclude that a remedy that could not save life endangered by a mild degree of disease, must be worthless in the severer forms. This would be a proper conclusion,

as from the omission to select food suitable to the conditions existing in this disease, the use of sedatives would favour an accumulation, the quality of which would make a fatal termination almost inevitable.

For the purpose of illustration, I will follow the plan adhered to in the previous chapter, and discuss only two of the drugs of the sedative class, viz., opium and its alkaloid, and alcohol and its preparations. Several reasons induce me to select these—First, opium has been the sedative I have generally depended on in urgent cases, and in mild cases it has been in alternation with some of the popular preparations of alcohol, and as the latter is used very indiscriminately in the treatment of diseases, I have felt induced to contribute my quota towards placing it in its proper place, and indicating when it ought to be used. Alcohol is a remedy, the reputation of which as a dietetic, has in latter years diminished and must utterly wane away, but only to reappear and take its proper place in medicine as a sedative, pleasant to use, and easy to control. But as of the two drugs, opium is in my opinion the "sheet-anchor" in the controlling of the several forms of intestinal lesions, it will first be discussed. There are many therapeutists who hold that alcohol in particular, and even opium also, sometimes act as a stimulant. That they appear to act as stimulants ought to be granted, but that they possess true stimulative property is negatived by exact evidence. Nowhere can I find scientific evidence against

this view.* Whatever may be the theoretical opinions of my readers, regarding the action of opium, they will admit that its value as a drug depends mainly upon the sedative properties it is well known to possess. I believe opium to be a *pure* sedative; and that it exercises its primary influence upon the sympathetic nerves. In evidence of this we have the well known fact, that its administration is followed by contraction of the pupil, and enlargement of the blood vessels from its paralysing action on the vaso-motor centres; Again, the pulse, from its action on the vagus, is made slower, this, again, by diminishing the oxidation of the blood reduces the temperature of the body. Such is its general action. Exceptions to this general statement of the effects of opium and its alkaloid—morphia—are sometimes observed, and result from the existence, in the particular circumstances of certain cases, of some condition modifying its action.

The best form in which to administer opium during the treatment of lesions of the intestinal tract, is that of liq. morphiæ sulph.† In very mild cases, and when vomiting is almost absent, it may be given by the mouth in fifteen to twenty minim doses three or four times daily, in proportion to the discomfort felt by the patient. Some cases, like case 38, may require none, or, like case 39, only an occasional dose, but should the vomiting be too frequent then the remedy requires administering by the skin, in doses sufficient to ease pain and control the vomiting, reducing it, if possible, to once or twice in

* See Appendix B. † Four grains to an ounce of water.

24 hours. At the onset of the disease this ought to be aimed at by the use of the ordinary hypodermic doses of the alkaloid, commencing with ten minims, repeated as signs of its action wear away, and the dose should gradually be increased, if preceding doses show no controlling effect.* The effects that follow the giving of opium during the treatment of gut-obstructions are the following, viz:, the tongue becomes more moist, the thirst less, the temperature falls, the pulse is reduced in rate and enlarged in volume, the pain is eased and the vomiting diminished. Such would occur in a hopeful case; or the opium may only ease pain, diminish the vomiting, lower the temperature, reduce the pulse rate but make it less perceptible :—unfavourable omens. And yet the sum of the drug-effect in the latter case is on the whole advantageous. The hypnotic action of opium is not much noticed during the treatment of the acute forms of obstruction, even when the largest doses have been arrived at. As soon as the temperature is observed to approach the normal condition, or to fall below it, then sedatives ought to be withheld, as collapse may be near, for should this come on while the patient was much charged with either opium or alcohol, his chance of reaction would be very poor. There are only two incidents in these diseases that require a deviation from the sedative

* In clinical experience I found that while by the long-continued use of opium the subject of such habit acquires a tolerance of the drug, no similar tolerance can be acquired for belladonna. But to this I have noticed an exception. In cases of tetanus, as the disease progresses, the constitution affected by it becomes more tolerant of belladonna, and this tolerance diminishes in proportion as the disease retrogresses.

line of treatment, viz., when the case has progressed so well that the symptoms are not felt by the patient, or when collapse threatens or is present. By a judicious use of opium, the suffering that accompanies this disease is removed. Thus the patient is spared continuous pain, one of the most wasteful tests to which the body can be subjected. This ease from pain is brought about by the opium arresting peristalsis in the healthy portion of the intestinal tract, and by its paralysing, or so-called inhibitory, action on the vaso-motor centres* enlarging the area of blood diffusion, and thus diminishing the pressure upon the diseased structures; and again, opium favours the accumulation of recent ingesta, which if reasonably selected for the patient's alimentation, will enable the unsuitable contents accidentally detained at the onset of the disease to be macerated, when they will come away, partly by vomiting but mostly by the natural manner, when resolution has further progressed. The use of opium in the treatment of these lesions is hedged round with conditions, and these must be rigidly attended to, otherwise, it may become a factor in making recovery impossible. Just as in surgery the mere daubing on a wound of antiseptic chemicals is not antiseptic surgery, so in these lesions the mere prescribing of opium is far from sufficient.

During later years a combination of opium and belladonna has been tried as a medicament in the treatment of intestinal obstruction,—under the belief that while the opium would

* Appendices A and B.

give ease from pain the belladonna would relax the muscular fibre of the gut; yet the same teachers, when discussing simple constipation, refer to the beneficial effect of belladonna in stimulating the gut. If the first of these assertions be correct then the last must be wrong. My own conviction is that the last proposition is true, for if belladonna possessed the property of relaxing muscular tissue, it could not benefit the condition of simple constipation nor neutralize the paralyzing tendency of opium. Again, a correctly proportional dose of belladonna and opium would result in a compound which, if prescribed for intestinal lesions, would be very inefficient. In intestinal diseases, it is desirable to get the full sedative effect of our narcotics to act upon the intestines. Opium influences through the sympathetic nerves primarily the intestines, and the addition of belladonna would, through the same system of nerves, specially protect the intestines from the action of the opium, and we should lose its sedative action where most wanted. The evidence supplied by independent investigations, points to this conclusion viz., that the prescribing of belladouna and opium conjointly—if in proportional doses—is irrational, while their use conjoined and in disproportionate doses forms a medicament of uncertain action.

Although opium is now admitted by all therapeutists to possess sedative properties, yet in past times there were individuals who stoutly maintained that it was a stimulant only. But alcohol is even yet generally supposed to be a stimulant.

Some few there be who hold that it is a sedative. Those who assert that it is a stimulant are mostly clinical observers, while the gentlemen who advocate the opposite opinion of its virtues have generally belonged to the departments of chemistry or physiology. This divergence of opinion may have occurred from clinical observers refusing to submit their deductions to be tested by the data collected by chemists and physiologists. But as the information given to us by investigators in chemistry and physiology has been a very important factor in bringing about the advancement in medicine that has taken place during our time, it hecomes probable that their views concerning alcohol and its action on the organism will ultimately be universally accepted by the profession. So early as 1789, and at the time when the art of prescribing began to be rationalised and reduced to a system Dr. Cullen, although he was not the first to do so, placed alcohol in the category of genuine sedatives; and as he has lucidly defined what he meant by the terms stimulant and sedative, there is no ground for doubt as to his real opinion.* But from his time

* STIMULANTS.—"The idea commonly annexed to the stimulant, is that of a power suited only to excite the action of moving fibres; but I am here to consider stimulants mora generally, as exciting the motion of the living principle, whether producing sensation or as producing the action of moving fibres."

SEDATIVES.—"These are the medicines which directly, and without evacuation, diminish the motions and powers of ihe human system. They are of different kinds, as these act more immediately upon the nervous or sanguineous systems; and we are to treat of them accordingly under the titles ot narcotics or refrigerants; the former to be first considered here." Cullen's Materia Medica, vol. 2.

until now, there has been much contention, as to whether alcohol be a stimulant or a sedative. My opinion is that it is a pure narcotic, and that even if the accumulated evidence of experimental investigators be not considered, clinical facts, when weighed without preconceived bias, can only lead to the conclusion that the symptoms which follow from its use indicate the physiological result of a drug of the sedative class. For instance, by its use the pulse becomes slower; the tone of the blood vessels is deteriorated, as shewn by their increased volume; the temperature of the body is lowered, and the pupil is at first diminished but finally enlarged, both conditions dependent on paralysis of special nerve centres.* These are the most constant signs that follow from administration of alcohol. Some slight deviation from such general symytoms may occur, but they only last for a very short period. The above enumerated signs, when they result from the use of this drug, conclusively show that it must possess narcotic properties. Although alcohol be a drug of the sedative class, it is not so efficient an assistant as opium in helping us to manage the acute forms of intestinal lesions; yet in the mild degrees of the disease and in alternation with opium, it becomes very serviceable. When alcohol is used the same precautions should be borne in mind as when prescribing opium. For instance, its use is contra-indicated in the state of collapse and also extra caution is required with it when blood poisoning co-exists with the intestinal lesion,

* See Appendices A and B.

as in typhoid and cholera; yet in the two latter conditions the total of the results which we may wish to secure can be gained with less risk by alcohol than by opium, as the former has a quicker effect, and elimination being more rapid than is usual with the latter, a mistake either in policy or quantity is not so dangerous to life. But alcohol does not influence so powerfully as does opium those nerve centres, which are distributed to organs necessary to the continuation of life. This explains why alcohol is of less service to us in the treatment of the acute forms of gut diseases, the alimentary canal being one of the organs whose functions are essential to the continuation of life. Acute obstruction is better controlled by opium than by alcohol, as the first-mentioned drug principally affects the sympathetic and ganglionic nerve-centres. Occasionally, and for a short time after the initial dose of alcohol, there may be *apparent* stimulation. The solution of this fact—supposed to be inconsistent with the view that this drug is a pure sedative—is this, that after the introduction of the initial dose there is a short period of partial diffusion, certain nerves and other structures, not being, as regards time or even eventually equally affected by the remedy. There exist grounds for believing that nerve centres are not all equally influenced by the same drug, some centres not being appreciably affected until toxic doses have been introduced. The simulated signs of stimulation, observed during the primary doses of opium and alcohol, seem to point to

the so-called "Inhibition by nerves" of physiologists, which I believe is only a disturbance of equilibrium. Like other drugs of the narcotic class alcohol diminishes the excretion of both urea and carbonic acid, a fact which militates against its indiscriminate use in septic diseases; for if the patient's system is already overcharged with products which require elimination, there may be no margin left in this respect, although we require such margin when using a remedy which can never be introduced into the human system without checking excretion, and therefore doing some little harm, however much general good may follow.

CHAPTER VII.

THE TREATMENT BY INTERFERENCE OF INTESTINAL OBSTRUCTION—PARACENTESIS, TUBAGE—ENEMATA—INFLATION—KNEADING—INVERSION—EXTERNAL APPLICATIONS.

In some instances of intestinal obstruction the distension of the instestine by gas becomes so great, that the pain is intensified and may itself threaten to thwart recovery, and as we cannot expect any relief of this distensile force by the use of drugs, the operation of paracentesis,—which is constantly performed to relieve ascites—may be necessary and appears a very simple and safe way of releasing the confined gas. The history of our art informs us that paracentesis is an operation that has been known and frequently practised by practitioners of medicine from a very early period, but the method of performing this operation in ancient times was very different from that now followed, so that its performance then for the relief of tympanites was extremely dangerous.*

Paracentesis was at times resorted to by our predecessors to relieve tympanites as well as ascites, but they refer to it as a dangerous operation.† Van Helmont refers to a case,

* Previous to the sixteenth century, in the operation of paracentesis, after the evacuation of a portion of the liquid, the canular was left in the abdominal parieties and guarded by medicated cloths, continuous drainage being allowed. It is obvious that such a procedure, if persevered with, after having allowed the escape of intestinal gas, would be very injurious to the patient.

† Foot note 1650.

in which the subsidence of the abdominal distension was instantaneous, but which "proved almost suddenly fatal." The operation was undertaken with the purpose of relieving ascites; but the case was evidently one of tympanites. The writings left us by practitioners antecedent to the commencement of last century, show that this mistake was not an unfrequent occurrence with them. Mr. W. Coley, surgeon, of Bridgenorth, was the first to advocate its general use for the relief of tympany, and to perform it in the way it is commonly done now, viz., by introducing the trocar and canula, and when the gas has escaped withdrawing the canula. This gentleman was also the originator of the rectal tube now known as O'Beirne's tube; he described such a tube and suggested that it should be passed up the rectum, and then an exhauster should be attached to the external end and so the gas be sucked out. *

Mr. W. Coley published his "Case of Tympanites, relieved by the operation of Paracentesis," in the London Medical and Physical Journal, Vol. vii., page 223. It was that of a male infant eight months old. The operation was performed with a trocar, which he reports as being one-sixth of an inch in diameter, but from the quality of the fluid that followed the gaseous discharge, it must have been

* The exhauster he recommended was one invented by Charles Brandon Trye, surgeon, of Gloucester, an illustration of which is to be seen in the volume on "Morbid Retentions of Urine," published by Murray, Fleet Street, London, 1784. This was the first of those surgical appliances used for treating ailments connected with the bladder of the type of those which Clover and Biglowe have introduced lately.

1-4th of an inch at least. The child died 18 months after. He never became convalescent though his life was prolonged by the operation as recovery was hindered from the omission to correct his dietary. During the last ten years the practice of paracentesis to relieve intestinal tympany has been revived, an operation not so harmless as when performed to relieve ascites; one being a mere plunge into the peritoneal cavity, the other extending further, entering a restive intestine, the movements of which the canula demonstrates. Evidence exists that in some instances the punctured intestine has leaked into the peritoneal cavity, although a *post-mortem* examination revealed no traces of such puncture. I have in very many instances performed paracentesis when the distensile force has been great, and often it was repeated many times upon the same person with no evil result, but my conclusion is this, that it should not be resorted to as a placebo, but only when the gas appears to have become a bar to further progress towards recovery. Again, it is my belief that the quantity of retained gas is no guide as to the necessity for operative interference, but rather the degree of tension the distended intestine is exercising on the anterior abdominal wall, as the latter may not have had time to relax owing to the early and rapid accumulation of gas, a condition in which the abdomen will not seem extremely enlarged; but still paracentesis may be required, in order to prevent any injurious effect from the combined pressure on other organs within the abdomen. On the other hand the

abdomen may *appear* greatly enlarged, yet the force of distension may be so little that it can safely be ignored, the abdominal wall having had time to relax,—the more the better —before the increasing force from within ; and injurious pressure on other organs being thus avoided. In order, during the performance of paracentesis, to avoid the only accident to be dreaded,—an invasion of the peritoneum by foreign matter —the centre of the area of resonance should be selected for puncture ; indeed, when the abdomen is purely resonant, the risk attendant upon this operation is very slight. In the performance of paracentesis to relieve tympany, a trocar of small diameter but of extra length should be used, not shorter than four inches, that it may remain well in the nearly always perturbed intestine. It is not advisable to let the canula remain long in the intestine, not longer than five to fifteen minutes, as delay in withdrawing tends to make the puncture patent. In withdrawing the canula or a hollow trocar, the thumb should be placed over the external orifice, to make sure that the contents of the tube do not drop into the peritoneum.

Tubage, or the passing of the long flexible tube, also designed and advised by Coley, for the purpose of inducing the descent of fæcal matter, or in the hope of releasing pent up gas, has been tried frequently during these last sixty years, and we have on record cases, in which this procedure seemed to directly attain the desired result. My own conviction is that the use of this instrument may be very injurious, nor do I now see in what

condition it can be of service in these diseases. Its employment by me has always ended in failure. It is a mode of interference that can only be excused, by some ignorance of the *rationale* of the true progress to a cure. If the case be a critical one, then meddling with the rectum—a trivial matter when the patients are well—becomes an act of moment, and ought not to be undertaken, unless some immediate and undoubted advantage is to be gained.

The tube generally used is from eighteen to twenty-four inches long, and although it has been reported that in cases of obstruction of the colon, it has been passed upward and through the impediment, there exists positive evidence gained from *post-mortem* data, which negatives this. Fæcal evacuations on some occasions have followed its introduction, but as it is seldom introduced during the early period of treatment it is not improbable that in those cases an evacuation was just about to happen. If the practitioners of the past, possessed the knowledge we now possess, the advent of the primary evacuations could have been predicted within forty-eight hours at the most; and thus one of my arguments against the practice of tubage would not be good—and their evidence would be of more weight. When the whole length of the tube has been seen to disappear into the intestine, it is still a matter of question as to whether it proceeded beyond the sigmoid flexure or not.*

* The BRITISH MEDICAL JOURNAL, December 7th, 1878, reports a case of obstruction in which repeated attempts were made at passing a long tube through the anus into the intestine, but with no success; yet the *post-mortem* revealed only replication at

It is well known that a flexible catheter can become coiled in the urethra in front of a stricture, although the difference of its diameter and the calibre of the urethra is small; but the difference between the calibre of the colon and the diameter of the "long tube" is very great, so that the slightest obstruction—normal or abnormal—tends to make the tube recoil, which causes the operator to suppose that he has traversed a long distance up the gut. Again, if it were certain that a tube could be passed through any obstruction in the colon, then the common practice of injecting liquids would be no gain, as above the obstruction there is always present a superabundance of liquid—in fact less than is found there generally would better tend to facilitate the cure. The arguments advanced by Dr. Brinton against the performance of tubage are very cogent; he refers to cases in which death followed this practice from the tube having perforated the bowel.*

Enemata:—this is another mode of interference with obstruction for which no justifiable reasons can be advanced. If we except the accumulation known as a "loaded rectum," suitable treatment will arrange for the collection of sufficient liquid where it is wanted, *i.e.*, above the point of obstruction, in due time to thoroughly swill the intestine. In most cases

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the sigmoid flexure, in which was a tenaceous plug of fæces. The patient had other incurable ailments, but the *post-mortem* shows that the natural method of resolution of constipation, could, in this instance, have remedied the intestinal complication. In this case the symptoms became more grave as soon as attempts were made at rectal feeding, in fact not until then was obstruction suspected.

* "Their total number I cannot estimate."—Dr. Brinton. Page 116.

the irritation present at the onset of the disease stimulates the whole intestinal tract, and thus the gut below the difficulty, if not already empty, will become so. Enemata are given for two purposes, either to induce an evacuation from above the obstruction, or for the purpose of feeding the patient. If liquid situated above the obstruction, tending by gravity and peristaltic action to advance, has been arrested by it, is it reasonable to suppose that liquid ascending contrary to gravity and opposed by peristalsis can get through it? The barrier must be operative, no matter from what direction the liquid advances. All the argument that can be advanced against the use of enemata in obstruction would not be worth consideration, if they could do no harm. Not only do they excite injurious peristaltic action throughout the whole intestine, but there exist at times conditions attendant upon intestinal disease in which their use involves a greater risk than is incurred by the administration of purgatives; for instance, if an enema were able to reach —which, luckily for the sufferers, it seldom can—the portion of diseased or inflamed intestine, fatal collapse would be very likely to follow,* an accident that sometimes happens. An enema

*The "STUDENT'S JOURNAL," vol. v., page 44, reports a case that forcibly illustrates the danger of inter ference per rectum even after the first few hours. In that case, hydrostatic pressure was employed, the pressure used being that of a column of water four feet high—Perforation of intestine resulted. In the early period of my practice, I myself had several cases that most emphatically convinced me of the danger of enemata in intestinal lesions. In one instance where the patient was suffering from slight enteritis, which followed strangulated hernia, and was doing well up to the twelth day, I gave a small enema which caused collapse followed by death in 24 hours. In another case of enteritis, in a young girl of 14 years, a small enema (half-pint) was introduced, when collapse followed in four hours, from which she partially

given at the commencement of acute cases of this disease may do no *permanent* harm, but whether the disease retrogresses or progresses, as the period of its existence extends, so the danger attendant on this operation increases.

During these latter years enemata containing various astringents have been tried in the chronic conditions of intestinal disorders. The latest and best testimony of its kind, bearing on the value of this treatment for chronic dysentery, is to be found in the *Lancet*, issued April 29, 1882.

Five cases are recorded—

Case 1, a sailor, aged 27, with a history of previous attacks of chronic dysentery, was admitted into a London hospital, weak, anæmic, bowels acting three and four times a day, and was treated at first with opium and rest in bed. Ten days after admission an enema containing one drachm of nitrate of silver dissolved in a pint of tepid water was injected. During the first ten days of his sojourn in hospital there was some slight improvement, and after the enema this improvement continued. He was discharged nearly well after being an inmate fifty-eight days.

When this patient entered the hospital he must have had better food than he was supplied with on board ship, but as the medical report of the case makes no reference to the diet, we may conclude that this—which was all important—was not thought so by those in charge of the case. Opium and

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recovered, but died 6 days after; she had done very well up to this unwise interference. In another case to which I was called in consultation, the medical gentleman at the earnest solicitation of the patient's friends, but much against his own judgment, permitted the administration of an enema; collapse followed, and under the use of belladonna, partial reaction, but the patient died in 10 hours. To those who use enemata for differential diagnostic purposes, here is a point to be depended upon in enteritis. and peritonitis; if the enema can get to the inflamed part, the collapse of the patient will convince all that at least it is not intussusception from which the patient is suffering.

rest in bed, could give no rest to the intestine if a suitable dietary had not been prescribed. The enema was of no benefit in this case, but it also appears from the report that no appreciable harm was done by it.

Case 2, D. J——, aged 38, a sailor, has visited most parts of the world, but has had no illness until the present, the commencement of which occurred at Hong Kong nearly two years before admission. It began with moderate severity, but continued during his voyage to San Francisco, where he went into hospital, and so far improved that his bowels acted only four or five times a day. In this state he remained until his admission into the London Hospital, Jan. 11th, 1879. He then had pain and tenderness throughout the course of the large intestine; abdomen distended and tympanitic. He was very weak and wasted. Tongue tremulous, but not red. His bowels were open upon the average five times a day, unless he walked about much, when they acted more frequently. Was ordered fifteen minims of the tincture of perchloride of iron three times a day, one drachm of cod-liver oil twice a day, five grains of compound powder of ipecacuanha night and morning, and a flannel bandage was applied round the abdomen. On Jan. 13 patient had five motions, mucoid and bloody; 14th, five; 15th, four; 16th, four; 20th, four. (On this day he had an enema of perchloride of iron, three drachms of the tincture to three pints of tepid water.)—21st: Four motions; less pain, but still some blood.—22nd: Three. For the first time since the commencement of his illness the patient slept throughout the night without the bowels acting.—24th: Three motions, fair sized, semi-solid, with trace of blood. No motion in the night. Enema, as before reported.—29th: Three motions, still trace of blood; less pain; feels better.—Feb. 1st: Three motions, semi-solid; no blood.—12th: Three motions; trace of blood; enema repeated. Has had middle diet up to now; to have nothing but milk.—15th: Had an attack of pharyngitis, which passed off in a few days. Temperature 102°.—17th: For the first time in nine months has only defecated once in the twenty-four hours. The motion was slimy.—18th: The motion to-day consists of two hard lumps and a little bloody mucus.—21st: No blood or mucus in stools.—23th: Has a bearing down pain, and his motions are again more liquid On this day I noted, "Since Feb. 8th, patient has had no food whatever, except milk. During this period his bowels have acted on an average once a day. The motions have been semi-solid, slatish-brown from iron,

sometimes with, sometimes without, mucus. He has been free from straining. To-day he feels weak and depressed, and his bowels have acted three times in the twenty-four hours, with a good deal of straining. Pulse 117; temperature 100·8° He complains much of cold in his extremities. His tongue is coated, and rather tremulous. The abdomen is not remarbably distended; there is tenderness on pressure in the left hypochondrium, over the descending colon, and slightly over the ascending colon. The colon rises slightly in the right hypochondrium. He is wasting."—26th: Seven motions; much bearing down.—27th: An enema of nitrate of silver (one drachm to three pints of tepid water) administered. The whole returned in about ten minutes. He felt no pain, and passed a good night subsequently. The bowels were moved three hours after the injection. There was no tenesmus then, and there has been none since.—28th: Bowels not acted for eighteen hours.—March 1st: One motion in twenty-four hours.—4th: Two; bearing-down pains have left him. Is cheerful, but still losing flesh.—13th: Nitrate of silver enema, as before, repeated. Half only came away in about thirteen minutes, so an injection with chloride of sodium was given. He felt a little sick and faint during the operation.—16th: No motion for thirty-six hours; the last was nearly formed.—25th: Bowels moved after being confined for two days and a half. Allowed bread in addition to milk.—April 2nd: Bowels not moved for two days.—4th: Allowed minced meat.—6th: Allowed to get up for two hours daily.—10th: Allowed to be up half the day.—16th: Pudding added to dietary.—19th: Bowels acted five times; motions liquid and dark; no blood. No cause for diarrhœa discovered.—20th: Two motions.—21st: None.—May 3rd: Bowels open once daily; motions well formed; no bearing down at stool or pain. Is still weak. Allowed a chop.—May 17th: Improvement maintained. Sent to the country. At the end of a month he returned to show himself. His bowels were acting naturally, the motions solid and well formed. About a year later he presented himself again, having been to sea in the meanwhile. He came not for himself, but to bring a messmate afflicted with dysentery. He told me his health had been good since leaving the hospital, and that, though exposed to the exciting causes, he had had no further attack of dysentery. This case was a very serious one, and the disease had lasted nearly two years. He was wasted and extremely weak on admission, and did not benefit in the least by the rest in bed, or from the Dover's powder and iron taken internally. Large enemata of perchloride of iron effected some good, but it was not maintained. A purely milk dietary, moreover,

did not suffice, in conjunction with the other measures, to arrest the flux. The effect of the first nitrate of silver enema when the patient was worn out with the disease and, in my opinion, in serious danger of losing his life was immediate and striking. A second enema sufficed to cure the disease that had lasted so long and brought him so low. It is instructive, too, to note that after the nitrate of silver enemata the return to a solid dietary occasioned no recurrence of the diarrhœa.

Case II. has here been reproduced in full, and from it the reader will perceive that the most important factor towards a speedy advent of resolution in this disease was omitted, viz., a fitting selection of the food, this patient being allowed first milk, then bread, minced meat, pudding, chops; coarse as this diet would be for such a case, it was very probably an improvement on that which he had generally consumed on board ship. Again, the tincture of perchloride of iron was administered, but this is a very questionable drug to use, when inflammation or ulceration of any part of the alimentary canal is suspected. Empirical observation informs us that the intestine in this condition becomes intolerant of most preparations of iron. I cannot perceive myself that enemata were beneficial in this case. The treatment lasted over four months, during the greater portion of which time no attention was given to symptomatic treatment which would have much shortened the duration of the disease.

Case III is given with details so meagre that it is of no value for comment.

Case 4, C. S——, a Norwegian sailor, aged twenty-three, was admitted on July 7th, 1880. He contracted dysentery on the voyage home from the East Indies in the previous February. Motions reddish-brown, with

foul odour, separated into liquid and semi-solid layers. There appeared to be some membranous shreds and a good deal of mucus in the stools, and a few pieces of solid fæces (scybala). Treatment : milk and beef-tea diet ; ten grains of Dover's powder twice a day.—14th : Since admission bowels have acted from four to six times in the twenty-four hours. As a rule there is no pain, but now and then there is a little griping. If patient does not strain at stool no blood passes. This morning motion of light colour, partly solid. To take, instead of the Dover's powder, twenty minims of dilute sulphuric acid and one ounce of the decoction of logwood, twice a day.—24th : Patient a little better. About three motions daily, in which is no blood ; six minims of the tincture of opium added to mixture.—Aug. 11th : Patient now passed two motions a day. Motions are liquid and painless, unless scybala are present, when there is straining. No blood and stools not so offensive. Has occasional griping pains. Has remained, as regards the bowels, in a stationary condition for some time, but has gained three pounds in weight during last week. An enema of half a drachm of nitrate of silver in three pints of tepid water administered. Returned in five minutes without pain.—13th : No effects from injection ; state as before.—21st : Yesterday an enema of one drachm of nitrate of silver to three pints was given, motions becoming looser, and accompanied by slight griping pains. The injection gave but little pain. A hypodermic injection of morphia was given to ensure a good night's rest. He passed a tolerably comfortable night, and now has no pain. 24th : Since injection bowels have been moved twice daily. The motions are still loose, but of lighter hue. There are no scybala and no blood. He had slight griping this morning.—25th : Bowels moved once this morning ; motion fluid, with a few scybala. An enema of one drachm of nitrate of silver.—26th : Bowels not opened last night, and only once this morning ; motion fairly solid, more so than any previous one ; no blood ; no pain.—31st : Enema of nitrate of silver, one drachm to three pints. Motions more solid ; no blood ; no pain. Feels he is gaining strength.—September 4th : Enema of nitrate of silver, a drachm and a half to three pints.—6th : is not improved. Bowels open twice a day (?) motions not more solid than formerly ; no blood.—13th : Nitrate of silver enema, a drachm and a half to three pints.—16th: Remains the same. Bowels moved once a day; motion still loose.—20th : The longest time patient has gone without his bowels acting is forty-eight hours. Since last injection has had only one solid motion. Motion passed to-day, liquid, of natural colour ; no blood : no pain. Enema of nitrate of silver, a drachm and a half to three pints given.

After this last enema the patient improved, the motions becoming more solid. He was made an out-patient on Sept. 25th, and remained under my observation some time without having had any serious relapse. This, though not severe, was a very intractable case. The influence of the injections was less marked, but the stronger ones eventually and gradually arrested the disease.

In this case it is reported that "the influence of the injections was less marked," and opium had to be given more freely than in the previous case, and the enemata had to be "muzzled" by a hypodermic injection of morphia; otherwise, I suspect the termination of this case would have given no encouragement to the treatment by medicated enemata. This case was under treatment over ten months.

Case 5, U. W——, a Finn sailor, aged 26, was admitted July 13th, 1880. He contracted dysentery at Zanzibar in April, which continued unabated until he came to the hospital. On admission bowels open about twelve times a day. Stools liquid, mixed with blood, dark-brown, and contained scybala. A good deal of tormina. Ordered twenty minims of dilute sulphuric acid, in one ounce of the decoction of chinchona, three times a day; milk and beef-tea.—July 17th: Motions loose and bloody; a good deal of griping pain.—20th: Ten grains of Dover's powder twice a day. —22nd: Much griping pain along the course of the colon; bowels open twenty times during the last twenty-four hours. Much blood and mucus. —23rd: Fifteen motions in twenty-four hours, contain much blood and mucus; no scybala.—26th: Thirteen motions; much blood and pain, which are restrained by subcutaneous injections of morphia.—Aug. 5th: Enema of thirty grains of nitrate of silver to three pints of tepid water given last night. As it did not return in a few minutes an injection with chloride of sodium was given. This last caused much pain, which was relieved by a hypodermic injection of morphia. This morning he says he feels much better; has no pain in the abdomen or rectum. Bowels have acted once this morning, in all four times since the injection. To have pudding.—10th: Bowels now moved twice, and occasionally three times, in twenty-four hours; no pain. Taking cocoa and two eggs.—18th: Pain in region of the navel. Bowels open eight times, motions dark

reddish-brown, mixed with blood.—21st : Enema of one drachm of nitrate of silver, preceded by soap-and-water enema. Returned quickly, and not accompained by much pain. Bowels opened nine times.—25th : Bowels opened two or three times a day ; one motion solid.—28th : Motions were becoming quite solid, but yesterday after pain they became as liquid as at commencement.—31st : Enema of nitrate of silver one drachm to three pints. During the night several liquid motions, some containing blood.—Sept. 3rd : Bowels moved once this morning, the first time for twenty-four hours ; motion firmer but not solid. No blood. To take one ounce of the quinine mixture three times a day.—4th ; Enema of nitrate of silver, one drachm and a half to three pints.—8th: Bowels act once a day. Motions more solid.—11th ; Bowels act twice ; motions loose ; no blood ; some pain. Enema of nitrate of silver, one drachm and a half to three pints, ordered.—16th : Bowels open five times since injection—*i.e.*, in six days. Motions solid. Feels his strength returning rapidly.—21st : Enema of nitrate of silver, one drachm and a half to three pints, preceded by a soap-and-water enema.—27th : Bowels open five times yesterday. The motions have become loose, and to-day he has passed a considerable quantity of blood.—30th : Not feeling so well. Motions semi-solid, about three a day. To have ten grains of Dover's powder.—Oct. 2nd : Enema as before ; not retained more than two minutes. —5th : Enema repeated ; not retained more than one minute.—9th : Enema repeated.—13th : Enema, returned immediately and caused pain.—17th : Enema ; pain prevented by a hypodermic injection of morphia.—25th : Since last injection bowels moved three times in twenty-four hours. Stools fairly solid and free from blood.—31st : Enema repeated. Mixture of quinine and iron, one ounce three times a day. Has gained five pounds in weight during the last fortnight.—Nov. 5th : Bowels acted twice daily.—26th : Motions have been very solid lately, only one during the last thirty-six hours.—Dec. 8th : Bowels act regularly once in twenty-fours.—23rd : Bowels confined. Olive oil enema, and an enema of starch and opium, fifteen minims, every morning.—Jan. 17, 1881 : Made out-patient to-day. Bowels since beginning of December opened only once a day. Has not passed blood for three weeks. Motions rather hard, and in consequence painful. Temperature normal for many weeks. Has gained 1st. 2lb. since admission.

Case V.—This case again lasted about six months, a period so long as to be no recommendation to the treatment by

medicated enemata. When given to this patient they had occasionally to be muzzled with morphia, especially when the solution of chloride of sodium was used. In my early days I frequently helped practitioners to administer enemata of chloride of sodium in cases of lead colic, and time has not erased from my memory the unpleasant effect of this medication. The reporter of these cases remarks—

"In the cases treated with large nitrate of silver enemata, it will not, as far as my experience goes, be usually necessary to restrict the diet in the same degree as in cases otherwise treated."

Had the diet been better selected, there would have been better assimilation and less excuse for interference. Again, in another paragraph we find,

"When there is pain along the colon, small doses of Dover's powder two or three times a day will be useful."

This drug would undoubtedly be beneficial, no matter where the pain existed, but if the intestinal lesion be not in the colon, of what use can enemata be? Carefully weighed, these cases are no evidence in favour of a deviation from the principles of treatment necessary for all forms of intestinal lesions.

During the last eighteen years I have been a resident in the largest seaport town in the world, and during that time surgeon to two large trade associations in connection with the building and sailing of the mercantile marine. A very large percentage of the members of these associations "follow the sea"—and thus opportunities have frequently been presented to

me, for observing the effect of certain treatment on chronic dysentery. My experience amounts to this, that no matter how severe the lesion is, by a fitting dietary and by adequate doses of opium, and the addition of the muriate of ammonia, the symptoms are controlled in a few days, though a cure may occupy some weeks, but never so long a period as twelve weeks. Indeed, I cannot bring to my recollection any case that required half that time.

The introduction of medicine by the anus with the intention of specially medicating the diseased locality, I hold to be incorrect in principle and to be condemned in practice, for if we grant that such medication can be of service, if it arrived at the seat of the disease, then its presence in a bulk sufficient to reach the part, would cause harm enough to neutralize any good to be expected from its use.

Enemata also employed with the intention of feeding the patient, is another form of unnecessary interference, and at times an injury to the sufferer. The cases in which rectal feeding is resorted to are generally of the graver types, and these are the instances in which we should specially abstain from this kind of treatment. Although nourishing enemata seldom exceed four ounces of liquid; yet clinical observations and the records of these diseases inform us that this quantity cannot be introduced into the rectum without giving rise to some distress.* I have myself never given food in this manner,

* I was not the first to declaim against the present, and from time immemorial, practice of giving enemata in intestinal diseases. Sydenham seems to have come to the same conclusion as myself, and writes very emphatically

but have seen others do so, and on every occasion some injury was done in serious cases. Even a momentary exploration of the rectum by the finger may become a serious matter. I have seen this done gently and quickly, yet an extra dose of the opiate had to be given. If food, small in quantity and suitable in quality, when taken by the mouth—a customary mode—induces aggravation of symptoms, it is not a matter of surprise that the introduction of food into the rectum should induce aggravation of symptoms. We have no positive evidence that the intestine below the obstruction is always at rest during its existence but rather the reverse, for inasmuch as the intestine below the obstruction is in most cases empty it must have been active so long as it contained matter; and its quiescent state depends upon the intestine being empty—thus the etiology of the subject does not favour interference by an invasion of the intestine from below. Mild cases of obstruction, those which usually resolve in from two to three weeks, may not seriously suffer by rectal feeding; but in

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in denunciation of this mode of interference. In Vol. I, Sydenham Society, Edin., page 196, he says:—"Your carminative enemata are merely so much fresh irritation." Page 200, "Hence I have more than once remarked, that the repetition of the mildest clysters has introduced a fresh series of symptoms; and common sense confirms experience," Vol. II., page 109, "A mere sugar and milk clyster may undo all that the paragoric has done: so that a relapse shall take place and the pain and vomiting brought back." No doubt Sydenham wrote from repeated observation, and perceived that such treatment necessitated "remedies for the remedy rather than for the disease itself." Brinton supplied us with invaluable information on the etiology of intestinal diseases, but in the province of treatment he was behind his eminent predecessor in medicine.

serious cases this interference—slight as it may seem—may turn the scale in the wrong direction, or delay the date of primary relief of constipation. It is often forgotten that the patient's danger arises from the disease, and not from debility or starvation, as even the most intractable cases seldom run over the seventh week, and during that time some food is taken by the mouth, which if even returned, has, on account of the distance traversed, fed the patient in some small degree. When feeding by the rectum is attempted, the distance the nourishing liquid travels is short, consequently only a small absorbent surface is traversed, and probably the absorbing power of the rectum is only slight. Enemata given for the purpose of feeding the patient remind one of baiting with a salmon to catch a sprat. An enema for the purpose of unloading the intestine during health is not objectionable. It is a proper, ready, safe, and pleasant method of purgation, and is as much a hygienic habit as a daily bath.

In these cases the most potent cause of emaciation is pain. It would be a much easier task to emaciate a person by inducing pain (which usually is accompanied by a loathing of food), than by a rigid curtailment of diet. It is wonderful how long a sufferer can tolerate even total abstinence from food when opium is given—as the drug appears to allay the feeling of hunger. At the period of resolution, the opium not being given so frequently ceases to keep the appetite in abeyance. I have known the case of a

sufferer from acute enteritis who retained nothing but a drink of iced water, frequently repeated in small quantities for 49 days, and yet recovered at the end of that long period of abstinence not much emaciated; although previous to this complication the same patient had suffered from another painful affection of a malignant character to which she succumbed eighteen months after the relief of the obstruction.

Inflation :— is a procedure that is resorted to for the purpose of correcting obstruction supposed to be caused by intussusception. There are two methods generally employed, viz., the insufflation of atmospheric air by means of a "bellows," and that by directing an effervescing mixture into the intestine; this latter plan has not been much used in this country. When we can diagnose beyond doubt intussusception of the colon, as for example, when the gut is seen protruding through the anus or when it can be felt by digital examination, under such circumstances inflation, if undertaken at an early period, might succeed, and should it fail, in the absence of inflammation* of the parts involved, no permanent evil might follow. As a rule, intussusception at the initial period of its formation, is very tolerant of interference.

* Such a case is recorded in the LANCET, Vol. I., page 66, 1857, where the small intestine had slipped through the ileo-cæcal valve and colon, and had presented at the anus. At an early period this, perhaps, could have been corrected by inflation. The *post mortem* showed that the peritoneal surfaces were adherent; no doubt a condition pertaining to a late stage of the disease.

Any intussusception within the small intestine is beyond the reach of insufflation, as the ileo-cæcal valve, if active and its mechanism unimpaired by disease, will arrest any intrusion of air from the colon. Again, the area of the abdomen will not allow of full distension of the colon and small intestine simultaneously; and without this the air could not be forced so as to reach an intussusception situated in the small intestine. Of the recorded cases of insufflating the colon, this practice was tried in a late stage, and so frequently repeated that it must have done much harm. In some cases the signs that lead us to suspect intussusception were not present. These facts render much of the evidence we have in relation to the treatment of obstruction by inflation, unreliable.

The last two cases recorded as having been successfully treated by inflation are to be found in the *Lancet*, published Feb. 24th, 1877, page 273, and Feb. 28th, 1880.

The first was a child six months old, and the signs present justified the supposition that intussusception existed, but this could only be a surmise, as no physical evidence such as rectal hernia could be seen or detected by a digital examination of the rectum. The treatment consisted of milk as a diet, injection of olive oil with laudanum, one drop and a quarter every six hours. Inflation with the bellows was performed once.

The child recovered, and would have recovered sooner if no medical aid had been obtained. The treatment was encentric, but the sufferer had not much of it, and so luckily tided over both that and the local difficulty.

The second case was that of a child eleven months old, after a "hearty breakfast, of which fish was one of the ingredients, he was suddenly taken ill." He was taken to a chemist who gave a powder of rhubarb and mercury, when the child began to pass blood per anus, was collapsed and in much pain. On examination of the abdomen a sausage-shaped tumour was felt in the right hypochondric and lumbar regions, and blood and mucus were passed per anus. The treatment prescribed was half a minim of tincture of opium every two hours, olive oil injection, one grain of compound ipecacuanha every second hour. Twice the bowel was inflated. Patient recovered.

The comments I have appended to the first case are applicable to the last; and further there were no grounds for suspecting intussusception. In both cases inflation was not resorted to as primary treatment, the only time it can be tried with safety and hope of success. These cases are types of the quality of evidence generally presented to us in favour of the practice of inflating the bowel to remove obstruction.

In the *Medical Times and Gazette* is to be found a report of another case of intussusception treated by inflation—

In this case the lesion could be felt by the finger when introduced into the rectum, and other signs were present which enabled the practitioner to arrive at a positive diagnosis. Inflation was practised fourteen hours after the usual signs were observed. The first inflation removed all the physical signs of intussusception, the child being collapsed by the operation, "the inflation was, however, after a short time repeated to make sure, if possible, that the bowel was completely reduced."

If the first inflation was a success, what was the purpose of the second? The duration of this case was barely thirty-six hours, and the *post-mortem* was not in favour of inflation.

The *Medical Times and Gazette* published Dec. 25th, 1880, contains the report of a case partly treated by inflation with the contents of a gazogene containing soda water. It is described

as a case of intussusception, which had existed three weeks before admission into a Metropolitan Hospital and the patient was dismissed after a sojourn there of twenty-two days. The food given was very unsuitable to a case of obstruction. While in hospital, there does not appear to have been complete obstruction, as fæces were occasionally passed. Indeed, the duration of the child's illness—three weeks—previous to its admission into the charity, informs us that either resolution or death was nigh; but the symptoms contra-indicated a fatal termination, an intussusception was supposed to exist, and the case was assiduously treated by inflation, inversion, chloroform and enemata. The signs of acute obstruction were absent, and it is doubtful if the case ever had been more than one of mismanaged simple constipation The practitioner who would inflate the intestine with the hope of reducing intussusception of three weeks' duration, cannot justify such practice by any acquired knowledge either of the etiology or pathology of the disease. A search through the literature of intestinal obstruction will show that all writers consider those intussusceptions of extreme gravity, where the intestine protrudes through the anus, or can even be reached by the finger. When these occur in children—as is generally the case—pathology shows that a large portion of the gut is often invaginated. The very general and persistent practice of direct interference in these cases, further shows that they are

thought to be serious lesions, and beyond the probability of unaided resolution.

Supposing an infant is presented to us sick, and that on examination we suspect obstruction; and this again is confirmed by the detection of either intestinal protrusion through the anus, or within digital reach of the anus, would the omission of interference be without justification? Is nature alone, or when controlled by drugs, equal to correcting so extensive an implication of the intestine as is given in this suppositious case? We have unquestionable evidence that it is. In the *Lancet* issued Dec. 20, 1879, page 909, is to be found unimpeachable evidence that resolution of intussusceptions involving even the cæcum and a portion of the small intestine, is possible without our direct interference.

"On the evening of July 5th, 1878, I was called in to see Lily M——, a rather slight, though previously healthy, child of seven months. She had shown signs of severe abdominal pain in the morning, followed by a motion, partly natural, but with a little blood at the last. This was attended by no relief to the pain, and in the evening there was passed another motion, consisting entirely of blood. Slight oozing of blood continued till my arrival, when I found it staining the parts about the anus, which showed no hardness, nor mark of injury. The child was crying incessantly, and kept its knees drawn tightly up to the abdomen.

Next day the extreme pain had subsided, but there was some hardness at the lower part of the body, and tenderness on pressure. An attempt to use a soothing enema failed, as the fluid came back at once.

Up to July 9th there appeared a slight discharge of reddish-coloured fluid, getting gradually darker and more offensive. On the 9th there was found protruding from the anus a dark-grey membrane covered by very offensive fæcal matter. While being washed, it slipped up into the bowel, and though there were frequent fluid motions during the next two days, it did not again make its appearance till the 12th, when it was found hanging

from the anus. On being cleansed it was seen to be of a dull, ashy-grey colour; it was wrapped up in warm cotton-wool, and supported by a napkin. During this day the child seemed to suffer great pain, and there was frequent vomiting and purging. Next morning the piece of intestine was found detached; it consisted of the cæcum, with its vermiform appendix, and the ends of the small intestine and ascending colon. The child was now much easier, and had been so during the night, probably from the effect of an opiate; and by next day there was less vomiting, and the motions yellowish and less offensive, and there was neither swelling of abdomen nor tenderness.

From the 15th to the 31st July, there were passed three or four loose motions per day as a rule, and in several of these were found what seemed like small shreds of muscular tissue. On July 31st, after severe purging and straining, there was marked prolapse of the anus. This recurred more or less severely on Aug. 13th and 21st, and on the 1st, 10th, and 24th of September. After this time the prolapse ceased, not reappearing even during the rather violent spasms of whooping-cough from which the unfortunate child suffered a few weeks after. In the meanwhile the evacuations had been gradually becoming more natural, and now when a year and four months have passed since the commencement of her illness, the child has been making fair progress in growth, and though pale and slight, has a pretty good appetite, and the motions are generally natural in appearance, though there is for the most part an interval of two or three days between each.

Here, then, we have had intussusception of the cæcum within the colon, and the constriction had been so great as to cause mortification of the invaginated portion, and at the same time to afford facility to perfect union taking place between the two adjacent portions of living intestine, thereby maintaining open the intestinal canal and effecting a complete recovery.

The principal medicine employed was compound ipecacuanha powder in minute doses, to relieve pain and keep the bowels quiet; afterwards bismuth in tragacanth mixture, for the diarrhœa; and a mild preparation of iron when the bowels had returned into a comparatively natural condition."

While I admit these forms of intussusceptions to be dangerous to life, I cannot see that they are more so than

other invaginations, it is most remarkable that in the majority of these examples, there were not grave concomitant symptoms until interference was practised. In the second volume of "Essays and Observations, Physical and Literary," page 353, published late in the last century, there is recorded, a case in which the gut "stood out four inches from the anus," but no serious symptoms occurred until interference by enemata and the passage of a whalebone probang were tried, which soon induced severe vomiting and tenesmus, and the child died. No wonder, at such a result if the probang was—as related—passed "a great way into the body," especially if through the intestinal wall.

Kneading and inversion, with or without injection of liquid into the intestine are procedures of interference that never can do any good; and, if practised a few hours after the onset of the disease may do much harm. Reasonable excuses for such treatment have not yet been advanced, nor does there exist an iota of evidence in their favour; those few persons who have tried kneading and inversion in obstruction of the intestine, had they possessed a knowledge of the etiology of these lesions, would not have ventured upon such extremely hazardous manipulations. As soon as a case happens not to progress, as we would wish, either a want of firmness or knowledge induces the practitioner to "tack about," and he tries several eccentric suggestions, adhering to none long, and thus we are presented with reports of cases, each of which was treated by drugs of diverse and opposite qualities, and

by modes of interference inimical to safe recovery, and to the last method is given the credit of the result.

As to external applications, during late years their use has been much curtailed in all diseases, as great injury must have often followed those potent counter-irritants so popular with our predecessors in medicine.*

In intestinal diseases counter-irritation must do harm. It may change the pain—but as we can effectually ease our suffering patients by the hypodermic syringe and opium,† there is now no excuse for this painful practice I have latterly discontinued the use of any local application. In my early practice, I advised a cloth steeped in cold water; the cold would sometimes give ease, at other times it would excite peristaltic action and had to be discontinued. If any external application is used, it should be a single fold of cloth wrung out of warm water, laid over the abdomen, and left exposed to allow of cooling by slow evaporation, taking care to

* That which further drew my attention to the subject of counter-irritation in general was the teaching of the late Prof. Syme, that effectual counter-irritation applied on the skin over the knee-joint produced irritation on the corresponding surface within the joint. Again, I noticed an attack of Herpes on any portion of the abdominal or thoracic wall induced an obstinate localized peritonitis or Pleuritis corresponding to the track of the Herpes. Most physicians must have noticed the obstinacy of the after-pain which often remains after the disappearance of the Herpes Zoster, while an attack of Herpes on the neck, arm, or lower limb, leaves no such after pain. This latter fact indicates to me that the pain remaining after Herpes of the abdominal or thoracic region cannot be referred to nerve lesion, or it would follow Herpes of the head, neck, arm, or lower limb.

† Frequently we are told the use of sedatives mask the symptoms and so mislead; but the more this is allowed the better, if certain details are strictly enforced. The navigator with the compass can navigate the sea, but other details besides watching the compass are to be borne in mind, to do so with safety,

cover with sufficient clothing the thorax, and upper and lower limbs. The random and rough usage to which cases of obstruction are subjected to, lessens in value the pathological records of these diseases, as the *post-mortem* appearances have been on many occasions mostly the traces of interference by the practitioner.

CHAPTER VIII.

TREATMENT OF OBSTRUCTION—INTERFERENCE BY SECTION OF THE ABDOMINAL WALL WITH MANIPULATION—WITH EXCISION OF A PORTION OF INTESTINE—BY INCISION OF INTESTINE.

The treatment of intestinal obstruction must occasionally require the aid of the surgeon, but the high rate of mortality that has hitherto resulted from their treatment by medicine has tended to their being of late relegated too frequently to the domain of surgery.

Surgeons again biased by the same errors as the physicians, have readily inclined to the conclusion that some one of the various methods of operative interference by a section of the abdominal wall, is the proper resort in these difficulties, and that such operations should be undertaken early. This has caused operative interference to be performed upon no more justification than the existence of the signs of obstruction; the result has been that many cases have been recorded, where section of the abdominal wall was performed,* and a general rummage of the abdomen made in search of

* The "LANCET," 1879, page 86, contains an example of this error. In the "BRITISH MEDICAL JOURNAL," July 29th, 1882, is reported another such mistake which terminated fatally. I had purposed to make a tabular summary of all recorded cases treated by section of the abdominal wall, but on careful consideration, it appeared to me that it would be of no practical utility, as improved medical treatment and the application to surgical interference of the modern operative precautions, so favours a decrease of mortality from operation that any deduction from past experience could not reasonably influence us in these days.

some form of absolute closure of the gut, but nothing found, some patients recovering even after this very serious, useless, and ill-judged interference.

On other occasions a search of the abdomen has revealed an invagination in progress of correction, and which only required time for its completion. It cannot be judicious surgery to perform hap-hazard operations, because in some isolated cases the *post-mortem* showed that an operation *might* have saved the patient. Such practice would only still further increase the present high mortality by subjecting to risk many, when out of these a small number only required operative interference. These errors of practice have not been infrequent. In the "American Journal of Medical Sciences," issued 1874, the reader will find a collection of thirteen cases of gastrotomy (abdominal section), compiled by Dr. John Ashurst, which is unwittingly a serious indictment of the grounds upon which this operation is resorted to. In eleven out of the thirteen cases, Dr. Ashurst has recorded, the primary treatment must have aggravated the disease, and the operative interference was either useless, or a further injury.

There are four methods of abdominal section, exclusive of herniotomy, applicable to the relief of intestinal obstruction. First — Colotomy, *i.e.*, incision in the left lumbar region. Second—By section of the anterior abdominal wall, and searching the abdominal cavity to correct any abnormality. Third—By section of the abdominal wall, and after detecting the lesion, excising it. Fourth—Section of the wall of the

abdomen in front, seizing the first presenting portion of gut, then stitching it to the opening previously made, and so incising it as to allow its contents to escape continuously; the original cause of the difficulty being allowed to run the chance of correction by a natural process. All of these operations are attended with some but not with equal risk. Again, it is very questionable whether we can by the operations that involve the least risk, secure at all times what we desire in operating. A decision as to which method of operating should be adopted, is not of so much practical importance as deciding whether operative interference is necessary. The surgeon ought to be convinced that the operation he is about to perform, is necessary. To this some surgeons would answer, there is no need to wait for decided evidence as to whether an operation be required; as the knowledge we now possess which enables us to avoid septic infection, &c., makes the opening of the peritoneum much less dangerous. My objection to such an argument is, that no matter what precaution or skill is exercised, the operation is not a trivial one, and ought not to be undertaken unless it is an unavoidable necessity at the time. Again, an operation may be decided on and the patient's friends refuse to permit it—the patient ultimately recovering without the operation. Non-attention to certain therapeutic details has engendered a belief that earlier interference by abdominal section would lead to a lessened mortality in these diseases. There

is some truth in the opinion that earlier operation would be attended by better success; for if performed early the patient escapes a long period of the higgledy-piggledy treatment still in vogue,—which is more dangerous than the operation if it is performed, ere his stamina has been frittered away by the misuse of drugs and by other interferences that never assist him towards recovery, but often, if long persevered in, make an operation futile. This is all that can be advanced at the present time in favour of early direct interference by abdominal section. If the operation be delayed, provided the patient is properly treated, his condition is even improved for operative interference; for the gut has been emptied below the obstruction, whilst that above has also been relieved of some of its solid contents by vomiting. Excitement will also have been allayed, pain assuaged, and the signs pointing to the necessity of interposing by direct operative interference, will have had time to become obvious, and thus a discreditable mistake be probably avoided.

In order to decide whether an operation be required, it is not essential that a differential diagnosis should be made. For a case of enteritis or even peritonitis may require an operation, while occasionally an extensive invagination or volvulus may not require direct meddling, as we know spontaneous correction of the latter is possible. If the patient is doing well art should stand aside and wait. It ought to be the servant not the tormentor of the sufferer. The medical treatment of the intestine after operations by

section of the abdominal wall, should be exactly the same—dietetic and medicinal as previous to this procedure. The general custom is, that as soon as the operation is finished, and the surgeon or physician knows, that from what has been done, the gut must be patent, they begin to look for a fæcal evacuation, and will not rest long before they begin to try the whole or portion of the primary treatment, as though the intestinal tube was an inert pipe through which matters ought to pass, whether it be active or inactive.*

To arrive at a conclusion, as to whether an operation be required, we ought to consider, first the duration of the disease, and next the present condition or that which it shows to be imminent.

Duration of the disease :—If the patient's primary treatment has been proper—as well managed as though Sydenham was in charge of the case—then it is highly improbable that an operation will be required earlier than the third day, or later than the third week. This rule applies to obstruction arising from those lesions I have placed in the first class, and also to some of those forms included in the second class, as hernia, stricture, intussusception, volvulus, strangulation from bands and rents in mesentery; but malignant disease, tumours and

* This is equally true of all operations which implicate the peritoneum, hernia, and also of ovariotomy. How frequently we read of reports in which the operator refers with pride to the fact, that after his ovariotomy, he gave an aperient or an enema in a few days or that the patient began to feed, &c. The medical profession seem to be imbued with some amount of the general prejudice in favour of a "purge," as though this daily habit can always be safely and beneficially induced. The late Professor Bennett ironically termed it "clearing the field for future operations," or "a preparation for all eventualities."

intestinal concretions, may require operative measures after having existed a long period. It will be found that in the majority of instances the period for operating will be indicated about the seventh day—and that only on very rare occasions will symptoms pointing to the necessity for an operation appear much earlier or later than the seventh day.

The Conditions:—If the sufferer after having had advice and fitting remedies, shows decided amelerioration of all the symptoms attendant upon his disease, there will be no grounds for surgical interference, *i.e.*, if the pulse is improved, temperature lowered, tongue moist, thirst moderate, vomiting reduced in frequency to twice in twenty-four hours, pain removed. But should the pulse early continue rapid, or at a late period become so, its rate being only little reduced or the volume increased by the opiate, (though this should lower the temperature), while the tongue has the typhoid appearance with intense thirst, and the vomiting exceeds four times in twenty-four hours; this condition, with or without collapse,* indicates the necessity

* Collapse—the gravest of all the symptoms observed in intestinal obstruction is not by itself an indication for surgical interference. I think it is possible to distinguish between that collapse, the correction of which can be aided by medicine, and that in which medicine, though it may influence, cannot correct. Collapse of a temporary type, comes on suddenly and during the second or third week, and is specially accompanied with slow pulse, and may be caused by sudden relief of distension, or some indiscretion of the patient himself or of his nurse. This is the form of collapse from which the sufferer may spontaneously recover, or in which medicine may make recovery more certain, its duration is seldom beyond an hour. But collapse occurring during the early period, or developed slowly, may exist from three to twelve hours, and is accompanied by the signs I have enumerated as pointing to operative interference, and brooks no delay if surgery is to be beneficial.

for considering the advisability of resorting to surgery—in hopes of relief—provided no fault of treatment or any avoidable cause for the grave condition can be detected; these are the signs indicative of the time when the patient ought to be given the chance, that can be afforded by a surgical operation. Should the practitioner, after close attention to the case, conclude that it is one of enteritis, or if he knows that life is jeopardized by the intestinal lesion of typhoid,* it would be necessary for him to perform one of the four methods of interference by section of the abdominal wall, as the case may be retrogressing, from the want of a temporary respite from distension, &c., when progress to cure would be resumed, and this grace can be secured without much risk—if a suitable method of operating is selected.

To operate early because this or that form of obstruction is known to exist is wrong: so long as the patient is doing well, he ought not to be interfered with. This is the rule for practice which past experience has indicated to us. If we examine the recorded cases of failures after abdominal section, the patient had in every instance, undergone a course

* Cases of typhoid have been observed in which ulceration and perforation was believed to exist have recovered. This is an argument in favour of operation in certain conditions of these cases,—we know that under unfavourable management single and multiple wounds of the intestines have often become healed—in fact, both the mechanism and the physiology of the contents of the abdomen, are more favourable to resolution than is generally supposed. John Bell, in his "Discourses on the Nature and Cure of Wounds," third edition, Discourses III, page 311, discusses very fully this matter, and there will be found the explanation of how it may happen that, on a *post-mortem* examination, leakage into the peritoneum of the gut contents is found, from an ulcerated perforation of the gut, which must have existed some time previous to the leakage.

of primary treatment, wasteful of his stamina, and conducive to the aggravation of the local disease—the treatment, not the time expended, being the most important factor in making the operation a failure.

Of the four methods of operating each possesses some merit, one being applicable to a condition to which another is unsuited. Colotomy is permissible only in an obstruction arising from a cause situated in the rectum or low in the sigmond flexure—but it is not destined to remain long in favour even for this form of obstruction. If the surgeon comes to the conclusion that the case is not progressing well and suspects a volvulus* or any form of complete obstruction to be the cause of the difficulty, then he should perform gastrotomy and correcting by manipulation. Gastrotomy has been advocated for the correction of intussusception, but Dr. Brinton, very justly and emphatically, denounced the practice. I have never yet met with valid evidence that any case of intussusception required this procedure. During

* "The greatest part of three hundred children, who having died either of worms, or during dentition, at the Hôpital de la Saltpetrière, came under the examination of M. Louis, had two, three, four, or even more volvuli, without any inflammation of the parts, or any circumstances leading to a suspicion, that these affections had been injurious during life. "These cases (says M. Louis) seem to prove that, intussusception may be formed, and destroyed again by the action of the intestines." (*Mem. l'Achad. de Chirurg.* 4to. t. iv. p. 222.) This opinion is confirmed by the authority of Dr. Baillie, (*Morbid Anatomy*, 2nd edit. p. 162), who observes, that "in opening bodies, particularly of infants, an intussusception is not unfrequently found, which had been attended with no mischief; the parts appear perfectly free from inflammation, and they would probably have been easily disentangled from each other by their peristaltic motion." A rare example is on record, where the displacement took place at birth. (*Beircil, De Intensis se intussuscipientibus, &c., Helmst.* 1769."

these last eight years, three representative surgeons* have advocated gastrotomy for the relief of obstruction arising from intussusception.

In support of this practice, Dr. Ashurt publishes in the lxviii. vol. of the "American Journal of Medical Sciences," thirteen cases of intussusceptions and given with such detail, as enables us to derive information for future use. The first case is that of the Baroness Lundi—This occurred "long ago," and is given with such meagre details that we can only surmise that the operation was necessary, as the primary treatment two hundred years ago was no better than it is now. No clue has ever been found to enable us to identify or know whence came the enterprising surgeon who thus successfully performed the first recorded case of gastrotomy for the relief of obstruction.

Case 2—Was performed with success at the suggestion of Nuck, the anatomist. No evidence is given that the operation was required, if we except the primary treatment, which was sufficient to do harm to a healthy gut.

Case 3—Invagination of twelve inches of colon, the treatment of this case previous to operation was all that should be avoided; yet his condition just before operation was "the vomiting after taking his medicine as well as after 'each paroxysm of pain' gave the patient relief, the pulse was nearly normal, respiration free, and the skin everywhere of a proper temperature." Condition after operation—"In six hours he had a soft stool and at night was hot, restless, and delirious, his pulse failed rapidly, his breathing became difficult, but his pain was relieved." Fatal.

Case 4—Was operated on with success by Fuchsius. After ten days of treatment by catharties and enemata, anodynes, metallic mercury, &c., the operation was a good exchange for the primary treatment.

Case 5—Is given as the first in which gastrotomy was practised for intussusception in a child. The infant was twelve weeks old. It failed, because the natural method of cure had progressed so far that manipulative interference was not possible, except by rupturing the gut, which was done. The report of the case gives no evidence that the operation was required, but the *post-mortem* made known that the infant would have recovered if not meddled with.

* Ashurst, Hutchinson, Bryant.

Case 6.—A negro with obstruction, which had lasted seventeen days, and treated by a method from which Dr. Ashurst nowhere dissents. "Active purgatives and metallic mercury;" disinvagination after abdominal section. "Disinvagination was effected by grasping the intestine above and below, and forcibly rupturing the adhesions which were quite firm." "His recovery was rapid and entire." Wonderful! But was the operation necessary or beneficial? Certainly not. This case was in progress to resolution, and the patient was subjected to a hazardous interference, because the natural method of resolution was not known to his attendants.

Case 7—Is given with details of the symptoms, which were present during the four months previous to operation, Medical treatment is not given—but case ended fatally.

Case 8—Is that of an infant four months' old—a very favourable age for spontaneous recovery. The intussusception had only lasted four days, and had been treated by some of the most objectionable modes of interference. No wonder "the child was almost moribund when the operation was begun." It is to escape "injections, insufflation of air and the use of sponge probings," that early operations are wise; the earlier the better, if it is the only way of avoiding these injurious items of treatment.

Cases 9, 10, and 11—Are very imperfectly reported, so that it is not possible to estimate their value in relation to an operation, but the three ended fatally.

Case 12—Is that of an an infant six months' old. The clinical history antecedent to the operation is not given. Ended fatally.

Case 13—An infant two years' old. The intussusception had existed one month, and the invagination protruded beyond the rectum. No clinical history previous to the operation is given, the fact that the invagination had existed a month rather indicates that it might with probable safety have been left to be cured by nature's method. None of these cases are evidence in favour of operative interference with invagination, but rather they point to a contra-practice. In justice to Dr. Ashurst, I must mention that these cases were not treated by him, but were collected only from previous records.

I shall now analyse the evidence, which Mr. Hutchinson has adduced in favour of operative interference in intussus-

ception, contained in his paper on "Abdominal Section for Intussusception," published in the "Medico-Chirurgical Transactions," vol. 39. He reiterates the opinions expressed in this paper, in his late contribution read before the British Medical Association, at Bath, in 1878. The author has always been an advocate of interference by manipulations of the abdomen, previous to any operation by section of the abdominal boundary. At the conclusion of his paper are appended a summary of his deductions — previously arrived at from personal experience. There are twenty paragraphs of "conclusions." I shall only discuss those conclusions which relate to the question of, "When should we perform gastrotomy for intussusceptions?"

CONCLUSIONS :—

5.—That in a large proportion of the cases in which children under one year are the patients, death must be expected within from one to six days from the commencement.

This is not creditable to the method by "abdominal taxis." By rational medical treatment death may be averted from six to forty days.

6.—That in the fatal cases death is usually caused by shock or by collapse from irritation and not by peritonitis.

This is correct so far as it goes; but death in the majority of recorded cases has been due to primary treatment, often inducing shock and collapse.

7.—That in many cases it is easy, by estimating the severity of the symptoms (vomiting, constipation, &c.). to form an opinion as to whether the intestine is strangulated or simply irreducible.

This is true of infantile invaginations, but in the adult the diagnosis is by no means easy.

8.—That in cases of strangulated intussusception, whilst there is great risk of speedy death, there is also some hope that gangrene may be produced and spontaneous cure result.

Though these cases again are tolerant of interference, the "speedy death" in such examples, when earlier than the sixth day, is often due to previous treatment.

9.—That in cases in which the intussuscepted part is incarcerated and not strangulated, there is very little hope of the occurrence of gangrene, and it is probable that the patient will die, after some weeks or months, worn out by irritation and pain.

But these are the cases of which we do not possess a single instance in which the patient has been allowed expectant treatment. In all such examples the patients have been worn out by induced irritation and pain.

11.—That the cases best suited for operation are those which have persisted for some considerable time, and in which the intestine is only incarcerated, and that these cases are also precisely those least likely to be relieved by any other method.

The natural method of resolution, equal to correcting the greater, is also equal to undoing the lesser mischief.

13.—That the records of *post-mortems* justify the belief that, in a considerable portion of the cases referred to, the surgeon will encounter no material difficulty in effecting reduction after opening the abdomen.

My studies into the records of *post-mortems* lead me to quite an opposite conclusion.

16.—That in cases in which the patient's symptoms are very severe, or the stage greatly advanced, it may be wiser to decline the operation and trust to the use of opiates.

If the severer examples of intussusception be amenable to medical treatment, why not the milder?

17.—That the operation is best performed by an incision in the median line below the umbilicus.

Mr. Hutchinson has very graphically shown that the operation of gastrotomy, and subsequent search among the abdominal contents do not end the difficulty or evils of this special operation.*

18.—That in cases of intussusception in young infants (under one year of age) the prognosis is very desperate, scarcely any recovering excepting the few in whom injection treatment is immediately successful, whilst a large majority die very quickly.

Why are intussusceptions treated by Mr. Hutchinson's methods in the infant, not attended with a lesser mortality than those in adult life? In early life our inability to demur together with our less acute sensations urges the surgeon to venture further and fare worse, with painful manipulations. I know from experience that obstruction in the infant is easier controlled within the limits permitting of natural resolutions, than in adult life.

In the paper read before the Medico-Chirurgical Society, Mr. Hutchinson refers to about twelve cases. Of these he appears only to have had personal knowledge of four,

* However careful the operator may be, it is almost certain that he will finish in having half the intestines outside, and in being at his wits' end to get them back again; with, perhaps, the added horror of a rupture of the bowel and unlimited extravasation of fæces. To reduce the bulk of the extruded bowel, acupuncture will have to be practised; and the surgeon will probably observe, just as he is returning the now collapsed coils, that little feculent bubbles of air are still escaping at his punctures. I speak not ignorant of misfortune.—*British Medical Journal*, 1878.

and appended to his paper is a tabular collection of 131 cases by Dr. Day, none of them specially instructing us as to the value of operative interference when invagination exist—but the four cases which come directly under the author's supervision are worthy of careful consideration.

Case 1—Was that of a delicate child, aged two years. The invaginated bowel protruded through the anus two inches beyond it. She had suffered for a month previous to Mr. Hutchinson's examination of the case. On the first day of the difficulty she had much pain also a motion containing blood and frequent vomiting. How frequent the vomiting was, is not stated. "There had been no absolute obstruction of the bowels," during the month prior to the patient coming under the author's care, nor had there been any decided medical treatment, but now "our first measure of treatment consisted in putting the child under chloroform, and then, whilst she was tied up by the feet, distending the rectum to the utmost with warm water. By this means the involuted part could be pressed up into the abdomec." This was tried several times but the prolapsus recurred—*this treatment was not continued long*,—and in its place gastrotomy was performed. "The operation had been an extremely simple one, and had not occupied more than two minutes, and was successful."

Later experience must have convinced Mr. Hutchinson that this operation is not always a simple one, for at the Bath meeting of the British Medical Association, he points out the difficulties of gastrotomy, an experience which tallies with that of his predecessors during the last hundred and fifty years.*

The after treatment of this case was similar to the primary treatment :—milk enemata every three hours, and five drops of tincture of opium occasionally added.

* Heister—Book I, chap. 5, para. 9.

Case 2—Child ten months' old, The case came under observation at the initial period, and "*during six days a great variety of means*" were tried, chloroform, "injections of air and water were made over and over again, and in various positions of the body, and attempts were also made with a long tube to push the bowel into place," The case terminated fatally.

Now if all that was done during the six days were placed on one side of the ledger, and gastrotomy on the other, there would have been found a balance in favour of the surgical operation as less risky to the patient's life; but the method of Sydenham would have been better than either, and my grounds for this assertion are based on the fact that, in nearly all recorded cases of this type of invagination, there was an absence of urgent symptoms previous to active meddling with the intestine.

Case 4—Infant fifteen months' old. Came under the author's notice on the second day. "*Repeated attempts were made by manipulations and by injections,*" and on the seventh day the child died.

A *post-mortem* revealed that there were only two inches of invagination, it had been supposed to be of much greater length originally, and to have been partially reduced. This is very doubtful. This case is not evidence in support of interference by a capital operation—but is evidence in the direction of trying a consistent course of medical treatment.

Case 5—Was that of an adult. In this case the patient lived four months from the commencement of his illness. This case terminated fatally. The treatment is not given, probably it was the same as that followed with the previous four cases, and which the author favours, *i.e.*, abdominal taxis. The *post-mortem* revealed an invagination of the ileum six inches long, the entire cæcum, and front part of the ascending colon.

There were no adhesions, so it is fair to infer that, by abdominal section this intussusception could have been reduced. Whether he would have lived longer we cannot judge, in the absence of information regarding his diet and medical treatment. Two other cases are referred to as having occurred in the author's practice, but the particulars are not sufficient as evidence for or against abdominal section. Whether the involuted part of an intussusception be strangulated or incarcerated, so long as all the symptoms are easy of control, so long operative interference ought to be delayed, and future experience will show that in these forms of obstruction an operation will very seldom be required. In the *Lancet*, published June 1, 1878, Mr. Bryant seconds most of what Mr. Hutchinson teaches regarding operative measures for relieving intussusception, and also draws special attention to supposed evils that may result after spontaneous resolution through sloughing of the involuted part. "The patient dies some months afterwards from contraction of the cicatrix." That this has happened I well know, but it certainly is an exceptional occurrence, and the popular medical treatment of this lesion ought to be credited with the fatality in many instances, for it prolongs recovery and induces inflammation of the intestines on either side of the anular cicatrix—which during the intussusception may have suffered from collateral inflammation. The consequent delay also from unsuitable food or drugs, must increase the thickness and strength of the anular cicatrix, as well as the inflammatory condition of the intestine, thus the physiological action of the intestine

at the part diseased is likely to be impaired. It is possible that isolated examples of invagination may be met with, in which symptoms show which call for immediate surgical interference; even then gastrotomy is not the operation best suited to such an occasion.

The third method—gastrotomy with excision of a portion of the intestine, and connecting the two sections of intestine by sutures, is an operation of recent date, and was first tried in a case of hernia by Professor Dieffenbach in 1836, and recorded in the *Medical Times and Gazette*, vol. xx, page 93. The patient, a strong man, had suffered from inguinal strangulated hernia fourteen days, and when Professor Dieffenbach visited him he had all the symptoms which would seem to "threaten speedy death;" and on the second visit

"The poor man was now sinking fast, and the anxiety of death was evident."

At this time the Professor operated, and removed three inches of the intestine, with a portion of the mesentery; after excision, the ends of the intestine were sutured together and returned into the abdominal cavity. Castor oil, and croton oil were given on the first and second days; and though the after-treatmeet included a course of mild purgation, this case recovered; but on a recurrence of obstruction from accumulation arising from his indulgence in an "Immoderate meal of fat meat and other indigestible substances," he succumbed to the primary treatment, which consisted of purgatives and bleeding.

An extraordinary case of gastrotomy with excision of intestine is reported by Dr. A. Bingham, Superintendent of the New York Lunatic Asylum, and published in the "American Journal of Medical Science," for April, 1845, page 335. This case may be described as one of Gastro-entrotomy, without primary interference, and is a remarkable example, both of recovery and of the mode adopted by nature to secure the resolution of so extensive a mutilation, as the removal of seventeen inches of intestine.

"The following very remarkable case of recovery, after extensive loss of small intestine, has lately occurred. The patient, a married woman, who had had five children during the two previous years, was admitted into the Asylum, with which Dr. Brigham is connected with, in June, 1843.

As some fears were entertained that she would attempt suicide, she was strictly watched, and placed in a room where no instruments, by which such purpose could be effected, were kept.

No material alteration in her case was noticed until Oct. 24th, when about nine o'clock in the forenoon, she obtained a large pair of scissors that had been accidentally left in the hall, which she took to her room and with which she made two wounds into her abdomen, one about an inch and a half above the umbilicus, the other half an inch below it. From the upper opening she took out part of the small intestines, from which she cut off a portion, seventeen inches in length, when she was discovered by another patient, an alarm being given, she was forced, not without some resistance on her part, to cease from further injuring herself

Dr. Buttolph, the assistant physician, was near, and saw her immediately. Discovering that the intestine was entirely separated, and also a considerable portion of the omentum, and that one end of the intestine was withdrawn into the abdomen, he concluded the case would soon prove fatal under any treatment, and therefore returned the end of the intestine that protruded into the abdomen, stitched up the wounds carefully, and covered them with adhesive plaster,—applied a bandage around the body, and ordered an attendant to remain with her constantly. While

thus dressing the wound she vomited, but did not appear to have much pain.

On examining the detached intestine, which she had cut into in several places, it was found to contain a small quantisy of fæces, and weighed one ounce and one drachm; the omentum, which was separated from it, weighed one ounce and two drachms. The ends of the intestine were ragged, and been cut off obliquely. For a few days she was disposed to vomit, and was not able to retain anything on her stomach but a trifle of water. Injections of laudanum and broth were administered, and she was kept constantly quiet. After a few days she called for food, and was able to retain a very little, and in about ten days she asked "if she had not ought to take some physic." She was reminded of the accident, and told that it would be improper to give her physic; but she did not appear to think so, and said she "felt as if it would do her good, and that she ought to have some."

She continued without much change, very quiet by aid of injections of laudanum, eating a little several times in the day, and vomiting occasionally, but without any marked tenderness or inflammation of the abdomen, until the 26th of November, thirty-three days after the accident, when she had a small discharge from the bowels of hardened fæces, and on the next day a copious one. This she said, gave her great relief, and she was soon able to walk about. Since then she has continued to have regular evacuations from the bowels, though there is rather a tendency to diarrhœa, for which she often takes laudanum. She now eats tolerably well, though inclined to vomit when she eats heartily. She is able to be about the house, and sews and knits, and is as well as she was for several weeks previous to the injury. She is, however, still feeble, and does not gain flesh, but is calm and quiet, though her mind is in rather a demented state."

Dr. Brigham in the "American Journal of Medical Science," for January, 1846, page 44, reported the death and *post-mortem* examination of this patient in twelve months after from some disease unconnected with the intestinal lesion. His second report I here append :—

"The portion of the intestine removed at the time of the injury was

found to be the colon, it having been divided about four inches from the entrance of the small intestine. The divided portions were drawn together at the place of injury and united by organized lymph, which also connected the intestines to the parietes of the abdomen where the wound was made. The passage between the divided ends of the intestine was small and crossed by a few ligamentous-like bands, but still large enough to permit the passage of semi-liquid fæces.

Judging from the size of the intestine removed, which was diminished by being drawn out at a small opening, we had erroneously supposed, without particular examination, that it was a portion of the small intestine, and so stated in our former communication."

Excision of a portion of the intestine, by gastrotomy and herniotomy has been frequently practised since the time of Dieffenbach with varying results, but the fourth method of operative interference—gastro-enterotomy, is the operation, which in cases of intestinal obstruction needing such interference will give the largest per centage of successful cases. It possesses more advantages than either of the other three, at the same time is not without fault. Its advantages are—1. It is very easy to perform.—2. Nearly bloodless.—3. The admission of air into the peritoneum can be avoided.—4. A differential diagnosis is not essential.—5. Relief from some of the evils symptoms attendant upon the disease is immediate.—6. Mistakes of after-treatment are not serious.—7. The original lesion can be ignored.—8. In cases in which there is extensive "matting" from adhesions, or when malignant disease exist, this operation will succeed, conditions in which gastrotomy would not. Its fault is, that if there exists complete strangulation internally—intussusceptions excepted—it may fail. The operation of gastro-enterotomy consists of incising

the abdominal wall to the inner side of the crest of either ileum, and seizing the first presenting portion of intestine, then stitching this to the external wound, and incising it. Simple and safe as we know this operation to be, yet its introduction into surgery was the result of the accumulated experience of many ages. In early times contending armies engaged in "close quarters," closer and more frequently than in our days, this with the prevalence of duelling gave our predecessors in surgery ample opportunities of observing wounds of the abdomen. Hildanus had noticed that the lips of a wounded intestine tended to adhere to the gap in the abdominal wall; advantage was taken of this knowledge, so that in extensive wounds of the intestine, instead of returning the intestine with or without suture—as in slight wounds—surgeons attached the gap in the intestine to the opening in the wall of the abdomen, sometimes amputating any portion of gut that might have sloughed. This practice may have probably suggested to Littrè in 1710, *his* operation of colotomy, subsequently modified by Callisen and Ammusat, as a method of relieving the intestine from congenital occlusion, when its correction was not possible at the situation of the anus. Littrè's intra-peritoneal operation—gastro-enterotomy—from the date of its introduction into surgery has steadily gained in favour, but has been more frequently resorted to by surgeons in France and Germany than in this country.

The operation of gastro-enterotomy, for the relief of non-congenital obstruction was first performed in this country by

G. Freer of Birmingham in 1817, and subsequently by D. Pring of Bath, in 1819, upon patients suffering from malignant disease of the rectum. Mr. Freer's case survived the operation nine days, but in Mr. Pring's case life was prolonged sixteen months. The patients were not operated on until the symptoms showed urgency and all known cathartics had been tried and had failed. After the operation a portion of the primary treatment was resumed. This, I suspect, caused Mr. Pring's case to fail early, and Mr. Freer also had almost lost his case early from the same cause ; both operations were followed by immediate relief.

The last two recorded cases of gastro-enterotomy are reported in the *Lancet*, May 25, 1878.

The patient, aged 57 years, had suffered from occasional attacks of illness, and had frequently used purgatives, "but none opened his bowels freely." On admission into hospital his medical treatment was opium, belladonna, and nux-vomica. He was operated upon seven days after admission. "It was decided upon performing enterotomy in the right groin, as it seemed tolerably certain that the obstruction was neither in the colon nor rectum, but in the small intestine."

Whether the right or left groin be selected in such a case, there would only be found presenting through the abdominal opening, intestine situated above the difficulty; in fact, that portion of gut wanted by the surgeon. It is reported as "chronic intestinal obstruction." Then was an operation imperative? While the clinical history of the case is reported minutely after the operation, the report is a very incomplete history of the patient's condition previous to the operation, so that

it is not possible to surmise whether interference was the only course left. The other case recorded was also a success—both were very creditable to surgery, but in their medical treatment there is nothing to approve of—especially that of the last case, either before or after operation—the latter being only a repetition of the primary treatment which had lead to "acute obstruction grafted upon chronic."

CHAPTER IX.

CASES IN ILLUSTRATION OF TREATMENT.

I have appended but a few illustrative cases—they are those alone of which I have notes.

Case No. 1.—During the early part of the year, 1876, I was called to assist in the treatment of a case of supposed intussusception. The gentleman in charge of the case told me that, a fortnight previously the patient had, whilst at work, had a sudden action of the bowels followed soon after by a good deal of pain, to relieve which the medical attendant was called in; and he attributing the cause to constipation, administered purgatives, enemas, &c., which, however, had given the patient no relief. When I examined him I found the abdomen very tender on pressure, especially in the right hypograstic region, with moderate distension and frequent vomiting, which had become slightly stercoraceous. I advised the discontinuance of all purgatives and all interference by the use of enemata, and ordered cold cloths to the bowels, elevation of the pelvis, and morphia administered subcutaneously night and morning. This treatment had the effect of diminishing the pain and partially arresting the vomiting, which now only occurred with a notable regularity about once in twelve hours. The morphia was continued, sometimes twice, and at others three times a day, for the seven days succeeding my first consultation, with the effect of greatly relieving the patient from pain and the partial arrest of vomiting; but there was no diminution of the distension, nor was the rapidity of the pulse much diminished. About the eleventh day after my introduction to the case the morphia dose had to be much increased, but did not completely ease the pain, nor diminish the rapidity of pulse, whilst the distension was increasing. On the twelfth day of my co-operation in the treatment the patient's condition appeared very precarious, and indicated to my mind that, if in the course of a few hours the symptoms did not improve, it would be necessary to practice some operative interference. This opinion was based on the fact, that the

morphia appeared not to have sufficient control over the pain, or the pulse. However, to my delight, when we met in consultation the next day, I was informed that the patient had passed frequent and copious semi-liquid stools, with great relief to all the symptoms.—We had decided to perform gastro-enterotomy (incision of the gut) on this day if there had been no improvement of his symptoms.—But he was still continued under the influence of diminished doses of morphia, and treated for a time as though the obstruction still existed. He ultimately recovered.

Case No. 2.—On the 7th of June, 1874, I was called to attend Mr. H—— H——, 55 years of age. I found him suffering from slight tenderness of the bowels, and thirst, with an irritable pulse, distended abdomen, &c., and as he had been under my care during three previous attacks of enteritis, I concluded that, in all probability, this was a recurrence of the old complaint. I administered a ¼ of a grain of morphia subcutaneously, night and morning, during the first four days, but the distension increased, with vomiting from once to twice daily during the first fourteen days, When the distension became extreme, I then trocared the abdomen on the most prominent point in the hypogastric region. This operation was repeated every other day on six occasions, with the effect of, at the time, releasing a great quantity of gas, and on each occasion totally collapsing the abdomen. During the whole time of treatment the patient's diet was restricted, and I raised the foot of the bed. A motion of the bowels took place on the 29th day, which continued acting for three days. Yet I continued the treatment for some time after. In the course of a fortnight the patient was so far recovered that he, contrary to my advice, went to attend to his business; and he continued apparently well, though very feeble, up to the 19th of September, when his previous symptoms returned. The treatment was resumed and continued until the 2nd of November. During this period, the bowels rapidly became distended, and the distension, which was mostly caused by gas, was relieved by trocaring, which was performed on some occasions as often as four and five times a day, in all the trocar being inserted on forty occasions. Relief to the bowels took place on the twenty-second day of treatment, but with no subsequent action, and on the 2nd of November the patient succumbed. He would not submit to operative interferenee.

This gentleman had been successfully treated by me during four previous attacks :—Two in 1871, one in Feb., 1873, and

one in 1874; in all five attacks, which includes the last fatal one. I was unable to decide the immediate cause of death, as I failed to gain consent for a *post-mortem* examination. The treatment was the same in all the attacks.

Case No. 3.—On the 10th of June, 1876, I was called to attend W—— H——, 49 years of age. I found him suffering from tenderness over the abdomen, with slight distension, accompanied by vomiting, a furred tongue, thirst, and an irritable pulse. His statement was that he had been taken ill the previous afternoon with intense pain in the abdomen; and as the pain increased and the vomiting continued I had been sent for. I at once administered a dose of morphia subcutaneously; applied cold to the abdomen, and restricted the patient's diet, ordering him cold drink, limited in quantity. On visiting him the next day, 11th of June, the vomiting was not so frequent, but the other symptoms continued though slightly abated. I repeated the injections of morphia. On the 12th June, I found the general symptoms had much improved. I continued the injections of morphia. On the 13th, I found the symptoms continuing to improve, and the distension and tenderness very perceptibly diminished. On the 14th, the vomiting had ceased, and the patient suffered but slight thirst. On the 15th, all the primary symptoms were absent, and I then prescribed a mixture of tincture of opium, a drachm in half a pint bottle of water, and ordered a tablespoonful to be taken every three hours. This he continued to take during the subsequent eight days. On the 23rd June, the bowels acted copiously. After this the opium was continued for a week, his diet being still restricted, after this his recovery was completed.

This was jndged to be a case of enteritis; probably, total abstinence from food, and limiting the patient to cold water for drink, and the omission of medicine, would have been sufficient in this case, with strict confinement to the horizontal position.

Case No. 4.—On the 31st of May, 1872, I was called to attend W—— G——, aged 40 years. This man had fallen from the masthead of a ship. I visited him in the evening of the same day and found him suffering from

a severe injury of the spine, which had paralysed the lower extremities, and caused also retention of urine, which had to be removed twice a day for several subsequent weeks. On the 3rd of June, the patient began to be disturbed by frequent attacks of vomiting, the bowels became tender and distended, and the tongue dry. I judged these symptoms to arise from traumatic enteritis, and commenced at the onset to administer morphia subcutaneously night and morning. The distension in this case gradually increased up to the twenty-seventh day after the accident, when spontaneous action of the bowels took place; and was followed by a slight diarrhœa, lasting some days, though the opium was continued.

This patient recovered perfectly as regards the enteric complaint, but it was two years before he began to regain power in the paralysed parts. The gas distension in this case was enormous, yet not possessing at that time sufficient confidence in the practice of trocaring the abdomen under such a condition I did not venture to practise it. This case reminds me of another one of traumatic enteritis, in which there was enormous distension, which occurred about fourteen years ago. I was called to attend a railway porter, a stout middle-aged man, who had been crushed between the buffers of two railway carriages, the force being applied to the right, just above the umbilicus, smashing his watch, which was in his waistcoat pocket. The treatment I practised was opium, restricted diet, &c., and so averted the threatening symptoms of traumatic enteritis; and in the course of two weeks he was apparently well. I cautioned him with regard to dietary, but in vain, as he commenced to feed himself with the usual routine articles of diet, and thinking my restrictions an unnecessary curtailment of his liberty, he requested me not to visit him again; however, I was again sent for, but not

until the recurrence of intestinal obstruction and abdominal distension with sloughing of the abdominal wall corresponding to the position of the crushed watch, where also I noticed the sloughed intestine protruding, and discharging its contents externally. This case was fatal through the want of thirty to forty days' further restriction from food. This case is also interesting as being an example of spontaneous formation of the condition usually brought about by the operation of gastro-enterotomy. First, the injured section of intestine had become adherent to the posterior aspect of the anterior abdominal wall, and again that portion of the wall, that had been subjected to injury, sloughed when subject to the further injury arising from the extreme distension of the abdomen by distended gut, and finally the intestine at the injured part loosing the support of the parietes also sloughed, and thus was formed the gastro-enteric opening which I witnessed,—the result of forces from within.

Case No. 5.—On the 11th of March, 1876, I was called to J—— W——, 25 years of age, residing at Liverpool. I found that the patient had been rather ill on the 7th of March, with an attack of what he and his friends thought was simply a bilious attack. For the three subsequent days they administered purgatives, which had only aggravated his symptoms. When I visited him I found slight distension and tenderness, and constant vomiting. I administered a dose of morphia subcutaneously, which had the effect of diminishing the vomiting, pain, and distension; and I ordered a mixture of tincture of opium, one drachm in half a pint of water, a tablespoonful to be taken every two hours. On the third day the symptoms were so far improved that the patient continued to take the mixture in diminished quantity. He rapidly recovered, having a spontaneous action of the bowels on the tenth day.—(This I thought was a mild case of enteritis.)

Case No. 6.—On the 15th December, 1874, I was called to attend a club patient of mine, Mr. P—— M——, 32 years of age, residing at R—— Street. I found him suffering from intense pain in the abdomen, attended with constant vomiting, which was stercoraceous in character. He had been sick some days, but judging that it arose from simple constipation he had used purgatives; consequently, I found early aggravation of the symptoms when called to him. I immediately injected a ¼ of a grain of morphia beneath his skin, and continued to do so twice daily, for three days, with the effect of diminishing the pain and decreasing the vomiting; but the distension increased. On the fourth day, commenced to inject under the skin a ½ of a grain of morphia four times a day, and on the sixth day, finding the distension still increased, he was tapped with an ordinary bladder trocar with the effect of relieving him of a good deal of gas which collapsed the abdomen. On the ninth day the trocaring was repeated, the morphia being still continued. The use of the trocar was repeated at intervals of three days, and in all on four occasions. On the twenty-first day a spontaneous action of the bowels took place, the patient being much relieved; yet the opium treatment was continued for some days, and the symptoms gradually resolved, and the patient recovered.

During the treatment of this case (the patient being an occupant of one of those filthy dens with which Liverpool abounds), necessity compelled us to be satisfied with what nourishment was contained in a little cold water in which a portion of Liebig's extract of meat had been dissolved. This was the only nourishment the patient had during the whole time, and he consumed four ounces of this commodity during treatment; and as an example of the knowledge of dietetics possessed by this man's partner, no sooner were the symptoms relieved than she prepared him a cabbage as a delicacy.

This case is instructive as showing how well the patient progressed with all the disadvantages arising from primary purgation, filth, bad nurse attendance, vitiated atmosphere, and

the absence of anything approaching comfort, beyond a hard bed, and a shed over head ; but he had two great advantages, his case was not complicated by an excess of food, and he had a free administration of opium, which also assuaged his sense of hunger. These two latter assisted in bringing about resolution, which occurred at least one week prior to my expectation.

Case No. 7.—Mr. C—— of D——Street, consulted me on the 1st of August last, suffering from an attack of diarrhœa. I prescribed tincture of opium, muriate of ammonia, and chloric ether, and he got apparently better in the course of seven or eight days. On the 10th of August, on visiting, I found him suffering from severe pain in the abdomen, accompanied by vomiting, thirst, with tongue dry and furred, pulse nine in five seconds, I injected a ¼ of a grain of morphia under the skin night and morning. Advised cold drinks, beef tea, arrowroot and sago, made with water and linseed tea ; his diet to be confined to these in an ounce dose, given every one or two hours, and cold water as a drink to be given frequently, but in small quantities. On the second day having found less tenderness of the abdomen, but more distension, diminished thirst, vomiting once of a bilious character, pulse eight in five seconds, continued the morphia by subcutaneous injections night and morning. On the third and fourth days, more distension and slight thirst, pulse seven in five seconds, vomiting once in thirty-six hours, not much pain. On the fith day, vomiting twice, pulse eight in five seconds ; increase of thirst, tongue slightly furred, little more tenderness, distension not increased ; the dose of morphia was increased to ½ a grain under the skin three times a day. Sixth day, vomiting only once in twenty-four hours ; pulse seven in five seconds ; less thirst, tongue clean and moist, no pain, distension not less. This condition remained unchanged during the seventh, eighth, ninth and tenth days of treatment. On the seventh day, the lower legs of the bed were raised a foot to elevate the pelvis, ease distension, and facilitate vomiting. On the eleventh day, he vomited twice ; the vomit being stercoraceous in character. Half a grain of morphia was given under the skin four times during this day ; the pulse on this occasion being eight in five seconds, and slight increase of thirst. On the twelfth day he had diminished thirst, and had vomited only once in forty hours, the vomit was stercoraceous in character. Morphia was

given under the skin three times this day. His condition and treatment continued the same on the three following days. On the sixteenth day, though the distension was not so extreme as to make the use of the trocar urgently necessary, he was trocared with a No. 3 size trocar; a small volume of flatus escaped; no perceptible effect upon the abdominal distension; continued the morphia as usual, the vomiting being absent at this time for thirty-six hours. On the eighteenth day, vomiting occurred once, moist tongue, pulse six in five seconds, temperature ninety-nine and a half. On the twentieth day, accompanied by my friend Mr. Rushton Parker, the abdomen was trocared again; about five ounces of fluid escaped and some gas. It had slight effect upon the distension, which was, however, not very extreme. On the twenty-first day, the vomit ceased to be stercoraceous, becoming rather serious in character, and occurring once in twenty hours. During the twenty-second, twenty-third and twenty-fourth days, the pulse varied during these days from six to seven in five seconds, temperature ninety-nine to ninety-nine and a half. September 3rd, the twenty-fifth day, action of the bowels occurred, and a motion of about one pound of pultaceous fæces was passed, distension of the abdomen perceptibly diminished; pulse seven in five seconds, tongue moist, very slight thirst, and slight pain. On the twenty-sixth day as there was no change, the morphia treatment was intermitted for a day. On the twenty-seventh day only ½ a grain of morphia administered once during the day. On the twenty-eighth day increase of the distension, with a good deal of pain, pulse became small, and nine in five seconds; administered ½ a grain of morphia three times a day. On the evening of this day, assisted by Mr. Rushton Parker, I trocared the abdomen, and removed a quart of stercoraceous fluid which diminished the distension, and after so doing administered a grain of morphia under the skin. About two hours after, the patient vomited fluid, not stercoraceous, and passed per rectum, in one hour after the last vomit fully three quarts of pultaceous stool. In three hours after this evacuation, I was summoned to see him at two a.m. on the twenty-ninth day, and found him very prostrate, pulse ten in five seconds, abdomen perfectly flacid and hollow, no appearance characteristic of collapse, but great pain. Now was given ½ a grain of morphia per mouth, as he expressed himself in much pain. The pain, I was afterwards informed by his attendant, continued up to 8 a.m., when he died.

My friend Mr. Rushton Parker did me the favour of making a *post-mortem* examination of the abdomen.

"Bony spare, belly flat. Whole surface of peritoneum shining, and injected, except at contiguous margins of the intestines, which adhere by the medium of a little puruloid lymph. In the belly, about a pint of thin, tumid fluid, coils of small intestine occupy the entire front of the abdominal interior and lie chiefly transversely. A double coil lies above and in front of the omentum, the tip of which occupies the internal inguinal aperture, whence it is easily withdrawn. The whole of the colon is collapsed; the rectum is little distended. The small intestine is everywhere slightly distended with fluid, and its walls moderately thickened. At the ileo-cæcal portion is a hard nodule, consisting of an anular thickening of the bowel about ¾ inch long, and on being slit, invagination of ileum. The layers of bowel are firmly united together by fibrous tissue, which completely seals over and smooths the peritoneal part of the fold, one half of the circumference. The thickened portion has a canal through it, about large enough to hold a cedar pencil, and here the mucous membrane is quite red, and covered with a little fæcal matter. No trace of the vermiform appendix remains, nor can the ileo cæcal valve, or anything representing it, be recognised. Left kidney was completely atrophied, right one much enlarged but healthy; no examination was made of the thoracic viscera."

Viewed by the light of subsequent experience, I believe now, that my treatment of this case was not free from error. First—It was not safe to trocar an intestine which, from percussion, I had learned contained much liquid, although at the *post-mortem* examination no trace could be found of the punctures in the intestine, still a stercoraceous odour and colour pervaded the peritoneum, and there may have been leakage—which, if slight, would probably be fatal. Indeed, I now incline to the opinion that leakage occurred in this case by the symptom present after the final relief of the primary obstruction. The patient had much pain, rapid pulse, and low temperature. Again, on the twenty-fifth day after partial relief of the primary obstruction, the patient was

restored to the horizontal position ; this induced some increase of pressure upon the diseased area, at a very critical period. This is to be concluded from the signs which immediately followed. If the fluid distension in this case had arrested progress to recovery, then it would have been better practice to have performed gastro-enterotomy.

In the *Lancet* issued Jan. 11th, 1873, page 42, is reported a case, the terminating treatment and symptoms of which appear to have been very similar to my own case, in this were also practised trocaring and removal of some of the liquid contents of the intestine, where the canula was also retained in place a long period—over twenty-four hours. This special item of treatment in the case has been referred to with approval by Professor George M'Leod, in the *British Medical Journal*, Nov. 25th, 1876, page 673, who also proposes to enlarge—"by means of a tangle-tent"—the puncture made by the trocar, "so as to serve as an artificial anus"; a rude and unsafe way of imitating gastro-enterotomy. Unsafe, inasmuch as the surgeon would have to depend upon the formation of adhesions, extensive and strong enough to hold the intestine permanently at the abdominal aperture, an improbability. The practice of trocaring the intestine, to relieve distension from liquid, is attended with more risk than would be incurred by the performance of gastro-enterotomy.

When the intestine is distended with gas, puncturing the intestine with a very fine trocar is comparatively safe—because

intestinal gas will escape through a very fine canula. This, on withdrawal, leaves a puncture which quickly contracts and heals, a puncture made by a canula large enough in the "bore" to allow of the semi-liquid intestinal contents to escape with or without the aid of the "aspirator," is liable to permit leakage, especially as by this method there is never sufficient liquid removed even to half empty the intestine; consequently, hyper-distension recurs early, stretching the recent puncture so that it "weeps" under the strain, though there may not be found any trace of the trocar on making a *post-mortem* examination. The fact that, in very many instances of trocaring the intestine, no trace of such puncture could be found after death, is no evidence of this practice been absolutely safe. Those who have had much experience in the use of the trocar with or without the aspirator must know this:—that if the confined liquid, which the surgeon desires to remove, is not *all* removed, "weeping" may readily take place through a "short track," and even through an extra "long track," by which the trocar may have been pushed to reach the collection. If the whole collection is removed then the operator knows he is safe, and the track will have been permanently closed before re-accumulation.

It is not rare for an attempt at the aspiration of a liquid collection to fail through a trocar equal in "bore" to a No. 4 catheter being employed; yet in its withdrawal some of the collection may follow by the late track. The knowledge gained from the now frequent practice of the "aspiration" of abnor-

mal liquid formations, show plainly the danger attendant on puncturing of the intestine when distended with liquids, the intervening peritoneal sac being the source of risk, the operation of gastro-enterotomy, in which the intestine is fastened safely to the abdominal opening, being a safe bridge across this chasm.

* In the last case I have here selected for comment, at the *post-mortem*, there was not found evidence of any intestinal puncture, but the terminating symptoms rather point to leakage having happened. A very slight quantity of liquid invading the peritoneal sac would be a very serious accident. Again, it was not noticed at the *post-mortem* examination that there had been any adhesion, or attempt at this, between the part of intestine punctured and the corresponding place on the internal aspect of the abdominal wall—and if this will not occur in twenty-four hours, it is not probable to take place in time to be of any practical assistance in treatment by use of dilating "tents," &c. In answer to my contention against the trocaring of the intestine loaded with much liquid, some facts may be advanced—that single and multiple punctured wounds of the stomach and intestines have occurred without leakage, and have recovered, this without direct interference, but could not have recovered had there happened leakage of their contents into the peritoneum. But the punctured wound of a previously healthy intestine, and which may remain healthy and flacid for many hours after the lesions and during that time prone to repair,

* January 11th, 1873, page 42.—*Lancet.*

is no guide to us or indication of what may follow a wound of an intestine suffering from hyperdistension before and after such wound, this distension having also vitiated its vitality, thus diminishing its tendency to heal, and the liability of the wounded spot to adhere to the abdominal wall, this latter being a vital process as much as the act of closure of the puncture. The dangers of trocaring an intestine when distended with liquid, have hitherto been underrated, a conclusion to which I have only been led by late experience.

Case No. 8.—On December 16th, 1878, at midnight, I was requested to go on board a Swedish vessel, in the Salthouse Dock to render professional assistance to one of the crew. On boarding her, I found the steward in great pain. His previous history was, that while "straining at stool," he felt a sudden pain in the right iliac region. There was no diarrhœa, thirst slight, acceleration of pulse. The captain, on the occurrence of the pain, had given him a dose of Epsom Salts. This he vomited immediately. My examination of the patient was made in about one hour after the accession of the pain. I at once injected under the skin a ¼ grain dose of morphia, prescribed abstinence from all food, and a limited quantity of drink, to be frequently repeated when required by the patient. Next day, at 9 a.m., my assistant visited him, with instructions that if in pain, to inject ⅛ of a grain of morphia. This dose was given, and at 4 p.m., visited him myself, and was informed that he had vomited twice (but slight in quantity) during the night. The iliac region was still tender, slight thirst, pulse accelerated. Now again was injected a ¼ of a grain of morphia under the skin, previous details as regards diet and drink to be adhered to. Third day visited and found that he had vomited once only since my last visit, all the other symptoms being the same as those present on the second day. Now advised removal to my hospital, but before removal injected a ¼ of a grain of morphia, 2 p.m. In the evening visited him at the hospital, and found the tongue more furred, no increase of distension, tenderness still present on pressure of the iliac region, temperature 100°, pulse as before, had vomited once this evening, repeated ½ a grain of morphia. On the fourth day, at 9 p.m., injected ½ a grain of morphia, symptoms present during this day, pulse no change, no vomit, tongue furred, slight tenderness and

distension, less than had hitherto existed, temperature 102°. In the afternoon he passed suddenly a very copious liquid stool. No food was allowed until the fourth day; a little arrowroot and water, and beef tea was allowed this day in response to the patient's request, and another ½ grain of morphia was administered under the skin at 10 p.m. Fifth day, 9 a.m., gave ⅞ a grain of morphia under the skin; at 12 noon, passed a copious pultaceous motion, pulse seven in five seconds, temperature 101°, tongue furred, no vomit, slight thirst, ½ a grain of morphia given at 6 p.m., not the slightest tension of the abdomen, but slight pain in the right iliac region on pressure. Sixth day, had during night passed several small pultaceous motions, pulse seven in five seconds, temperature 99°, tongue less furred, no distension, pain in the region diminishing, no morphia given in the morning, patient wanted to return to Sweden, but by the advice of two other medical friends he was persuaded to remain another week; 10 p.m., ½ grain of morphia under the skin, as there was increase of pain. Seventh day, pulse and temperature normal, tongue correct, no thirst, pain only on firm pressure of iliac region, bowels acted three times during the day; ½ a grain of morphia was given at 10 p,m., same diet continued. Eighth day, apparently well, but still slight pain on firm pressure, continued same diet, and ½ a grain of morphia under skin at bed-time. Ninth day, all abnormal symptoms absent, and the evacuations passed appeared of normal consistence, though small in bulk, indicating that all accumulated liquids had been passed consequently the conditions permitting the spurious diarrhœa which so often follows relief of obstruction existed no longer.

Never before had I been consulted so early after the accession of the symptoms of intestinal difficulty as on this occasion. In this case he was prescribed for one hour after the commencement of obstruction, as indicated by pain. This case was relieved on the sixth day. How early relief of obstruction can occur it is difficult to say. Sales-Giron's experiments show that, about the fifth* day in the dog, resolution takes place

* In the "Medical and Physical Journal," 1823, is to be found a case of intussusception,—proven by the fact that on the eighth day a portion of gut fifteen inches long was passed per rectum,—is reported as having had release of accumulation on the fourth day,—but from what we know of the history of invagina-

even in one of the most serious forms of intestinal obstructions.

Case No. 9.—Case of the young man at the Boys' Home.—The patient, a young man 20 years of age, on the 18th of Jan. 1878, partook of a hearty meal of hashed flesh and vegetables, at 7 p.m., but, two hours after going to bed, he was awakened with a great pain in the left hypogastric region, which was soon followed by vomiting, which continued during the whole of the two following days, the 9th and 10th. On the evening of the latter day a message was sent to my house which, however, was not delivered to me. On the morning of the 11th a second message was sent, on the receipt of which I at once visited the patient, and found him in bed, in a stooping position, which he had assumed in order to get some relief from the pain he was suffering. On examination, I found the tongue furred and the patient suffering from great thirst, with constant vomiting, accompanied by acute pain in the left hypogastric region. The abdomen was tense, with moderate distension, pulse ten in five seconds. This was his condition at 10 o'clock in the morning of the third day of the attack. I immediately injected under the skin ¼ of a grain of morphia, which at once arrested the vomiting, and visited him again at 11 a.m., and found the same symptoms present with the exception of the vomiting, which had ceased; injected another ¼ of a grain of morphia. At 2 p.m., there was no relief of pain. At 11 p.m., the pain still continued, and the patient had had no sleep. Now injected ½ a grain of morphia, the pulse being nine in five seconds. There was no vomiting. January 12th, 10 a.m.—The patient had slept a little during the night, pulse ten in five seconds, thirst and furred tongue, temperature 102°, a slight diminution of pain, no vomiting. Now injected ½ a grain of morphia and had the foot of the bed raised two feet, which latter was followed by a marked relief of pain, so much so that the patient began to sleep before the opiate could have had time to have any effect. At 5 p.m., the pulse was eight in five seconds, and the pain was much diminished though the abdomen was still tense. The patient expressed his gratitude for the relief he had derived from the inclination of the bed. At this visit injected a ¼ of a grain of morphia. At 10 p.m., I found the pulse nine in five seconds, temperature 100°. I tried the effect of lower-

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nation, to decide on the date of its formation is not possible at all times. However what the practitioner wants is not rapidity with increase of risk, but safety with diminished dangers.

ing the couch, which was followed by an increase of the hypogastric pain; it was, therefore, restored to its previous height; ½ a grain of morphia was injected at this visit. January 13th, 10 a.m.—Pulse nine in five seconds, temperature 100°, tongue improved, abdominal distension as before. Had slept a little during the night; 12 noon, pulse eight in five seconds, no pain but slight thirst. Had not vomited since the first day of my visiting him; 11 p.m., I was accompanied by Mr. Rushton Parker. We found the pulse nine in five seconds, temperature 101½°, distension moderate, pain only when disturbed. I injected one grain of morphia. January 14th.—Pulse eight in five seconds, temperature 101°, distension diminished, no pain, bed had been lowered; the patient had slept well during the night, no vomiting. 12 noon, I injected ½ a grain of morphia. 10 p.m., continued the morphia. There was no pain, no vomiting, and no action of the bowels had yet taken place since the first day of the attack. Had slept a good deal during the day. Injected ½ a grain of morphia. Jan. 15th.—Pulse seven in five seconds, temperature 98½°, distension much diminished, slight thirst. Had slept well during the night; no vomiting and no pain. Injected ½ a grain of morphia. 11 p.m., distension diminishing, no pain, pulse seven in five seconds; no vomiting. January 16th, 10 a.m.—No distension, pulse six in five seconds, no pain, no vomiting, nor action of the bowels. At 2 a.m., however, of this day, the eighth day of the attack, the patient's bowels acted, the stool being of natural consistency. At 11 p.m., pulse six in five seconds, no pain or thirst; injected ½ a grain of morphia. January 17th, 10 a m.—Pulse and temperature normal, no distension or pain; the bowels had acted. At 8 a.m., fæces pultaceous in character. January 18th.—On this day the patient was allowed to leave his bed, with instructions to restrict his diet, and having by this day secured, as I thought, perfect recovery. January 19th.—Was sent for in the evening, the patient being reported as not feeling well, and on arriving at the Home, was informed that the sufferer had disregarded my advice, and regaled himself at noon with a hearty meal of hot toasted bread and tea, with the effect of causing some return of the hypogastric pain. I inderdicted all food, and gave him a course of subcutaneous morphia during the 20th and 21st of January, with the result of arresting the recurring symptoms, and by a more strict surveillance of the patient by the Superintendent of the Home, he recovered perfectly.

Case No 10.—J—— C——, Ashwell Street, a ship scraper (paint scraper) was visited by me July 1st 1875. I found him suffering from

painter's colic. His previous history was that, during the week preceding my first visit he had suffered from slight colic symptoms, but July 1st became much worse, when he took castor oil to remove some evil that he supposed to be in the abdomen. This purgative was taken in the early morning, and this he vomited, and then tried a dose of jalap; which again returned immediately. Finding his own skill not of any benefit to him, he sent to request the aid of a medical officer of a neighbouring dispensary, who promptly attended and gave him every attention, and prescribing Mist Senna Co, to be taken at stated intervals, but with no better result, as the vomiting and pain continued up to mid-day, July 2nd, when I visited him and found him in great pain, vomiting occasionally, lead line on the gums, all the symptoms of lead colic; and, on enquiry, I found that he had been employed all the previous week in scraping lead paint from the bottom of iron ships. I commenced treatment by restricting his diet, and giving a subcutaneous dose of morphia, which dose was repeated July 3rd and 4th. The vomiting and pain ceased on the first day of my visit, and a very copious pultaceous discharge per rectum occurred on the evening of July 4th, after which for a few days he took a mixture of tincture of opium one drachm to half a pint of water, an ounce three times a day; and, after the seventh day, required no further medical supervision.

This patient was most unwilling to omit purgatives whilst under my care, holding fast to the belief that the proper course to pursue, was to "storm" a "right of way," but I firmly dissented, and also predicted what would happen if he did not accept, my advice; consequently, on the fourth day he was most lavish in his expressions of confidence.

The treatment of lead colic requires no deviation from the principles that should guide our treatment of other lesions of the intestinal tract. In actual practice there will usually be found only the difference of degree; the practitioner should prescribe the same diet and drugs, but moderate doses of remedies easily control the symptoms; or, perhaps, no drug

may be required. Dieting and waiting may bring about resolution, and the only difficulty the physician may meet with may be, the anxiety of the patient or his friends to try a purgative method. In the treatment of lead colic, enemata have been much used, and I have in past times often assisted at the giving of enemata of various sorts; generally a warm water solution of muriate of soda or infusion of tobacco—but on most occasions several kinds of enemata would be tried, and the last administered credited with the result.

My late fellow-townsman, Dr. Inman, was an enthusiastic advocate of the use of alum, by the mouth, in solution with water. The use of alum for lead colic was tried long anterior to Dr. Inman's recommendation of it. Dr. Inman's treatment solely by alum, is certainly an improvement upon what is often done, for if it has no beneficial effect, we know of no injurious effect it would cause.

Case No. 10A.—On one occasion I had the pleasure of securing the aid of Dr. Inman, during my treatment of an intimate friend, D— J—, residing at the Q— P—, who was suffering from what was thought to be lead colic, supposed to have been caused by his remaining at home during extensive painting, &c., of the interior of his residence. After my learned brother in the profession had seen the case, he advised the use of alum, to which I consented, but after its use for twenty-four hours, we were compelled to return to my previous treatment, small subcutaneous doses of morphia, once in twenty-four hours. The difference between the two modes of treatment was so marked that the patient began to demur to a continuation of the alum treatment.

Case No. 11.—During the early quarter of 1878 I was requested to visit a case at D—— S——t, where a patient, who had previously consulted me at my house for an injury to the arm was now taken ill; but being engaged as a witness in a public enquiry, was

not able to visit the sufferer that day. On receiving a second message on the following day, visited the patient at once, and found him suffering from symptoms of typhlitis,—pain in the right hypogastric region, furred tongue, thirst and nausea. The treatment was commenced by morphia, subcutaneously administered, with an occasional dose by the mouth and restriction of diet. This treatment had the effect of alleviating the pain ; tongue became clean, thirst diminished. About the sixth day an enema of one pint of water was given, which produced a slight motion. About the tenth day another enema was administered, but no fæces came away. About the fourteenth day (though doing well) the patient became anxious, and suggested that a consultation should be held. The consultant, selected by the patient, though not professing to understand the case, still looking, as is usual with some practitioners, on the constipation with suspicion, pressed me to try what has been termed by one of our Hibernian brothers a "muzzled purgative,"—castor oil and opium. This was given with the effect of aggravating the previous symptoms, but produced a copious discharge per rectum. The aggravation of the symptoms naturally made a second consultation appear very necessary in the opinion of the patient's friends. On our second meeting, the gentleman consulted was so forcibly impressed with the aggravation of the symptoms that he was inclined to suspect malignant disease, as he could not otherwise account for the succeeding symptoms.

Here terminated my attendance in the case ; for when the consultation was over the relatives of the patient hinted to us their doubts of my ability, &c.; and not being supported by my colleague, I handed over the case to him, who received it with "gladness."

This was to my mind undoubtedy a case of typhlitis, and had the opium method, with restriction of diet been continued from four to six days longer the patient would have been convalescent. It will be noticed in the rough report of this case that two enemata were given on my own responsibility. My friend, Dr. Hardman of Blackpool, (who appears to have seen

many cases of typhlitis), with whom, before meeting with this case, I had the pleasure of, and instruction consequent on, an exchange of opinion as regards the subject matter of this paper, confidently maintained that the administration of enemata in this lesion was not usually injurious, or very risky. Knowing Dr. Hardman to be a careful observer, I had confidence, on this occasion, in deviating slightly from my own practice, but I would never do so again. For after administering the purgative, though it was "muzzled with opium," and seeing its attendant and subsequent results were by no means of the muzzled type—so much irritation did the aperient give rise to, that the consulted suspected malignant disease on observing the result during his second visit. Typhlitis is no exception as regards the principles of treatment.

Case No. 12.—A ship carpenter, aged 64 years, residing at H—— S——t, was taken ill with the usual symptoms of enteric fever and, a few days after, with pneumonia. The only therapeutical treatment practised was small doses of opium and digitalis, and restriction of diet—no preliminary purgation. About the seventh day, there being some slight abdominal distension, his wife asked if I would permit a purgative to be given, as he had been seven or eight days constipated, and also informed me that some years previous his bowels became constipated, and that it was only after the conjoined labour of three medical gentlemen, who laboured with remedies per mouth and rectum for many days that the bowels were induced to act. I explained my views, in which she concurred, and purgatives were omitted. The distension varied at times, but was never much ; and on the sixteenth day, spontaneous action of the gut occurred. The opium and restricted diet were continued for four weeks, the intestines acting every four or five days.

This man made an excellent recovery.

Case No 13.—A man, following the occupation of plasterer, residing in N—— S——t, suffered from an attack of enteric fever. I was introduced to this case in time to hinder any preliminary purgation. During the fever he had an attack also of bronchitis. The enteric lesion was accompanied by a moderate amount of distension and tenderness of the abdomen on percussion. The constipation in this case could never be maintained longer than four or five days, when slight diarrhœa would occur, necessitating slight increase of the opium. The diet had to be restricted for eight weeks, as any return to the ordinary articles of routine diet was followed by the recurrence of distension and tenderness, which had subsided during the fourth week.

Case No. 14.—A boy, aged 10, Wellington Road, Wavertree. This boy had been brought to me occasionally for advice as to the treatment of a hip-joint affection, of which he was well after three years' treatment, during which abscesses had formed. This year he had been taken ill with enteric fever. Being called in early to see him, no preliminary purgatives were permitted ; he was treated by small doses of digitalis and opium, and his diet restricted. Extreme distension of the abdomen occurred in this case, and the parents were at one time most anxious for the administration of an aperient, but they submitted to my judgment. Spontaneous action of the bowels occurred about the fourteenth day, and afterwards about every four days. I restricted the diet for four weeks, when the patient made a rapid recovery.

Case No. 15.—A young lady, while returning from a central part of the town to her home near the suburbs, was knocked down by a ruffian, which caused some slight local injury and general shock, which I was called to treat. After a few days' attendance, symptoms appeared not explicable as arising from the slight injury she had received ; and on making a careful inquiry as regards her health previous to the accident, it transpired that she had suffered from diarrhœa for two days previous to the injury. Next symptoms indicative of enteric fever developed themselves—no preliminary purgation was practised. The enteric lesion was treated by morphia, 1-16th of a grain under the skin night and morning. This patient did not tolerate any remedy by the mouth, but what she took in the way of food (restricted) was retained and enjoyed. Spontaneous action of the bowels occurred about the seventeenth day—diet being restricted for four weeks. The abdominal tenderness and distension were moderate in this case ; she recovered rapidly.

In cases 12, 13, 14, and 15, no purgation was practised. In the first three opium with digitalis was given by the mouth. In the last opium alone was given and that subcutaneously—the diet being carefully restricted. Diarrhœa threatened in one case, but was easily controlled by a increase in the dose of opium. In these cases the slight omission, for a few hours, of the prescribed dose of opium caused a dry and furred tongue, with increase of thirst, and accelerated pulse. These four cases occurred during the year 1879, and illustrate my usual treat-treatment of typhoid fever where medicine is required.

It is probable that many practise what I here advocate as the course to pursue with the intestinal lesion of typhoid, but it is very evident, from our public journals, that those, who are admitted to be authorities in this special question, do not. A perusal of the *Practitioner*, vol. xiv., published so late as 1875, shows also that some physicians practise an opium method (with diet partially restricted) unwittingly; as for instance, at page 161, simple diarrhœa and that of enteric fever are said to be treated by castor oil emulsion, but on reading the paper, it is very plain that it was an opium method, as to two drops of castor oil was added 1-16th of a grain of morphia, surely an effectual extinguisher to the two drops of oil, being a proportion of about 1-240th of a dose of oil to a quarter of a dose of morphia—an extreme disproportion.

Many cases of typhoid fever require only the selection of

suitable food, no drugs being wanted. Opium or alcohol, if required, have to be administered with caution, but may be continued with benefit if they reduce the pulse rate, and *increase* its volume—by diminishing arterial tension, —and lower the temperature, but if the pulse is diminished in volume and rate, even though the temperature is reduced, the continuance of these sedatives may injure the patient. In typhoid—as there is absence of much pain, which is an antidote to sedatives,—during the advance of the intestinal lesion very small doses are sufficient at the commencement, although ultimately the case may require a large dose, which can be given with benefit and no risk. In the late stage of this disease the pulse and temperature may become so reduced that belladonna stimulation will be found a valuable aid to assist in tiding over any threatening prostration. Sedatives given to relieve sleeplessness are very risky.

Case No. 16.—In August 1878, a boy was brought to have my assistance to correct a dislocated elbow. Patient was about ten years of age, the son of a reverend gentleman residing in the south end of this town. After reduction of luxation the patient did well until October 4th, when I was requested to visit him, as he was very unwell. On visiting him and making an examination, I found the tongue dry, slightly accelerated pulse ; nausea, but no vomiting ; right hypogastric region very tender on percussion ; slight distension ; right leg so fixed at an angle to the trunk, that he was even with assistance totally incapable of extending it. He could not curve the spine as in hip disease. I concluded that this was a case of loaded cæcum, causing typhlitis and perityphlitis. The history of this lesion, given by the boy's parents, was that some day previous the boy had been collecting blackberries, and while so engaged he had partaken freely of the fruit, and soon after began to feel unwell ; and on Oct. 3rd, appearing much worse, they had sent for a neighbouring practitioner, who

ordered castor oil. This was given, but was not followed, so far as I could learn, by any noteworthy symptoms. On giving my opinion to his parents as to the nature of the case they appeared much alarmed, and said that several of their relations had died from intestinal obstructions. I answered that he would certainly recover, if they would rigorously restrict the patient's diet, to which they consented, and he was fed on beef-tea, mutton broth, chicken broth, arrowroot, and cold water. Again, taking into consideration the early age of this boy and that typhlitis with its contiguous inflammation is not so serious as other forms of obstruction, I decided to give opium in the form of a mixture; water eight ounces, tincture of opium thirty minims, half an ounce of this to be given four times a day.

During the first fourteen days the above were the diet and medicine given. Slight action of the bowels took place on the twelfth day, but it was only the contents of the gut below the obstruction that came away, as the dulness, and tenderness over the right hypogastric had not diminished, but the flexion at the hip was diminishing daily. Pulse and tongue after the third day had become normal; no thirst; and on no occasion did vomiting occur. At the end of the third week he appeared well; no tenderness in any part of the abdomen; could extend thigh in line with trunk, but dulness on percussion over cæcum remained. At the end of the third week I allowed him to be dressed and to go about, and requested that he should visit me in the course of few days; his diet to be rigorously restricted until I prescribed an alteration. Accompanied by his mother the patient visited me, and reported frequent repeated fluid evacuations, which did not cease for several days. Having satisfied myself that the difficulty had been genuinely resolved, I now permitted a very gradual return to the ordinary routine of diet. Patient continues well up to this day. November 1878.

Here the patient got well of the cause of his difficulty, but had no action of the bowels for many days after he had been going about.

This case reminded me that some years before a relation of the same family meeting me by accident informed me that her son Mr. —— was dying, and related his case. He had been many months ailing, I suspected from the narrative from a

chronic inflammation of some portion of his intestines. I suggested that he should set aside all medicine and diet himself according to certain rules; the result was that the patient, who was supposed to be dying from malignant disease, was in a few months well.

Case No. 17.—E—— N——, painter by trade, residing at Tavistock Street, sent for me on October 4th, and I found him suffering from the usual symptoms of painter's colic. I at once restricted his diet, and his medical treatment consisted of the injection of one quarter grain of morphia under the skin daily. The latter he submitted to willingly, but to the restricted diet and abstinence from purgatives he acquiesced only after some argument. Action of the bowels took place on the nineteenth day. As soon as the morphia treatment was commenced the abdominal pain, &c., disappeared.

There was at no time much distension. On finding my prediction of the result of treatment verified he was much pleased, and remarked that a fellow tradesman and co-worker had been in the same difficulty, and that the treatment he underwent was "almost equal to being crucified." Although this remark was an exaggeration, I can recollect that in my apprentice days it was the fashion,—and is now occasionally—to give enemas of salt and water, tobacco, turpentine, soap, gruel and purgatives *ad libitum* by the mouth, and to annoy the sufferer until action of the bowels had taken place.

Case No. 18.—A—— M——, Beaufort Street, February 1st 1878, at 6 p.m., was taken with great pain in the abdomen, he having just finished his evening meal; and although it continued until next morning, yet he took no remedy and went to his work. The pain still continuing, he consulted a fellow-workman, as to what remedy he should use to get relief, who advised a black draught, which he sent for and took. This aggravated the pain, and he went home and sent his wife to consult a chemist, who sent him a dose of Gregory's Powder,

and informed his wife that had he commenced with a Gregory's Powder and then taken a black draught, his pain would not have been aggravated, and probably he would have been well. The chemist's remedy having made the patient still worse, I was sent for on this the second day; but not being at home, my assistant visited the sufferer at 6 p.m., and prescribed a chalk and opium mixture, and gave orders to restrict his diet. On the third day, at 6 p.m., being informed that he was still very bad, I visited the patient, and found the abdomen moderately distended, pain on percussion, and pain even when the abdomen was not manipulated, The dulness was confined to the region of the bladder, consequently I explored this viscus and found no accumulation; tongue furred; pulse eight in five seconds; very thirsty. I advised strict restriction of diet; ¼ of a grain of morphia under the skin.

Visited again at 10 p.m., and found him free from pain, but no other change; repeated the morphia.

4th day—Visited at 12 a.m., no pain, but the other symptoms unchanged. No remedy at this visit, but visited again at 5 p.m,; gave ¼ of a grain of morphia; no other change.

5th day—Visited at 4 p.m., slight pain; moderate distension; pain on percussing the abdomen; tongue dry and brown; pulse seven in five seconds; much thirst; had vomited about four ounces of bilious-coloured fluid. At mid-day, gave him a ¼ of a grain of morphia under the skin. Visited again at 10 p m.; tongue moist, thirst less; no pain on percussion; pulse six in five seconds; has not slept much since the commencement of the ailment; now gave ¾ of a grain of morphia under the skin.

6th day—At 10 a.m., moderate distension; pain on percussion; pulse six in five seconds; tongue moist but fresh; no vomit; injected a ¼ of a grain of morphia under the skin. 10 p.m., distension moderate; tongue moist, but not clean; pulse seven in five seconds: very little pain if not manipulated; has passed flatus per rectum several times; gave ⅜ of a grain of morphia under the skin.

7th day, 10 a.m.—Pulse eight in five seconds; temperature 97·5°. Tongue dry, and distension increased; passed flatus during night; no vomit but feels inclined to; pain tolerable; ¼ of a grain of morphia under the skin. Visited at 4 p.m.; pulse eight in five seconds; tongue furred but moist; abdomen distended; slight pain on percussion; had passed flatus since morning. Visited again at 10 p.m., accompanied by my friend Mr. R. Parker, and found that the patient had parted with two copious

motions, the fæces being pultaceous in consistence; pulse six in five seconds; abdomen still tense, but less tender; gave a ¼ of a grain of morphia under the skin.

8th day—Slight distension; pulse six in five seconds; tongue moist, slightly furred; bowels acted twice.

9th day—No action of bowels to-day; tongue improved; slight abdominal distension; pain only on firm pressure of the abdomen.

10th day—No special symptoms.

11th day, 4 p.m.—Had passed small quantity of semi-fluid fæces during the day; pulse seven in five seconds; tongue dry brown fur; much thirst; slight pain; abdomen distended slightly; gave a ¼ of a grain of morphia under the skin. Visited again at 10 p.m., to see the effect of the morphia; no pain; tongue very moist and nearly clean; less thirst.

12th day—Pulse six in five seconds; tongue moist; no pain; no morphia given.

13th day—Pulse six in five seconds; tongue slightly dry, and found no pain; slight distension, also thirst; ¼ of a grain of morphia under the skin; no action of the bowels since the eleventh day.

14th day—Bowels acted; nearly all the symptoms have abated.

15th day—The patient progressed to recovery, with no special symptoms, and remains well to this day.

What form of obstruction this was neither Mr. Rushton Parker nor myself could decide, but we did agree as to the treatment. It certainly was a mild form of intestinal lesion, which would have been readily converted into the grosser form by a further continuation of the purging which he commenced with.

Case No. 19—Monday, Nov. 19th, 1878, I was requested to visit C—— T——, aged 24 years, living in 20, V—- Street, in this town, and on visiting him, and making an examination, I found present all the symptoms of intestinal obstruction. His previous history, related to me by his wife,

was that on Sunday, 18th, he had taken a hearty meal of flesh meat, potatoes and carrots, and that in one hour after this meal, he was seized with colic like pains in the stomach, accompanied by a desire to defecate, and passed a moderate amount of fæcal matter, but this was followed by no relief; and towards evening he sent for aid to a medical gentleman close at hand, who ordered a Bismuth mixture and opiate pills however with no relief. Pain increased during the night. As he was a member of one of my clubs, he demanded my assistance on the morning of the 19th; but being very unwell myself, could not get to him until noon the same day, when I found the symptoms of obstruction, viz., hard distended but not very prominent abdomen; pain acute in the left hypogastric region; pulse nine in five seconds; temperature 101°; tongue dry; moderate thirst and continuous vomiting, with very slight intermission. I could come to no conclusion as to the nature of the difficulty, a matter (in the absence of hernia through the abdominal boundaries) of no consequence at the commencement of treatment. Treatment—His diet was restricted; injected under the skin a ¼ of a grain of morphia, and elevated the lower bed-stock eighteen inches. Visited him again at 5 p.m.; no effect from the treatment; now gave ⅜ of a grain of morphia under the skin. Visited at 9 p.m.; no change; now gave ½ a grain of morphia under the skin.

2nd day, 10 a.m.—Less pain; had vomited only three times since the last visit; feeling of distension; the abdomen more prominent; pulse eight in five seconds; tongue better, but not correct; gave ½ a grain of morphia under the skin. Second visit, 3 p.m.—Vomited once since 10 a.m.; no other change; gave ½ a grain of morphia under the skin. Third visit, 10 a.m.—Vomited once since 3 p.m.; no other change of symptoms; now inserted ¾ of a grain of morphia.

3rd day, 10 a.m.—Pulse seven in five seconds; temperature 99·5°; tongue clean and moist; had vomited once since last visit; inserted ¾ of a grain of morphia under the skin. Second visit, 3 p.m.—No change of symptoms; gave ¾ of a grain of morphia under the skin. Third visit, 10 p.m.—Had vomited at 9 p.m; no other change; gave ¾ of a grain of morphia under the skin; has as yet very little sleep, and only slight pain except when the effect of opium had worn off.

4th day, 10 a.m.—Vomited once since last visit; pulse seven in five seconds; temperature 99·5°; tongue moist; moderate thirst. Second visit,

3 p.m.—Since 10 a.m., had vomited copiously, stercoraceous in character; no other change; gave ¾ of a grain of morphia under the skin. Third visit, 10 p.m.—Had again vomited stercoraceous fluid; repeated ¾ of a grain of morphia under the skin.

5th day. 10 a.m.—Pulse seven in five seconds; temperature 99·5°; abdomen more prominent; pain tolerable; dulness on percussion over whole of left hypogastric region, much as it had been from the commencement; inserted ¾ of a grain of morphia. Second visit, 3 p.m.—Vomited since 10 a.m., stercoraceous matter; ¾ of a grain of morphia under the skin. Third visit, 10 a.m.—Complaining of insufficient sleep; now injected one grain of morphia.

6th day, 10 a.m.—Pulse six in five seconds; tongue clean and moist; abdomen tense; tender and moderately prominent, pain now diffused over the whole abdomen, rather than localised as previously. Second visit, 3 p.m.—No change; injected ¾ of a grain of morphia. Third visit, 10 p.m.—Vomited once at 7 p.m., not stercoraceous; much troubled with hiccough this day.

7th day, 10 a.m.—Pulse six in five seconds; temperature 97·5°; tongue clean and moist; injected ¾ of a grain of morphia under the skin. Second visit, 3 p.m.—Vomited once since 10 a.m., stercoraceous; injected ¾ of a grain of morphia under the skin. Third visit, 10 p.m.—No change of symptoms; injected ¾ of a grain of morphia under the skin.

8th day, 10 a.m.—Pulse six in five seconds; temperature 97·5°; tongue clean; moderate thirst; much less pain, but abdominal distension increased; no medicine. Second visit, 3 p.m.—No change; ¾ of a grain of morphia inserted. Third visit, 10 p.m.—No change; ½ a grain of morphia given; there had been vomiting for twenty-four hours.

9th day, 10 a.m.—Much worse; pulse nine in five seconds; temperature 101·5°; tongue dry; much pain; vomited at 1 a.m., stercoraceous; gave now one grain of morphia under the skin. Second visit, 3 p.m.—Much better; pulse six in five seconds; temperature 97·5°; tongue better; abdomen not so tense; moderately prominent; gave ½ a grain of morphia under the skin. Third visit, 10 p.m.—Accompanied by my friend, Dr. Steele; rather more uneasy; no vomit during this day; slept a little; pulse seven in five seconds; temperature 99·5°; tongue correct; gave one grain of morphia under the skin.

10th day, 10 a.m.—Passed painless night but did not sleep much; vomited stercoraceous matter once since last visit; pulse seven in five seconds; temperature 98°; tongue clean and moist; injected one grain of morphia. Second visit, 3 p.m.—Has vomited once 10 a.m., yellow transparent stercoraceous fluid; pulse eight in five seconds; tongue clean; no change in form of abdomen, but no dulness on percussion at any part of it. Patient expressed himself as having felt perfectly well this day, but I assured him he was far from well yet; injected $\frac{2}{3}$ of a grain of morphia under the skin. Third visit, 10 p.m.—Pulse six in five seconds; temperature 98°; tongue clean; vomited at six p.m., stercoraceous yellow transparent fluid. Hiccough has again troubled him.

11th day, 10 a.m.—Vomited three times since last visit, and still stercoraceous; pulse six in five seconds; temperature 97·5°; tongue clean and moist; injected one grain of morphia under skin. Second visit, 3 p.m.—Felt very uneasy all day until now; no further change; injected $\frac{2}{3}$ of a grain of morphia. Third visit 10 p.m.—Pulse seven in five seconds; temperature 98°; tongue clean and excellent, and felt (so he said) perfectly well.

12th day, 10 a.m.—Had passed an excellent night; no change of symptoms; injected under the skin one grain of morphia. Second visit, 3 p.m.—Vomited a quantity of stercoraceous fluid; injected one grain of morphia. Third visit, 10 p.m.—Vomited again since last visit, same in character as previous visit; pulse six in five seconds; temperature 98°; tongue clean; no change in the physical condition of the abdomen.

13th day, 10 a.m—Pulse seven in five seconds; tongue moist; vomited once since last visit; injected one grain of morphia. Second visit, 3 p.m.—Pulse six in five seconds; temperature 97·5°; tongue moist; injected one grain of morphia. Third visit, 6 p.m.—Pulse six in five seconds; temperature 98·5°; tongue moist; no medicine as he was much easier.

14th day, 10 a.m.—Vomited once since last visit—stercoraceous; pulse six in five seconds; temperature 97·5°; tongue moist; has but very little pain; injected one grain of morphia. Second visit, 3 p.m.—No change; injected one grain of morphia. Third visit 10 p.m.—No change; injected another grain of morphia.

15th day 10 a.m.—Pulse seven in five seconds; temperature 100°; abdomen more distended; tongue, no change; did not feel so easy as on the previous day; injected 1¼ grains of morphia. Second visit, 8-30 p.m.—Pulse six in

five seconds; temperature 98·5°; feels easier; injected one grain of morphia; vomited during the day a clear yellow fluid, not stercoraceous.

16th day, 10 a.m.—Pulse seven in five seconds; tongue clean and moist: temperature 99°; abdomen less tense; injected 1¼ grains of morphia. Second visit 3 p.m.—No change; gave one grain under the skin of the opiate; vomited once since morning, stercoraceous. Third visit.—Not had much sleep; injected 1½ grain of morphia.

17th day, 10 a.m.—Pulse six in five seconds; temperature 97·5°; tongue clean and moist; injected 1½ grains of morphia. Second visit, 3 p.m.—No change; injected 1 grain of morphia. Third visit, 10 p.m.—No change, except vomiting once, stercoraceous in character; gave 1½ grains of morphia under skin; expressed himself as feeling rather well this day; and has passed flatus per rectum twice; slight hiccough, the passage of flatus indicated that the liquid accummulated above the obstruction had now drained to the lower portion of bowel.

18th day, 10 a.m.—Pulse seven in five seconds; temperature 97·5°; tongue slightly furred but moist: not much pain; vomited twice since last visit stercoraceous matter; injected 1½ grains of morphia. Second visit—Pulse six in five seconds; tongue furred; abdomen less tense. Third visit 10 p.m.—Pulse seven in five seconds; temperature 98°; tongue furred, but moist; gave 1 grain of morphia.

19th day, 10 a.m.—Pulse six in five seconds; temperature 96·2°; tongue clear and moist; vomited once during night, stercoraceous in character; injected 1½ grains of morphia. Second visit, 3 p.m.—Pulse, tongue, &c., no alteration since last visit; injected 1 grain of morphia. Third visit, 10 p.m.—I was accompanied by my friend, Mr. Rushton Parker, and we found pulse six in five seconds; tongue clean and moist; abdomen more distended than on any previous day; he had indulged his appetite by an extra quantity of "pea flour," so this aliment was restricted in quantity; we injected 1¾ grains of morphia under skin at this visit.

20th day, 10 a.m.—Pulse six in five seconds; temperature 97·5°; tongue moist; slight increase of thirst; vomited early in the morning stercoraceous; injected 1½ grains of morphia. Second visit, 3 p.m.—Pulse seven in five seconds; tongue clean and moist; still thirsty; abdomen not quite so tense; has passed since morning two volumes of flatus, rather more than the quantity passed than on the seventeenth day; one grain of

morphia was given. Third visit, 10 p.m.—Pulse six in five seconds; temperature 97°; tongue moist and clean; rather thirsty; complaining of much pain; gave two grains of morphia under the skin; abdomen very tense, though not very prominent.

21st day.—Received a message at 8 a.m., to say that the patient was dying after having passed a sleepless and painful night; had vomited five times during the period that elapsed between the last visit and 9 a.m., a period of eight hours. As it was impossible for me to go, asked Mr. R. Jones to visit the patient, and fully instructed him what to do under certain eventualities. Mr. R. Jones found the patient in a state of collapse, pulse scarcely perceptible at wrist; Liq. atropiæ minims iij. injected under the skin, and he was surrounded by warm bottles. At 10 a.m., accompanied by Mr. Rushton Parker, I visited the patient, prepared to operate, but we noticed at once that there was no indication for manual interference of any sort; pulse eight in five seconds; symptoms of collapse wearing off; abdominal walls relaxed. Patient now partook of warm beef-tea. At 4 p.m., repeated my visit, still some prostration, and stercoraceous vomiting, but quantity brought up was very little; pulse seven in five seconds; temperature 98·5°; gave him Liq. atropiæ minims vii. by mouth. Again visited at 10 p.m.; much improved; pulse seven in five seconds; temperature 98·5°; vomits very small quantities of stercoraceous fluid every hour.

22nd day, 9 a.m.—Pulse seven in five seconds; temperature 98°; tongue dry, but easily moistened by a drink of water; no vomiting; no medicine. Second visit, 4 p.m.—Pulse six in five seconds; tongue dry; abdomen much distended, but feels easy; has passed volumes of flatus at mid-day; no medicine. Third visit, 9 p.m.—Pulse six in five seoonds; temperature 98°; tongue dry; slight pain, such that he did not, as was his wont, demand an opiate; no vomit; abdomen becoming more prominent, though at no time in this case was it equal to what is usually observed; no medicine. Fourth visit, 12 midnight.—No pain; pulse good; no vomit; prostrate; spirits excellent.

23rd day, 9 a.m.—Pulse seven in five seconds; temperature 98°; tongue dry; very prostrate this morning; *had twice passed, early in the morning, copious pultaceous fæcal masses;* no medicine. Second visit, 12 noon.—Abdominal wall more relaxed; no change since 9 a.m. Third visit, 4 p.m.—Has since morning passed two other pultaceous quantities of fæces'

Fourth visit, 10 p.m.—Pulse seven in five seconds; temperature 98°; abdomen flaccid; had passed at 5 p.m. another pultaceous "stool," in all five this day, all of which were searched, but gave no information; gave ½ a grain of morphia under the skin, as he had intolerable pain and had not slept for twenty-four hours.

24th day, 10 a.m.—Pulse seven in five seconds; temperature 98°; tongue moist and clean; vomited a small quantity of bilious fluid; no medicine. Second visit, 4 p.m.—Pulse seven in five seconds; tongue dry; abdomen relaxed, but very tender; no medicine. Third visit, 10 p.m.—Pulse seven in five seconds; tongue dry; abdomen painful without pressure; no action of the bowels this day; gave ½ a grain of morphia under the skin.

25th day, 12 noon.—Pulse seven in five seconds; temperature 98·5°; vomited small quantities of bilious fluid; tongue dry; no pain; no medicine. Second visit, 9 p.m—Pulse seven in five seconds; tongue moist and clean; temperature 98·5°; feels very easy; no medicine.

26th day, 1 p.m.—Pulse seven in five seconds; tongue furred; vomited much bilious matter during the morning; to-day allowed small quantities of biscuits as an addition to his dietary. Second visit, 9 p.m.—Pulse five in five seconds; temperature 97°; tongue moist and clean; this day passed immense quantities of fæces, and flatus frequently; no medicine.

27th day, 10 a.m.—Passed at 5 a.m. three copious pultaceous stools; pulse five in five seconds, full and firm; tongue clean and moist; abdomen concave. Second visit, 3 p.m.—No change. Third visit, 10 p.m.—Feels no pain; slept well during the night; no medicine; abdomen this evening decidedly distended again, but no pain even on manipulation.

28th day, 10 a.m.—Pulse six in five seconds; tongue moist; abdomen not distended; had passed three pultaceous "stools" in the early morning. Second visit, 10 p.m.—Pulse seven in five seconds; tongue moist; no pain; felt "strong and well"; was allowed raw eggs as a further addition to his diet; passed another "stool" at noon this day, rather firm in consistence.

29th day.—Visited at 10 p.m.; no symptoms to report; diet still restricted.

30th day.—Not visited ; one stool was passed.

31st day.—Progressing well ; action of bowels this day.

32nd day.—Ordered the patient out of bed ; warned him to restrict his diet for fourteen days longer, and report himself to me occasionally.

During the attack the urine was scanty, not more than three to four ounces being passed daily.

He remained perfectly well for one month, when returning home after after a morning's stroll, and feeling very hungry, he partook freely of boiled beef and potatoes. This was about 1 p.m. ; at 5 p.m. he sent a message that his complaint had returned. Mr. R. Jones visited him and injected ½ a grain of morphia under the skin, and brought him to my hospital, when, during the first three days, his medical treatment consisted of the injection of a ¼ of a grain of morphia night and morning ; no other food than cold water being allowed him. Restricted diet was allowed on the fourth day, and opium continued. On the fifth day action of the bowels took place, and on the sixth day he went home well.

Two months after this he committed a second indiscretion in diet ; but ten days' abstinence from all food with one dose of opium corrected the ailment. He, at my advice, selected his food, avoiding many of the coarse and indigestible articles of diet in common use amongst persons with healthy intestines.

In the treatment of this case forty-five grains of morphia were consumed, and the treatment extended over thirty-two days ; altogether one hundred visits were made. Of these I made, daily, the second and often the evening visit. Being in ill health at the time, I found the second visit difficult. Most of the morning and evening visits were made by my nephew Mr. R. Jones, who very efficiently assisted me.

When first called to this case I suspected that it was one of intussusception ; and as no preliminary ill-treatment had been

practised, I thought that the patient must certainly get well if no deviation from my mode of treatment occurred. To the mother and wife of the sufferer were explained the nature and seriousness of his malady, and also the importance of strict adherence to the advice Mr. R. Jones and myself should give; and much credit is due to his relatives for the faithful way in which our instructions were carried out, despite the meddling of spiritual advisers and also of nurses connected with a charity.

There were many disadvantages—conspicuously a miserable bed-room and no fireplace. A lamp, however, was maintained burning night and day to keep the room warm; hot bottles also were called into requisition; indeed, every care was taken to render the miserable habitation more comfortable.

At no time was a dose of morphia given until the effect of the previous dose had worn off, and the patient complained of pain.

Several notable and usual clinical symptoms were observed during the treatment of this case. For instance, morphia reduced the frequency and increased the volume of his pulse, lowered the temperature, alleviated the pain, and reduced the frequency of the vomiting; hiccough—a symptom in itself of no moment—troubled him occasionally.

On the eighth day, when the opium was diminished in quantity, his symptoms became much worse. On two occasions, early in the treatment, the patient expressed himself as being "perfectly well," an expression, during the opium treatment,

frequently made. Sometimes fluid not stercoraceous was vomited, but preceded and followed by stercoraceous matter. On the seventeenth day he passed flatus, which denoted slight drainage of the liquid contents from above the obstruction to the lower portion of bowels.

On the twenty-first day the patient became collapsed, but guided by previous experience I administered what I have found to be an almost infallible stimulant, and was further prepared to perform gastro-enterotomy if this did not in two hours attain my object. Liq. atropiæ minims iii. was given under the skin, and in less than twenty minutes the pulse could be felt at the wrist, and patient continued to improve up to mid-day, when another dose was given by the mouth. After this day the use of the opium was continued as before, *i.e.*, whenever pain was present.*

I was (and am still) of the opinion, confirmed by observations during its progress, that there was an intussusception somewhere in the colon.

Case No. 20.—July 23rd. 1878, I was requested to visit a captain of one of the steamboats, who resided at Twiss Street, and on making an examination, found him suffering from some form of intestinal obstruction, the nature of which I could not satisfy myself of. His pulse was eight in five seconds ; temperature 100° ; severe colic pain ; slight abdominal distension, but abdomen very hard and resisting when pressed upon;

* Early in 1880 this man called at my surgery and tartly demanded how long he was to limit his diet. Rather astonished, I asked, "Have you not long ago set aside my restrictions on your food ?" He replied, "No." I informed him that it was an oversight, and that he could commence at once with a full dieting. It appeared that he had taken no fish, or animal food for two years, using only bread, soups, rice, sago, and other starch preparations.

tongue slightly furred ; most intense thirst ; vomiting, so often as, every five minutes. These observations were made at 7 p.m. of the third day of his difficulty. His previous history was that, about 4 p.m. of the 21st, he rose suddenly from bed to assist a child who was complaining, and that the sudden effort caused the descent of a slight hernia, which had existed two or three years. It protruded rather more than usual, and gave intense pain ; he was able to reduce it immediately, but some little pain remained for several hours. Next morning he arose about 7 o'clock, to go to duty, but feeling faint, he decided not to go. His wife then gave him a dose of castor oil, which was not retained ; she then procured a dose of chlorodyne ; this dose also was not retained, and the vomiting continued about every two hours until evening, when a medical friend visited him for me, as I was engaged when I received a message to attend him The medical visitor injected under the skin ¼ of a grain of morphia, which relieved the pain, and, for a short time, arrested the vomiting. Next morning a message was received by my friend informing him that the patient was very bad, and that his symptoms had returned since 6 a.m. An aperient powder was now ordered, which was retained for a short time ; and he was visited again about 11 a.m. on the same day and a black draught given, but not retained ; then two seidlitz powders, neither of which remained over a minute, and the vomiting became continuous ; again, an enema of castor oil was injected, followed by another of gruel, but the symptoms only became aggravated ; and at 7 p.m. of third day an urgent message was sent to his medical visitor to repeat his visit. He being engaged, I was obliged to go, and found the symptoms before reported. I at once injected ¼ of a grain of morphia under the skin, and during my stay of five minutes he vomited three or four times slightly bilious-coloured fluid, but not much in bulk, as the repeated vomit during the day had made any accumulation nearly impossible. I revisited him at 9-30. found pulse eight in five seconds ; temperature 99° ; abdomen as before ; vomiting constant ; hiccough without intermission ; intense thirst; less pain. I had already limited his aliments ; gave ⅛ of a grain of morphia under the skin. Visited again at 12-30 midnight — Pulse and temperature as before ; vomiting slightly diminished, but so frequently as every ten to fifteen minutes ; pain nearly gone ; hiccough continues.

4th day, 8-30 a.m.—Had vomited six times since my midnight visit ; abdomen unchanged ; no pain ; pulse seven in five seconds ; temperature

98·5°; hiccough constant; had slept none; gave now ½ a grain of morphia under the skin. Visited 12 noon.—Vomited once since last visit, the matter ejected being of light pea green colour; and on my remarking to the patient that it was a strange colour, he said that it looked like the green peas he had taken the day previous to his being taken ill; pulse and temperature as before; hiccough gone; abdomen less tense; diminished thirst. 5 p.m.—Pulse, temperature and tongue as before; no pain; has vomited three times; gave no remedy. 11 p.m.—Pulse and temperature unchanged; has vomited since 5 p.m.; no pain; gave only ¼ of a grain of morphia, as he felt sleepy.

5th day, 8-30 a.m.—Pulse seven in five seconds; temperature 98·5°; tongue correct; thirst much diminished; vomited six times during night; no hiccough; no pain; gave ½ a grain of morphia under the skin; has as yet taken only cold water, but now ordered cold arrowroot with a taste of brandy to make it palatable. 4 p.m.—Pulse and temperature as before; no change of symptoms since 8-30 a.m., except that he has passed a quart and a half of fæces, reduced to the consistence of thin gruel. Visited again at 10-30 p.m.—Pulse five in five seconds; temperature 97°; tongue perfect; no thirst; pain gone: has not vomited since morning visit at 8-30, as might be expected from the fact that the symptoms had abated and that temperature was specially low; gave only ¼ of a grain of morphia under the skin on this occasion.

6th day, 4 p.m.—Pulse, temperature, tongue, and abdomen correct; no symptoms remaining to indicate the previous difficulty. He asked to be allowed to get up. I permitted him if he felt able. No action of bowels this day; warned him of the serious result that might follow if he deviated from a suitable dietary; gave ¼ of a grain of morphia under the skin.

7th day.—Was up, and had come downstairs into his parlour; felt weak. I drew his attention to the importance of his dietary, and gave no medicine.

8th day.—Copious action of bowels; no medicine given; diet still restricted; was perfectly well in another week, but his diet was regulated for three weeks more.

Case No 21.—July 15 operated for stone on a boy, aged five years, and removed one, not quite so large as an Egyptian bean. The operation was

performed at my hospital on the day of his admission, but previously I had given him an enema of half a pint of warm water. Though given to him two hours before, it only returned just as I was sounding his bladder previous to operation, and the little patient passed a quantity of partially digested food. Nothing of special clinical interest occurred on the first day, but on the morning of the second day his temperature suddenly rose to 103·5°; very rapid pulse, with intense thirst and abdominal tension; furred tongue and vomiting, which continued at intervals of from three to four hours. I had him placed in a warm bath which was gradually cooled down, and as soon as the bath had an appreciable effect in lowering his temperature, he was removed wet and placed in a dry blanket, where he perspired freely for one hour. He was afterwards wiped dry, and left without any clothing or covering, and frequently sponged with cold water; by the evening his temperature had diminished to 102·5°, but his pulse was very rapid; respiration 36 to 40 per minute, and furred tongue. I now took precaution to make certain that there was no retention at the wound. During this day five drops Liq. Morphiæ Sulph. were given on two occasions. On the morning of the third day the abdominal distension had subsided, but the temperature, was still as high as 102·5°; tongue furred; pulse and respiration, though better, very rapid; vomiting, not so frequent, every five to six hours; intense thirst; diet since the operation had been limited to beef-tea, arrowroot, water and linseed tea; he was ordered another warm bath, to be cooled gradually, which the patient appeared to enjoy, and when removed from the bath he was to be frequently sponged with cold water and left uncovered; had two doses this day of Liq. Morphiæ Sulph, five drops each; vomited three times during evening.

4th day, Morning. — Temperature 103·5°; pulse 130 per minute; diminished thirst; vomited once during the night; abdominal distension returning, and nearly equal to the condition present on the second day; five drops of Liq. Morphiæ Sulph. were given on this occasion; vomited in the evening; no bath, but frequent cold sponging and exposure to cold were practised.

5th day, Morning.—Temperature 102·5°; diminished thirst; improved pulse; respiration much less frequent; tongue slightly improved this morning. Thinking that the patient suffered from fæcal accumulation in the rectum, a gentleman who accompanied me on my visit strongly urged the

administration of calomel and jalap by mouth, and an injection of warm water per rectum. I could accede only in the matter of the enema, giving in this way an ounce of warm water, but the giving of even this quantity was much against my convictions, the calomel and jalap I would not give. When the injection was returned, I perceived by the action of the Sphincter Ani that the rectum was empty, and then ventured more boldly with my opium treatment. I may mention that small as this enema was the little fellow at once complained, and for the first time, of abdominal pain, sufficient, however, for him to class it as "belly ache." I have no doubt that six ounces of water would have caused collapse. The boy had morphia four times during the day, in varying doses of five to ten drops, with the effect of cleaning the tongue, arresting the thirst, so much so that the child had to be asked to drink, the temperature invariably going down one degree in an hour after the ten drops of morphia, with corresponding improvement of pulse, which improvement lasted until the therapeutical effect of the morphia began to wear off.

6th day.—Abdominal distension not diminished; temperature 101·5°; no thirst; tongue clean; respiration normal; morphia four or five times during the day in five to ten drops doses; sponging with cold water and exposure.

7th day.—No thirst; temperature 102°; pulse 140; respiration correct; abdominal distension not diminished; during the early morning passed about two tablespoonsful of pultaceous fæces.

8th day.—Temperature 101·5°; no thirst; tongue clean; abdominal distension still undiminished; complained during the day on several occasions of "belly ache"; and ten drops of morphia were given on four occasions; the increased doses made him rather sleepy, but did not perceptibly affect the pupils; all this time his diet was limited to beef-tea, arrowroot and linseed tea, the latter of which he preferred.

9th day, Morning.—Temperature 101°; pulse 144; tongue moist but furred; abdominal distension slightly less during the day; gave fifteen drops Liq. Morphiæ on four occasions with decided improvement, so that by evening he had absolutely no desire for drink; temperature 100·5°; pulse firm and 122 per minute; tongue moist, clean, and indicating no sympathy with his condition; his abdomen still large, but the skin over it was flaccid.

10th day, Morning.—Temperature 100·5° ; tongue furred ; no thirst ; no change in the appearance of abdomen ; gave fifteen drops of Liq. Morphiæ and in an hour after temperature reduced to 99·5° ; pulse 120.

11th day.—Pulse 120 ; temperature 100° ; abdominal distension steadily subsiding ; tongue clean, moist, and correct in every particular ; no thirst ; fifteen drops of Tinct. Opii. were given in the morning and in the evening.

12th day.—Pulse 120 ; temperature 100° ; no thirst ; tongue clean ; abdomen still slightly distended ; the bowels acted early in the morning, the fæces passed being of normal consistence and appearance.

13th day.—Pulse and temperature as usual ; no thirst ; no pain ; abdomen much less distended.

14th day.—No change.

15th day.—Abdomen much improved in appearance ; has passed pultaceous motions in moderate quantity.

16th day.—Passed large quantity of fæces ; pulse 100 ; temperature 99° ; no thirst ; no pain, or any special symptoms.

17th day. — No symptoms of the peritoneal difficulty remains ; dietary gradually varied. The child was now convalescent, but his diet had to be selected for nearly six weeks after his recovery from the Acute Peritonitis.

Case No. 22.—About the middle of August 1878, I was requested by an old patient of mine to visit his mother, who resided with him in Park Lane in this town. He informed me that she did not appear seriously ill, suffering from constipation only, but as she was of extreme age, 87 years, he feared she might become suddenly ill, and consequently thought it would be wise to call in medical assistance. Her previous medical history was that "the bowels had not acted for over a week," and that during the two days anterior to my visit, she had taken castor oil, salts, other purgatives and enemata, but they had produced no effect. I found the patient in bed, and on making an examination I found the tongue moist, but slightly furred ; no thirst ; pulse and temperature normal ; no retention

of urine, the abdomen slightly distended; no tenderness, however, but presented the contour indicative of an accumulation in the small intestine, *i.e.*, a central globular form, not unlike an enlargement of the uterus. This was a case of what is usually termed "obstinate constipation," caused in all probability by the patient, an aged and debilitated subject, indulging in an inordinate amount of coarse food, which the muscular power of the intestines was unable to propel to the rectum. After examining the patient, I called aside the gentleman who sent for me, aad counselled that the patient should have the strongest and safest purgative that could be had. He consented, and requested to know what was the strongest purgative that could be procured. I now gave him an outline of the treatment of the difficulty by diluents with abstinence from all solids, and directed that she should have half a pint of hot tea (this was the "strongest purgative") every four hours for two days. This was rigorously carried out for two days, when I visited her and found no change. I then ordered her to have a warm water injection every morning for three days, and to take half a pint of warm beef-tea every four or five hours until my return. On my revisiting her on the sixth day, found no change of symptoms, three enemas had been given, but they brought away only a few scybala. I again advised a continuation of the beef-tea, with arrowroot and water, also an enema of hot water every day. The patient during this visit expressed to me her firm conviction that she should not recover from this difficulty, mentioning also that this the form of occlusion had troubled her some years before. I called again on tenth day, and found the patient walking about the house; she had, since my last visit, several copious evacuations per rectum. I examined the form of the abdomen; it appeared rather concave than convex in contour, so thoroughly had it been emptied. My attendance on the case now terminated, and I told her a more sparing use of solids would be more suited to her age; no medicine was given in this case. This case brought to my recollection a similar one. It occurred some six years ago.

Case 22A.—I was called to Birkenhead to visit a case of Myelitis, in which there was paralysis of the rectum and baldder. When relating his symptoms, he informed me that all means to empty the bowels had failed. I examined the abdomen, and there was nothing giving evidence of acute obstruction, not even the slightest distension, but it was possible (as the patient was much emaciated) to count the scybala in the transverse colon. On enquiry I found that the administration of an

enema had been attempted, and only as much water would enter as might be supposed to fill the rectum. Not crediting this I undertook to give an enema, feeling certain of succeding, but, much to my astonishment, failed. I afterwards explored the rectum with the hand, but could not find the cause of the obstruction to the passage of water into the gut. I then advised small doses of opium by the mouth (five drops of laudanum), and confined the patient to the diluent form of aliments, with the result that in a very short time diarrhœa occurred, thus removing this difficulty.

Case 22B.—During 1878 I advised my friend Dr. Steele in a case of enteritis. The patient had received a severe injury to the spine, which had caused paralysis of the lower portion of the intestines and bladder; yet as soon as the intestinal obstruction occurred, which was about ten days after the accident, this difficulty was overcome by suitable diet and small doses of opium under the skin, the bowels acting copiously, discharging their contents, much reduced in consistence on the twenty-third day after the commencement of the obstruction. In these two last cases we have a stiff test of the correctness of my practise. The result was the same although the patient suffered from palsy of a portion of the gut.

Case No 23.—On Tuesday morning October 24th, 1878, my coachman informed me that a powerful and previously healthy black mare, my property, was not well. I visited the stable and found her presenting the usual symptoms of colic—scraping the floor, laying down suddenly, then rising again, refusing food and drink, with pulse slightly accelerated. I ordered a draught of Tinct. Opii. one ounce, which appeared to give relief. Repeated the dose in the evening, and gave orders that her food should be stopped, and only allowed a drink of water. In the evening the symptoms appeared unchanged. Morning of second day decidedly worse; gave two ounce dose of Laudanum in half a pint of whiskey and water. Found that although I prohibited any fodder, yet this order had been set aside, but on my reprimanding the stableman, he promised not to ignore my injuction again. I now left home at 2 p.m. At that time the mare was suffering, but not so much as in the morning. On my return next day at 2-30 a.m. I found her much worse, and she had been so for many hours. Gave a draught of four ounces of Tinct. Opii. and introduced into Pharynx a gallon of warm water, by means of the "horn." At 9-30 a.m. no better; had been very restless during night, up

and down, pawing the ground, rolling about, exhibiting signs of extreme pain. At 9-30 on the third day of the difficulty, administered five grains of Morphia in solution under the skin. In thirty minutes she was easy, demanded food, which she did not get, but was offered drinks of water which she refused; in fact she presented no symptoms of the difficulty. At 11 p.m. the spmptoms returned, and I repeated the dose with a like result, so that the mare appeared perfectly well; pulse nearly normal. Gave her another gallon of warm water.

4th day,' 9-30.—Became very restless; no indication of pain; six grains of morphia under the skin; in thirty minutes relief was obtained, so that she demanded food. At 1 p.m., as she was reported to be in pain, I repeated the dose; and did so at 12 p.m. on the recurrence of the alarming symptoms. This evening the manger was filled with water in which were deposited two handsful of bran. During the night she drank half of this, in bulk equal to two gallons."

5th day, 9-30 a.m.—In pain; return of symptoms; gave seven grains of morphia under the skin, and repeated the dose at 2 p.m., also at 12 midnight; the injection under the skin always relieving her in thirty minutes. Left a drink in the manger, of which she used fully two gallons. During this day passed a small, hard motion, and a small pultaceous one. I satisfied myself that the rectum was not plugged; the abdomen, which up to this day was tense, but not to an extreme degree, now became perceptibly relaxed.

6th day.—Return of symptoms, but in a milder degree. Gave eight grains of morphia under the skin, which perfectly relieved her; no food has yet been allowed; began to mix a little bran with the water in manger, the bran used up to this day altogether could not have weighed four pounds. Did not see her again until 5-40 p.m., and then found her in pain, laying down. The stablemen urged her her to get up, as I preferred to give the injection of morphia under the skin while she was in an upright position. However, as it was not possible to get her to move, I gave her eight grains whilst she was in the recumbent position. On my return in forty-five minutes, I found her up, loudly demanding food. She contiued easy and apparently well and in good spirits until 11 p.m., when she showed slight symptoms, indicating a return of the distress. Gave eight grains of morphia under the skin.

7th day.—Return of symptoms, but not nearly so urgent; gave ten grains of morphia under the skin; abdomen much reduced; no distension; had taken a gallon of thin oatmeal and peameal gruel during the night; remained well and in good spirits up to eight p.m., when, on slight return of symptoms, twelve grains of morphia were injected under the skin, and a gallon of thin oatmeal gruel was left in the manger to be ready if she was disposed to take it during the night.

8th day, 10 a.m.—Not in pain, as far as objective symytoms show; will not get up; had been lying some hours; got up at 10-30, but lay down again; now gave ten grains of morphia under the skin, and a gallon of oatmeal gruel; she also drank at 12 noon a bucketful of water, and rose up making signs for her usual food, and appeared all right. When lying down the skin of the abdomen was in folds, showing that there was no distension; pain returned. At 6 p.m. gave twelve grains of morphia. At 12 midnight gave fourteen grains of morphia—gave this large dose as the former doses appeared to lose their effect too soon.

9th day, 10 a.m.—Evidence of some distress; gave fourteen grains of morphia under the skin. In one hour afterwards my stableman passed his hand into the rectum and withdrew a small quantity of fæces, covered with the excretion peculiar to horses fed on oatmeal and peameal. The usual diet of oatmeal and peameal, made very thin with hot water, was given this day; and in the evening at 11 p.m., eleven grains of morphia.

10th day, 10 a.m.—Appears much better; had lain down in the early part of the night, but as she had become jammed diagonally across the corner of her "loose box," she was racked up with the rack chain, attached to the head collar by a piece of calico bandage, so that if any undue strain occurred, the bandage would break and release her. This arrangement kept her standing all night.

11th day, 10 a.m.—She appeared free from pain; gave only ten grains of morphia under the skin; allowed bran mash with oatmeal well reduced by hot water. At 6 p.m., I was sent for, as she was supposed to be dying. Found her lying on her back in the "box;" hind leg tucked up to the abdomen; fore legs spasmodically flexed and fixed; eyes closed, and breathing imperceptible. I could not detect the

slightest motion or tremor, viewing her from a distance of six yards. This condition lasted about five minutes, when she partly arose, and looked towards her flanks. Injected fifteen grains of morphia, and in half an hour she was all right, Got up neighing and playing with the horse in the next stall, and making signs for food. She was given two gallons of oatmeal gruel. This freedom from pain lasted until 11 p.m., when she gave evidence of some slight pain, and fifteen grains of morphia were again given under the skin; and in an hour after (12 midnight) she was lively: indeed appeared as though she never had been a sufferer.

12th day, 10 a.m.—Symptoms of pain; sixteen grains of morphia were given under the skin; this dose was repeated at 11 p.m., on recurrence of signs of the distress.

13th day.—Repetition of treatment as pursued on the twelfth day.

14th day.—Appeared in much pain at 11 a.m.; no abdominal distension; gave twenty grains of morphia under the skin, which was followed by usual relief, and the mare appeared in excellent spirits; took a bucketful of bread soaked in hot water. At 6 p.m., appeared again in much distress, lying down and declining to rise when urged, and looking as if dying; gave twenty grains of morphia under the skin, and in thirty minutes exactly appeared perfectly well, in good spirits, playing in the stall, and demanding food. The hand, to-day, was passed into the rectum, and a slight amount only of excrementitious matter, evidently from oat and pea meals, was withdrawn.

15th day, 10 a.m.—Found her on her back with very evident signs of pain. Some friends that were with me assured me she was dying; my previous experience informed me otherwise; gave twenty grains of morphia under skin; and in forty minutes she was up and apparently well. Her diet this day was limited to strong Linseed tea and cold water, of which she took about a gallon. Twenty grains repeated at 2 p.m., and again at 12 midnight, relieved all pain, so that during this day she gave no further signs of distress.

16th day.—After the strong doses of the previous day she had not the usual signs of distress present in the morning, consequent on the effect of the remedy being spent. Another twenty grains of morphia under skin at

10 a.m., also at 2 p.m. and 12 midnight; and thin, fine flour gruel only was allowed. Common salt and water were given this day, as I thought she did not drink sufficiently. It had the effect of making the mare drink more this day (about two gallons). She passed an excellent day; and at midnight lay down in apparent ease and good spirits.

17th day, 10 a.m.—No evidence of pain; pulse only slightly accelerated; no morphia this morning. Continues well all day, but gave fifteen grains of morphia at night (11 p.m.); has drunk more liquid, in the form of gruel, this day, and also about a gallon of water.

18th day, 10 a.m.—Pulse nearly normal; no evidence of pain; refuses drink or any form of nourishment, not even the ordinary food, a small quantity being offered to her for the purpose of gaining information. At 11 p.m. was very quiet; lying down; pulse normal; no opiate given.

19th day.—Refuses food and drink; no evidence of pain; no remedy given; lies down and has no symptoms indicative of malaise; gave enema of two quarts warm water, which brought away slight motion.

20th day.— Was called at 3 a.m. by the stableman reporting that the mare was in pain. Got up and found her with symptoms of distress; gave fifteen grains of morphia under skin, which gave ease in thirty minutes. 10 a.m.—Pulse accelerated; she is not perfectly easy; has taken one gallon of water, but refused more up to 10 p.m., when she took a little drink; I gave her fifteen grains of morphia under skin, as she appeared restless.

21st day, 10 a.m.—Restless; slight acceleration of pulse; refuses food and drink; gave ten grains of morphia under skin, and some salt was placed in her manger, after which she took half a bucketful of water; 7 p.m., has taken raw oatmeal and water frequently during day; fifteen grains of morphia were given, as she appeared uneasy; again, at 11-30 p.m., ten grains, as she now gave evidence of some distress; took now nearly a bucketful of water.

22nd day, 10 a.m.—Pulse accelerated; drank freely of oatmeal and water; shows signs of pain; gave fifteen grains of morphia under skin; and, again, at 8 p.m., twenty-two grains.

23rd day.—Symptoms of pain; gave 20 grains of morphia at 10 a.m., 11 a.m., and 11 p.m., and she partook of raw oatmeal and cold water mixed.

24th day, 10 a.m.—Symptoms of pain; gave twenty-five grains of morphia under skin; repeated the dose at 11 p.m.; took during the day nearly two gallons of cold water, with raw oatmeal in it.

25th day.—Pulse normal; appears free from pain; no evidence of the difficulty; looks emaciated; refuses food and drink all day; no medicine given.

26th day, 10 a.m.—Pulse normal; refuses food and drink. This condition continued up to 6 p.m., when she had symptoms indicative of pain; lying down; looked at her flanks, and rolling on her back, with legs intensely cramped; gave twenty-five grains of morphia under skin; and in about three-quarters of an hour she was up, and took one fourpenny loaf broken up in a bucket and a half of water. At 12 midnight gave twenty grains of morphia.

27th day, 10 a.m.—Appeared much better; pulse only slightly accelerated; has taken a little bread and half a bucket or water during day; lies down also, and appears cheerful. 9 a.m—Slight symptoms of uneasiness; gave twenty-five grains of morphia under skin; no abdominal distension for many days; passes about eight ounces of water every other day.

28th day.—Pulse normal; no special symptoms; refuses any food or drink; no medicine given; lies down for an hour or two; then stands for the same period.

29th day.—Pulse rather below normal, but full and regular; no signs of the past difficulty; has taken a little water and half a dozen potatoes, two turnips, and two moderate sized carrots with half a bucket of water; no medicine given.

30th day.—Pulse normal; sleeps and rests well, and moves about as though she were convalescent. During this day took six potatoes, two moderate sized turnips, and three moderate sized carrots; drank also a bucketful of water, and passed spontaneously, fæces of normal consistence in masses five inches long; no medicine given.

31st day.—Doing well ; no medicine ; has taken a few beans, potatoes, and two buckets of water ; has been washed all over, and appears well but very weak, and lies down occasionally ; passed small quantity of fæces, less than previous day.

32nd day.—Appears well ; has taken a few beans, six potatoes, and drank a bucketful of water.

33rd day.—No special symptoms ; appears well but emaciated and feeble.

34th day.—Nothing special ; takes daily about half a dozen potatoes, three or four turnips mixed in a handful of beans with bran in half a bucket of water. About twelve midnight I visited the stable and sound pulse and respiration much accelerated ; refused drinks and solids ; abdomen tense ; no indication of pain, but covered with saw-dust (bedding). This made me suspect, anterior to my visit, she may have been down struggling and in pain. Gave ten grains of morphia under the skin ; and visited again at 1 a.m., but found her worse ; showing nose, ears, and feet cold ; pulse nearly double the normal rate. I now felt certain she must die. I made the stable extra warm, turned the lights "full on," and left her. She was fouud dead in the morning at six o'clock.

During the treatment of this case I observed that the opium had the same effect as when given for the treatment of this lesion in the human subject, viz., large doses did not produce any toxic effect, it diminished the thirst, moistened the tongue and mouth, diminished the frequency of pulse, and gave perfect relief from pain. A suspicion, that possibly some error of commission or omission had been practised in the treatment, inasmuch as the mare, that had been apparently well for many days, died suddenly, induced me, accompanied by my nephew Mr. R. Jones, to visit the Knacker Yard and witness a *post-mortem*. The lung, heart, &c., were sound : there was much abdominal distension. The cause of death was the impaction in the colon of a large scybalous mass, enclosed in a thick layer of lymph, which, at an inflamed part, had been arrested in its progress down to the rectum, and had led to rupture of the gut. The mass was found in the peritoneum, with, of course, a certain amount of fæcal

matter, much reduced in consistence and equal to the density of gruel. This scybalous mass had exactly the shape of the heart of the same animal, but of slightly larger size.

During the treatment of this case I had many difficulties. In the first place my stablemen were much averse to the opium and restricted diet, and wished to be permitted to use copious enemata, turpentine draughts, and several other very unsuitable remedies. Again, many of my friends who saw her, urged me to use different remedies; others asserted that it was not a case of intestinal difficulty; and from the first to the last day of treatment I was pestered by all around me to call in the aid of a Veterinary Practitioner. I unfortunately gave way in some degree, and allowed her a too free indulgence in solid forms of food, such as beans, potatoes, and turnips. Noticing that the urine was very scanty—sometimes none for three or four days—means were taken to induce thirst, as I feared she was not taking sufficient fluid to reduce the consistency of any accumulation that probably existed. This was a mistake as the *post-mortem* showed that there was more than sufficient liquid in the bowels. Again, I did not take into consideration that the horse does not vomit, and by this means part with the liquid taken, and that, consequently, a moderate amount of fluid would suffice to overcome the mechanical condition on which the obstruction depends. Again, on the twenty-ninth day, there were present all the signs of returning health, which, unfortunately, induced me to use more food. The scybalous mass was an exact model of the *cul-de-sac* end of the "Blind Gut," and had evidently been formed at a period long anterior to the date of the difficulty, and was covered with a thick layer of lymph. However, the mass had begun to soften, and, when touched with a cane, split into two parts. It appeared to consist of chopped hay only, and was of a dark green colour. I had a conversation with the "Knacker Man," who informed me that he "cut up" about two thousand horses annually, and that a large percentage of them die from this malady, and that their life is seldom prolonged beyond the seventh day of the disease. Several of my veterinary friends inform me that from eight hours to five or six days is the usual average in fatal cases. This case has convinced me that intestinal obstruction, when it occurs in the horse, should be treated in the same way exactly as when met with in the human subject.

During the treatment of this member of the animal kingdom, I could not avoid noticing a very instructive feature, indicative of the value of

the therapeutical agent employed. No matter what degree of violent excitement she exhibited before I came in, as soon as she saw me armed with the morphia syringe, she instantly calmed down and remained so until I had injected the dose, nobody being needed to control her ; and no old hospital or private patient, long suffering from pain and accustomed to the "needle," could appear to exhibit more quiet satisfaction on receiving the injection.

This is the second case of intestinal obstruction which I have treated in the horse. The first case recovered after three weeks' illness. It was one of enteritis, brought on by excessive exercise after a drastic purgative. The treatment followed was opium by the mouth in varying doses, commencing with Tinct. Opii. ℥ i three times a day up to ℥ x twice a day. A diagramatical illustration of the lesion in case 23 is given in plate 3.

Case No. 24.—In June this year I was requested to attend the wife of a Liverpool dock-gateman. Her medical history was that, some three months previously, she had consulted me for some pain and swelling in the right hypogastric region, when, suspecting slight typhlitis, I had ordered her a restricted diet with an opiate mixture, and that in about ten days afterwards she was fully recovered. In three months afterwards the tenderness and swelling returned, when, by the advice of a midwife, she took a sharp purgative. This so aggravated the symptoms that she sent for me, and I found evidence of typhlitis. I treated her with small doses of opium, and, when this failed to alleviate suffering, supplemented it with an occasional dose of morphia under the skin. Her diet was, of course, also restricted. I did not keep daily records, but the bowels acted on the twenty-third day ; she then suffered diarrhœa about every alternate day for a week, when she commenced to pass scybala of the size, shape and colour of chestnuts. These were passed daily during three days, and numbered in all thirty-eight. The patient recovered.

Case No. 25.—June, 1878, I met a medical friend, who informed me that a mutual friend and professional brother was seriously ill with some form of intestinal obstruction. In the evening of the same day, I had a message from the gentleman in charge of the case, that the patient wished me to call upon him, and also that the patient, who had been very ill, was much better. The latter part of the message caused me to delay visiting, as I

hoped that in a few days my visit would be more acceptable, when he would have regained some strength, &c. On June 29th, 1878, I visited him, and found him on the couch in his drawing-room, and, after a few preliminary remarks, we soon found ourselves discussing what he judged his past difficulty to have been. His history was, that during the last three months he had been in very indifferent health, and suspected some threatening liver complication, that, late in the last month, he commenced to vomit, and for a short time stercoraceous matter, and that he suffered at the same time from constipation. He invited, to assist him in his illness, a medical friend; and for some days opium, in doses inadequate, as I surmised, to produce any apparent benefit, was given. The result was, that when certain symptoms arose, they were misinterpreted. The medical gentleman, supposing them serious, proposed a consultation, when a change of treatment was advised, the opium discontinued, and the medicated enema branch of the "main force" type of treatment adopted, including the exhibition of tobacco, belladonna, &c., which appeared satisfactory, inasmuch as partial relief of constipation happened at the time. This occurred two days before my visit. At his own request, and with the consent of his medical attendant, I examined the patient, and found the pulse nine in five seconds; temperature 100°; tongue furred; moderate thirst; abdomen moderately distended, the swelling being principally confined to the umbilical region. I found also that his diet, judging by the rules which I adhere to, was very unsuitable. During my visit he commenced to have pain, and I suggested that ¼ of a grain of morphia should be injected under the skin, but he objected, as the last dose he had taken, some five or six days ago, had, he said, made him delirious, and he also added that he did not think opium suitable to his case. From this I emphatically dissented, adding that the last dose of morphia given was not sufficient to have a beneficial effect, and that he was delirious from pain. I also tried to convince him that the disease, which he judged as cured, was still present, and that he was in a critical condition. I pressed him also to further restrict his diet, and inasmuch as he would not permit the administration of opium, he was urged to take another form of narcotic, viz., a glass and a half of brandy with water. The medical gentleman, in charge of the case, agreed with me as to the treatment and the necessity of further caution. In ten days the patient sent for me to hold a consultation with his medical adviser, and I found the patient much better; tongue moist; less thirst; pulse and temperature improved; abdomen much less distended. The report given to me was that, in three hours after the termination of

my first visit, he began to suffer from extreme pain, when his medical attendant injected under the skin ¼ of a grain of morphia, and repeated the opiate in gradually increasing doses, every six hours, until the pain had disappeared, and the bowels commenced to discharge their contents daily, the opium being after a few days resorted to only on special occasions. He continued to improve steadily up to July 26th, when he drove out to the country and partook of about four ounces of cream. This was followed, in about twelve hours, by vomiting, which continued, every two to three hours, for twenty-four hours. Morphia was given, and he was soon better; but unfortunately he committed another error in diet, which was followed by symptoms so serious, that on July 29th a message was sent to me that the patient was dying. On visiting him I found present all the symptoms indicative of obstruction in some portion of the small intestine. During my stay at this visit he frequently vomited matter, stercoraceous in appearance, but it had not the faintest trace of the characteristic odour usual in obstruction; but feeling certain that it was a case of obstruction, I judged that the peculiar odour was absent, *probably*, because the obstruction was very high up. The vomited matter was examined, both at the time it was discharged by the patient, and also some hours after it had been ejected, but in neither case was the slightest stercoraceous odour perceptible, nor was there such odour in any of the vomit parted with during my attendance. The pulse on this day was nine in five seconds; temperature 101°; abdomen moderately distended; thirst intense; pain moderate; tongue furred. Morphia was now given in ½ grain doses about every eight hours, just when necessity for the remedy arose. The patient had now such confidence in his opiate, that he had the syringe constantly charged in case it might be required during the absence of the medical attendant, and on several occasions a member of his family gave the dose, and thus his pain was promptly relieved. I now visited him daily; the constipation lasted on this occasion during eight days. This avoidable relapse, we thought, was the most serious of all he had yet had. At the expiration of the eighth day his bowels acted freely, but the distension was only slightly reduced. After an interval of forty hours the bowels again discharged their contents, and continued to act for four days, collapsing the abdominal wall, so that it presented a concavity when the patient was in a reclining position. He continued to improve, and went to the country for change of air. This was in a week after my last visit. He appeared very well, and he was most urgently advised by myself and others to stringently adhere to a certain diet, &c., until his return.

On his return home I visited him again, and he expressed himself as feeling much better since the change from town. He had been away about a month. I now carefully examined him, and found the abdomen extremely distended, the swelling showing the highest elevation at the umbilical region, and he also had a small tumour-like swelling in the right hypogastric region, indicating, in my opinion, that the small intestine was partially occluded low down; tongue furred; pulse slightly accelerated; temperature 100°. I informed him that he was much worse than I had yet seen him, as the accumulation was certainly greater than it had been yet, and that possibly all these relapses would cause the gut to be permanently œdematous, and, consequently, paralysed; and that during the next week he would have to go through a repetition of his previous distress. He, however, did not think there was any ground for alarm. During a long conversation I elicited from him enough to satisfy me, that this relapse had an avoidable cause. As I predicted, he had to be treated again for genuine obstruction, from which he was relieved, but only for a time, as the difficulty recurred when even the slightest deviation from a suitable diet was allowed. Milk seemed to be the article of diet that, from the beginning, specially caused him distress. This patient had from six to seven relapses, four of which could have been avoided, and most certainly had we been able to have convinced him that his case was one of genuine obstruction, his co-operation, even after the third relapse, would have saved him. He died in the sixth month without any symptoms of obstruction, save vomiting during the last week of his illness, his bowels acting two to three times daily; not the slightest distension for days previous to his decease, but slight pain, for which an occasional small dose of morphia was given. It was noted in this case that as soon as his distension was relieved there was, occasionally, decided, though not the extreme collapse—such as is usual; yet some hours would elapse before the lower segment of intestine parted with its contents. It was also remarkable that this gentleman, though the subject of a serious lesion, was confined to bed only for a short period, not over six weeks in all. The patient, who had always taken a great interest in his profession, had requested that a *post-mortem* examination should be performed, to place beyond doubt the nature of his complaint. The *post-mortem* was performed by Mr. Rushton Parker, who found intussusception involving the region of the ileo-cæcal valve, not a trace of which was present, and the opening from the small intestine to the larger intestine admitted the passage of the finger only; but there was also a loop

of the small intestine which adhered to the cæcum, and communicated with the cæcal cavity by an opening, caused by ulceration, so that nearly all the contents of the small intestine passed into the large intestine without traversing almost sixteen inches of the latter end of the small gut. (See Plate 4.) It astonished me to see the existence of this double form of obstruction, intussusception, and partial isolation ; yet had their diagnosis been possible, it could not in any way have effected the treatment. His suffering and the physical symptoms were not so intense as those frequently observed in cases of a milder type of obstruction. The original attack and each relapse were accompanied by identically the same symptoms, commencing with pain, distension, vomiting, accelerated pulse, rise of temperature, together with more or less collapse when relief of distension occurred, then passages of flatus, the discharge of the contents of the lower segments of the bowels, a series of discharges lasting for several days—an occasional day intervening,—the treatment by opium, together with elevation of part of the couch and restricted diet, always triumphing over the obstruction. This case showed me the possibility of serious obstruction existing with most obstinate and frequent vomiting for days, the matter ejected having not the faintest odour of what is supposed to indicate obstruction of the intestine, *i.e.*, stercoraceous matter. I have often noticed the stercoraceous fœtor in the vomit for days, and then its absence for a few hours, and then again a repetition of the characteristic odour ; but its total absence from first to last, as happened in this case, I had never before observed.

The question naturally arises, could this case have recovered? I think there was a high probability of his recovery, had certain details been followed from the commencement. Several errors occurred during the treatment, the most notable being my own, in permitting his visit to the country, and so losing control of him for four weeks. Case 19 was identical with this, and of the two, certainly accompanied by symptoms of greater intensity: but in that case I know for certain, that with the exception of two occasions, (when errors in diet caused two relapses which happened within some twelve weeks after patient's recovery from the primary attack), not an iota of variation from my instructions was permitted, and to this only I attribute his recovery. Certainly one mistake in deviation would have killed him. That Case 19 was the most difficult to treat is only too apparent from the fact that he required morphia in doses varying from one quarter of a grain to two grains under the

skin, which had to be repeated every six to eight hours, while in this case one quarter to half a grain of the remedy sufficed, and had only to be repeated every eight to twelve hours. The medical gentleman, with whom I co-operated in the treatment of this case, agreed with me as to the line of treatment, and a differential diagnosis was not sought for. We judged, at first, the case to be one of mild enteritis, aggravated by frequent and avoidable relapses. Had the exact state of matters been made known to us, no alteration would have been made in the treatment.

Case No. 26.—In the early part of the year 1879, I was requested to visit Birkenhead to attend the engineer of a steam tug-boat, who had been injured in the discharge of his duty. On my arrival I found the patient in bed, and, that most of his distress arose from some ailment affecting the abdominal contents; pulse was slightly accelerated; temperature nearly normal; slight thirst; abdomen moderately distended, and on manipulation an irregular tumour could be felt; he suffered from slight nausea and constipation, with constant pain within the abdomen,—he had also suffered from fracture of several ribs, these I found nearly well. His history was that, having occasion to go into the steamers's paddle-box, his fellow engineer started the engines while he was on the paddle floats, which were made to revolve many times, before his critical position became known to those in charge of the boat As soon as he was extricated—being then in Cork Harbour—he was taken to a public hospital, where for a short time he continued in a state of collapse, and after reaction set in he remained in a very critical condition, not being expected to survive the injuries and general shock. Surviving, however, he left the hospital, as soon as he was able to be removed, the surgeon in charge of his case prognosing that he had an internal tumour which would probably hinder his ultimate recovery.

His symptoms and medical history inclined me to think that this was a case of chronic obstruction, arising from traumatic enteritis, and that suitable treatment would finally remove the malady. At my advice, he became an in-patient of my hospital in Hardy Street, his wife accompanying him there, as I wished to instruct her so that, when he returned home—this being a case that would probably take a long time to cure—she could continue the treatment and dispense with my visiting him at Birkenhead, which would be rather inconvenient for me. He remained in my hospital three weeks.

During his stay there, his diet was rigorously restricted, and occasional doses of morphia were given by the mouth, but only when pain much distressed him. When he left the Hospital all his abdominal symptoms, not excepting the tumour, had disappeared. During the space of six months he carefully restricted his diet, &c., and after that period was able to resume his duty as engineer, though still on the restricted dietary. At the termination of nine months he gradually resumed the ordinary and reasonable use of food. I advised him to abstain always from new bread, boiled or stewed flesh, dried fish, raw fruit, and a few other kinds of food difficult to digest. He has remained perfectly well up to this date, October, 1882.

From what I learned from the patient, the abdominal mischief was, during his stay in the Cork Hospital, thought to be so serious and hopeless of relief, that a merely expectant rule of treatment was practised in his case, and to this no objection can he advanced, when we consider how cases of traumatic enteritis are generally treated. I attribute the want of progress towards recovery, whilst there, to the fact, that his diet was not suitable—milk in particular being allowed. This arrested improvement, but he escaped any prescribing, which if it had been a repetition of the prevalent practice, would have caused retrogression and death. Careful restriction of diet is the principal factor in this, as, indeed, it is in all cases of obstruction, bringing about resolution of the disease.

This case brings to my recollection another, treated by a medical friend, in which the medicine used was suitable, yet by the non-adherence to the conditions permitting of its use, *i.e.*, restriction of the quality of food, it became an obstacle to recovery.

The medical history of this case was, that at a certain date my method of treatment for obstruction was commenced and continued for three weeks, and with such success, that all the admitted signs of obstruction rapidly vanished, —yet the intestines not having had primary relief—the existing constipation was attributed to atony of the gut, and an aperient was given. Immediately after all the symptoms of obstruction returning, proper treatment was again resumed, with the previous excellent effect; and in two weeks more, primary relief of obstruction, with very copious evacuations, occurred. Unfortunately this was judged to indicate complete recovery, but the opium was continued, though the restrictions placed on the quality of food were removed; this brought about such an accumulation that it terminated fatally.

The use of opium in combination with an unsuitable quality of food, is the worst form of malpractice in these diseases.

Case No. 27.—On September 17, 1879, I was requested to co-operate with my fellow-townsman, Dr. Lambart, in the treatment of a case in whlch obstruction of the bowel was supposed to arise from arrest of the usual intestinal contents, from an ulceration in a part of the gut and consequent suspension of its propelling power.

As there were some features of practical interest in this case, the physician in charge of the patient kindly furnished me with his notes of its progress, which are here appended *in extenso*:—

"On September 15, J—— R——, 6, E——th Street, aged 64. For many months the patient had irregular evacuations from the bowels, having to retire to the closet three or four times daily, when only small liquid motions, mingled with blood, would come from him. The appearance of blood did not alarm him, as he had long suffered from piles. On September 11th, noticing that the usual cause for retiring to the closet did not arise, the patient took two rhubarb pills, and as they produced no evacuation, on the 14th of September he consulted a chemist who gave him a draught and pills. These, again, not acting as purgatives, he took once ounce of castor oil, but this also falled to relieve the constipation.

"On my arrival, Monday 15th, he was in bed; temperature 100·5°; pulse 110; vomiting stercoraceous matter; ordered beef-tea and a simple tonic, with an injection of soap and water with castor oil, also morphia ¼ of a grain by the mouth. Little sleep followed; pain in the bowels and rumbling noise, like the shaking of air and water; abdomen swollen and tympanitic; vomiting every ten minutes.

"16th.—Constant vomiting; pulse 88; temperature 99·5°; repeated aperient draught and tonic, also enema; latter brought away some small scybala. This day Mr. Thomas and myself consulted together, and we decided to make a new departure in the treatment, by restricting the patient's diet and giving morphia under the skin as medicine, and by trocaring the intestine through the abdominal wall, to relieve the extreme tension of the abdomen. This procedure was very effective—utterly collapsing the abdomen; ¼ grain of morphia was given subcutaneously; the foot of the bed was raised twelve inches, this was done at 3 p.m.; morphia repeated at midnight.

"18th.—Passed a better night; feels happy; less pain; less vomit; pulse 90; temperature normal; morphia ¼ grain given under the skin morning and evening of the day.

"19th.—Feels comfortable; vomiting less frequent, and less in quantity; morphia ¼ grain under the skin morning and evening.

"20th.—Pulse 110; temperature 98·5°; morphia ¼ grain under the skin twice this day.

"21st.—Pulse 115; temperature 98·5°; rather more pain; gave ⅓ of a grain of morphia under the skin morning and evening.

"22nd.—Passed flatus during night; feels much better; vomiting two or three times a day; gave ⅓ of a grain of morphia under the skin morning and evening.

"23rd.—Pulse 124; temperature 98°; passed more flatus; less vomit; morphia repeated as previous day.

"24th.—Pulse 120; temperature 97·5°; vomiting has ceased; feels easy, passing flatus; morphia repeated as on previous day; abdominal distension gradually increasing.

"25th.—Complains of pain since 4 a.m., but most intense at 11 a.m.; temperature 98°; pulse 128; more distension of the abdomen this morning; gave ½ a grain of morphia under the skin. Was sent for at 8 p.m., as he had been in much pain since 4 p.m.; pulse 148; injected ½ grain of morphia subcutaneously.

"26th, 7-30 a.m.—Pulse 186; had not much pain during the night, until he turned suddenly in bed, which caused great pain; ordered brandy and water, and gave another dose of ½ grain of morphia under the skin; indeed, all the morphia given after Sept. 17th was subcutaneously. The abdomen this day became much distended, and at noon Mr. Thomas and I again consulted, and tapping of the tympany was a second time resorted to with complete relief of the distension, and directly after another ½ grain of morphia was given.—9 p.m., pulse 120; temperature 99°; abdomen refilling with gas, but the patient is better, and has had no vomiting all day; gave another ½ grain of morphia.

"27th.—Pulse 124; temperature 99°; passed excellent night, no vomit, distension increasing; ½ grain of morphia morning and evening.

"28th, 8 a.m.—Had comfortable night; pulse 124; temperature 99°; no vomit, no pain. Again I trocared the intestines. Pulse reduced to 118.—2-30 p.m., pulse 112; gave ½ grain of morphia.—9-30, pulse 110; gave ¾ grain of morphia as usual.

"29th, 8 a.m.—Pulse 108; temperature 98·5°; gave ¾ grain of morphia. Had passed a good night, no vomiting.—2-30 p.m., pulse 118; gave ½ grain of morphia.—10-30, pulse 112; gave ¾ grain of morphia.

"30th, 9 a.m.—Pulse 112; has passed much flatus; gave ½ grain of morphia.—2-30 p.m., pulse 108; gave ½ grain of morphia.—9-30, pulse 120; passed more flatus; gave ⅔ grain of morphia.

"Oct. 1st, 9 a.m.—Pulse 118; passed more flatus; temperature 99°; gave ⅔ grain of morphia; no vomit, slight pain, distension moderate.—2-30 p.m., more flatus; pulse 110; gave ½ grain of morphia.—9-30 p.m., pulse 118; more flatus passed; gave ⅔ grain of morphia.

"2nd, 9 a.m.—Pulse 120; temperature 100·5°; more flatus passed; abdomen soft, but much rumbling noise, very little pain; food has been hitherto beef tea, arrowroot cooked in water, and water to drink.—2-30 p.m.—Pulse 118; gave ½ grain of morphia.—10 p.m., pulse 126; gave ¾ grain of morphia.

"3rd, 8 a.m.—Pulse 110; temperature 98·5°; gave ¾ of a grain of morphia, 2-30 p.m.—More flatus passed; no pain; pulse 108; gave ⅔ of a grain of morphia. 10-30 p.m.—More flatus passed; pulse 110; gave ⅔ of a grain of morphia.

"4th, 10 a.m.—Pulse 110; flatus passing; gave ⅔ of a grain of morphia. 2-30 p.m.—Pulse 116; gave ⅔ of a grain of morphia. 9-30 p.m.—Pulse 118; gave ¾ of a grain of morphia.

"5th, 8 a.m.—Pulse 112; gave ¾ grain of morphia. 2-30 p.m.—Pulse 116; gave ¾ of a grain of morphia. 10-30.—Pulse 118; gave ¾ of a grain of morphia; passed flatus this day many times.

"6th, 8 a.m.—Pulse 110; gave ¾ of a grain of morphia. 2-30 p.m.—Pulse 112; gave ¾ of a grain of morphia. 10-30 p.m.—Gave ¾ of a grain of morphia; has passed flatus frequently this day.

"7th, 8 a.m.—Pulse 118; temperature 98·5°; gave ¾ of a grain of morphia; complains of feeling weak, and desponding, but looks as well as he could be reasonably expected to look under the circumstances; has pain in the right flank. 2-30 p.m.—Pulse 110; gave ¾ of a grain of morphia. 10-30, p.m.—Gave ¾ of a grain of morphia under the skin as usual; has passed flatus frequently during this day.

"9th, 9-30 a.m.—Pulse 104; temperature 98·5°. 2-30 p.m.—Pulse 106. 10-30 p.m.—Pulse 110; had three doses of morphia of ¾ of a grain each; appears comfortable, sleeps but not soundly.

"10th, 9 a.m.—Pulse 108; temperature 98·5°; feels sick, with much pain in left side, especially when turning in bed, but not much pain on manipulation of the abdomen, neither is there much distension. 2-30 p.m.—Pulse 106. 10-30 p.m.—Pulse 112; had three doses of morphia of ¾ of a grain, each, this day.

"11th, 9 a.m.—Pulse 106; temperature 98°. 2-30 p.m.—Pulse 108. 10-30, p.m.—Pulse 110; passed flatus; had three doses of morphia of ¾ of a grain each.

"12th, 9 a.m.—Pulse 114; temperature 98°; passed a small quantity of liquid fæces during the night. 2-30 p.m.—Pulse 110. 10-30 p.m.—Pulse 112. There can be detected by manipulation a hard lump in the right side above Poupart's ligament; abdomen is very flaccid.

"13th, 7-30 a.m.—Much pain; pulse 120; temperature 98°; abdomen swelling again, could not detect the lump of yesterday, and now resumed the morphia which had been omitted for twenty-four hours, giving 1 grain under the skin. 2-30 p.m.—Pulse 114; looks badly; little more fæces; gave ¾ of a grain of morphia. 10-30 p.m.—More pain; pulse 114; gave 1 grain of morphia.

"14th.—Pulse 114; temperature 97·5°; little fæces; distension moderate; expresses himself as feeling better than he has felt ever since the commencement of his illness; gave ¾ of a grain of morphia. 2-30 p.m.—Gave ¾ of a grain of morphia. 10 p.m.—Pulse 110; gave 1 grain of morphia.

"15th, 9 a.m.—Pulse 100; temperature 98·5°; considerable flatus and slight fæces; abdomen less distended. 2-30 p.m.—Pulse 110. 10 p.m.—Pulse 110.

"16th, 9 a.m.—Pulse 106; temperature 99°; more wind passed and very slight fæces during the night; gave ¾ of a grain of morphia. 2-30 p.m.—Pulse 110. 9-30 p.m.—Pulse 112.

"17th, 10 a.m.—Pulse 118; temperature 98°; complains of feeling very sick; abdomen more distended and passing no flatus. 2-30 p.m.—Pulse 110; gave ¾ of a grain of morphia. 10 p.m.—Pulse 108; gave 1 grain of morphia.

"18th, 9 a.m.—Pulse 112; temperature 98·5° ; little fæces passed in the night. 2-30 p.m.—Pulse 116. 10 p.m.—Pulse 114 ; gave 1 grain of morphia.

"19th, 8 a.m.—Pulse 122 ; temperature 99°; two chambers full of pale fæces ; feels sick and low, and looks very pale. 2-30 p.m.—Pulse 116. 10 p.m.—Pulse 112 ; gave 1 grain of morphia.

"20th, 8 a.m.—Pulse 116 ; temperature 98·5° ; gave $\frac{2}{3}$ of a grain of morphia ; feels sick, and looks pale and emaciated. 2-30 p.m.—Pulse 110 ; gave $\frac{2}{3}$ of a grain of morphia. 10 p.m.—Pulse 108 ; gave $\frac{3}{4}$ of a grain of morphia.

"21st, 8 a.m.—Pulse 116 ; temperature 99° ; gave $\frac{2}{3}$ of a grain of morphia. 2-30 p.m.—Pulse 108 ; gave $\frac{2}{3}$ of a grain of morphia. 10-30 p.m.—Pulse 106 ; gave $\frac{2}{3}$ of a grain of morphia.

"22nd, 8 a.m.—Pulse 116; temperature 96° ; gave $\frac{2}{3}$ of a grain of morphia. 2-30 p.m.—Pulse 112 ; gave $\frac{2}{3}$ of a grain of morphia. 10-30 p.m.—Pulse 110 ; gave $\frac{2}{3}$ of a grain of morphia.

"23rd, 8 a.m.—Pulse 112 ; temperature 98·5° ; much flatus passed; commenced to take pea-flour added to his beef-tea at 3-30 p.m. 10-30 p.m.—Does not like the pea-flour.

"24th, 8 a.m.—Pulse 120 ; temperature 99° ; complains of feeling sick and weak. 2-30 p.m.—Pulse 112 ; gave $\frac{1}{2}$ grain of morphia. 10 p.m.—Pulse 116 ; gave $\frac{2}{3}$ of a grain of morphia.

"25th, 8 a.m.—Pulse 118 ; temperature 98·5° ; gave $\frac{1}{2}$ a grain of morphia ; feels very weak ; passed flatus. 2-30 p.m.—Pulse 116. 10-30 p.m.—Pulse 112.

"26th, 10 a.m.—Pulse 122 ; temperature 98·5° ; gave $\frac{1}{2}$ a grain of morphia ; much fæces passed during the night, looks bad, feels sick and weak, and no appetite. 2-30 p.m.—Very weak and sleepy, vomiting yellow fluid. 10-30 p.m.—Pulse 106 ; gave $\frac{1}{2}$ a grain of morphia ; feels sick ; more fæces passed.

"27th, 11 a.m.—Pulse 116; temperature 98·5°; much fæces passed; gave ½ a grain of morphia; still sick; ordered ½ ounce of brandy when faint. 2-30 p.m.—More fæces passed. 9-30 p.m.—Pulse 112; temperature 98·5°; gave ¾ of a grain of morphia.

"28th, 8 a.m.—Very sick (vomiting); more fæces; temperature 99½°; pulse 116. 2-30 p.m.—Gave ½ a grain of morphia. 9-30 p.m.—Gave ¾ of a grain of morphia.

"29th, 9 a.m.—Pulse 120; temperature 98·5°; ordered wine and water as an occasional drink, also a dose of rum and eggs. 2-30 p.m.—Pulse 116; gave ½ a grain of morphia. 10-30 p.m.—Pulse 114; ¾ of a grain of morphia injected as usual.

"30th, 9 a.m.—Pulse 118; temperature 99°; passing flatus. 2-30 p.m.—Pulse 116. 10 p.m.—Pulse 114; gave ¾ of a grain of morphia as before.

"31st, 9 a.m.—Pulse 114; temperature 99°; gave ¾ of a grain of morphia. 2-30 p.m.—Pulse 116; gave ¾ of a grain of morphia. 10 p.m.—Pulse 116; gave ¾ of a grain of morphia.

"Nov. 1st, 9 a.m.—Pulse 114; temperature 99°; gave ¾ of a grain of morphia; very low and appetite bad; passed flatus and looks bad. 2-30 p.m. and 10-30 p.m.—Pulse 116.

"2nd, 9 a.m.—Pulse 112; temperature 98·5°; some solid fæces passed. 2-30 p.m.—Pulse 114; gave ¾ of a grain of morphia. 9-30 p.m.—Pulse 110; gave ¾ of a grain of morphia, all the doses of morphia being, invariably, given under the skin.

"3rd, 8-30 a.m.—Pulse 112; temperature 98°; got out of bed to pass fæces and fell; no appetite; gave ¾ of a grain of morphia. 2-30 p.m.—Refuses nourishment; pulse 118. 10-30 p.m.—Pulse 116; more fæces passed.

"4th, 9 a.m.—Pulse 116; temperature 98·5°. This day was induced to take a little beef-tea, brandy and water, then gruel and milk diluted with brandy and water. 2-30 p.m.—Pulse 114; gave ¾ of a grain of morphia. 10 p.m.—Pulse 116; gave ¾ of a grain of morphia, and a mustard poultice was applied to stomach.

"5th, 8 a.m.—Pulse 118; temperature 98·5°; had been very sick during the night and is very pale and low. 2-30 p.m.—Sleepy. 10 p.m. —Pulse 112; gave 1 grain of morphia.

"6th, 9 a.m.—Pulse 124; temperature 98·5°; very anœmic, very sleepy and looks wretched. 2-30 p.m.—Pulse 110; sleepy. 10 p.m.— Gave 1 grain of morphia, and a mixture of Ammon. Carb. and Ext. Taraxaci was ordered.

"7th, 8-30 a.m.—Pulse 118; temperature 99°; has taken food better. 2-30 p.m.—Pulse 112. 10 p.m.—Pulse 116; has tried a little rice pudding.

"8th, 9 a.m.—Pulse 112; temperature 98°. 2-30 p.m.—Pulse 106. 10-30 p.m.—Pulse 110; gave $\frac{2}{3}$ of a grain of morphia.

"9th, 8-30 a.m.—Pulse 114; temperature 99°. 2-30 p.m.—Pulse 110. 10-15 p.m.—Pulse 112; gave $\frac{2}{3}$ of a grain of morphia.

"10th, 8-30 a.m.—Pulse 116; temperature 98·5°; feels better. 2-30 p.m.—Pulse 114. 10-30 p.m.—Gave $\frac{2}{3}$ of a grain of morphia.

"11th, 8-30 a.m.—Pulse 112. 10-30 p.m.—Pulse 114; taking more nourishment.

"12th, 8-20 a.m.—Pulse 116. 10 p.m.—Pulse 110.

"13th, 8-30 a.m.—Pulse 110; gave digitalis tincture ℥i in ℥iv mixture, ℥i ter die. 10 p.m.—Low and complaining; pulse 118; gave 1 grain of morphia.

"14th, 8-30 a.m.—Pulse 120; increased the dose of the digitalis mixture to ℥ii ter die; temperature 99°; passed copious fæces. 10 p.m.— Gave $\frac{2}{3}$ of a grain of morphia.

"15th, 8-30 a.m.—Pulse 110. 10 p.m.—In pain; gave $\frac{2}{3}$ of a grain of morphia; pulse 106.

"16th, 8-30 a.m.—Pulse 110. 6 p.m.—Called early as he was in severe pain; gave 1 grain of morphia; had copious motions this day.

"17th, 8-30 a.m.—Pulse 112; restless and talking in his sleep, not feeling so well. 10 p.m.—Pulse 112; pain at times severe; gave 1 grain of morphia; small motion.

"18th, 8-30 a.m.—Pulse 116; gave ⅔ of a grain of morphia; fair night, feels low and not improving in strength. 10 p.m.—Pulse 116; gave 1 grain of morphia; passed fæces again.

"19th, 9 a.m.—Pulse 116; gave ½ a grain of morphia; seems better. 10 p.m.—Pulse 106; gave 1 grain of morphia.

"20th, 8-30 a.m.—Pulse 101; gave ½ a grain of morphia. 10-30 p.m. —Pulse 112; gave 1 grain of morphia.

"21st, 8-30 a.m.—Pulse 118; improving and feeds better. 10-30 p.m. —Gave 1 grain of morphia; passed fæces.

"22nd, 8-30 a.m.—Pulse 104; gave 1 grain of morphia; passed fæces.

"23rd, 8-30 a.m.—Pulse 114; gave ½ a grain of morphia. 10 p.m.— Pulse 110; gave 1 grain of morphia.

"24th, 9-30 a.m.—Pulse 110. 10-30 p.m.—Pulse 114; gave 1 grain of morphia,

"25th, 9 a.m.—Pulse 98; gave ½ a grain of morphia. 8-30 p.m.— Gave 1 grain of morphia. From the 26th to the 29th no special symptoms to record. Was visited twice daily, gave 1 grain of morphia in the evening, and the 29th passed a large motion. From the 29th to Dec. 4th was visited once daily at eventide, and was given 1 grain of morphia daily, and on Dec. 4th had many copious natural stools. These continued several times daily from the 5th to the 15th of Dec. On Christmas Day had roast goose and potatoes for dinner, and had been eating roast beef and mutton chops for several days previous.

"Dec. 29th.—Resumed the morphia (which had been discontinued) in 1 grain doses.

"30th, 9 a.m.—Passed large and well-formed fæces; slept uneasily; diminished the dose of morphia. Not visited again until January 5th; passing normal fæces. Was sent for on Jan. 13th, as he had much pain after eating mince pie, and no motion since the 9th of January. The opium treatment and restricted diet were again adopted. Much wind was passed on the 19th and 20th, but on the 30th he was so inflated that I let off the gas by canula, and again on the 6th of February, when I had to leave Liverpool on account of my own terrible bereavement, and my assistant took charge, but the patient died on the 8th of February without relief."

This case has been already published in one of our weekly medical papers, but so much abbreviated, that it was not possible to glean from it the instruction, which a fuller report conveys. The patient ultimately died from an avoidable cause—the resumption of an unsuitable dietary too soon after relief from accumulation, and long before we could reasonably expect the patient to have recovered from the original disease of the intestine, which gave rise to the obstruction. During the treatment of this case, which was a very critical one, the slightest deviation from the dietary suitable during these difficulties was followed by graver symptoms. During the last week in November, diarrhœa became very excessive and so intensely fetid, that for the patient were prescribed large doses of the muriate of ammonia, which apparently had the effect of correcting both the fetor and the frequency of the diarrhœa.

Case No. 28.—On May 27th, 1880, I was requested to visit a patient in Henry Street whose physician had advised that a surgeon should be sent for as, he said, an operation was indispensable and ought to be performed without delay. On examining the sufferer, I found her to be a strong, well-nourished female of forty years of age. Her

medical history was, that on May 21st, about 2 a.m., she had an attack of colic and vomiting, but no action of the bowels downwards. During this time an old umbilical hernia, about the size of an orange, was subjected to much strain, but was easy of reduction. The treatment adopted from the onset of the symptoms up to the time of my visit, May 27th, 5 p.m., was croton oil, pills, assafœtida, with opium and belladonna. The vomiting had been constant since the morning of the 25th of May, and had become stercoraceous since noon of the same day; and was so at the time of my visit. She was also suffering from much pain ; tongue slightly furred ; temperature 99·5° ; pulse eight in five seconds ; hernia reduced and effectually retained within the abdomen both by a pad over the umbilicus and bandage over it and around the body. Injected 20 minims of Liq. Morphia, B.P., under the skin, and promised to return in two hours and operate if then needed. I interdicted all food, and allowed her water only to drink. On my return, at 7 p.m., was informed that she had vomited only once. Next visit 11 p.m. —Pulse seven in five seconds ; temperature 99° ; no pain ; had slept and expressed herself as feeling well ; flatus discharged downwards; injected another 20 minims of Liq. Morphia.

May 28th, 10 a.m. — Visited by Dr. R. Jones, who reported the pulse, temperature and tongue to be in a normal condition ; he injected 10 minims of Liq. Morphia ; flatus passing down frequently.

29th, 10 a.m.—Visited by Dr. R. Jones ; no abnormal signs ; began to be allowed food, arrowroot and water with brandy ; now injected 10 minims of Morphia. On receiving a report that that the patient was worse, an evening visit was made, and I found her suffering from slight colic ; gave 20 minims of Liq. Morphia under the skin.

30th.—Visited again and found the patient doing well ; 15 minims of Liq. Morphia were injected.

June 1st.—No signs of her late ailment except constipation.

2nd, 3rd, 4th, and 5th.—No special symptoms ; appears cured.

6th.—This day passed on one occasion an immense quantity of semi-liquid fæces ; food still restricted to arrowroot and brandy.

9th.—Secondary relief of constipation.

11th.—Tertiary relief. Nothing special occurred after this date, the patient recovered permanently.

This patient left her bed three days before relief of constipation occurred. I delayed two hours on the day of my first visit before deciding to operate, as it was very proper to make certain that an operation was necessary.*

Case No. 29.—On Oct. 1st, 1880, I was consulted by J. Williams, of Llandudno, who was desirous of correcting a recently acquired contraction of both knee-joints. During the interview I cross-examined him so as to arrive at the cause of the defect now present, in connection with the articulations (both joints were in health), and learned that during the last three years the impediment had become much worse whilst confined to his bed, suffering from abdominal disease, which had commenced some twelve years previous, at which period he first began to suffer from what he thought was indigestion, and soon after the commencement of this sensation of dyspepsia he was taken with what is popularly termed a "bilious attack," and called to his aid a medical practitioner who prescribed a drastic purge, which caused a severe diarrhœa attended with much colic. To cure this brandy and mercury were given. Not receiving any benefit from this treatment another practitioner was sent for, and under his care the diarrhæa gradually ceased, but the pain remained and continued for three years, with the additional symytoms of frequent daily vomiting with

* Some years back I attended an elderly lady, residing in some houses attached to an oil mill close to Burlington Bridge. She had umbilical hernia, which was easily reduced and maintained. When I first visited her, she had all the signs of strangulation, but judicious treatment corrected all this, and she was so much improved that all cause for anxiety had nearly passed away. Accompanied by Dr. Steele, I visited her one evening, and on my entry into the sick apartment, the patient addressed me thus. "Mr. Thomas, I have known your grandfather, father, and yourself when a child, and I am astonished that you should have permitted my bowels to remain bound nearly a fortnight." Argument she would not listen to, and a practitioner who would try and overcome the difficulty by a method more traditional was called in to supplant me. The patient died two days after, with the renewal of the signs of obstruction.

obstinate constipation. To get over the latter difficulty, enemata were daily administered, but with slight effect, bringing away only small scybala. At the termination of three years the pain left, and the vomitings also was much diminished, occurring only after meals. This condition continued for six years, during which the enemata were continued, but with very scanty effect. At the end of this period he had gradual aggravation of his symptoms; his abdomen, which had previously been only slightly distended, became much inflated and pain unbearable. He now consulted another doctor, who ordered him to be fed principally with lime water and milk, with no restriction of quantity; no medicine was prescribed, as the patient refused to take any remedy; the enemata were continued. After the elapse of a short period another medical gentleman was consulted, who diagnosed cancer, basing his opinion upon the presence of a distinct tumour in the abdomen —he prescribed medicine but the patient declined to take any. At this time another member of our profession was consulted and he prognosed that the sufferer would soon be defunct, and that the enemata were all that the case required in the way of treatment. His condition after this improved slowly, pain became much less and the vomit ceased. About six months prior to my being consulted he had been an inmate of a public hospital in this town. During the period he was in the hospital, his diet was limited to milk, tea and toast; he lost flesh; had no vomit; but very obstinate constipation and rather more pain; the treatment was principally the above limit of diet and giving enemata, the latter having only the slight effect of removing an occasional scybala. The medical staff after a time of some weeks dismissed him as incurable. After being enlightened by the information conveyed to me by the history of his case, and an examination of the abdomen, I had confidence to assert that his case could be certainly relieved, perhaps cured. I requested him to become an inmate of my hospital in Hardy Street, to which he consented. As soon as I had commenced to treat the deformity of his lower limbs, I instructed his nurse to feed him with arrowroot, sago, pea flour, fine flour, either of these cooked with water, or beef tea, chicken broth, or any form of flesh broth; no other diet, and the patient promised to confine himself regularly to this restricted diet—restricted as regards quality only, there being no indication calling upon me to restrict the quantity. I also informed him that during the next three weeks he was to abstain from using enemata and that I would confine my attention to his joints, and did not wish to know anything about the

abdominal difficulty until after the expiration of three weeks. At the end of this period I asked him had his bowels been moved, and I was assured by his nurse and himself that he had adhered to the advice given to him, and that, after a constipation lasting ten days, the bowels acted regularly every four days, passing soft well-formed motions. Although neither medicine nor enemata had been used, the primary evacuation contained a few scybala. At the end of the fourth week, I happened to ask him whether the bowels were progressing well, and he informed me that constipation having set in, enemata had been used but were of no avail. On questioning him I found he had indulged in unsuitable food, and warned him that he could not recover except he persevered in his restricted dietary, and he promised not again to deviate from a method of feeding which had been of such benefit to him. In three days after he had resumed a suitable dietary constipation was relieved, and he passed, per anum, a cast of a portion of the bowel, after which he had regular action of the bowels every two to three days.*

Case No. 30.—About the middle of Nov., 1880, a fellow-countryman, residing in the Cheshire side of the River Mersey, interviewed and requested me to accompany him to see his wife, who was ill of some ailment within the abdomen. He also informed me that she was already under the care of two medical practitioners. I said that I would go with him to his residence, and there wait until the gentleman in charge of the case was communicated with. This procedure would avoid delay, it being then late on in the evening and the sufferer was judged to be very seriously ill. On arriving at the house, I was informed that the doctor was then with the patient, and, that if I would wait, he would soon be disengaged. I waited a considerable time, with nothing to occupy my attention except the groans of the invalid, coming from an upper apartment. After a time my patience began to be strained, which I politely informed the husband of, and soon after the practitioner granted me an audience, and when, after cordial greeting, my purpose in the house was explained to him, he informed me that I could not see the patient, as a Mr. B—— was in attendance with him. On my part the reply was, "that

* The improvement continued for eighteen months after his return to his home in Wales, but he was then taken suddenly with an ailment, unconnected with any intestinal lesion, from which, after a short illness, he died—the exact nature of which I failed to get information of.

as he was the gentleman in charge I wanted his permission, having been asked to assist him in the case." He firmly and respectfully declined to accept my co-operation, and my snswer to this was, "that under the circumstances, retiring was my duty"; and we both were leaving together when the host arrested me and said that he hoped I would not depart without seeing the sick lady, to which I replied "that if he wished, it would be now etiquette for me to do so." On examination, I found that the patient was suffering from, and had been treated for, intestinal occlusion, and had been energetically treated according to the medical traditions in relation to these difficulties. Her temperature was 99°; pulse eight in five seconds; tongue very slightly furred; abdomen enlarged, but not much distensile pressure; umbilical region flat, this showing that the difficulty lay in the large intestines and low down. Enemas, some of them given by "the long tube," had been repeatedly used for ten days, with no effect, except to induce tormina and occasional vomiting After seeing the patient the husband and myself held a consultation, and my advice to him was — *First*— That her diet should be scrupulously restricted to beef tea, chicken broth, arrowroot and water, and, if inclined to enjoy it, to the sedative known as brandy and water, in small doses. *Second*—That she should have sixty drops of Liq. Morphia not oftener than every twelve hours, but none if all colic pain was absent, and that he should continue this treatment for two months after the relief of constipation; but when this might happen I could not predict, but thought it would not be longer than one month. *Third*—That all doctors should be dispensed with, myself in particular. After the lapse of three days Mr. O.. again called at my surgery, and said that his wife was determined not to endure any longer without a doctor, and begged I would come over the river to see her. I promised to do so in three days' time, and on visiting her found the pulse seven in five seconds; temperature 98°; tongue moist and very slight fur. I informed her that my visit was waste of time and money, from which opinion she dissented, and I was obliged to promise to return in three days, when I again visited her. Temperature, pulse and tongue as before. Before leaving I promised to return in four or five days, and after making this visit I transferred the case to Dr. R. Jones. A brief digital exploration of the rectum was made, as she complained of feeling full in that region, but no rectal accumulation was present. On the twenty-seventh day, to the hour, from the accession of her symptoms, relief was completed, and during the following twenty-four hours six

copious evacuations appeared, no portion of which contained any hardened fæces, all being semi-liquid.

This case is cogent evidence in favour of a reform of treatment in these ailments. Both of the gentlemen, who preceded me in the treatment of the case, are men of ability and possessing great knowledge of things belonging to their profession, so that the sufferer must have had the advantage of all remedies generally supposed to aid recovery in these diseases.

The patient made an excellent recovery and remained well for over twelve months, when she was again taken ill, and, on this occasion the general symptoms, though not severe, were more so than on the first occasion of obstruction to the bowel. She again, by adhering to the treatment previously advised, recovered and remained well for nearly nine months, when she had a purulent discharge per vaginam, which I was satisfied was caused by some pelvic disease. Now another obstruction formed; from which she recovered, so far as to have relief of constipation—but never recovered so as to be able to leave her bed—dying apparently from heart affection, the immediate cause of death being a matter of much doubt. Although I pleaded to be allowed a *post-mortem* examination it was not permitted.

With the gentleman originally in charge of this case, I had, some time after, the pleasure of exchanging notes. I had been invited to the case without his being consulted and he

very properly resented the rather too abrupt introduction of another into the treatment.

The obstruction in this case probably arose from some disease within the limits of the pelvis, which did not, until lately, involve the intestine. Many years previously she had consulted me, when suffering from slight pains in the lower part of the abdomen, but no serious disease was then suspected.*

Case No. 31.—About the middle of March, 1881, on a Thursday, a medical practitioner invited me to assist him in a case where fracture of the neck of the femur had occurred. The patient was a hale man of 60 years and there was nothing exceptional in his case so far as related to the injury. After setting the limb, the gentleman in charge of the patient invited me to revisit him in consultation on the following Sunday. Before leaving, I asked the patient if his bowels had "acted" recently, to which he replied, "I never missed a day in my life." I then suggested that his diet should be limited, that he might be able to tolerate a week or two of constipation, so as to avoid disturbing him, before the pain, in connection with the fracture, had either diminished or ceased. During our second visit on the following Sunday, the consulter informed me that, on the day following my first visit, an aperient had been given with no result, and also enemata of turpentine were very frequently administered, but no fæces came away. On examination of the patient, I found the pulse 96; temperature 100°; abdomen slightly enlarged with much distensile force, but resonant all over; tongue moist; much thirst; vomiting, and in much pain. At 2 p.m. 30 minims of Liq. Morphia, B. P., were injected under the skin. Visited again, at 9 p.m., with the gentleman in charge of the patient, and we found him much easier; passing flatus; no vomit; pulse 108; but still the tension of the abdomen was extreme, though not

* During the year 1879, in conjunction with Dr. Girdlesten, I visited Rhyl to see a lady suffering from intestinal obstruction, which was easily relieved by a rational course of food and medicine, but the slightest deviation from this course brought on recurrence of the difficulty. The lady, who was about 50 years of age, died, and a *post-mortem* revealed extensive malignant disease within the pelvis.

apparently large in volume ; less thirst ; tongue still moist ; had no sleep ; now inserted 40 minims of Liq. Morphia, B. P. At 3 a.m. after sleeping and feeling much easier he informed the nurse that he felt suffocating and died directly after he had made this remark. A *post-mortem* was performed the same day by an expert, and the heart, lungs, liver and kidney were found healthy, and the intestines also were found healthy and free from any evidence of obstruction, either mechanical or physiological, and there was no trace of any excrementitious matter or liquid, but much gas.

The details of this case almost renders comment superfluous. It is to be regretted that trocaring of the gut was not practised, as the condition was present permitting of this operation being done with very little risk of doing harm—the abdomen being resonant all over. The fact, that the abdomen had not become much enlarged, lead us into this omission, though the degree of tension ought to have been our guide. This was a case of simulated obstruction from uncalled-for interference. There exist, on record, cases where simple constipation has been converted into obstruction by treatment, but none like this in which an empty gut had been goaded so injuriously that all the signs of obstruction appeared. The information which the patient gave me on the first day " that he had never missed a day in his life " without a discharge from the bowel, the *post-mortem* showed to be probably true.*

* In the "LANCET," published September 30th, 1876, there is reported a case of constipation, treated by the usual practice of stimulating the gut. The practitioner carried out the theory so effectually that he ruptured the gut. We may suppose, as he anonymously signs himself, M.A. and M.B., that his qualifications to practice were fair evidence that he knew his art so far as he had been taught. The patient was under treatment nine days, and had stimulants both muscular and narcotic ;

Case No. 32.—During the early part of the year 1881, a medical practitioner visited me to enquire if, in a particular case, anything more could be done than I had already indicated as correct treatment in my published treatise on intestinal obstruction. The patient, in whom he was interested, was suffering from occasional severe attacks of colic and constipation, and his father was reported as having died from this ailment. My reply was, "that I could add nothing more to what he was already doing,—a carefully selected diet, not to limit his drink, and morphia, when the colic pain was present." This patient was engaged all day in the management of a business that much tasked both his brain and lower limbs. The pain and discomfort, which the patient suffered from, precluded his giving proper attention to his duties, which urgently needed his personal supervision. He had already sought for relief by consulting several physicians of repute. After a discussion on the case, it was agreed that his diet at 8 a.m., was to be limited to thin oatmeal and water gruel, with some salt and a little brandy in it; at 12 noon he was to have beef tea or some form of flesh broth, thickened with arrowroot or sago; at 4 p.m., pea flour, lentil flour, or revalenta; a tablespoonful of either of these to ¾ of a pint of hot water with butter and salt, and patient to retire to bed at 7 p.m.; supper, sago, or arrowroot and water, with brandy to flavour; hot water in bottles to feet, water compress to stomach, and to change position in bed several times during the night; to drink water only when thirsty, but a little extra salt was ordered when flavouring his food, so as to create thirst. We believed this selection of foods would enable him to attend to his business and progress to recovery; morphia also was to be given by the mouth, but only when colic was felt. This treatment was very effective, pain and all abnormal symptoms gradually ceasing, constipation excepted. On the twenty-fifth day of constipation and treatment, the medical gentleman in charge of the case again called, and expressed his doubt as to the result, he arguing that, as the patient had taken much liquid, and all being retained, it was very surprising that a thorough emptying out of the gut contents had not been the result ere this day. I agreed with him, and was surprised myself, for if he had taken much liquid and retained but little,

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jalap, castor oil, rhubarb, nux-vomica, belladonna, atropia, and medicated enemas enough to kill. On the ninth day, at 7 p.m., "she heard a distinct crack of something giving way," and at 9 p.m. died. This something giving way, a *post-mortem* showed to be rupture of the intestine. In this case the bowels were discharging, there being no constipation until stimulation was much increased, after which obstruction arose.

then 30 to 40 days might be expected to elapse before a favourable result might ensue. However, as urgent symptoms were absent, and taking into account the whole circumstances of the case, and that the patient was engaged actively all day, I said that in this special case we had, possibly, an exception to the rule, and advised an exploratory enema, to which he consented. On the twenty-seventh day, the medical gentleman called again, and said that after leaving me, he decided to wait and not give the enema, and that he was pleased to be able to inform me that the patient had passed spontaneously the whole contents of the gut, the quantity being very great, and quality semi-liquid. He had been treated, previous to my friend being called to him, by enemata, castor oil, belladonna, opium; he had been thoroughly drugged, but with no improvement, by gentlemen of whose ability to practice medicine it would be folly to doubt.

Case No. 33.—On July 13th, 1881, a messenger arrived at my surgery, and requested me to prescribe for a dock gateman, suffering from what he thought was English cholera, and the answers, which he gave to my interrogatories, induced me to believe that the diarrhœa then prevalent was the ailment of the sufferer, and he was prescribed for accordingly; this was about mid-day. On the following day the patient's wife called at my house, and from her description I suspected that my previous conclusion was wrong, and at once made a visit to the sufferer, who informed me, that on the Saturday, July 13th, at 5 a.m., he awoke with a violent colic pain in the left side of the abdomen, just above the crest of the ilium, which was soon followed by a desire to defecate, after which vomiting commenced, and as it continued he sent to a druggist close by, who supplied a warm draught, but as this was not followed by relief, a fellow-workman was despatched to get my advice,—and returned with a bottle of medicine, containing Opium, Ammon. Mur., &c. This giving him no relief, he called to his aid a practitioner of medicine residing in the neighbourhood, who gave a dose of calomel gr. ii., pul. ipec. gr. xx.; this, again, not giving ease, I was sent for at mid-day, Sunday, and found him with pulse six in five seconds; temperature 99°; moderate thirst; tongue clean; abdomen tense, but not large, a central swelling being indicated; the abdomen was resonant, with the exception of the spot where he first felt the pain, and where also he thought he felt something hard. Injected $\frac{1}{8}$ of a grain of morphia under the skin at 3 p.m.; and again visited him at 10 p.m.; he had very little sleep; pulse nine in five seconds; temperature 100°; injected $\frac{1}{8}$ of a grain of morphia.

Monday, 3rd day, 10 a.m.—Easy; tongue correct; temperature 100°; pulse nine in five seconds. 2 p.m.—Easy, but had vomited about two quarts of bilious green liquid; distension less; had not slept; gave ¼ of a grain of morphia under the skin. Visited at 10 p.m.—Found temperature 100°; pulse six in five seconds; less pain; not much sleep; vomited about eight ounces of fluid—same in appearance as before; gave another ¼ of a grain under the skin. Had from the beginning regulated his diet as to quality, and raised the foot of bed eight inches.

Tuesday, 4th day, 10 a.m.—Pulse nine in five seconds; temperature 99°; pain tolerable; thirst moderate; tongue moist; gave ¼ of a grain of morphia under the skin. 10 p.m.—Pulse 110; temperature 100°; had vomited twice bilious-looking liquid in all about two quarts; tongue moist; thirst and pain as in the morning; repeated the morphia.

Wednesday, 5th day, 10 a.m.—Pulse nine in five seconds; pain moderate; slight sleep; tongue moist; gave ⅛ of a grain of morphia under the skin. 4 p.m.—Tongue moist; pulse eight in five seconds; gave ¼ of a grain of morphia under the skin. 10 p.m.—Tongue moist; pulse eight in five seconds; temperature 99°; had vomited twice, pale green liquid; very little pain; distension moderate, and still umbilical.

Thursday, 6th day, 10 a.m.—Pulse six in five seconds; temperature 98°; pain moderate; feels comfortable; vomited a pint of bilious liquid; feels cold and perspiring freely. 10 p.m.—Temperature 97°; pulse six in five seconds; tongue moist; has vomited about two quarts since morning; perspires freely; feels slight pain; no morphia given this evening, as the temperature was too low.

Friday, 7th day, 10 a.m.—Temperature 98°; pulse six in five seconds; a little pain; tongue moist and clean; vomiting every six hours; gave ⅛ of a grain of morphia. 5 p.m.—Great pain; pulse eight in five seconds; temperature 98°; tongue moist; moderate thirst; continues to vomit every six hours; gave ½ a grain of morphia under the skin; distension at this visit felt less tense but greater in volume, and no longer central and circular, but oblong in shape; a line through the umbilicus to the ensiform cartilage would have been the centre line of this cylinder-like swelling. 11 p.m.—Free from pain; pulse seven in five seconds; tongue correct; has not vomited since 5 p.m.; temperature 97°; no morphia given, temperature being too low.

Saturday, 8th day, 10 a.m.—Temperature 97°; pulse eight in five seconds; slight pain; vomited once, fluid same as before; no medicine. 2 p.m.—Temperature 97°; pulse seven in five seconds; not much pain, but urgently requested a dose of morphia, and had ¼ of a grain under the skin. 5 p.m.—Appears much the same as in the morning; sweating and tongue dry; vomiting once since morning. I now trocared the gut through the abdominal wall and let away a great volume of gas, relieving the abdomen from tension, which this day has become extreme. The patient expressed himself as much relieved; the abdomen previous to the operation was resonant all over, and no fluid came through the tubular needle. 8 p.m.—During my visit at 5 p.m., I had feared that collapse was coming on, from the low temperature and dry tongue with the rather free perspiration—but at this visit found temperature 98°; pulse seven in five seconds; less sweating; vomiting less in quantity, and no pain, the patient expressing himself as feeling grateful for the ease gained by the relief from gaseous distension. The abdomen had, however, refilled, but less tense than immediately before the operation of trocaring had been performed, yet not sufficient to produce discomfort. 12 midnight.—Pulse seven in five seconds; temperature 98°; moderate distension; slight pain; vomited ½ pint of green billous-looking liquid; tongue slight brown fur; gave ½ a grain of morphia under the skin; suffering from retention, passed catheter and withdrew two pints of urine.

Sunday, 9th day, 10 a.m.—Tongue furred; pulse eight in five seconds; temperature 98·5°; vomited twice during the night; slight pain; gave ⅛ of a grain of morphia under the skin. 3 p.m.—Tongue furred; less sickness, but still only green bilious matter; pulse nine in five seconds; temperature 100°; sweats profusely; has been slightly delirious; gave ⅛ of a grain of morphia, as he had some pain; distension moderate. I now decided to operate, if not better in three hours. On my return, at 6 p.m., he appeared rather worse. In operating, I selected the left side of the abdomen close to the crest of the ilium, and opened the abdominal wall, by an incision one inch and a half in length; but the distension not being great, the gut did not, as usual, present into the incision, so, by the means of a dressing forceps a knuckle of the intestine, the portion nearest to the incision, was drawn out, then stitched to the abdominal wall and incised; a small volume of gas escaped, but no other gut contents. I passed my finger into the gut, both up and down; nothing was felt, but it returned coated with dark green matter of a stercoraceous odour. When performing

the operation, which was done without any anæsthetic, the patient showed but slight consciousness—but afterwards recovered perfect consciousness; also the pulse and temperature improved, so that I looked forward to success; yet he died in five hours after, nine days from the time when he was first taken ill. On being informed of his death, my first thought was, that I might have seized a portion of the gut below the lesion, though this is a highly improbable accident, indeed nearly impossible, as that portion generally lies snug and out of reach; then it might have been a case of intra-peritoneal strangulation with gangrene, or that he had rupture of the gut-wall from over-distension. Although I had always a firm belief in the improbability of anyone arriving at a correct differential diagnosis, yet this case I did confidently assert to be one of intussusception, or some form of strangulation of the gut, but it was not so. Being engaged on the day of his death, my partner Mr. R. Jones and my friend Dr. Lindsay undertook to try and get permission to make a *post-mortem*, which they after much difficulty succeeded in obtaining, and they brought away with them the site of the lesion, a portion of the ilium and the cæcum including the valve. There was a perforation one eighth of an inch in diameter found, the result of ulceration; there were other ulcers which were in progress towards perforation, and there were also cicatrices pointing to recovery from previous ulcers, so that the *post-mortem* revealed a fact never suspected by me, that at the very onset of his symptoms there existed a perforation of the intestine. His case was hopeless from the commencement. Even supposing an improbability, viz., that his case had been diagnosed differentially, then abdominal section, with excision of the part ulcerated and cleansing the peritoneum would have given the patient but a very slender chance of recovery.

In this instance the performance of the operation was delayed longer than many surgeons would approve of. But experience has led me to the belief that, if the treatment has been correct, a much longer delay is justifiable, than when the patient's stamina has been frittered away by indefinite treatment.

This case, though it did end fatally is fair evidence to show

what benefit medicine can give in these lesions. The patient lived ten days, a very long period, when we take into consideration the nature of the disease. A fatal termination often brings on suspicion of the treatment, and very naturally so, if we are not in possession of the theory that should guide our practice. We very carefully examined the opening in the intestinal wall, and the question arose, "how long could it have existed?" That there must have been an opening during the last ten days of life I can find no reason for disbelieving, and indeed facts and arguments can be advanced, tending to prove that this opening through the intestinal wall could have existed longer, and without leakage into the peritoneal sac. On careful inspection the opening was found to measure ⅛ of an inch in diameter, the edges nearly as thick as the wall of the healthy intestine, beautifully smooth, cicatrized, and a perfect circle with edges, just as can be observed in a healthy naso-palatine fistula. It certainly appeared of a longer duration than ten days.

In the midsummer of 1881, I chanced to visit my friend and fellow-townsman, Dr. W. Carter, when he showed me a pylorus, in the wall of which there was a circular opening, the result of ulceration, being in diameter ¼ of an inch with smooth cicatrized edges. I made the remark to Dr. Carter that it must have existed longer than three days—the period which had elapsed from the onset of symptoms till death—though afterwards I mentally concluded this to be an utter impossibility. Since then I have found reasons for modifying my previous

conviction. Some of our highest authorities in medicine have expressed their belief that patients have recovered from perforations of the intestine, resulting from the intestinal lesion of typhoid. Of course if adhesive connections form between the lesion and parts adjacent, leakage is nearly impossible and recovery very probable. Again, this has happened in single and multiple wounds of the intestine, but had any of the intestinal contents leaked into the peritoneum, they must have ended fatally. It may be said, in these examples, that early and rapidly formed adhesions soon form a protective barrier,—but this provision of nature is not alone equal to the emergency. For instance, if we admit for argument's sake, that after a sword-thrust through the abdomen wounding the intestine, that adhesions form in five minutes, then is there any provision or condition which tends to delay leakage from the intestine of its contents during the antecedent four minutes? I believe there is a condition of the parts tending to stem leakage through any opening in the gut, and though I cannot prove that it may operate for days it would not be very easy to prove the reverse; if my contention be correct, the graver signs of leakage may be delayed after perforation has occurred. Of this we certainly have pathological evidence, *i.e.*, the actual appearance of the opening; again, physical law tends to support my proposition.

In any attempt to elucitate this matter, it must be remembered that the serous sac, called the peritoneum, is an

enclosure, but—to all intents and purposes—is one without space in the healthy subject, and thus its surfaces being always in absolute contact are in adhesion from the operation of the same physical law which causes adhesion between any apposite true planes, as can be mechanically demonstrated, by the apposition of a couple of Whitworth's surface plates. An opening through one or both of these plates would not diminish the adhesion of the remaining parts of the surfaces of the planes. This fact must be one of the factors which protects the peritoneum in the female from extraneous invasion along the Fallopian tubes, but adhesion, even combined with other physiological facts, is not sufficient to protect the peritoneum of a female from invasion, if a certain amount of force be employed, as the practice of obstetric surgery has already taught us.

I hold that this adhesion between the surfaces of the peritoneum, provided there is no hyperdistension of the gut, is mainly the mode by which the danger of perforation is primarily either delayed or tided over until other processes have still further minimised the danger. This adhesion between the peritoneal surfaces, has also conduced to the safety of the patient after trocaring, and, in my opinion, makes the operation a harmless one, provided at the time it is effective, *i.e.*, if the hyperdistension is so far relieved that it cannot quickly recur, ere the breach made by the trocar can have closed.

It is generally taught that ulceration, without or with perforation of the gut, is indicated by constitutional symptoms special to this lesion :—neither pathological nor clinical observation warrants this conclusion. There have not yet been observed, up to this date, any signs specially indicating either ulceration or perforation apart from the symptoms, more or less intense, usual in intestinal inflammation, but pathology has made known to us that either of these two conditions may exist without any perceptible signs of intestinal ailment. Leakage from the intestine into the peritoneum has special signs. When there is a *sudden* invasion of the peritoneal sac by blood, pus, or gut contents, then may be noticed the agonising pain and rapid collapse—but should the invasion take place very gradually, then there have only been noticed the usual symptoms of intestinal lesion. The *supposition*, that in these diseases every grave retrogression has its indication, has led, and must always lead, to the neglect of precautions,* which is culpable neglect, as our predecessors have accumulated for us evidence enough to show that throughout these lesions, and not when grave signs arise, every precaution should be exercised. Our knowledge regarding intestinal perforation has been mostly culled from the pathology of typhoid fever, where perforation is not a rare occurrence. Since the days of Sydenham much information regarding the

* See "British Medical Journal," Nov. 4th, 1882.

etiology of this fever has been gained, but to the treatment nothing, nay, there has been retrogression. The teaching that dietary precaution must be exercised, as this or that calamity threatens, was only excusable when less of the etiology of the subject was known. The navigator of to-day can make all preparations for safety long before he sees the land or scents the storm, and our knowledge, to-day, that intestinal perforation is a probable sequel to this fever, enables us to be forearmed. There is no excuse for not having so prescribed that, from the onset to the termination of the disease "no change of front" can be required, should calamities come.

After a very careful consideration of this subject, I come to the following conclusions :—*First*—That so long as there is not hyperdistension of the intestine, an opening in the intestinal wall may not leak, *Second*—That if hyperdistension is present, then, should the opening be minute, leakage is improbable, this improbability being increased in proportion to the lessened diameter of the opening. In the healthy subject the commencement and termination of the gut are closed, but, practically, open, at both ends, as any tendency to hyperdistension will be relieved by progress, upwards or downwards, of the intestinal contents. *Third*—That leakage into the peritoneum is not followed by symptoms differing in features from those appertaining to other intestinal lesions, except that they arise more rapidly, and are of greater intensity.

But these may not be observed, if the invasion of the peritoneum comes on slowly.*

Case No. 35.—On Oct. 1st, 1881, there was carried to my surgery one John McAdam, who had been crushed between the "buffers" of two railway trucks, which compressed the central portion of the abdomen. I saw him in about ten minutes after the accident, and found him suffering from the collapse of traumatic shock; cold, and pulse very feeble; no vomiting. I gave him a dose of chloroform in hot water, and ten drops of tinct. opii. and directed that he should be taken home and placed in bed; hot bottles to be applied and warm drinks given to him, but no food until morning. In the morning he was much better; pulse slightly accelerated; temperature 99·5°; abdomen slightly distended and slight pain; no vomit; slight thirst; tongue clean; prescribed tinct. opii. ℥i., aq. chlorof. ℥viii., ℥i to be given every three hours; his diet to be limited to linseed tea, arrowroot and water, and animal broths. No change of interest took place until the fourteenth day, when his bowels first began to act and continued to act frequently until next day. As the fæces were mixed with blood, and as the frequent action of the bowel was giving him pain, I feared some local lesion had resulted from the injury, so I ordered tinct. opii. ℥ii, amm. mur. ℥ii., aq. chlorof. ℥viii., ℥i every three hours. This mixture made him more comfortable, and he continued to take it, more or lest frequently, daily,—this being left to his own discretion and feeling; his diet was restricted for two months, and at the end of which it was partially restricted. He recovered perfectly.

This case was very similar to one that has been referred to on page 181, and both accidents occurred while in the same service,—London and North Western Railway Company—and I reminded this patient of the sad result that followed in the other case from not acting up to my advice.

* In John Bell's volume, entitled, "Discourses on the Nature and Cure of Wounds," Third Edition, Edinburgh 1812, Part II., Discourse IV., is contained very interesting and useful information relating to the subject here discussed.

Case No. 36.—The notes of this case were presented to me by my friend, Dr. Hugh Williams, Breckfield Road, who also had, occasionally, invited me to see the patient with him at Stanfield Road. The lady was 38 years of age, the youngest of a family of eleven, four of whom were still living. Up to the period of her illness, she had enjoyed average health, and had been married eighteen months; her menses had ceased four months previously, and since she had suffered from shooting pains in the lower part of the abdomen. These pains had increased steadily for the last three months; did not herself suspect pregnancy, as she had not any of the usual signs of this condition, and through life her bowels had always been regular.

"On the 24th of September, 1881, I received an urgent message to visit the patient, as she was in extreme pain. On my arrival at the house, I found the patient on the sofa in a cold clammy sweat; pulse, 50; temperature 95°; suffering great pain in the abdomen, being referred to the central portion around the umbilicus; frequent vomiting and tenesmus, but no discharge per rectum, the stomach constantly rejecting anything swallowed. These were the symptoms at 11 a.m., and had existed three hours. She attributed them to her having caught cold while out in the early morning and that, during the three previous days, she had gone through more physical exertion than was usual to her. I ordered her to be placed in bed, with hot bottles to the extremities, and two tablespoonsful of brandy and water to be given every half hour, with seven minims of Liq. Morphia every three hours, and her diet to be only toast and water. Visited her again in four hours, and found her still in pain, but warm and composed; temperature 100°; pulse 112; vomiting continuing; no action of the bowels; gave ¼ of a grain of morphia under the skin, and mustard externally to the abdomen. Physical examination showed that the abdomen was slightly distended and painful when percussed. An examination per vaginam confirmed my surmise that she was pregnant. 10 p.m.—Found her much easier, and ordered the morphia by the mouth, and permitted arrowroot and water with wine; no change in temperature or pulse.

"25th, 2nd day, 10 a.m.—She had severe pains all night, and had vomited everything given to her, the vomited matter being green; tongue dry; pulse 120; temperature 102°; ¼ of a grain of morphia was given under the skin, and an effervescing mixture with seven minims of liq. morphia in

each dose, every three hours. 10 p.m.—Vomiting stopped; has had a little sleep; free from pain; tongue now moist.

"26th, 3rd day, 10 a.m.—She is much better; had a good night; free from pain; no vomit; abdominal wall relaxed; she declined to have morphia given under the skin, it was therefore given in increased doses by the mouth so as to control the pain; pulse 112; temperature 101°.

"27th, 4th day.—No change.

"28th, 5th day.—Was sent for early in the morning, and on visiting found the patient in extreme pain; had passed a very bad night; no sleep; vomiting; face flushed; tongue dry; abdomen more distended and painful to the touch and resonant; temperature 103°; pulse 144. I now learned, that on the previous evening she had taken half an ounce of castor oil, and that painful symptoms were developed soon after—she had been cautioned by me not to take any form of aperient; now $\frac{3}{4}$ of a grain of morphia was given under the skin. Three hours later I found the patient much relieved, but distention of the abdomen increased. At 4 p.m., I was accompanied by Mr. Hugh O. Thomas, and after we had warned the patient and her friends that any indiscrete act might be rapidly fatal, we made a careful examination of the patient and decided to continue the previous policy of treatment, and further raise the bed feet and apply cold cloths to the abdomen. We also carefully examined a hard swelling, easily felt in connection with the uterus, but we did not think that it had any direct effect in causing the obstruction now present. Temperature 103°; pulse 132; $\frac{1}{2}$ a grain of morphia was given under the skin, and $\frac{3}{4}$ of a grain at 9 p.m.

"29th, 6th day, 10 a.m.—Had passed an excellent night; abdomen less tense; inclines to vomit: tongue dry and furred; injected $\frac{1}{4}$ of a grain of morphia under the skin. 9 p.m.—Has not been so easy during the day; gave $\frac{3}{4}$ of a grain of morphia.

"30th, 7th day, 10 a.m.—Passed a fair night, and slept for three hours; bowels were relieved of their contents three times during the night; abdomen less distended; occasional vomiting; tongue clean but dry; gave morphia by the mouth, with acid mur., and in the evening $\frac{3}{4}$ of a grain of morphia under the skin. The uterus, with its tumour attached, can now be readily felt.

"During the subsequent three weeks, the obstruction did not recur; bowels acting once or twice daily—her diet being still restricted, though much more varied, as she was allowed pea flour, soup, fine flour, and water gruel, ground rice, &c., and a small quantity of biscuit, yet she was seldom free from pain, to relieve which opium was given by mouth or skin, according to the urgency of the symptoms. Still, though the primary object of treatment—the relief of obstruction—has been attained, she lost flesh, and though the temperature was nearly normal, yet the pulse remained quick, ranging from 112 to 144; tongue brown and dry most of the time, but at times moist with slight fur; vomiting once or twice a day. I tried doses of atropia, but with no special benefit, and had to return to the opium; the abdomen continued slightly tender on pressure, but no distension; took nourishing food in sufficient quantity. Mr. Thomas and myself now became convinced that it was a case of malignant disease. On Oct. 28th, Dr. Steele assisted us with his advice, as to the propriety of inducing premature confinement, and he recommended a few days delay, as that, in all probability, labour would occur from the stimulation of the pain she was suffering from. In two days afterwards parturition commenced, and with the aid of ergot and forceps she did very well. There was but slight hœmorrage, which was followed by much prostration and rise of temperature to 101°; pulse 170. Now that the uterus was empty, the tumour became perceptible through the abdominal wall.

"Nov. 2nd.—She had a good night, under the influence of morphia; very little pain and no vomiting; took food freely; temperature 101·5°; pulse 120.

"3rd.—More pain; bowels acting; temperature 102°; pulse 144; towards evening the patient began to vomit and pain became intense; tongue dry, and low delirium.

"4th.—No change.

"5th.—In great pain; vomiting; temperature 100°; pulse 180, and could not easily be counted; died at 7 p.m., this day.

"After some difficulty, consent was given to a *post-mortem* examination, when the following information was acquired:—Body much emaciated. On opening the abdomen, the omentum was found slightly adherent to

the abdominal wall, adhesions had also formed among the small intestines. Attached to the superior and posterior aspect of the uterus was found the tumour, which had burst and discharged pus into the peritoneal sac, the adhesive and general matting of the small intestine being evidently an attempt to limit this evil. The tumour was malignant.

"H. W."

This case, though terminating fatally, had a great success as regards treatment. The patient lived forty-two days, although she suffered from one of the worst and most hopeless forms of obstruction. The tumour had just ruptured, and was draining its contents into the peritoneum on the occasion of Dr. H. Williams' first visit. Obscure pains had existed some months previous, indicative of the growth of the malignant disease, which at the age of this patient would grow rapidly, so that to have prolonged her life forty-two days, under the series of grave complications met with in this case, was a splendid triumph of medical art.

Case No. 37.—There resided, in Upper Pitt Street, a German labourer, apparently a very powerful healthy man, so strong that, as he was wont to boast, he could discharge from a river flat 100 tons of salt per day. On Monday, February 20th, 1882, he arose from bed in his usual state of health and spirits, and, after dressing and partaking of breakfast, at 6 a.m. proceeded to his employment, but returned to his lodgings at 10 a.m., complaining of intense pain within the abdomen. On his way, returning towards his lodgings, he had visited a druggist, who gave him a "Black Draught." On his arrival home his friends, who had to assist him to bed, applied a hot poultice to the abdomen, then sent for a German practitioner close at hand, and in the meanwhile gave him a dose of castor oil. The doctor sent for did not come to his aid, this led to an unqualified practitioner, who hailed from the United States, being invited to attend the patient. On his arrival he ordered an enema of soap and water, but the intended effect did not follow. Now another enema was

ordered, consisting of salt and water, and a slight quantity of blood, but no fæcal evacuation, was discharged ; next castor oil was again tried. The patient was now and had from the onset been vomiting so frequently as from every five to ten minutes; a bottle of medicine was now prescribed, the nature of which I was not able to find out. However, the patient, in his eagerness to gain relief from the agony of suffering, drank, at once, the whole contents of the bottle. This was about 3 p.m. of the first day ; now a further development of his symptoms took place, for, besides severe pain and constant vomiting, he had very frequent straining efforts at defecation, small quantities of blood only being discharged. About 4 p.m., medication was again renewed by the giving of a castor oil enema and two drops of croton oil by the mouth. This prescription so increased his sufferings, that he could not be retained in bed and he frantically paced the room, to mask his pain. After this medication the abdomen rapidly began to distend, until the tension became extreme. On the morning of the second day, there was no amelioration of any of the grave symptoms. On this day a qualified practitioner visited the patient, and after an examination and making the patient walk about the room, ordered his removal to a public charity, and about 11 a.m. he walked down the stairs from his bedroom and entered a cab, but during the journey his bowels commenced to be relieved. On arriving at the hospital he was delayed three hours before he was placed in bed. During this delay he was able to visit the water closet several times, the bowels discharging on each occasion. This discharge of semi-liquid fæces and blood continued after he was placed in bed ; when in bed he, without the aid of a nurse, changed his linen. When placed in bed the patient had all the signs of collapse, and lived only three hours after, I was informed by one of the hospital authorities.

This case is a genuine example of the " kill or cure," " hit or miss " treatment of these lesions. This unqualified practitioner gave the method by stimuli a thorough trial, and it was as effectual as though a plumber's force pump had been used ; had he been qualified his treatment would not have varied in principle, but, perhaps, it would in degree. This is one of the most rapidly fatal cases of gut obstruction on

record—it terminated fatally within forty-eight hours,—when we consider that at the *post-mortem* there was no evidence of perforation, strangulation, or any mechanical form of obstruction.

Case No. 38.—On June 3rd, 1882, I was requested to visit a sick man, residing in Upper Frederick Street, but being engaged at the time, I requested my neighbour Dr. Canavan to visit and take charge of him. On meeting the doctor about an hour after, he informed me that the sick man was suffering from bronchitis, that he had also an unreduced hernia and that he was vomiting stercoraceous matter. We now visited the patient together, and elicited the following history:—His age was sixty, a fine powerful man. He had on many occasions suffered from bronchitis, and the hernia had existed many years—for which he wore a truss,—and whenever it protruded, he could always hitherto easily reduce it. Up to May 26th, had been in his customary health, but on that day he was, while on duty on the River Mersey, much exposed to the inclemency of the weather that then prevailed; this brought on another attack of bronchitis, with pains in the abdomen, and he confined himself to bed, where he remained until the time we visited him. During this time the hernia protruded, which he had tried to reduce, but did not succeed. On Wednesday, May 31st, he took a dose of castor oil, which brought on vomiting; a doctor was now called to his aid, who prescribed aperient pills and powders, with a mixture and an enema. All these were employed during the three days previous to our seeing him; a few hours before our visit, an unqualified practitioner had been called in to see him, who appears to have been alarmed at the symptoms and declined to advise. On making an examination of the patient, I found that the bronchial disease was not urgent; pulse slow and feeble; tongue moist; not much pain nor thirst; abdomen slightly distended; and the hernia protruding, not much distended nor painful, and was easily reduced; no local signs of strangulation, but the vomiting was frequent, and the matter vomited was stercoraceous in colour only. We now advised total abstinence from all medical treatment, as well as all food, except arrowroot cooked with water, to which was added brandy; his diet up to this period had been milk gruel. This change of treatment was commenced on the evening of June 3rd. On visiting him next day, June 4th, we found the patient much improved; no vomit; no pain; no thirst; pulse

correct ; feeling well ; no medicine ordered, and the previous very limited dietary was continued, and we also warned the patient and his attendant that if any alterations were made in his dietary without our permission, his case would *certainly* end fatally.

June 5th.—Feels well ; again informed him that his dietary was all important.

6th.—Feels exceedingly well ; bowels acted freely ; he had been constipated during the previous fortnight ; now recapitulated my warning as regards food, &c.

7th.—No further action of the bowels ; feels well.

8th.—Diarrhæa set in, and the bowels were emptied many times during the day. I now informed him that I would not visit him for two or three days, and drew his attention to the success that had followed, from strict adherence to our very simple advice, and begged he would not make any change without consulting Dr. Canavan or myself.

11th.—On returning home this evening at 5-30, I found a message awaiting me from Dr. Canavan, requesting that I would go and see our patient in Upper Frederick Street, as he was very ill. I immediately went, and found him lying in bed—collapsed ; cold ; very pale ; no pulse at the wrist, and covered with perspiration. Without delay, I ordered hot bottles to his feet, loins, and between the thighs, and gave four minims of liq, atropia under the skin, and waited twenty minutes, but there was no perceptible effect ; now ten minims were given by the subcutaneous method, but at the expiration of half an hour there was no signs of reaction ; now fifteen drops were injected under the skin, and I waited one hour, when I noticed the pupils began to dilate, skin become warm and of a feeble salmon colour, but no pulse at the wrist ; the pulse counted at the femoral region was eleven in five seconds ; there was no vomiting ; the abdomen was moderately distended, its contour indicating distension of the small intestines—a central globular swelling. The case terminated fatally at 8-30 p.m.*

Now the question presented itself—What caused relapse and death ?—no *post-mortem* was allowed. The immediate

* See dietary of Case III, page 38, this volume.

cause of death, I believe, was perforation. As to the cause of the relapse, we were informed that, on June 9th, the patient had felt so well that he had got up from bed, and had repaired some clothing and done some other matters, which showed that he must have felt fairly well; that he also got up on June 10th, and that on this same day, some good-intentioned friend sent him a fried "sole," new potatoes, and fresh rolls for dinner, all of which he consumed at one meal, and expressed himself as having much enjoyed the feast. In two hours after, he complained of pain in the stomach, and said to his attendant, that it would be a great relief to him if the food would return. Unfortunately, his friends allowed him to remain in pain thirty hours, without sending for aid, and it was only when collapse set in, that they sent for Dr. Canavan, about 2 p.m., June 11th.

Case No. 39.—On June 6th, A—— B——, residing at Upper Essex Street, called at my surgery, feeling very unwell. On examination I found his pulse slightly accelerated; tongue furred; pain in the abdomen; no action of the bowel for forty-eight hours; felt inclined to vomit; abdomen slightly tender and distended. I ordered him home, and to limit his diet to beef tea, arrowroot and water, with brandy to flavour, and to remain in bed, and take a tablespoonful, every two hours, from a mixture containing ½ a grain of morphia dissolved in half a pint of water. My partner, Mr. R. Jones, visited him next day, and found some improvement; no urgent symptoms; this continued up to June 16th, when a hard swelling was observed in the right iliac region, and the abdomen was rather more distended. With the excepiton of this region, the abdomen was resonant all over. About 12 midnight, of this day, I received a message that the patient was not so well, consequently Dr. Jones made a special visit. The patient presented no urgent symptoms, but about two hours previously he had had a rigor and slight signs of collapse,

which, however, had passed away. Dr. Jones noticed that the tumour in the right iliac region had become much less. On my visit next day, June 17th, I found only a slight trace of the tumour; tongue, pulse, and abdomen presented no special feature.

June 18th, being the twelfth day, and there being no action of the bowel, the patient's friends became alarmed and desired a consultation, naming a collegian that should have assisted me in Case XI. I declined, my experience of that occasion influencing this decision. Two hours after this visit, the bowels acted freely—and continued acting occasionally for many days—and the patient was soon well.

"Case No. 40.—On the 9th October, 1882, I was consulted about an old lady, 70 years of age, who had been suffering for a week from pain in the stomach, diarrhœa, and occasional vomiting. As it was late at the time, and as I was well informed of the patient's condition, I was not asked to visit her, but to prescribe for the pain; ordered morphia and acid hydrochloric, to be given according to the severity of the pain, her condition to be made known to me the following morning. I heard nothing further till the 16th, when her daughter called, stating that the patient was about the same—the pain not so severe, the vomiting rather worse, and the bowels acting several times a day, with some blood in each stool. This day I visited her, and found her pale and reduced in flesh; otherwise she appeared in her general health, the tongue clean and moist, the abdomen soft and neither distension nor pain on manipulation, and some gurgling noise in the right illiac region. I learned that the bowels had not acted for two days, and that the medicine produced vomiting, consequently she only took three doses. She was now ordered half the dose, viz., 1-16th of a grain of morphia, and put on simple diet—wine, whey, warm buttermilk, and gruel, in small quantities at frequent intervals. On the following day she was rather better; had vomited once, the bowels had not acted, and there was occasional pain in the abdomen. Pulse 80; temperature 98°.

"For the next two days there was no change, vomiting once or twice in 24 hours, for which I prescribed effervescing mixture, bismuth, &c. The bowels not having acted for five days, the patient became rather anxious. She had been in the habit of taking two rhubarb pills almost daily for many years. Up to this time I did not suspect obstruction. I allowed her

to take two pills, to be followed in 6 hours by a seidlitz powder if the bowels did not act. These had no effect, and she thought that they were vomited. Two days afterwards I ordered an injection of soap and water, and 10 grains pil. colocynth et hyos. On the following day I was sent for early, and found the patient in great pain, with the abdomen distended and tympanitic; the pills had not acted, and the injection brought nothing away. This was the ninth day since the bowels had acted, and the sixteenth since the diarrhœa had commenced. The mist. effervescens was discontinued and morphia alone given internally, and a small quantity of whiskey and water every hour. The attendant was cautioned against giving any opening medicine, the foot of the bed was raised, and the patient ordered to be kept at perfect rest. Pulse 120; temperature 100°.

"Next day she was not so much distressed, and the abdomen less distended; vomited three times in 24 hours. Pulse 120; temperature 99°.

"Up to the fifteenth day of the obstruction there was no material change in the condition of the patient, except that she had vomited once only in 24 hours. She had occasional pains in the right iliac region; the abdominal wall being very thin, the coils of small intestine could be traced in situ, the lower coils being full and dull on percussion, and tympanitic in the epigastric and upper part of umbilical region.

"On the seventeenth day vomiting ceased; temperature became normal; pulse 100; and the patient felt in every way better.

"On the nineteenth day the bowels acted slightly, and on the twenty-first day copiously, and daily up to the present, Nov. 14th. She is now doing well, although much reduced and weak."

This case is another, during the treatment of which, Dr. H. Williams invited me to visit with him. The general signs indicative of intestinal obstruction were all present, and although not to an extreme degree of intensity, yet I expressed my doubts of her ultimate recovery, as she appeared very feeble and constitutionally weak, and had much fluid contents in the intestines. At her advanced age these conditions

made her case appear to me far from hopeful, as experience had taught me that aged persons often progress satisfactorily towards recovery, but finally fail purely from lack of recuperative power.

The treatment of hernias, either after reduction by taxis or operative interference, should be conducted upon the same principles and line of practice as other intestinal lesions. In irreducible omental hernia I have known several occasions where, by strict attention to the mode of practice advocated in this volume, the signs of obstruction passed away without operative interference; and the rationale of the cause of obstruction in omental hernia advanced by Professor R. Parker much strengthens my conviction, that the symptoms attendant upon obstruction from irreducible omental hernia may be corrected sometimes without operation. The last case of this character which I witnessed, was one attended by me in connection with Dr. H. Williams.

It was an inguinal hernia, in a female, consisting of both gut and omentum. The intestinal portion of the protrusion was, after some difficulty, returned by taxis, but the omental portion was irreducible, and naturally we feared that the abnormal symptoms, which remained after the reduction of the gut, were continued by the unreduced omentum. A third gentleman was called to assist us with his advice, who, after an examination of the patient, concurred with Dr. Williams and myself that further delay from operative interference was justifiable, and he also advised an enema; but this suggestion

Dr. Williams, who was in charge of the patient, vetoed; and, though the patient remained some hours in the doubtful condition, yet in fourteen days after the triple consultation she was perfectly well. To me it is a doubtful question whether omental hernia can be fatal; granting that the advice and medicine given to the patient have been such as the etiology of the lesion indicates. The practice generally adopted by surgeons and physicians of an improved treatment will ultimately supply us with data that must decide this question.

Against the practice of prescribing sedatives in intestinal lesion, there has been advanced—but only during the last two years—the objection, that "sedatives mask the symptoms." It is not plain what these objectors mean by masking of the symptoms. The fairest construction to place upon the phrase would be, that medicines of the sedative type diminish the symptoms attendant upon a case of intestinal obstruction, and the natural typical signs are lost, so that the condition of the patient becomes obscured to the physician; but if a drug of the opposite class is prescribed, are not the signs increased, and the typical symptoms in this case also modified so that they become obscured to the physician. This masking of the symptoms objection is a cogent argument for leaving the sufferer to the uncontrolled efforts of nature, and, indeed, it is better to do nothing, if we are in ignorance either of what we do, or of the train of consequences that follow what we elect to do. The practice of both medicine and surgery consists

mainly of masking symptoms and sensations, and an intelligent practitioner ought to be able to take the situation, although some remedy may be modifying the antecedent condition. The clinical cases presented to the reader in this chapter are not published as evidences of successful treatment, from which a rate of mortality can be calculated, favourable or otherwise, to the treatment; inasmuch, as I have not published many other successful caes, being anxious rather to give the reader such examples as would be useful guides to treatment. To enable us to judge of the value of any inovation, in the treatment of a lesion, it is essential to know first, what course the disease would run if not interfered with; secondly, the success attendant upon previous methods of treatment. Of the first, the mode of the "natural method" of resolution advanced by me in these pages is unassailable; but of the second—statistics—I have presented the reader with no data, but, in lieu, I have given that which is of greater importance to the practitioner,—a demonstration of the natural and art-controlled process during progress or retrogression, where intestinal lesions exist, a correct knowledge of which must ultimately bring about a much needed reform in treatment.

CHAPTER X.

THE inconveniences of hernia are truly great when collectively considered, though individual cases or groups of cases may frequently be met with, in which these inconveniences are but slight. That a hernia may be borne for years uncomplained of by the possessor, unsuspected by others, is well enough known. The support of a truss is generally, but by no means always, an essential condition of prolonged harmless toleration, and the requisite instrument can be easily procured at the shop of any surgical mechanician or druggist. The ruptures that are amenable to a truss at all are often as comfortably kept from protrusion by an inexpensive article, as by more elegant and costly apparatus. In the umbilical hernia of babies, the most perfect truss is a plate of sheet metal or stout card sewn up in the infant's binder. Such herniæ seem to readily disappear in a few weeks or months, in nearly all cases. In adult life umbilical hernia is more frequent in women than in men, but is seldom effectually controlled by any truss. The inguinal hernia of boys, men, and women can often be comfortably held up by an inguinal truss, the result of which is, in some cases, after continual efficient use for several years, to bring about a complete cure of the hernia. Femoral hernia can be supported by a similar truss, in suitable cases occurring in male and female adults, female

children being exempt from femoral and inguinal hernia. These inguinal and femoral trusses are known as such at the shops; are made "right" and "left;" and can be procured of the requisite size by measuring round the hips just above the femoral trochanters. Thus, for a person measuring thirty inches in girth at this situation, a "thirty inch truss" will be required. Medical men and other subjects of hernia have told me that they prefer a "double truss," both for comfort and efficiency, even though the hernia be only one-sided.

Any one may be disabled, or seriously hampered in erect movements, by any of these herniæ; while even without disablement, the existence of a hernia in a man or boy disqualifies him for admission into the army and other occupations. But the great inconvenience and source of the urgent importance of hernia is the liability to intestinal strangulation, a definite form of obstruction, the accessible position of which renders it easy both of recognition and of relief. So definite are the symptoms in typical cases, and so unmistakable is the relief afforded by successful taxis or skilful herniotomy under average circumstances, that this particular form of intestinal obstruction constitutes a perpetual theme in medical teaching. But little is wanting to render complete all that is taught about the symptoms and treatment of strangulated hernia. Examiners never weary of it, and students dare not neglect it. So far so good; it is impossible to exaggerate its importance. But I am decidedly of opinion that too much is made of one side of the case, and too little of another. The typical symptoms

cannot be too well known, too searchingly analysed, or too early attended to. But they are, after all, the symptoms common to all forms of complete intestinal obstruction, *plus* the presence of a hernia that immensely simplifies the recognition or "differential diagnosis," facilitates the treatment, and increases the hope of success. Yet the beginner has good excuse for entertaining the impression that the symptoms are the special characteristics of a separate disease, according to the teaching usually provided for him. The brilliant and increasingly safe effect of successful reduction, the disappearance of symptoms, the restoration of the patient (often from serious illness and always from danger) to a state of speedy or immediate comfort, is indeed undeniable, and one of the greatest triumphs of healing. But this is a special treatment, fitted for this form of intestinal stoppage alone, being in other occlusions usually impossible, and always a most dangerous experiment. Yet surgeons continue to hanker after "abdominal taxis" in vain attempt at relief of conditions that are often due to functional causes alone, and are seldom capable of exact differential diagnosis. The specialization of the symptoms of strangulated hernia, and the generalization of the principles of treatment, are fundamentally erroneous, bringing disappointment to the practitioner and death to the patient. The very contrary requires to be observed. A generalization of the symptoms in all kinds and every degree of intestinal obstruction, mechanical and functional, very much facilitates both treatment and diagnosis; while the prompt recognition of the

hopelessness of all notion of taxis, except for hernia, will neither hinder the mechanical treatment of these, nor fail to improve the functional treatment of all.

The symptoms upon which reliance is placed, in the recognition of strangulation, are—

constipation, vomiting of all food and drink, and other sensations of the patient, such as griping pain, distress or discomfort in the middle of the belly, and the suspected or proved irreducibility of the hernia.

The constipation may not be conspicuous in an early stage of the malady; and even after obstruction has come on, a stool may escape, either spontaneously or in response to an enema (which is still sometimes allowed, but which is here strongly deprecated). After the lapse of a day or two, or more, the existence of total constipation is more clearly evinced by the absence of the accustomed stools. But there is a symptom which indicates complete obstruction much more delicately than the absence of stool, and that is the non-escape of wind *per anum*. This is not only a valuable clinical guide, based apparently upon physiological truth, but is one about which the patient is generally perfectly clear. Whatever may be the doubt, the inaccuracy, or even the prevarication, attending the answers to various questions put to patients under these circumstances, I have hardly ever seen a moment's hesitation or the absence of clear conviction with regard to flatus, ever since my attention was first given to this detail, which happened after reading a communication to the *Lancet*, of Jan 8th, 1876, by Dr. William Hardman, of Blackpool.

The act of vomiting and even persistent retching may be a conspicuous feature; may be confined to a single occurrence at the outset, never to be repeated; or may occupy a middle degree of importance. If food or milk be given after obstruction has come on, so surely will there be vomiting, which may or may not be followed by retching besides. The symptom is not at all a necessary part of the malady; it is often a purely artificial creation, due to the mistaken judgment of those who permit the administration of the food and drink, which do not in truth first cause it, but which may alone keep it up. In a properly managed case, therefore, this symptom may often not be repeated, though it is almost sure to occur at the onset. It is quite useless to give food to a person who is suffering from nausea, whether it be due to sea-sickness, or to other known or unknown causes. But in any form of intestinal obstruction it is not only useless, but is injurious, and may seriously prolong or exaggerate the symptoms, with sometimes fatal effect. As soon as the cue has been taken from this symptom, all ingesta are to be stopped, except the smallest quantities of water or simple fluid. It is a common routine practice to give ice under these circumstances, and if the patient craves for it and continues to accept it, by all means let it be given if it be at hand. But ice, or cold water, however acceptable to the patient during the extreme thirst that is common before relief has been procured, is better avoided afterwards. The patient now desires less, or even refuses, such very cold drinks, which set

up griping that is capable of being discriminated after some approach to comfort has been brought about. Warm or even hot water, and hot tea, are now (as, in fact, throughout) more rationally beneficial and more acceptable, when anything at all must be taken.

The abdominal griping, or other pain or discomfort, may be directly attributed to the irreducible hernia, or indirectly associated with it, by the patient. So much the more easy for the medical attendant. But the patient may not know of a hernia at all, which may have for the first time come down, or may be otherwise overlooked. In obstinate constipation with persistent vomiting, it is the first duty of a medical attendant to search for a hernia, in the presence of which alone can he discover strangulation; in the absence of which he may promptly recognise intestinal obstruction of some other form, though he may be not able to name it. In the majority of cases, if hernia be not the cause of obstruction, the latter will prove to be one of the milder and eminently curable degrees, in which rapid or at any rate sure recovery results from the prompt and total suspension of solid food (including milk, which is solid as soon as swallowed); the great limitation of watery drinks, with, if necessary, the efficient aid of morphia, of alcohol, or of both. To this must in all seriousness be added the unflinching avoidance of enemata, and even of the slightest manipulation *per anum*, the speedy effect of either of which is a griping pain, a vomit, or other symptom of injurious peristalsis.

Given, then, the symptoms of complete obstruction, and a hernia the ascertained seat, the relief of the constricted bowel is essential. Successful taxis may procure total removal of all distress, with speedy recovery, but persistent liability to hernia. It must, however, be understood that efforts at taxis ought always to be considerately, and at the utmost, only moderately employed, when strangulation has come on. It is better to abstain from taxis than to do it violently, and in some cases it is wholly inadmissible.

Speedy relief, then, is what all hope for and generally obtain, after timely taxis; but all events should be anticipated, and one of these is the accident of reduction *en bloc* or *en masse*. It is fortunately not a frequent complication, but none the less insidious on that account, and still more so from the extreme and misleading facility with which it is sometimes produced. It is impossible to exaggerate the warning conveyed by this fact, though few can realise it without having experienced its occurrence by personal manipulation. I have once effected a reduction *en masse* in a case where this false and fatal replacement was accomplished most easily, and with as little force as that required for any reducible hernia that I ever saw. Much valuable time was lost before the still necessary herniotomy was performed, and the case terminated in death. In a subsequent case where I operated "when in doubt," in the absence of all pressing symptoms, and in the not very certain presence of a hernia, I had the satisfaction of releasing a reduction *en masse*,

and safely rescuing from this imminent danger a robust young man, as follows :—

[Medical Times and Gazette, *February 4, 1882.*]

Case of Strangulated Inguinal Hernia—Reduction en Masse*—Antiseptic Herniotomy—Fœcal Fistula Spontaneously Healed.*

Richard J——, aged twenty, admitted August 22, 1879. The patient, a farmer from Knowsley, had had a right inguinal hernia for three years, but had not worn a truss. The hernia had never given trouble until a month previously, when there had been difficulty in reducing it himself. On August 21, 1879, after a stool, he failed to reduce the hernia again, and having abdominal pains, went to bed and sent for a medical man, who also failed. The next day vomiting occurred several times, and, under chloroform, taxis once more proving unsuccessful, he was sent to the Liverpool Infirmary, where taxis under chloroform was a second time unsuccessful. Mr. Parker was sent for at ten the same night. There was now no vomiting, no abdominal distension, slight tenderness, little or no pain, but some uneasiness. A soft swelling in the scrotum seemed to have slight impulse on coughing, but was dull on percussion, and undiminished on gentle manipulatlon. Although something had been reduced, the House Surgeons were not satisfied that all was fairly back ; so, in spite of the absence of symptoms, the history, and the request of his medical man that the Surgeon on duty should see him that night, were responded to by immediate herniotomy under carbolic acid spray.

The sac was opened at once, and nothing but blood-stained clear fluid found in the scrotum. On searching upwards, and pulling down the neck, bowel was found constricted at the internal ring, and lying within the abdomen before being drawn down. The neck was held with the forefinger-nail and nicked with the tip of a blunt-pointed knife, and the bowel gently examined. This was found to be small intestine, moderately congested, slightly ecchymosed, but shining; and it was reduced. A superficial catgut drain was put in, and another laid from the internal ring to the lower corner of the wound, and then sutures. Wet boraic lint dressings were used. Wind passed the next day, and every day afterwards. The bowels were first moved twelve days after the operation, for the first half of which time nothing but beef-tea and a few doses of sulphate of morphia were ordered. Bread was added on the sixth day. No bowel symptoms, or any other symptoms, occurred, and

the patient made a slow but perfect recovery. On the fourth day, though the wound had appeared to be healing by first intention, a little sweet pus escaped on using pressure. On the fifth the discharge was fœtid, and the edges of the incision showing unnecessary inflammation, although (without always using the spray) precautions had been taken to prevent unpurified air reaching the wound from the ward at each inspection and change of dressing.

However, it was presumed that these precautions had been insufficient, though it was evident that the irritating agency had been working from within. Still the patient continued well, and the wound was now freed from sutures, made to gape, occasionally squeezed and wiped, and smeared with boracic ointment.

On the eighteenth day wind escaped from the wound, and on the day following some intestinal contents, though without a fæcal odour. This ceased in a few days, though wind continued up to the end of the fifth week. The wound was healed about eight weeks after operation, the bowels having hitherto acted twice or thrice a week, and after this daily.

He was discharged on October 24, free from hernia, but he returned in a week or two with a small bubonocele. A truss was procured at once, and answered its purpose perfectly.

In November, 1881, he was seen again, with the truss still on, the hernia not having come down since, and was advised to continue the use of it.

Note.—It is not improbable that ulceration of the bowel proceeded from the mucous surface inside, and that the septic material which got into the deep parts of the wound, eventually spreading to the skin surface, were from this source originally, as they certainly were later on while the state of fæcal fistula lasted.

Thus, the symptoms continue unrelieved in spite of apparent taxis, in the event of reduction *en masse,* which is merely a veiled strangulation, requiring to be sought and mechanically relieved by manipulation. But the symptoms may continue even when the taxis has been more evidently complete; in fact, when it is certain that proper reduction has been effected. This is a state of things always requiring much clinical judg-

ment, and at best may be said to expose the patient to great danger. Many cases die exhausted from the symptoms thus continuing, and so easily capable of exaggeration, prolongation, and wearisome variation. Food, enemas, and the restless meddling that accompanies divided counsels or vacillation at this juncture, are generally at the root of the evil if now recovery fail. Such cases should be tended until they are well, and all hernia cases, after reduction of strangulation, however mild, should be watched until quite capable of resuming full ordinary diet with impunity. In fact, the after-treatment of a hernia, of which the strangulation has been released by taxis or operation, ought to be conducted on the principles applicable to intestinal obstruction in general. For want of this, and owing to great imprudence on the part of the patient in resisting the attention subsequently provided for him, I have known a patient die six months after successful taxis, with stricture, hypertrophy, adhesion of intestines,—a series of pathological changes that might probably all have been avoided, if he had been content to wait until his intestines were fit to resume their duties. The case has been quoted elsewhere among five others, of which the anatomical features were analysed in relation to the symptoms. (*Lancet*, 12th August, 1876, p. 220.)

The following case illustrates in a very complete way the persistence of some of the obstructive symptoms after successful taxis. It was judged at the time to be a case of functional laming, the result of prolonged strangulation, and

consequently not capable of immediately complete relief by mere reduction. It was treated as such, with the entire recovery of the patient.

[Medical Times and Gazette, *March 4, 1882.*]

Case of Strangulated Inguinal Hernia reduced by Taxis—Continuance of Functional Obstruction—Puncture of Distended Bowel—Rest secured by Recumbency, Suppression of Food, and a little Opium—Complete Recovery.

John D——, aged thirty-four, a labourer, from Earlestown, Lancashire, was admitted on October 8, 1880, on account of a right inguinal hernia, five days old and two days strangulated. Mr. Harrison reduced the hernia the same day at his visit, but was not perfectly satisfied with the feel and look of the parts; so, being about to leave town for a few days, he explained his impression to Mr. Parker, and requested him to watch the man in the event of renewed emergency. The following day vomiting had occurred, the patient was uneasy, the site of the hernia was a little swollen, but evidently devoid of contents, and the neighbourhood tender. But the pulse was about eighty and temperature about normal. No wind had now passed for three days; but there was no distension or hardness of the belly. Water and filtered beef-tea were alone permitted. Twenty-five or so drops of laudanum were given by the mouth, to be repeated night and morning unless obviously not required. He continued fairly comfortable and quite contented under this treatment for the following days, showing no change except an increasing fulness of the belly, with disappearance of the tumefaction over the inguinal canal; the pulse and temperature also remaining about the same. No wind was passing; but no abdominal symptoms were apparent, except a tympanitic condition with its consequent and increasing discomfort. The foot of the bed was elevated, and the relief to the abdomen was appreciated; but the size of the belly was increasing, and its tension too. Thirst was of course experienced, and it is not unlikely that it was too frequently and too copiously slaked.

On October 14, the sixth day after reduction, the abdomen was punctured with an exploring trocar and canula in three places, some fœtid gas escaping. Though the issue was small the tension was lessened, and the patient was pleased at the relief. The punctures were repeated on the two following days, and the distension thus kept within bearable limits. Then a copious liquid stool followed, the belly flattened down, and the

patient continued to do well; the diet being carefully restricted to bread, potatoes, and beef-tea or tea. The bowels remained sluggish after his diet was increased, and an occasional hot-water enema was used after they appeared to be otherwise sound and free from tenderness; but a flabby and bagging condition of the lower abdominal front persisted almost throughout the convalescence. A local complication arose in association with the punctures, and prolonged the confinement to bed, though fortunately without masking the uninterrupted good progress recognised in the abdominal functions. Some fæces occasionally escaped by the trocar, which was protected by carbolised oil, and manipulated with deliberate care to try to avoid intra-peritoneal effusion, with success. But a little escaped into the subcutaneous fat on the first day of puncture, and led immediately to a small putrid abscess, which was opened, but not properly disinfected or drained at once. There followed in consequence a serpiginous phlegmon round the abdomen and flank, which was then progressively incised and treated with terebene and oil, washed through, and covered with gutta-percha tissue without rags. Some subcutaneous sloughs occurred, but were thus speedily disinfected, and rapid healing followed their issue. On one of the few days on which the bowels were punctured, at the height of their distension, the tongue became dry and the breath sweet. Whatever be the real significance of the latter feature, one could not help recalling its usual association with collapse and other forms of threatened or impending extinction, nor resist the fear that failure was, after all, about to result. But as very little opium had been used—perhaps too little, considering the still increasing flatulence—an extra dose was now given. Not many hours later came the copious evacuation, preceded by increased comfort attributed to the opium.

Note.—The persistence of symptoms, after the release of the hernia, was regarded as the not unnatural result of an acute strangulation; yet it was not easy to decide between that, a functional maiming the effect of bruise, and the physical constriction of a possible reduction *en masse*. The case forms an interesting and instructive contrast with that previously related, and it is obvious that but little was wanted in either patient, at the critical time, to turn the scale against him.

A still minor persistence of symptoms, very easily managed, but itself capable of being quite misunderstood, may be found after successful taxis. A young man had a strangulated

inguinal hernia reduced by taxis. The next day he had vomiting, griping, and quickened pulse, and was admitted into the Infirmary. I was called to him shortly after his admission, and gave him about ⅓ of a grain of sulphate of morphia subcutaneously. In less than an hour he felt well, and never complained again, leaving the hospital perfectly well in a day or two. In another exactly similar case which I saw in consultation with two professional friends, it was supposed that reduction *en masse* had resulted, an opinion that I however did not share. It was decided by the vote of two against me to give an enema, and if that brought nothing away, to then follow my advice and give morphia, as in the preceding case. Nothing but the water injected could be got to issue, and much griping was immediately occasioned and complained of by the patient. The morphia was thereupon given subcutaneously, and repeated a few times, with speedy complete relief and total recovery. From the appearance of both these cases, both generally and locally, it was evident enough that they were mere instances of "griping," after strangulated hernia, owing probably to the want of a sedative dose of opium in addition to reduction. There was no proving it, however, except by experiment, which in both cases appeared conclusive, and in the latter doubly so.

There are thus, after complete reduction by taxis, several degrees of functional disturbance or laming, that may give rise to symptoms more or less identical in kind and in degree with those that existed during full strangulation. The mechanical

attempt at relief having been effected, there remains to be adopted proper functional therapeutic means, which are simple and effectual when fully appreciated; but which must be thoroughly adopted if the utmost known success is to be attained. But these symptoms and this treatment occur repeatedly in persons who have no hernia; attacks of griping diarrhœa, flatulence, or constipation, singly, alternately or combined, in various stages of severity. All degrees and varieties of functional disturbance of the bowel have to be considered in estimating the importance of any one of them, whether present with a hernia or not. Apart from definite obstruction or impending strangulation, some of these minor ills may be of frequent occurrence as a distinct accompaniment of hernia, not unfrequently gradually culminating in actual strangulation. Under ordinary circumstances purgatives and enemata are both convenient and effectual in relief of these conditions. But they are full of danger when symptoms of obstruction have come on. Many cases of hernia, previously complicated by griping, constipation, or atony, and then relieved by purgation or enema, are easily strangulated or their strangulation exaggerated, when obstruction has commenced. As sure as this is even threatened, during the whole time of its continuance, and for some time after reduction or the cessation of all obstructive symptoms, purgation and enemas must be most zealously forbidden. It is now important to prevent or to diminish the peristaltic movements of the bowel. This is effected by preventing anything from

entering into it either by the mouth or the anus. All forms of enema, and even manipulation with the finger, must now be withheld from the rectum, otherwise painful peristalsis from above is immediately set up. Suppositories, in fact, *everything* must be withheld from insertion into the now morbidly sensitive rectum. As for food and drink, the former is *totally* stopped, and the latter as fully as possible. Warm tea, warm water, in trifling quantities to allay thirst, may be permitted when urgently desired, but as long as there is no thirst let them be stopped. Opium by the mouth, morphia under the skin, not only control spontaneous peristalsis, but also allay or prevent both hunger and thirst. It is useless to expect proper action of opiates if milk or other food be administered. The effectual action of the former requires the supplementary avoidance of the latter.

As long as it continues to be held permissible to administer milk diet, to inject enemas, or even to conduct digital explorations of the rectum, in *any* well ascertained or even doubtful instance of intestinal obstruction, be it organic or be it functional, be it definable or be it (as it often is at first, as it not seldom is throughout) entirely indefinable, so long will many of such cases, from a comparatively mild beginning, drift from bad to worse until beyond the hope of rescue. They may truly shew, in great perfection, every symptom known; they may illustrate without stint many eccentricities of function to which the disordered animal frame is liable; they may verily prove the most interesting of "typical cases,"

both before and after death; but it is certain that they would generally be just as well off if they had no medical attendance at all. The most misguided assiduous friends could not do much worse for them, and not unfrequently the barest common sense does far better for them; for the natural tendency on the part of the patients often is to abstain from food and drink entirely, in response to the instincts of the hour, which in these circumstances are not erroneous, and to following which alone and unaided people have owed their recovery. It is not enough that practitioners have begun to view with shame the notion of purging patients suffering from obvious strangulated hernia; they must regard with equal shame the admission into the lamed intestine, at either end, of anything that excites peristalsis. Everything that requires to be digested excites peristalsis; also cold water in copious quantities, to say nothing of flatus, now so easily generated in the smallest digestive efforts. As for milk, so extremely valuable a food in its proper place at the proper time, it is here a veritable poison. This liquid article of commerce is, when swallowed, a solid article of food, that is almost as unsuited to the circumstances as a piece of chewed meat. There are practitioners here and there who fully appreciate the immense importance of thorough "fasting," as the one and only essential to the speedy alleviation of the symptoms of intestinal obstruction. (The usefulness of opium is very much hindered without this absolutely necessary precaution, but combined with it supplements all still wanting in the conditions of relief.) But strange

Page 293, line 6, *for* "eruction" *read* "eructation"

it is that among this number are not yet to be found those in "authority." And so the mild cases of functional laming, as well as the severe, are liable to be made worse by inappropriate traditional treatment.

Discomforts of various kinds and degrees such as constipation, flatulent distention, griping, eruction, loss of appetite or impaired digestion, may attend cases of hernia, as has already been stated. Although any or all of these symptoms are common enough in persons without hernia, and although they may coexist with hernia without being related as cause and effect, they are frequently fairly attributable to the direct influence of the hernia, especially in adult cases of some standing. Some of these cases are "reducible hernia" of which the contents may be bowel, omentum or both; while others are irreducible, in which event omentum is seldom absent, and often present alone. The presence of unreduced intestine in a hernia may easily explain any degree of disturbed bowel function, from strangulation down to the slighter interference indicated by the symptoms just referred to; but similar symptoms have been noticed in herniæ containing only omentum; in fact evidence of obstructed intestine has not been wanting in purely omental ruptures; so that "strangulated omental hernia" has come to be spoken of as something of which the symptoms are more or less identical with those of strangulated intestine, "only less severe." The cases are quite exceptional varieties of hernia, but it has become somewhat usual to accept their existence either upon the published

impressions of others or upon the superficial aspects of the cases themselves. In fact the existence of these cases has been held up as an argument against the ligature of masses of omentum, in such operations as may have appeared to demand it, on the perfectly obvious ground that no strangulation of omentum can be tighter than that caused by thorough ligation. So it was advised by many, as it is by some to this day, that redundant or irreducible omentum be cut off, and its bleeding vessels separately closed, without including the whole structure in a ligature. In the beginning of this century it was known that ligature of omentum might occasionally be done with impunity though it was so frequently followed by distressing symptoms and death, that many surgeons abandoned it on principle. Scarpa, admitting the apparent dangers, yet bearing in mind the occasional impunity, adopted a measure which in his opinion minimised the dangers without abandoning the practice, which he accordingly performed only after a delay of some days. He left the omentum lying in the wound, wrapped up in lint spread with ointment, until granulation was established, after which he applied his ligature without serious effect. It is probable that safe adhesion around the neck of the hernia, shutting off the main peritoneal cavity, took place during the delay; whereas immediate ligature with return of the stump and unprotected thread would easily set up septic peritonitis, and be followed by death. The peritonitis thus set up would be attended by disablement of bowel and symptoms of more or less complete obstruction, and was thus attributed to the

constricting ligature. Hence the deprecation of the practice altogether by Lawrence, who writes thus (Ruptures, 5th ed., p. 454) :—

If strangulation of the omentum by the ring is sufficient to produce dangerous and mortal consequences, must they not be equally expected from that stricture which is caused by the ligature?

But the occasionial impunity of omental ligature before the antiseptic era, has been replaced by invariable success under conditions increasingly understood, so that hardly any surgeon or student is now unprovided with demonstrated proof that the tightest ligature, multiple or single, of any amount of omentum, is in itself a harmless procedure. It is therefore evident that whatever symptoms may shew themselves in cases of unreduced omental hernia, they are never produced in consequence of artificial constriction of that membrane, ever so tight. If the ligature of omentum by the surgeon's hands produce no symptoms of strangulation, how comes it that the comparatively slack constriction of a hernial neck can be supposed to do so? Mr. Timothy Holmes is the only author I know of who, believing in strangulated omental hernia, yet confesses the contradiction involved. But as he cannot reconcile the conflicting assertions, he leaves the question unanswered, and gives adhesion to the unproved assertion, in face of the fact which belies it on his own shewing. In "Surgery: its Principles and Practice," 2nd ed., p. 620, he writes—

The strangulation, even of omentum only, produces symptoms identical in kind with those of strangulated bowel, though possibly not so severe, a

fact which I find it difficult to account for on purely mechanical principles, especially as the omentum, when exposed in the operation for hernia, is constantly tied tightly, in order to remove portions of it, with complete impunity.

It is indeed difficult to account for symptoms of obstruction in unreduced omental hernia on the supposition of strangulation or constriction of omentum alone, seeing that the utmost constriction of ligature fails to produce such symptoms. But this apparent clinical paradox is nevertheless not so unaccountable, I think, as Mr. Holmes makes it. In any such case where the symptoms, supposed to be due to the constricted omental hernia, are clearly proved to have been so due by their prompt disappearance on reduction, whether by herniotomy or by taxis alone, it is pretty clear that obstruction to intestine may have been brought about by the "dragging of omentum," the pull upon which is sometimes sufficient to obstruct the colon. It is not an uncommon thing to find the greater part or the whole of the omentum in a hernial sac, and held there under a tension sufficient to obstruct the transverse colon. I have seen *post-mortem* evidence of dragging marked by a distension of all intestine above the omental attachment, while all the bowel below this point was empty and contracted, in a case where death resulted after taxis. I have never yet seen a case suspected to illustrate this supposed omental strangulation, so that my information on the subject has had to be derived from published records, and from the conversational allusions of friends. None of the cases thus accessible to me, however, have afforded any proof

convincing me that the symptoms observed were due to mere omental constriction. Scarpa makes no allusion whatever to "strangulated omental hernia," a circumstance that truly conveys no disproof of its existence, but which is a significant omission by so accomplished a clinical observer. A similar omission is made by Mr. Birkett, from his article "Hernia," in Holmes' System of Surgery. He does not even discuss it, and is careful in using the word "strangulation," often to add "of intestine," in a way that is suggestive of a deliberate avoidance of the question, and of the utter contradiction involved in the accepted idea of "strangulated omental hernia." The notion of constricted omentum alone causing any of the symptoms that have been observed is quite unintelligible and incredible in the face of habitual harmless ligature, and some other explanation must obviously be given to the cases thus erroneously classified. The sources of fallacy which I would suggest are these:—(1) Certain cases have had taxis performed, but not having been entirely relieved, have been submitted to herniotomy with success, and only omentum found in the sac. I would submit that in some of these cases there has at first been strangulation of bowel, its subsequent reduction by taxis, omentum remaining unreduced. Persistence of symptoms has been attributed to the unreduced omentum, after the reduction of which in herniotomy it has appeared that relief has followed this process alone. Such cases are capable of the explanation that the previously strangulated bowel was all the while at fault, but had not recovered its function until

after the reduction of omentum. (See three cases of epiplocele from the practice of Mr. Hulke, "Medical Times and Gazette," Feb. 13, 1875.)—(2) Cases in which no bowel is protruded, but where the transverse colon is obstructed by the drag on irreducible omentum, as before mentioned. The bowel does not require hernial constriction, invagination, volvulus, or the presence of an intra-peritoneal band, in order to be incapable of transmitting its contents at any particular spot. There are other causes not effecting actual mechanical compression, that quite prevent the proper assumption of the tubular peristaltic attitude, one of which is a pull upon the omentum. It is already known that the similar pull resulting from adhesion of the intestinal tube itself may effect total obstruction without constrictive compression, and a sufficient pull upon omentum or mesentery is equally capable of abolishing the tubular passage, by suspension of the muscular functions of the canal at the locality thus under tension.

(3) Inflamed omental hernia with peritonitis may produce symptoms that some might describe as "strangulated omental hernia." The following case is an instance published in the

[Medical Times and Gazette, *April 15, 1882.*]

Case of Inflamed Omental Inguinal Hernia—Peritonitis—Herniotomy—Subsequent Vomiting, Constipation, and Distension—Recovery, with Radical Cure of the Hernia.

Daniel K——, aged fifteen, admitted September 8, 1880. Two years previously this boy was hit in the left groin by a cricket-ball, about six months after which there appeared a hernia, which he easily reduced two or three times a day. For a month previous to admission the hernia had been irreducible, but without inconvenience until September 5, since when

he had suffered pain and tenderness in the lower part of the abdomen, the bowels being open each day. He was attended by Mr. Richard Williams, who, finding that he was getting worse and showing evidence of partial peritonitis, transferred him to Mr. Parker's care at the Infirmary. Shortly after admission he lay on his side, with his knees and hips bent; his breathing shallow, accompanied by fretful sounds, indicative of pain. The belly was flat, concave, tender below, and somewhat painful. In the left scrotum was a swelling above the testicle, oval, smooth, and doughy, slightly elastic, not tympanitic, and not feeling as if holding fluid, without impulse on coughing, and itself quite devoid of pain or tenderness. The swelling was about the size of a small walnut, and nothing could be made out as to whether or not it had a neck passing up the inguinal canal. Ether was given, and herniotomy was performed the same night, two or three hours after his arrival, under the spray and all the proper precautions of Lister's carbolic acid method. The sac was cut into at once, and found filled with omentum, and a drachm or two of turbid sanious serum. There was no tightness of the neck or appearance of constriction in the omentum lying there, but this membrane was brightly and finely injected in patches, on which were smaller patches of greenish-yellow lymph. The omentum was tied in several places with catgut, cut off below the ligatures, and the stalk passed up into the abdomen. The thickened sac was left undisturbed. A catgut drain and catgut sutures were used; carbolised gauze dressings were applied, and changed on the second and fifth days. Rapid healing of the wound occurred in a few days, by first intention, except the site of the drain, which granulated and closed in a few more. Just before operation the temperature was 103°, and the pulse fine and weak, though its number is not recorded. After operation one-sixth of a grain of sulphate of morphia was given subcutaneously, and a hot bottle applied to the feet.

On the *second day* the abdominal tenderness was gone. The temperature 100° and the pulse about 120 at mid-day. He vomited green fluid and was thirsty. The tongue was rough and furred yellow, and ice was given to suck. Evening temperature 99°, pulse 128, and respirations 30 per minute. Still slight vomiting and thirst, but no tenderness. Sulphate of morphia subcutaneously, one-third of a grain at 1 p.m., and one-fourth of a grain at night.

Third Day.—1 p.m.: Temperature 101·5°; pulse 120. Morphia half a grain, as before. 5.30 p.m.: Temperature 100·2°; pulse 120. 8.45 p.m.: Temperature 102°; pulse 132. Morphia one-third of a grain.

Green liquid vomit at 1 p.m., and about once again in the previous twenty-four hours. At night, distension of the belly noticed, and slight delirium, but no tenderness, vomit, or sleep all afternoon.

Fourth Day.—At 1 p.m., pulse 120; a single vomit of yellow-brown fluid. Tongue thinly coated with brown fur. Half a grain of acetate of morphia (in the temporary absence of the sulphate) under the skin.

Fifth Day.—Noon: Belly a little fuller, but quite slack, and free from pain or tenderness. Slept soundly now and then for two hours or so at a time during the last two days, during which the delirium increased and then declined. Morphia one-third or one-fourth of a grain thrice in the night under the skin, and two or three ounces of brandy with water in the last twenty-four hours. Temperature 99°, pulse about 100. The patient complained of hunger, and was ordered a little beef-tea containing pea-flour, to be repeated if held, but discontinued if any vomiting occurred.

Sixth Day.—Distension a little greater, but no pain or tenderness, though all along he had kept his knees up more or less. At the visit, ℥ss. of tinct. opii in ℥ij. of water swallowed (but vomited at once), in addition to one-fourth of a grain of sulphate of morphia under the skin night and morning. Temperature morning 99°, evening 100°; pulse about 100.

Seventh Day.—Temperature 101°; pulse 120. Belly fuller and more tense, veins over it enlarged; face dusky. No peritoneal pain or tenderness, but deep discomfort apparent in the bowels. This was relieved at once, appreciably, on raising the foot of the bed on blocks, and much satisfaction expressed also at the application of a thin rag, wetted with cold water, to the belly, where it instantly steamed. At 11 a.m. one-fourth of a grain of morphia had been given under the skin. At 2 p.m. one-third of a grain was so given and to be repeated at night. The quantity of beef-tea, having been increased, was now cut down to isolated tea-spoonfuls, filtered, and alternated with tea, repeated only to suit the necessities of thirst. That evening he passed a costive stool and much wind, and had one-fourth of a grain of morphia under the skin later at night.

Eighth Day.—The belly smaller and slacker, and the pulse under 100. He had rested well all night, and altogether felt and was found better.

Twenty-eighth Day.—Up, and well in the main. After a continuance of a similar treatment, with a gradual disuse of opium, the employment of an occasional enema of hot water, followed by a resumption of more solid food, he had eventually improved. But his convalescence flagged at one

period, when it was ascertained that he had been for several days gorging himself between and at meal times. When he got up he was found to have a lateral spinal curve, so he was directed to lie down occasionally, and when up to stand at vertical arms' length, holding on to the top of the screen, several times a day. The diet was chiefly bread, potatoes, and butter at and after his discharge, which occurred about this time.

About three weeks later he had a relapse at home, with a return of all the symptoms, followed by the bursting of an abscess at the umbilical cicatrix. He was attended by Mr. Williams, and made another good recovery.

On February 24, 1882, there was no trace of a hernia, and not the slightest impulse on coughing, with a very faint cicatrix at the site of operation.

Remarks.—The notion of strangulated omental hernia, and the deliberate appearance of symptoms after its ligature, might appear to have in this case almost a demonstrated confirmation. The question is interesting in many ways, and not unworthy of discussion, though here there is neither place nor fitness for that. Out of deference to the historical importance of this traditional conception, however, one may be permitted to record its utter repudiation. The symptoms after operation were of course due to the functional lameness of the bowel, the result of peritonitis, though disappearing less quickly than it.

It may be noticed that no constipation existed until after the operation, and the relief of the acute peritoneal tenderness, of which however it was apparently a consequence. Obstruction from arrested muscular function of the bowel, as in peritonitis, may also occur in malignant disease of the peritoneum; or, as I sometimes call it, "malignant peritonitis." Three years ago I attended for a few weeks in the Infirmary a case in which one of my colleagues had recently performed colotomy for malignant stricture of the rectum. The patient was a woman, and became obstinately constipated with subsequent flatulent distension of the intestines. Accumulation increased until food had to be much reduced, but no stool could be procured.

Puncture was repeatedly done, with temporary relief, but the patient soon died, exhausted and emaciated, without vomiting or griping. At the *post-mortem* no mechanical obstruction was found, but the peritoneum was everywhere studded with small malignant nodules, the intestines being dilated and containing a large amount of liquid fæces, which could have easily escaped had the bowel been able to perform its peristaltic tubular functions.

Peritonitis, then, is an efficient source of functional obstruction of the bowel, and is characterised by the features common to all obstructions, with the addition of superficial abdominal tenderness. Constipation, if absent at first and slow to come on, may eventually be present. Vomiting, as in hernial obstruction, seems to depend upon ingesta inappropriately administered, though it may at any time come on as a sympathetic act. The combination of peritonitis with reducible hernia, though not frequent, requires to be borne in mind as a possibility requiring discrimination and the avoidance of unnecessary and fruitless herniotomy. There is a form of peritonitis set up by injury without wound, apparently a state of bruise, in which great tenderness and vomiting are present, and in which constipation may last several days, with paralysis of the bladder and retention of urine as well as of fæces. It is enough to hint at the malady and the requisite circumstances, to prevent its being mistaken for strangulation in the event of a co-existing hernia.

The occurrence of "fæcal fistula" is a complication that may supervene on strangulation of a hernia. Perforation of intestine is essential to the production of fæcal fistula, and the aperture results from ulceration, with or without accompanying gangrene. Sir Astley Cooper ("Hernia," 2nd folio edition, 1827, p. 45) relates the case of a woman, aged 60, in whom a strangulated femoral hernia suppurated, with issue of some inches of gangrenous bowel through two separate openings, resulting from sloughing of the integuments. A fæcal fistula existed three months, and afterwards spontaneously closed. The whole case is an instance of spontaneous recovery from unreduced strangulated hernia, a rare event, seldom to be expected and never to be deliberately awaited. But in some other kinds of intestinal occlusion, as for instance intussusception, volvulus, &c., the only chance of the patient's recovery lies in the occurrence of spontaneous re-union of the proximal and distal portions of living bowel, with passage of the intervening sphacelus along the bowel and its issue *per anum*. The duty of the practitioner is, in such cases, to do his utmost to keep the patient alive during the accomplishment of this momentous process, by withholding food and effectually administering morphia. In this way, and in this way alone, can it be hoped to assist the natural process, which generally tends to a cure, and in which it is so important not to permit the usual intestinal functions, for fear of the giving way of the bowel and the consequent intra-peritoneal extravasation of decomposing agents and products. In addition the protective

aid of the narcotic, of warmth, and of rest in every form, is required to the utmost, to guard against death from collapse and other nervous symptoms that may result from unrestrained peristalsis, or distension alone, even if septicæmia have been averted by preventing intra-peritoneal perforation.

One case of fæcal fistula has already been here related (see page 284). Another may be added.

[Medical Times and Gazette, *February 18, 1882.*]

Case of Strangulated Umbilical Hernia—Herniotomy—Fæcal Fistula—Second Herniotomy, with Closure of the Fistula.

Jane O'H——, aged thirty-eight, housewife, admitted June 14, 1879. The patient is very short, very stout, very florid, but of exceptionally healthy appearance; and had usually been quite well, except occasional biliousness. Three years previously she had been struck in the abdomen by a butting goat, followed shortly by umbilical pain and the perception of a swelling. She was laid up a fortnight at home and six weeks in hospital, and has had a hernia ever since. During the past three weeks the hernia had been protruding and irreducible. The bowels had been open every other day, though she had had nausea and vomiting all this period. The last stool was on the morning of admission, vomiting occurring throughout the day, and by evening becoming stercoraceous, on which Mr. Parker was sent for.

Under ether, on June 14, 1879, herniotomy was performed under carbolic acid spray, a swelling about the size of an orange being cut into. The sac was adherent to the skin in some parts, and filled with omentum, which completely surrounded the neck, and hid in its midst a loop of small intestine, congested, and at one part abraded. This was with difficulty returned, and the omentum was tied with many ligatures of carbolised silk. Sutures, drain, and Lister's gauze dressing were used, and the patient never had a bad symptom, the diet being carefully restricted, and opium administered as required. The bowels were moved on the third day, and at convenient intervals afterwards. A piece of skin, adherent to the sac, and itself cicatricial, sloughed early, and suppuration occurred, with the establishment of sinuses, during which boracic ointment and boracic lint were used, frequently changed. The patient was up and

about in less than two weeks after the operation, and constantly afterwards. About six weeks after the operation, some of the skin and the slough were removed under ether, and ten days later she went home. More or less discharge continued, and it gradually transpired that she had a fæcal fistula. This interfered with the retention of the hernia by a truss, and the two conditions combined were a source of much discomfort and inconvenience.

On June 11, 1880, a year after the strangulation, she was again placed under ether, and the sac opened. A coil of small intestine, adherent at the site of the fæcal fistula, was detached, and the aperture closed by inverting it and applying a glover's suture of catgut to the approximated peritoneal edges of the bowel. The neck of the sac was closed with carbolised silkworm gut, and the integuments were held with relaxation sutures quilled over rubber tubing, besides ordinary edge sutures. Rapid healing took place, and the patient was well in six weeks, a single sinus remaining. A truss, consisting of a plate of sheet zinc enclosed in a binder of swan's-down calico, was worn at once. Four months after the operation one of the sutures of silkworm-gut escaped, with the knot and loop unaltered, as if it had been wire. The hernia still protruded when unsupported, but was rendered quite comfortable, and kept reduced by the truss above referred to.

In this case the fistula remained open for nearly a year, and might have been open still if it had not been closed by operation, whereas in the previous case spontaneous closure resulted in less than three weeks. In the first case the fistula produced no inconvenience, while in the second it was much less so than in others I have seen. I attribute this greatly, if not entirely, to the careful selection of a diet that produces little or no fæces. If patients be allowed to fill themselves with the materials of ordinary meals they will almost inevitably harbour a quantity of fæces, that more easily escape by the fistula they thus dilate, and tend to prevent from spontaneously closing, to say nothing of the filth and cutaneous excoriation

around the aperture. But neither was there in these cases any "collapse" or anything resembling it, although "perforation" must have occurred before a fæcal fistula was possible. It is often said that perforation of intestine is speedily followed by collapse, which is shortly followed by death. So it is, sometimes, but why not always? If the collapse is the consequence of perforation *per se*, it ought never to be absent. Which are the cases, then, attended by collapse, and in which do we not find that catastrophe? It is pretty plain that collapse is usually the result of those intestinal perforations only in which the contents of the bowel are largely admitted into the peritoneal sac. The effect is a rapid and appalling sapræmia with its attendant and necessary collapse. The collapse is due to rapid and excessive pollution of the blood, brought about by direct absorption or drainage from the peritoneum. But collapse never appears when perforation occurs so as to let the fæcal fluids escape elsewhere. If they issue from the sac of a hernia, or if they set up a fœtid gaseous abscess between the tissues, even if death occurs eventually, it is never preceded by collapse. It is not therefore the actual perforation that is so much to be dreaded, as the wholesale admission into the circulating fluids of the myriads of poisonous organisms that swarm so near to it in the intestinal canal, but so perfectly separated from the vital fluid when no direct receptive communication is established between them. But when largely spilt into the peritoneum, fæces at once establish in it a vast putrid lake, drained by innumerable outlets into the lymphatic,

and thence into the general circulation. Hence the collapse is that of putrid absorption, and corresponds to that produced under various circumstances, with or without fæces, when putrid fluid accumulates in the peritoneum. Cases in point are met where impaction of some concretion in the vermiform appendix is followed by ulceration and perforation, with or without gangrene, of that, in the main, most inconvenient diverticulum. Everybody knows of these cases, the offending body being a cherry stone, an intestinal calculus, or even a small lump of fæces. When perforation takes place, as it unfortunately generally does, into the peritoneum, the usual collapse and death result, with fæces and the rent discovered after death. Should it, however, occur on the extra-peritoneal side, or should it occur gradually enough to be accompanied by a protective wall of even intra-peritoneal lymph, the effect is a putrid abscess, with a fæcal fistula, followed in some cases by recovery. I have a patient now living, in whom I treated such an abscess of the right loin and groin three and a-half years ago. A fæcal fistula resulted in both situations, and a calculus was removed through the wound in the loin, from the immediate vicinity of the cæcum. It was about the size and shape of a large horse bean, on analysis was found free from urinary salts, and almost certainly may be attributed to the source I am now referring to. The two fistulæ have both long ceased to be fæcal, and the sinus in the loin healed about three years after it formed. That in the groin still discharges a little more or less turbid serum, while the patient, a man aged

forty-four, is in good health and strength, and able to exert himself in every way. No "collapse" ever shewed itself in him, though he had distinct "perforation of the intestine."

Although the case of "gangrene" related by Sir Astley Cooper terminated in spontaneous recovery, such a termination may easily fail to occur. It is generally supposed, with every reason, that the prevention of death is due, under similar spontaneous circumstances, to the protective effect of intra-peritoneal adhesions, shutting off the fæces and other putrid materials from the peritoneal cavity. This prevention may fail to occur in some cases where gangrenous intestine is left in a hernial sac, and is almost sure to occur if intestine become suddenly gangrenous while still in contact with adjacent healthy peritoneum, in the absence of a protective layer of lymph. Hence the very proper practice, resulting from a correct appreciation of the antiseptic principle, by which gangrenous bowel discovered in a hernia is now assiduously cut away, to prevent progressive contamination of the neighbouring or adjacent peritoneum. Tissues that are dead do not under all circumstances putrefy, but when the putrefactive organisms are not successfully shut out from a dead tissue, putrefaction inevitably occurs. Non-putrefactive gangrene of tissues previously perfectly disinfected is a phenomenon now familiar in surgery, and may be witnessed in external wounds of tissues that have been maintained perfectly aseptic. In fact small areas of commencing gangrene, without wound, may be preserved free from putrefaction and consequent spread, and

then may undergo resolution or a dry exfoliation by scabbing, even when disinfection has not been undertaken until after the gangrene has commenced. (See Mr. Lister's *Papers*, and Watson Cheyne, on *Antiseptic Surgery*.) But in the bowel, by the time gangrene is discovered, putrefaction has already had a chance, and is generally well advanced, owing to the invariable presence of the organisms which set up the process, if not of the very process itself, in the intestinal contents. Death in gangrene of the bowel is also due to blood poisoning, which, however gradual, is eventually generally characterised by collapse, owing to the continuous absorption of putrid materials. Even when direct escape of fæces into the peritoneum occurs, its gradual issue has to be inferred rather than proved, owing to subsequent absorption. Hence the frequent absence of all intra-peritoneal fluid, even where there is evidence of putrid peritonitis, owing to the great draining capacity of that membrane. Some years ago I failed to account for death in several consecutive cases of herniotomy which I performed, and in all of which the gut was gangrenous. The patients were young, middle-aged, and old; the obstruction was relieved in each case; and the gangrenous bowel was opened and left lying in the sac; yet the patients all quietly died in a few days, as if nothing had been done. They died from sapræmia or direct pollution of the blood. (See Ogston, on *Micrococcus Poisoning*, Journal of Anatomy and Physiology, July and October 1882.) The following case shews the modern treatment of gangrene in strangulated hernia, affecting

the bowel, the omentum, and the sac. It failed owing to the existence of intra-peritoneal gangrene, in addition to that removed.

[Medical Times and Gazette, *June 3, 1882.*]

Case of Strangulated Inguinal Hernia—Gangrene—Excision of Omentum, Mesentery, and Gut, with Re-union—Death.

J. G———, aged sixty, a hard and previously healthy brickmaker, admitted March 3, 1882, had had a right scrotal hernia for years, always reducible until February 28, on which day he had his last stool, and had passed no wind since. On the 29th Dr. Parry was called in, and found him vomiting, and tried to get him to go at once to hospital for the relief of his strangulated hernia; but the patient took a course of his own, and tried an unstinted assortment of purgatives for two more days, during which vomiting persisted with frequency. After admission he lay on his left side retching, and sometimes vomiting fœtid intestinal fluid.

The breath was cool and sweetish in odour, in addition to the fœtor ejaculated; the pulse was under 110, and soft, with moderate volume; the hands were cool and clammy, but the covered parts were not; and his grisly, unshaven, somewhat pinched facial appearance, seen on a ground of healthy ruddiness, and associated with some mental vigour, were thought to suggest the dilapidation of fatigue rather than the misery of collapse. The right scrotum was distended, hard, and red; the swelling extended up the inguinal canal, and was free from impulse on coughing. No taxis was, of course, undertaken, but the parts were shaved, cleansed with ether, and carbolised. Herniotomy was done over the outer side of the inguinal canal, under ether and Lister's spray and complete carbolic acid method. On reaching the sac fœtid bloody fluid issued, and was quickly evacuated, with black fœtid clots, the fixed internal parts being freely swabbed with hot carbolic lotion. A mass of omentum, partly gangrenous (grey), and all covered with the fœtid bloody fluid, was tied with catgut above contact with gangrenous parts, cut below the ligatures, the stump well washed with lotion, and reduced. A coil of gangrenous small intestine (black and in part shreddy and perforated), very fœtid, was washed, enveloped in a carbolised rag, pulled down with more gut, and the healthy parts washed and kept under the spray. A piece of gut about six inches long was excised, with some attached mesentery, in cutting free of the gangrenous portion. Forceps and fingers were used to clamp while the vessels were

tied. Subsequently about six inches more of gut, purple and untrustworthy looking, were removed, and the stump clamped as before and its vessels tied. The two ends of gut were then inverted, and stitched together with catgut all round by interrupted and continuous suture. The gap in the mesentery was also closed with catgut sutures, chiefly continuous, and all was again washed and then returned into the abdomen. The sac being fœtid, green and black, in the scrotum, was stripped and cut away, being tightly and doubly tied at the internal ring, where its vitality was preserved. The incision was then extended down the scrotum to the lowest limit occupied by the sac (which proved to be acquired, and above the testicle and its coverings). Strong chloride of zinc solution was soaked into the tissues now exposed, and into the stump of peritoneal sac, and the wound filled with gauze steeped in cream of salicylic acid, suspended in carbolised glycerine, packed over with wet and dry gauze, and covered in a gauze dressing, including a perineal pad, according to Mr. Lister's excellent plan.

The patient began to look intelligent before leaving the table, and hot bottles were put to him in bed. He was not very long in becoming comfortably warm, and a satisfactory night was passed. On the second day the dressings were changed, and dry iodoform was rubbed throughout the wound, which had already imparted a slight fœtor to the lining plug. The tissues where putrefaction had existed were black, presumably from combination with the zinc; and very dry, owing apparently to the glycerine. A fresh plug, with salicylic cream, was laid in over the iodoform sprinkling, and the dressing renewed as before.

The patient had not vomited a single time since the operation; the tongue was now moist, and nearly clean; the belly was slack, and free from tenderness. The pulse was 120, and the thirst great. A little morphia was given subcutaneously a few hours after his return to bed, but nothing was administered by the mouth. To allay his thirst he had only been permitted to suck a wet towel, but was now allowed an occasional tea-spoonful of water. He was quite himself, and wanted a pint of ale or water to drink, complaining greatly of thirst. He lay talking easily, folding his arms, and looking well; moreover, he paid an earnest tribute to Dr. Parry and to the anxious efforts that gentleman had made on behalf of earlier operation, assuming to himself the whole responsibility of the disastrous purging to which he had submitted himself. He began, however, to get low about twenty-four hours after the operation, and sank quietly after about thirty-six hours.

At the post-mortem, the reunited parts were found secure, and the bowel-junction apparently water-tight, all adhering together and to the obliterated entrance of the sac by fibrinous lymph free from yellow or green colour. The intestinal coils above the site of the hernia lightly adhered by a thin layer of fibrinous lymph, and were injected a little along intervals between the adherent surfaces. The peritoneum was free from fluid, and the lymph exuded showed no trace of puriform admixture. The rest of the bowel lay contracted and almost empty behind. No further damage was noticed now, but subsequently came to light on re-examination of the foot or two of intestine adjacent to the seat of operation which was preserved.

Remarks.—The death is naturally attributed to septicæmia, of which the commencement was suspected before operation. The satisfactory condition on the following day led to the supposition that any incipient septicæmia had been arrested, or had perhaps not even taken place. So, when death after all occurred, the source of a fresh dose of septic poison was looked for at the post-mortem, but not unmistakably found. The wound, though not yet totally free from decomposition, had almost completely yielded to disinfection, and was thought to be no longer a source of danger; while re-infection by way of the peritoneum seemed at first quite unproved. Then again, the original dose of poison before operation, if any at all, seemed to have been exhausted in the face of such decided temporary improvement. Yet the intra-peritoneal lymph, though scanty and free from puriform change, seemed to tell a tale. Some days later, on re-examining the portions removed subsequent to death, after they had lain in spirit, commencing gangrene was distinctly found in patches and without properly established lines of demarcation. In some places the mucous coat was involved as well as the serous. From these patches there must have been abundant source of continuous intra-peritoneal absorption of putrid fluid. The condition of the patient was truly desperate—more so than could be recognised, and much more so than the symptoms suggested. He was very nearly rescued, and that by a method of treatment which is one of the irresistible developments of the antiseptic principle.

The effect, then, of unalleviated gangrene of the bowel is "perforation," and this may result, as in ulceration alone, in extra-peritoneal effusion of fæces with abscess, or in intra-

peritoneal effusion. The intra-peritoneal effusion is, if copious, always promptly followed by collapse; while if slight and gradual the collapse may be so late and so gradual as to be merged in the signs of "death by exhaustion.

Among the sequelæ of strangulation, when successfully relieved by reduction, especially with herniotomy, it may be as well to mention the return or persistence of the hernial protrusion. Not that this has inevitably followed, for an occasional result of herniotomy, from time to time, has been a total radical cure as welcome as it was unexpected and unsought. Of this more in detail later on. Given, then, a chronic hernia, strangulation and even successful herniotomy may be repeated when the necessary circumstances occur. The following instance is peculiar as illustrating an old femoral hernia strangulated and relieved, followed by inguinal hernia on the same side, also strangulated and relieved, the two sacs communicating with each other. If it serve no other purpose, the case cannot fail to impress upon surgeons the advisability of not being content with merely saving the patient's life in the relief of strangulation; but of effecting, if possible, a total cure of the hernia, and thus averting, for ever, a repetition of the former danger.

[Medical Times and Gazette, *March 4, 1881.*]

Strangulated Old Femoral Hernia—Successful Herniotomy—Strangulated Inguinal Hernia on same side two years later — Communication between this and former Sac—Successful Herniotomy again.

Mrs. D., aged seventy-two, had had a right femoral hernia for twenty years, and no truss. The hernia was generally protruding, but not incon-

venient until about July 1, 1874, when constipation and vomiting attracted her attention. She took two doses of castor oil between that and the 7th, when herniotomy was performed, immediately after incomplete reduction by taxis under chloroform. The sac was opened, and a small piece of gut, reddened and lightly adhering all round, reduced after nicking the neck, which was very tight. The operation was peformed under a spray of carbolic lotion (one in eighty), carbolised waxed silk sutures were used, carbolised gause dressings were applied, and a simple recovery took place. The first stool passed on the fourth day. She wore a truss after six weeks, and for a time the hernia failed to return in the erect posture, even on the removal of the truss. A year later she became very stout and less active than before. About two years after the operation an abscess formed in the hernial region, burst, and healed up; and a hernia appeared above the old site. This always went back when she lay, until November 17, 1876, when it remained down and pain accompanied it. The hernia was clearly inguinal, tympanitic all over, irreducible, and evidently very thinly covered. Gas was drawn off by puncture with an aspirator-needle the size of a No. 2 catheter. The hernia collapsed, but could not be reduced. Morphia was given under the skin, and temporary relief produced. Vomiting and pain, however, occurred on the 19th, and the hernia had filled again. Puncture was repeated, and liquid contents of bowel issued. Herniotomy was then at once performed, and the sac opened at the first incision, being adherent to the skin. The gut, being discoloured with green-brown intestinal matter at the site of puncture, was now fairly punctured with the knife, emptied, tied up with catgut, and washed. The stricture was divided with a blunt-pointed knife, and the bowel reduced (small intestine). The sac led also into that of the old femoral hernia, and the finger was passed into the abdomen by the inguinal canal and by the femoral. A thick catgut suture was put into the inguinal neck, and another into the deep part of the wound, of which the rest was left open. No dressings were used, except a piece of American cloth with the waterproof side laid on the skin. The diet was carefully restricted, and morphia given in small quanties subcutaneously. The wound was kept open by the finger. Barley-water and tea alone were given for four days, then a little gruel was added, and two days later a little buiscuit. The usual diet was resumed about the twentieth day, when she got up. The first stool passed on the seventh day; a week later they became daily, and the recovery was altogether uncomplicated. She died about four years later, at the age of seventy-eight, of some other complaint.

CHAPTER XI.

HERNIOTOMY, FINISHED BY RADICAL CURE.

There is no remediable accident which more certainly endangers life than strangulation of a hernia, and none is, therefore, more dependent upon the prompt resources of the surgical art. No patients more willingly, as a rule, abandon themselves to the operative will of surgeons, than those well under the influence of this untoward condition; and no department of operative surgery shews a greater variety of anatomical detail, or a more changing series of unexpected incidents. When success was less frequent than it has become, it was at least conspicuous; it is now the rule to which exceptions are increasingly few. In advantage to the patient and in interest to the surgeon, herniotomy for the relief of strangulation is a source of extensive satisfaction. The improved control over adverse conditions, the successful introduction of the catgut ligature and the spread of the antiseptic principle generally; the substitution of deliberate promptitude and even alacrity for the reluctance of a *dernier ressort*, have brought about the further achievement of sound radical cures. And this not merely in persons already endangered by strangulation, and thus preserved from repetition of the danger; but also as undertaken beforehand, "in cold blood," in many from whom that danger is thus permanently averted.

Radical cure, however, is not confined to hernia submitted to operation for the purpose. The effect of a truss is in some instances the cessation of all protrusion of the hernia, and total immnnity from all evidence of liability, as tested by lapse of many years, and the repeated resumption of attitudes, movements and exertions, favouring a re-appearance of rupture.

After herniotomy, performed without the intention or even hope of a radical cure, that welcome event sometimes occurs, owing, evidently to the existence of circumstances favouring the occlusion of the protruded sac by coalescence of the inner surfaces lying in contact with each other. These favouring circumstances would appear to be a state of adhesive inflammation or granulation of the serous lining, with an undisturbed maintenance of contact, during a time and over a surface convenient for cicatrization. The records of herniotomy published in the medical journals furnish examples of effectual cures that have happened thus, and one of the cases related above apparently also illustrates the same principle (see page 298).

It is probably correct also to attribute to similar agency the occurrence of radical cure in the following case, after the employment of a faulty method, tending to fail in some, perhaps most, instances, and so being undeserving of reliance. As an instance of failure, under conditions closely resembling those in which it succeeded, a case is also given.

[Medical Times and Gazette, *May 20, 1882.*]

Prophylactic Herniotomy for Radical Cure—Imperfect Method, but Complete Cure.

Robert C., aged twenty-eight, a joiner, admitted June, 1879. A fluid collection, not unlike a hydrocele of the cord, was tapped on admission and once previously, but not followed by disappearance of all the swelling on either occasion. What remained was soft and quite irreducible up the inguinal canal, though not having an unequivocal neck or other local characters clearly suggestive of a hernia. But, on the grounds of probability and exclusion, it was nevertheless presumed to be an omental hernia with a narrow pedicle, and its attempted cure by operation was decided on, and performed under Lister's arrangements on June 20, 1879. The diagnosis was verified on opening the sac, where lay much adherent omentum, of which the pedicle was tied in several places with stout carbolised silk, and reduced after severing and removing what lay beyond. The sac was detached, folded up, and stitched in the inguinal canal, and the wound closed by sutures. To avoid further detail, it may be added that eventually sound healing occurred, though not until after suppuration up the cord and the formation of an acute abscess in the iliac fossa. The patient never wore a truss after, and never experienced or manifested any further hernial protrusion. More than a year later he had on the same side a hydrocele, which was tapped and injected with strong iodine liniment, resulting in the usual acute inflammation, effusion, and re-absorption. On December 1, 1881, he was well and strong, without a sign of hernial protrusion or appearance of liability.

Prophylactic Herniotomy for Radical Cure—Imperfect Method and only Imperfect Result.

John M., aged twenty-four ; had a left inguinal hernia at the age of two, wore a truss, and eventually dispensed with it. In 1870 the hernia came down, and had existed ever since, though always reducible until a week before his admission on October 1, 1880. Ever since the hernia became irreducible he had had pain and general local discomfort, but no interference with the functions of the bowel. Rest in bed was followed by speedy and complete relief of all discomfort, but the hernia remained as a scrotal and inguinal tumour, and was known to have resisted repeated efforts at taxis before admission. On October 8, herniotomy was performed

somewhat as in the preceding case. The omental protrusion, being too large for reduction without widening the neck of the sac, was tied in several places with stout carbolised catgut, and the stump reduced after cutting off the portion beyond. The sac was folded up, tied, and also reduced. Catgut drain was used, sutures put in, and carbolised gauze dressings applied, with Lister's precautions. But the same unsatisfactory incidents in the after-treatment occurred as in the previous case—namely, retention of discharge, extra inflammation, suppuration, and decomposition, with iliac abscess; though in neither case was it made out at the time in what way the probable error had been made. In this case, too, healing eventually resulted, and for a time he went about and worked as a baker without return of the hernia. But early in May, 1881, the rupture reappeared, and he allowed it to protrude for a fortnight before reporting the fact. A truss was applied, and has acted well. He was seen well in March, 1882, wearing the truss, and failing to show a hernia when standing and coughing without it.

Remarks.—The former case was from the first considered unsatisfactory, in spite of the perfectly successful result, on account of the faulty progress of the wound, and the consequent hazard to the patient, though no dangerous symptoms were encountered. The latter case was still more so, and further proved, besides, that no uniform confidence could be placed in a mere tucking-in and sewing of the protruded sac as a means of occlusion. The two cases, however, have both been really acceptable to the patients, and are of this value, that they represent one of the steps by which the operation of radical herniotomy has been so vastly improved in utility and safety.

The failure of sutures to effect the radical closure of a hernial sac has also been shewn in the umbilical case recorded above.

There would be no occasion here to say anything about the method of procedure in herniotomy, were it not for the finishing details involved in the radical cure. There is only one method of radical cure applicable to all herniæ alike, femoral, umbilical and inguinal, reducible and irreducible, and that is by HERNIOTOMY WITH FIRM OCCLUSION OF THE SAC. There is only one method by which the sac can be confidently

occluded, in a majority of cases, that is little short of totality, and that is by LIGATURE OF THE PERITONEAL LINING, with or without other coverings, at the offset of the former from the main peritoneal pouch, by means of antiseptic catgut, or other similarly protected animal fibre, as in the ligation of blood-vessels. It is unnecessary to discuss other methods, however successful, since no other is suited to all kinds of hernia, and since this method is more successful for all than any others are for some. Sir Astley Cooper thought of this plan, and would have done it, if he had known any means of tying the tissues, without the process being spoiled by sloughing at the point of ligature. Having failed with suture he predicted a similar issue for ligature not without reason.

The process is most simple in femoral hernia. Herniotomy is done, as it has been done in times past, in most of the manipulative details, and the sac is of course opened nearly always. In case of strangulation this is advisable, in order to properly inspect, and more safely reduce, the bowel. In case of adhesion whether of bowel or of omentum, it is necessary as a prelude to reduction. If the bowel be wounded, it is to be sewn up, or a puncture tied, with catgut; if gangrenous, the sloughs are to be excised, the bleeding vessels tied with catgut, and the severed tube and mesentery pieced with catgut sutures, by joining the serous surfaces and inverting the mucous and cut edges. Omentum should be reduced, either entirely, or after ligature and excision; and there should be no avoidable chance of subsequent hæmorrhage permitted. It is a matter

of perfect indifference whether healthy omentum be reduced whole or after excision, provided it be aseptic, and provided none of its vessels, if wounded, be left untied. The ligature of catgut may be single or multiple, according to the thickness of the stalk ; but there must be no mistake about the tightness and security of the tying. After the reduction of all contents, in a perfectly aseptic condition, the sac must be tied at the point where it joins the peritoneal main pouch. In cases operated on for the prophylactic attainment of radical cure, before the occurrence of strangulation, or after the successful reduction of strangulated bowel or incarcerated contents, this occlusive ligature of the neck of the sac may sometimes be done without opening it at all. This is not a matter of the slightest importance and is only possible in a minority of instances, but it is simply a fact that it may be occasionally practised. It is well at this point to thoroughly understand what is the purpose and effect of ligature, in order that the surgeon may not drift into error or failure in exceptional cases. It is just as easy to strip up and tie the entire hernial protrusion, peritoneal lining and all coverings together, in many cases, as it is impossible to effectually do this in occasional large ruptures. The essential detail is the *ligature of the peritoneal lining*, which in even enormous herniæ is not a very bulky structure after being stripped. I have assisted at prophylactic herniotomy in one femoral hernia as large as a child's head, with a neck as wide as a man's wrist, and with coverings a quarter of an inch thick. The ligature of this mass would have required the string of a

bass or perhaps of a double-bass fiddle for its effectual closure by tying, whereas by stripping the peritoneal lining and tying that alone as high up as possible, the outlet of the peritoneum was safely and completely shut with the thickest ordinary surgical catgut, and the other structures left to fall together at leisure. This ligature of the peritoneal lining stripped up from the other coverings of the sac is not only essential in all large herniæ, but renders the radical cure feasible and very certain in some (probably most) umbilical cases. By stripping up the peritoneal layer until the *inside of the abdominal wall is* reached, the very root of the hernia is annulled. In average femoral cases the hernia is so small, and the crural aperture is so narrow, that general ligature of the whole concern is simple and effectual. But large ruptures with wide necks are the test cases, those in which the cure is most required, and in which it most easily fails. The "principle" of cure is truly "ligature of the neck of the sac," and in small femoral cases this is all very well when done by roughly including the whole protrusion. But the detailed stripping of the serous lining and its separate ligation flush with its offset from the peritoneal pouch is a point in practice essential to the attainment of the "principle" concerned, and one particularly valuable, and probably all-essential in umbilical cases. These herniæ, whatever their size, are thus really amenable to the same operation of ligature and occlusion, after the reduction of their contents, that is so easily applicable to the femoral variety.

Precisely the same procedure is required for inguinal hernia when cut either for the relief of strangulation or for the prophylactic radical cure. These herniæ are the most numerous, and most various; but their curative treatment is undoubtedly complicated by the "pillars of the ring." Not that the pillars of the ring are in themselves any real obstacle in the generality of cases; but on account of the traditional prejudices with which these pillars are associated. Earlier operations for the purpose of radical cure having been suggested for inguinal hernia alone, and having had for their object the occlusion of the sac by and with the attempted approximation of the pillars of the ring, these structures have still a hold upon the imagination of surgeons, and are a source of, I think, unnecessary complication, and probably of error. Not that I presume to deny that widely-gaping pillars of the external ring may favour the re-descent of an inguinal hernia, how well soever the sac may have been tied at the internal ring. But the majority of cases have not widely gaping pillars of the ring, and a good many inguinal herniæ that come to operation, whether previously strangulated or not, have the pillars just as tightly braced up and as closely apposed after reduction, as can be required. In inguinal hernia occupying the non-congenital or so-called "acquired" sac, the whole sac with its coverings should be, if small, stripped up along the inguinal canal, pulled well down, and tightly tied high up, with catgut once, twice, or even thrice if the surgeon choose, after due attention to the proper

disposal and reduction of contents as suggested under the head of femoral cases. The sac is cut below the ligature, and is found to slip well away into the iliac fossa. If the hernia be large, its neck be wide and its covering bulky, the peritoneal lining alone is pulled down, tied, and reduced. The wound is treated according to the taste of the surgeon, with due regard to the attainment of aseptic progress and results. A complete gauze dressing on Lister's plan, with sutures and drain may be chosen; or the wound may be left unsewn, well smeared with a suitable antiseptic, say eucalyptus petroleum ointment, and covered with a piece of gutta percha tissue, bound on with a folded draw-sheet. This dressing permits perfect aseptic healing by granulation, with constant immediate access for inspection; and is as safe and comfortable to the patient as it is convenient for the surgeon. It is time enough to interfere with the pillars of the ring if they be extremely lax or widely apart, or if, as now and then happens, the sac be backed by a piece of colon the protrusion of which necessitates ligature low down, below the bowel, and require forcible confinement within the abdomen. The attainment of cure under these circumstances I have not yet been able to witness, having assisted one of my hospital colleagues in one such case and having operated on one myself. Both however were fatal. In my case I had to sew up the pillars of the ring in order to keep the hernia reduced, but that is the only case in which I have done so. What is it that separates the pillars of the ring? Surely the hernia. If the hernial protrusion be removed the pillars of the

ring may fall together. But the very existence of a smooth serous tube as a funnel depending from one of the lowest corners of the peritoneum, gives ready admittance to bowel or omentum, under abdominal pressure, which need not be great to produce an almost irresistible separation of the pillars of the ring as soon as ever the hernia enters the inguinal canal, pretty much after the way in which the fœtal bag of membranes opens the *os uteri* during expulsion. Tie this serous sac at or above the internal ring, and the most violent expulsive efforts in struggling, vomiting, or coughing, are found to be most effectually abolished so far as the inguinal canal is concerned. I have noticed this in some of my operations upon inguinal cases. The patient has happened to struggle before the sac was exposed, and the hernia not only came down, widely separating the pillars of the ring, but required one person's entire attention to hold it back and prevent the extensive expulsion of intestine after the opening of the sac. Some of the operations happened to be continued during the struggle, but after the sac was tied and the hernia thus prevented from issuing through its neck, there was nothing to separate the pillars of the ring which were then pulled together by the expiratory muscular exertion. What I contend for is that in the majority of cases, in all but extreme cases, the absence of the hernial protrusion from between the pillars of the ring is all the subsequent treatment they require. But I am quite prepared to find, and to admit, that in selected cases the pillars should be sewn together in addition. In

my first inguinal case, treated thus by ligature, the sac was tied too low down, its neck was very wide, and a return of the hernia occurred. Perhaps there the pillars of the ring ought to have been sewn together. In all my cases, except the fatal one I have referred to, the pillars of the ring were left alone, and of them all have perfectly succeeded except the first. If the inguinal hernia be in a congenital sac, the latter should be divided at about the external ring, and then be stripped up from the spermatic cord to which it is attached, and tied separately at the internal ring. In cases of undescended or imperfectly descended testicle it may sometimes not be worth while to preserve the testicle, in which case the cord and the hernial sac may be tied together; but with a little perseverance and adequate patience I consider it generally *possible* to detach the hernial sac from the spermatic cord, when lying merely in front of the latter as usual. If the cord pass through the sac, like the tendon of the biceps passes through the synovial capsule of the shoulder, there can be no independent ligation of the sac. But this is a rare eventuality though I have seen it once. In one case of omental femoral hernia with a very narrow neck, I tied the sac and omental pedicle all together. A perfect radical cure has resulted, but not more perfect than in all the femoral cases in which the sac was tied alone. I do not intend to do this again, however, for although no harm has resulted, the better practice seems to me to be the avoidance, when possible, of all unnecessary bands and adhesions that might favour intra-peritoneal constriction of intestine.

In illustration of this principle are the following cases, five femoral, two umbilical, and seven inguinal.

[Medical Times and Gazette, *May 20, 1882.*]

Prophylactic Operation for Radical-Cure Treatment of Irreducible Femoral Hernia—Ligature of Neck of the Sac and Omental Pedicle together—Complete Cure.

Mary A., aged forty-five, a strong working-woman, having a right omental femoral hernia the size of a hen's egg. Herniotomy was performed on January 4, 1881, under all Lister's precautions; the sac opened, and a very narrow neck and omental pedicle found. These were both ligatured together outside the sac with carbolised catgut as high up as possible, and the parts below cut off. Catgut sutures and drain were put in, and gauze dressings applied. On the tenth day these were changed, and the knots of the sutures and the protruding ends of the drain found lying loose. A small amount of granulating surface healed in the next three days. No truss was worn, and after a few weeks' rest the patient went about as usual. On February 12, 1883, she was well, and free from hernial protrusion.

Incarcerated Omental Femoral Hernia—Ligature of Sac alone, after Reduction of Omentum by Taxis—Complete Cure.

Sarah R., aged fifty, admitted March 29, 1881: had had a small left femoral hernia two years, unsupported by a truss, but irreducible. For the two previous days the hernia had been down, no stool had passed, and vomiting had come on with pain. Wind had passed, however; and this fact, and the evident purely omental character of the protrusion, were duly appreciated, on her admision, by Mr. Meeson, the House-Surgeon, as excluding the likelihood of strangulation, though he sent for assistance on account of the somewhat equivocal symptoms, and at the same time refrained from taxis. The hernia was evidently omental, and apparently reducible. The belly was undistended, and the bowel symptoms slight, so under ether Mr. Parker reduced the hernia easily. Seeing, however, that at any time the incident might be repeated, with even intestinal accompaniments of severity or danger, herniotomy was at once decided upon for the purpose of radical cure. The empty sac was opened, separated, and then tied tightly and high up with carbolised catgut, being cut off beyond. Two or three dressings sufficed, with catgut drain and sutures, resulting in

speedy and simple healing, without further illness. The patient was in her usual health on December 1, 1881, but, being habitually bronchitic, was not robust; the hernia, however, showing no sign of existence or tendency to reappear, though she had been up and about without a truss within a month of the operation. She was still free from hernia on 10th February, 1883.

Three more femoral cases have been done recently. All are quite well, and so far free from hernia up to 15th February, 1883.

Woman, aged fifty-two, operation 26th June, 1882. Right femoral hernia (strangulated).

Woman, aged forty-two, operation 21st November, 1882. Right femoral hernia (strangulated).

Woman, aged sixty-four, operation 28th Dec., 1882. Right femoral hernia (strangulated).

[Medical Times and Gazette, *May 27, 1882.*]

Irreducible Omental Umbilical Hernia — Prophylactic Herniotomy — Excision of Omentum—Ligature of Sac alone—Complete Cure.

Catherine W., aged fifty-seven, having a hernia about the size of a hen's egg, being also a confirmed bronchitic, submitted to operation under ether on July 16, 1881. Adherent omental bands were severed, and tied with catgut, but the whole mass not proving reducible after some efforts, the pedicle was tied in several places with carbolised catgut, and the stump reduced after cutting off the mass beyond. The peritoneal lining of the sac was now stripped up to the innermost margin of the abdominal opening, and tightly tied with two thick ligatures as nearly flush with the inner surface of the abdominal wall as was possible, and the residue beyond the ligatures cut off. Some of the skin was removed, and the layer of subcutaneous fat closed over the stump of the sac by deep skin sutures quilled over rubber tubes, thus approximating the gaping skin edges, into which interrupted sutures were put. Lister's precautions, with due drainage and gauze dressings, were applied, and all proceeded safely by first intention and granulation without suppuration. On July 30 there remained only a few granulating points unhealed, with boracic ointment on

boracic lint for dressing. A plate of sheet zinc in a swan's-down calico binder was worn as a truss pending firm cicatrisation. She went home in August, healed. On October 15 she called and showed a depressed white cicatrix, firmly adhering to the deepest parts of the umbilicus, and perfectly resisting all intra-abdominal pressure. She has suffered more or less from bronchitis ever since, and on 23rd Feb., 1883, she was again seen. The umbilical cicatrix was now reduced to about the usual size, and in place of hernia or any trace of it, every time she coughed, the umbilicus was drawn in.

The seventh case was an irreducible umbilical hernia, of large size, containing bowel and omentum, protruding through two necks, one wide. The patient was a woman, aged forty-two, stout, and of good physique, introduced to me by Mr. J. Kellett Smith, of Liverpool, and operated upon, in private practice, 5th October, 1882, shortly after recovering from her third or fourth attack of severe obstruction, this time short of complete strangulation. The bowel was detached and its bleeding surface sewn with catgut. Much omentum was tied and cut off. After reduction the peritoneal lining of the sac was stripped and tied separately at the two necks (which were adjacent), and tied again singly round the necks thus tied, all three sets of ligatures being left on. The ligatures came away and the stump of the sac sloughed partly off, though a firm knob remained closing the outlet on the deep side of the abdominal wall. The patient made a simple recovery without a bad symptom, and the resulting cicatrix was dimpled down to the linea alba, as a proper umbilicus once more. She was up in three weeks, about the house in four, and out for a walk in five, and so far remains sound and free from hernia ; but this report is only four months after operation.

Congenital Inguinal Hernia in a boy—Radical Herniotomy, with Ligature of Sac—Imperfect Result.

Robert R., aged twelve, had a very large right scrotal hernia, over six inches long and four wide, of the congenital variety. On March 15, 1881, under ether and Lister's antiseptic precautions, the sac was separated from the cord and tied with catgut ; a small residue was left around the testis in an attempt to construct a closed tunica vaginalis, and the intervening portion removed. Catgut drainage and sutures and gauze dressings were used ; but suppuration and even decomposition were not prevented, though speedily allayed and perfectly controlled on removing all dressings, smearing on boracic ointment, and frequently squeezing out discharge. In

the operation the sac was inadvertently tied rather low in the inguinal canal instead of at the internal ring, but it was hoped, on recollecting this shortly after, that subsequent precautions might suffice to prevent a return of the hernia. But all control of the lad utterly failed, as he got up and danced and turned somersaults in bed, as soon as ever he could do so without pain to himself, whenever the nurse's back was turned. Notwithstanding that, the absence of hernia and the apparently successful cure existed up to six or eight weeks after operation. He was seen on December 1, 1881, however, with quite a moderate hernia, and was said by his mother to be an utterly wild and hopelessly unmanageable street-arab.

Inguinal Hernia—Ligature of Neck of Sac—Perfect Cure.

Patrick R., brother to the previous case, having a left inguinal hernia, was submitted to a similar operation on May 24, 1881. The incision in all these inguinal cases was made over the inguinal canal, rather than the scrotum, for easier access to the internal ring. On this occasion the ligature of catgut was tied high up, the sac below being stripped and removed. A similar but perfectly harmless course of the wound followed, and a totally successful result, without the faintest sign or threat of return, was maintained up to December 1, 1881, when he was last seen.

Inguinal Hernia—Ligature of Neck of Sac—Perfect Cure.

William Kelly, aged eight, submitted to operation on the right side, as in the latter case, for a scrotal hernia the size of a large hen's egg, on June 7, 1881. In the last two cases the boys were up and about considerably under a month, and no truss or mechanical precaution was attempted or appeared necessary, even on account of the cicatrix, after superficial healing was completed. He was last seen on December 1, 1881, free from hernia and from all evidence of likely return.

[Medical Times and Gazette, *June 3, 1882.*]

Strangulation of Old Inguinal Hernia—Symptoms totally Masked—Herniotomy—Radical Cure.

George S., aged forty-seven, had had a left inguinal hernia for about ten years, always reducible until April 16, 1882, when he thought he walked too far. However, he vomited his breakfast on his return at noon, and vomited or retched four other times the same day; being visited by Dr.

Hardman at Blackpool, who, failing to reduce the hernia, proscribed all food, and gave a hypodermic injection of morphia, repeated at night. The next day taxis again failed. The scrotum and inguinal canal were moderately distended by a hernia, devoid of resonance and expansible impulse on coughing; but the patient was free from pain, abdominal distension, vomiting or retching, and in fact from all symptoms except local tenderness and uneasiness, and a certainty that he had passed no wind, and could pass none, since the descent. Elevation of the pelvis and total abstention from food left the hernia still down, its size being about eight inches by four outside the skin.

On the third day (April 18) herniotomy was done by Mr. Parker, the patient being put by Dr. Hardman under chloroform, followed by a mixture of alcohol, ether, and chloroform. The sac was was cut into, and several ounces of bloody serum let out, the only other contents besides red fibrin being a coil of small intestine of light purple colour. From the feel of the sac previously it had been confidently supposed that there was omentum too. The neck had to be enlarged to permit the return of the gut, after which the sac was divided in the canal, a little below the internal ring, stripped up, and tightly tied above that ring with strong carbolised catgut. The peritoneal stump was pushed up, and the edges of the skin in the lower half of the wound were stitched with catgut to the edges of the peritoneal lining of the sac, which was left in its place in the scrotum; the skin opposite the inguinal canal was stitched to the other coverings of the sac that here alone remained, by which means the subcutaneous fat and all the exposed planes of connective tissues were shut up again.

The parts had been sponged from time to time with warm carbolic lotion. The only vessel divided had been twisted at both ends, and the gap thus left was allowed to fall together, a drain of folded gutta-percha tissue being laid between the sides of the cavity, leading out from the ligatured stump of peritoneum along the lower part of the wound. The drain and interior of the wound were kept smeared with a beautiful form of eucalyptus petroleum ointment used by Dr. Hardman, and made with chrisma instead of vaseline. A piece of gutta-percha tissue was laid over the wound and covered by a folded towel.

Morphia was given subcutaneously night and morning, and nothing except filtered oatmeal-and-water and weak brandy-and-water for four or five days. Everything went on perfectly. Wind passed the day after operation, and daily afterwards. The first stool passed on the eleventh day. No pus or anything resembling it formed in the wound, which began

to adhere, where apposed, in a few hours. A little bloody serum was conducted out by the drain during the first twenty-four hours, but none after, though it was retained for safety three days. On the exposed surface there gradually appeared, in succession to the "glaze," a formation of fibrin in patches of the cleanest white appearance, and totally devoid of yellow, green, or other puriform evidences. The translucent granulations only showed slowly and in patches the injection of vascularity, and the discharge was confined to the bloody serum referred to in the first few hours. A little induration was felt in the edges of the wound on the second day, but this gradually diminished, though it never disappeared, during the healing process.

Morphia was discontinued on the third day after operation. The diet was increased to custard and blanc-mange on the seventh day, and to meat a very few days later. In a fortnight the patient came downstairs, and went out a fortnight later.

On May 21 he was in his best health, walking out every day, and free from any tenderness, weakness, or other local appearance suggestive of favouring a fresh protrusion, though a corner of the wound remained not quite healed. Precautions are taken against careless violence or excess of exercise, but no truss is worn.

On February 12, 1883, he was seen and examined by Dr. Hardman, who reported him free from hernia.

Three more inguinal cases follow, the sac having been tied at the internal ring in all with simple recovery, and so far, satisfactory freedom from hernia, in the erect posture and in progression, both resumed shortly after operation.

Man, aged twenty-five. Left inguinal hernia, strangulated in congenital sac of a testicle undescended below the inguinal canal. Testicle saved, and sac stripped from the cord.

Man, aged seventy-five. Right inguinal hernia of recent standing. Operation, for radical cure only, 5th January, 1883.

Man, aged twenty-two. Left inguinal omental hernia. Operation, 26th Jan., 1883, a week after incarceration of bowel, which was reduced by taxis. Sac congenital, testicle atrophied and down in scrotum, but descent some years late. Sac and cord tied together and testis removed.

Though the method, here advised, of attempting radical cure, is to be commended above all others hitherto suggested, it must be added that a few failures, besides the one here related, have occurred in the experience of other surgeons. In any case a few more years must elapse before complete confidence in it can be established. But in the meantime, ligature of the sac high up is at least a fitting and advantageous termination, to herniotomy, that simplifies the course of the case and permits the patient to get up and about, without immediate risk of re-descent, at a very early date after operation, in those cases (and they are a majority) to which it is applicable. In the event of a fæcal fistula being probably imminent owing to severe injury of the bowel, short of obvious gangrene, it may now and then be prudent not to tie up the peritoneum, but rather to keep it open for free exit of fæces, should the bowel give way. In such case I would advise plugging the sac with the antiseptic dressings that may be employed, in order to ensure abundant granulation, and the best chance of subsequent close and extensive coalescence along the sac's interior, as the next best way of securing a permanent and firm occlusion.

APPENDIX A.

SEDATIVES.

THE action of physiological doses and the probable effect of therapeutic doses of many remedies have, in most instances, been deduced from observing the effect of lethal or toxic doses. Such conclusions are not trustworthy evidence of the remedial qualities of drugs, inasmuch as when the lethal condition is approached the distinguishing signs of special poisoning begin to merge, so that their identity is nearly lost. For instance, the differences between a fatal dose of belladonna and one of opium, or strychnia, are less than the variations of symptoms to be noticed when the subject is under a safe or physiological dose of either of these. The effect of the fall of a balk of timber, on one person would give no information to a witness as to what would follow if there descended on another person a portion of timber too light to kill. Again, even conclusions arrived at, after witnessing the action of toxic doses, have been tinged by our previous opinion of their qualities. This antecedent bias has caused recent investigators to assert the possibility of certain medicines possessing, in varied doses, diverse properties,—stimulating one and depressing at the same time another structure.* This error has arisen from not giving sufficient attention to the fact, *that each drug has a primary affinity for certain structures, thus causing a temporary defect of co-ordination.*

Some writers on therapeutics have made a class distinction between sedatives and narcotics,† this classification being based upon the various affinities of certain drugs for particular structures. I fail to see that this is justification for separating those drugs that have been termed sedatives and narcotics. To me the terms are synonymous. To place various drugs in diverse classes because they may vary in affinity for separate structures is as reasonable, as to vary the species of the different members of the human race, on account of the quality of the food they incline to. Sedatives or narcotics retard life, and their effect upon the structures, which they primarily operate upon, *is to inhibit more or less their function and to cause in other structures, unaffected by the sedative, the signs of defective inhibition or want of co-ordination,* identically the same signs observed after mechanical interference with such structures.

* Royle's Materia Medica, page 754.—Article, Morphia.

† Royle, Headland, and J. Harley.

In experiments performed upon the vagus nerve, all mechanical interference, such as section, ligature, and electric shock, has been termed stimulation or excitation of the nerve.* This is, in my opinion, incorrect, as either of these generally gives rise to a shock to the nerve, arresting its action. These experiments have also shown that the nerves capable of acquiring some degree of habituation, so that the shock from mechanical interference loses its effect, just what we observe to follow in the use of drugs.† In proof that mechanical irritation of this nerve induces a condition of shock, we have the fact that atropia (true stimulant)‡ protects the nerve from the shock consequent upon mechanical disturbance.§ I have not as yet met with any evidence which proves the existence of any inhibitory nerve fibres in this or any other nerve.

Again, diverse qualities have been attributed to drugs from observing their mode of action varied upon the lower animals as regards symptoms, in comparison with the signs of their action on man; but this fact does not inform us that any drug varies in its properties, whether given to man or any of the lower animals.‖ It only demonstrates that drugs vary in their affinity for analogous structures in the various types of animals experimented on; although one drug may give rise to varied degrees of intensity of symptoms in the several types of animals tested; yet, in all, the ultimate drug effect will be found to be identical.

Do sedatives act as direct stimulants? I believe they do not; but their primary effect may be to simulate stimulation, and in those instances where this simulation appears it is a primary action,—then also the sedative is exerting a minimum or medium effect only. When discussing the remedies applicable to the treatment of obstruction, I have placed opium and alcohol in the class of pure sedatives, and their action upon the several organs of the body confirms this. Their effects can be best observed by noticing their physiological influence upon the iris, heart, blood-vessels, and viscera. If a full dose of opium, short of being a rapidly fatal dose, be given, the diameter of the pupil becomes diminished. This is caused by the drug having a primary sedative or paralysing action upon the radiating muscular fibres, through its primary affinity for the sympathetic system of nerves specially controlling the radiating fibres of the iris. But

* Foster's Physiology, page 119.

† Preliminary account of an inquiry into the Functions of the Visceral Nerves, by J. Lister. Pages 376-7.—Pro-Royal Society, 1859.

‡ See Appendix B.

§ Foster's Physiology, page 171.

‖ Harley—Vegetable Neurotics, pages 105-6 and 191-2.

if a fatal dose be administered, then the cerebro-spinal system of nerves, hitherto less affected by the opium, shows signs of its full toxic effect, and the circular muscular fibres of the iris also become paralysed, as evidenced by the increased diameter of the pupil. The effect of opium upon the heart and blood-vessels is to act first upon the blood-vessels, but later on the heart secondarily. Hence we have at first an increased volume in the pulse from diminished tonicity, and finally a slower rate of beat when the dose has been sufficient and has had time to influence the heart. There is also to be observed a diminution of the solid constituents in the liquid secretions of the body and a fall of temperature. All these are signs of retardation of vital changes—sedative action. The exception to these general signs of the physiological effect of opium is to be met with when small initial doses of opium are given; then may be noticed acceleration of pulse and vomiting, which may be thought to indicate stimulation rather than retardation.

In explanation of this clinical fact, which appears to disprove my contention, I advance the following reasons:—(1) This simulated stimulation is only temporary, and is evidence that the drug has affected only those structures for which it has a primary affinity—the time being too short or the dose too small for its full physiological action to have been developed; and thus the phenomena of the so-called defective inhibition or want of co-ordination appear,—this is often interpreted as indicating stimulation. (2) That by the use of any remedy there is introduced into the system a foreign body, which may give rise to some temporary constitutional disturbance until some amount of habituation has been acquired. We have many familiar examples of this,—as change of air, diet, pleasure, relief of pain, sea voyage,—yet no physician would advise a trip to sea in place of prescribing an emetic, the latter being nearer at hand and more certain of action. So with opium, its indirect effect in simulating stimulation is not so ready or so safe as employing a genuine stimulant, when the effect is desired (3) Some remedies, are, at times, modified in composition by the condition of the secretions which they become mingled with after introduction into the body,—this change of character being frequently influenced by the age of the patient. Any experienced practitioner must know how rarely any of the signs of so-called stimulation comes on after the administration of opium to subjects under the age of ten years; yet how frequently are we disappointed in its action when given to patients who have passed the meridian of life, the intestinal secretions then being in many instances

probably abnormal,—for, if the remedy be given by the skin method in preference to the mouth, an unalloyed sedative effect follows. (4) The most probable explanation of the non-occurrence of vomiting after the administration of opium I believe to be that in some subjects, especially children, it rapidly affects the pneumogastric nerve and its branches, so that defective co-ordination is avoided and thus the stomach and intestines remain quiescent. In proof of this there are the observed clinical facts that only large doses produce vomiting at the commencement of their action, or at the termination of their action, i.e., when the pneumogastric nerve has not been yet reached by the drug or its influence on the nerve is waning.—This nerve being affected later and recovering earlier from the drug than the sympathetic nerves. There is further proof in the fact that when opium is given by the skin method its action is rapidly operative all round, and the period of possible and isolated excitement of the pneumogastric nerve and its branches is bridged over so that vomiting is avoided. This explanation of the phenomena of vomiting after the use of a sedative is quite consistent with what we observe of the effect from doses of belladonna, which also induces vomiting occasionally.

Many of the prevailing errors regarding the therapeutic effects of both opium and alcohol have arisen from misinterpretation of the signs of their action, and of the symptoms of the disease which they were required to correct.*

Alcohol in its various forms, as in popular use, I maintain to be a drug possessing purely sedative properties, and in its method of action is allied to opium. It primarily affects the sympathetic nerves, then the vagus, and finally the cerebro-spinal system. When the nerves become subject to a full non-toxic dose, the pupil contracts; but soon after a fatal dose has been taken, the pupil dilates some time before death.† The action of alcohol upon the heart and blood-vessels, through the vagus and sympathetic system, is also analogous to that of opium. Primarily it attacks the blood-vessels through the sympathetic nerves, diminishing their tonicity, — thus relieving the heart from blood pressure,—so that the initial signs of its action may be a temporary acceleration of the

* A practical example of this is referred to at page 38 of this volume. The high temperature, &c., prevailing in that case, indicated that retardation of vital change rather than stimulation, was needed, and though a stimulant was thought to be required, a sedative was unwittingly given, and the modification wished for resulted.

† Ogston and Anstie, on Stimulants and Narcotics.

pulse, as well as an increase of its volume, simulating stimulation ; but if the dose is sufficiently increased, then the heart is also affected, and the pulse becomes reduced in rate.

Again, by alcohol, the solid constituents of the liquids secreted are diminished, and the normal quantity of carbonic acid exhaled by the lungs is reduced ; and in corroboration of these ascertained data there is to be observed a fall of temperature. All these signs point to a purely sedative result—retardation of life, not acceleration or stimulation. The simulated signs of stimulation by alcohol arise from the primary affinity that certain doses of alcohol have for certain nerve structures, and a misinterpretation of the signs of its primary action has engendered the belief that true stimulation is gained ; and though sometimes this mistake in practice may do no harm, yet when true stimulation is required its administration would be a serious error. Its primary effect can not be a safe substitute when stimulation is urgently demanded and requires to be continued. It may be argued that contraction of the pupil, when influenced by alcohol, may be brought about by stimulation of the circular muscular fibre of the iris, and not by paralysis of the radiating muscles. But the only explanation admissible regarding the mechanism of the increased volume of the arteries when influenced by alcohol, enables us to check our deduction regarding the mechanism of the action of the iris under its influence. If this drug could stimulate, the diameter of the blood-vessels would be lessened from contraction of their circular muscular coat. Again, if alcohol could stimulate, then its primary affinity for structures specially under the control of the sympathetic would cause this stimulating property to influence first the radiating fibres, and dilatation would be the first alteration observed in the pupil during its first stage of action.

Other neurotic sedatives act, after introduction into the human frame, much like opium and alcohol. I have observed the action of Calabar Bean frequently during latter years, when prescribing it for chorea, tetanus, and the muscular spasm attendant upon fractures of bones. I have observed that its action has many signs in common with opium and alcohol. In the early stage of its action the sympathetic nerves first begin to feel its effect, and we have vomiting and purging, from its delayed effect upon the pneumogastric branches of nerves supplying the muscles of the intestinal muscular coat ; but as soon as the sympathetic nerves succumb to its influence, then

the cerebro-spinal nerves are inhibited also, and the striated muscles relax. The heart is nearly as much inhibited by this drug as it is by digitalis, but its sedative action upon the heart is greater than that of opium or alcohol.

During the physiological action of Calabar Bean, the pupil becomes contracted from palsy of the radiating muscle of the iris, but as soon as a lethal dose is operative the pupil before death dilates, showing that other nerve centres have been influenced.* Henbane, another drug of the sedative class, during its primary action dilates the pupil of the eye, and this is explicable by the fact that Henbane possesses a primary affinity for the cerebro-spinal nervous system.† Experiments have shown that the striated muscles are first controlled by it ; secondly, the sympathetic ; and finally the vagus becomes inhibited, so that the pulse, accelerated during its primary action is finally reduced below the normal rate.

Digitalis, again, is a sedative that possesses a primary affinity for the vagus, and is practically useful in influencing the important organs to which the nerve is distributed. During its primary or physiological action it has no effect upon the muscles of the iris, and the anatomy of the nerve, which Digitalis primarily affects, excludes the probability of the iris being influenced until a lethal dose of the drug has been taken and other nerve centres have become poisoned by it, then the pupil dilates before death. When the merits of various anæsthetics are discussed, æther is frequently incorrectly referred to as a heart stimulant, when the proper explanation of its merit should be, that its affinity for the heart, probably through the vagus, is less than that of chloroform and from this it is a safer anæsthetic. In the action of septic poisons there are examples of special affinity for various structures, these so operating, that the so-called signs of defective inhibition or want of co-ordination become the distinctive signs of special diseases.

I feel some confidence in predicting that in the medical practices of the future, this selective affinity for certain structures, possessed by contagious and infective poisons, will become a basis for the selection of aids in treating the diseases which these poisons cause, in place of the present tendency to attempt to neutralise the original evil by a general antiseptic saturation of the blood and tissues, that in future we shall have more of physiology and pathology with our chemistry to guide the physician.

* Anstie, on Stimulants and Narcotics, page 481.

† Experiments of Harley, and the Clinical Observations of Dr. T. Browne.—British Medical Journal, Nov. 25th, 1882.

APPENDIX B.

STIMULANTS.

DIFFERENCE of opinion prevails among therapeutic authorities, as to whether certain drugs are endowed with sedative or stimulant properties. I shall only discuss the physiological effect and medicinal results that follow the use, either experimentally or therapeutically, of belladonna, this drug being selected by me in consequence of its value in the treatment of collapse occasionally occurring during the existence of intestinal affection.

By the term stimulant, I mean any matter which, after its introduction into or absorption by vital tissues, increases the activity of the condition antecedent to its introduction, without supplying the source of force for maintaining this increase of power or function—as food can do, *i.e.*, a stimulant draws upon a reserve, which can only be renewed by food. How therapeutists could have come to the conclusion that belladonna

"Possesses powerful anodyne and hypnotic properties." "Valuable anti-spasmodic."*

At the same time,

"Stimulant effect on the circulation,"—"potent diuretic"—*

is to me explicable only by the supposition that investigators have not made the physiological doses of belladonna the basis for their deduction in prescribing, and its toxic effects their basis for antidotal treatment.

If the symptoms, which follow the physiological doses of belladonna, are analysed, there always remains evidence of stimulation, and during its action the phenomenon of special affinity for certain structures is demonstrable, just as may be observed during the action of sedatives. Its effect in full physiological doses is to stimulate the radiating fibres of the iris by its special affinity for the sympathetic nerves, a branch of which aids in regulating the radiating muscle of the iris; but it may be said that this dilatation of the pupil by belladonna arises by the same mode of action as

* Harley, Vegetable Neurotics, page 244. Headland, Actions of Medicines, page 275. Royle, Materia Medica. page 493.

that which causes Henbane to dilate the pupil. But this objection is inconsistent with the fact, that the blood-vessels are diminished in calibre when under the influence of belladonna, from contraction of their muscular coat (necessarily a stimulative result), so that the pulse is less perceptible, but increased in tone, and the temperature becomes elevated. Further, the heart's action is always accelerated by belladonna from its primary affinity for and stimulating effect on the vagus nerve, which nerve this drug can protect from the collapse arising from mechanical irritation,* provided the use of the drug be such as not to approach too near the toxic area. During the action of belladonna the solid constituents of the liquids excreted are increased—another phase of stimulation. Hitherto no evidence has been made known which shows that belladonna retards life so long as its action does not overstep the area of physiological action—that of safety; and this area of perfect safety in a healthy subject is exceeded as soon as the drug, whether sedative or stimulant, begins to act beyond the structures, which they have a primary or special affinity for. A remarkable discord of opinion exists in explanation of how belladonna can benefit in medical practice. With some of these views I coincide, from most of them I must dissent. For instance—

"Belladonna allays pain . . . . the attendant spasm . . . . . it relaxes muscular fibre" . . . "in spasms the expulsive effects are moderated" . . . . Belladonna relaxes the hollow viscera, and it is to this effect that we must attribute its antispasmodic as well as expulsive action.—Harley, Vegetable Neurotics, page 230.

"By relieving spasm arising from irritation of the air tubes, gall ducts, and ureters in bladder, belladonna is serviceable."—Royle, Materia Medica, page 495.

These quotations, all from recognised authorities, are a collection of contradictions. If it allays pain, relieves spasm, relaxes muscles, how can it possibly have an expulsive action?

"The constricting fibres of the intestines and of the ducts of glands are, in like manner, relaxed by belladonna, and of this we may take dilatation of the pupil as the outward sign. The dilatation of the pupil under the influence of belladonna is active and due to a stimulant effect on the sympathetic nerve."—Rolye, Materia Medica, page 492.

If the constricting fibres of the intestines are relaxed by belladonna, how the dilatation of the pupil by the same drug can be an active change, I fail to perceive. This inconsistent teaching appears to have arisen from a misinterpretation of the mechanism of stimulation on the non-striated

* Foster's Physiology, page 171.

muscle. For instance, the effect that stimulation has upon the pupils, and upon the muscular coat of the blood-vessels. As an example—

"The sympathetic has, it will be observed, an effect on the iris, the opposite of that which it exercises on the blood-vessels. When it is stimulated the pupils are dilated while the blood-vessels are contracted."—Foster's Physiology. page 466.

"It is probable that these fibres are under the control of the sympathetic system of nerves. If so, it must be observed that the sympathetic nerves have an effect upon the iris directly opposite to that which it exercises upon the blood-vessels, since when it is stimulated the pupils are dilated, while the blood-vessels are contracted."—Ranney, Applied Anatomy of the Nervous System, page 133.

The sympathetic has not an opposite effect on the iris to what it has upon the blood-vessels. Stimulation of the sympathetic nerves excites the circular muscular coat of the blood-vessels to contract, and this contraction can only take place in the direction of diminishing the area of a circle. The iris being a radiating muscle, then, if stimulated through the sympathetic nerve, it can only contract in the direction of its largest circumference, as the iris is a radiating muscle attached at its greatest or external circumference, so that it can only contract in the direction of its outer circumference, its base of resistance, and so dilatation must occur when the radiating muscle of the iris is in action; theoretically, dilatation of the pupil corresponds to contraction in a blood-vessel, when either is under sympathetic stimulation.

"Retention of urine is a frequent result of a full medicinal dose of belladonna."—Royle, Materia Medica, page 492.

In the above quotation we have another, out of many errors in regard to the action of belladonna that can be found in standard works written on therapeutics; it is an example of the toxic action being selected as evidence of the medicinal result of a drug. Retention of urine is not a result that follows a medicinal dose of belladonna; but it may be urged, if it is not the result of either a physiological or medicinal dose of the drug, it is fair evidence that it relaxes the muscular coat of the bladder and points to a sedative effect. This, I deny. It is excellent evidence that it is a stimulant, and this toxic effect of belladonna upon the bladder is quite consistent with its effect upon other structures, and in support of this contention my reasons are the following :—

If the anatomy of the nerve supply to the bladder be considered, it will be found that the upper part of the bladder is supplied from the

hypogastric plexus of the sympathetic, while the spinal nerves can be traced directly to its neck and base.*

The most reliable authority on the action of the vegetable neurotics has conclusively established that large doses only have the effect of causing retention of urine, and I hold that causation of this act arises in this manner. As soon as a toxic dose of belladonna has crossed its area of physiological action (vagus and sympathetic), the store of nerve energy, within this area upon which it has primarily drawn is much diminished,† but further forward in the toxic area which includes the vagus, the sympathetic and spinal nerves, the store of energy within the spinal nerve is in full force, until this area is crossed and death supervenes. These toxic doses of belladonna, having exhausted the nerve supply of the body of the bladder, at a time when it is commencing to stimulate the base and neck, must necessarily give rise to retention of urine.

As regards the doses of atropia, it is my opinion, that when administered

* Quain's Anatomy, vol ii., page 426-7. Eighth Edition.

† We have proof of this in the observation made by Dr. J. Harley, at page 205-7 of his excellent contribution to therapeutics, "Vegetable Neurotics,"

"I have occasionally injected 1-20th of a grain of atropia; and agreeably with what I have observed after the use of larger doses than 1-30th, the effect upon the pulse has been less apparent than after an ordinary full dose of 1-48th of a grain." As contributions to the elucidation of the properties of drugs, we have the labours of the Edinburgh Committee, presided over by the late Prof. J. H. Bennett, and Dr. J. Harley's volume on the Vegetable Neurotics. These two volumes, in my opinion are, incomparably, the most able and trustworthy contributions to therapeutics; they present the reader with data from which he can glean much practical information though he may dissent from some of their deductions. As, for instance, in regard to belladonna Dr. Harley at page 230 of his volume, asserts the probability of this drug possessing relaxing and stimulating power. This, I hold, is just half of a fact; a toxic dose which appears to relax circular fibres under the control of the sympathetic nerves, and stimulate longitudinal ones under the control of the spinal nerves, does not actually so operate, but the phenomenon is properly explained, only, upon the supposition that when the muscles under the control of the spinal nerves are affected by belladonna, those under the control of the sympathetic have been previously exhausted by primary stimulation. This is also the explanation of the observation that belladonna is a better antidote to opium than opium is to belladonna. In bella donna poisoning the nerves having been "run down," opium cannot be reasonably expected to awake nerve force, but in opium poisoning the nerve force may be arrested (held), and it might be reasonably expected that the stimulus of belladonna would again relieve it.

by the subcutaneous method, any quantity exceeding 1-48th of a grain becomes a toxic dose, and that, provided the drug be of good quality, it is always advisable to commence with much less, say 1-60th, and increase gradually until the physiological effect is attained.

Belladonna is now admitted to be an antidote to opium poisoning, but it has also been noticed that opium will not act as an antidote to belladonna. This is further evidence that belladonna possesses genuine stimulant properties only, as over-stimulation (poisoning by a stimulant drug), must lead to exhaustion, a condition which would certainly not be benefited by any drug that tended to arrest vital action.

The efficacy of belladonna as an antidote to opium is explicable by the fact that it possesses an earlier affinity for the vagus than opium possesses. Thus, if a toxic dose of opium be taken, and an antidotal dose of belladonna be also given, ere the opium has affected the vagus, the other drug precedes it in affecting the vagus, and thus protects the nerve rather than neutralizes the coming action of the opiate. The prescribing of a combination of opium and belladonna is evidence, I maintain, of ignorance for which, at the present day, no trained practitioner has good excuse.

In the selection of drugs for the treatment of maladies, it is my opinion that more attention ought to be given to their physioiogical action on the healthy portion of the body as it is the indirect or secondary effect of remedies in many instances that brings about relief to the diseased area, the latter not being susceptible to direct drug action.

The theory advanced in appendices A and B, in explanation that no drug possesses true or direct divergent properties has been arrived at after many years of careful consideration of experimental investigations by therapeutists, and of clinical observation by myself.

The theory here advanced in explanation of the apparent divergent action of drugs will, if used as a guide to the interpretation of the data given by experimental and clinical observers, enable us to harmonise the signs, that follow the action of drugs, which otherwise would appear contradictory. It is my opinion that this theory will also be of some assistance towards the settling of the open question as to the existence of "nerves of inhibition."*

* After I had formed this opinion, it was a source of satisfaction to find that an eminent experimental investigator had also questioned the correctness of the prevalent views held regarding the question of inhibition.

My explanation of the phenomena which have led physiologists to believe in the existence of inhibitory nerves is the following:—That each animal contains, stored in certain nerve-centres a quantity of nerve force which, for the sake of illustrating my argument, the whole quantity may be reckoned as represented by a unit, this being originated and stored in several nerve centres, which I will suppose to be represented by five fractions components of the total (unit). It would not be an unreasonable supposition that, if by a drug or mechanical influence, any one of these five nerve centres was inhibited, then there might remain one-fifth more available source of force for service elsewhere, which could only be utilized and deflected along the remaining unaffected four-fifths of nerve structure. This economy of nerve force, in one direction, would raise the fractional energy of the remaining untouched nerve-centres so that their force would be represented by a fractional power of one-fourth of the total unit. Such a transposition of nerve energy would cause, for a time, those parts to which the remaining four fractions habitually conveyed energy to show signs of excitement. And there are good grounds for believing that such nerve inhibition can be induced or prevented by drug influence, as it is patent that the simulated signs of stimulation follow the action of narcotics, from certain doses producing isolated action upon certain nerves only; and the question naturally arises, why should there be a temporary excitement of the unaffected nerve-centres when no stimulation had been exercised nor extra force introduced? This excitement cannot exist without extra source of power, and as the excited nerve-centres had already their usual store, probably this sign of increased energy-excitement, may have been derived by some method of deflection of store from the inhibited force being arrested from being distributed to its locality of expenditure. The preceding I believe to be the solution of the method by which the phenomenon, that follows the inhibition of nerves, is caused, as there has been no evidence of the existence of inhibitory nerve fibres, though their existence has been previously asserted. Experimental physiology and clinical observation both are in favour of the probability that nerve force can be distributed collaterally; and why should the store of nerve energy within a special centre, if arrested from being distributed to its usual points of expenditure, not be deflected into another centre, all being known to be connected.

It is from observation of the signs that follow the administration of drugs belonging to the class known by the terms sedatives and narcotics—inhibitory drugs—that we must seek for physiological and clinical information

which may enlighten us in regard to the debatable question of the existence of nerves of inhibition, more than to the effects that result from mechanical interference with animal structures* ; not that I would totally ignore information derived from suc source. If we again select opium and alcohol, both narcotics, in illustration of the views upheld in this contribution, if after the administration of a physiological dose of either of these, a careful watch is kept upon its progress across their area of physiological action, what do we observe, first one system of nerves—the sympathetic—is inhibited and the remaining ones are excited, but as soon as another nerve-centre is reached by the narcotic and becomes also inhibited, all the other nerve-centres show further excitement, and when these have succumbed to the drug action, we have the total narcotic effect. Those, who are accustomed to the habitual use either of alcohol in any of its various popular forms, or opium, or indeed of any narcotic, tell us of the pleasures they enjoy from the extra activity of the sensorium. Some even profess that with the aid of what is mis-termed alcoholic stimulation and the sedative action of other nareotics, they are, whilst under its influence, mentally and physically superior ; this may be found to be true, if it could be proved that temporary drug inhibition of nerve centres, not necessary to mental or physical exertion, did increase the nerve force available for use by the remaining unaffected nerve-centres.

Some may suppose that the action here attributed to alcohol, is a justification or even an encouragement to its being habitually consumed, but this is certainly not a proper deduction to make from the theory advanced in this paper, as the habitual use of alcohol and of other narcotics by their inhibitory effect both upon the action and nutrition of the liver, kidney and heart, tends to produce in all persons, and in many produces, a diseased state of these organs. Some may also suppose that the remarks here made in regard to the simulating of stimulation which follows the use of narcotics is also a justification for using them when pure and urgent stimulation is wanted. This would be justifiable only, if no true stimulant was known or near at hand, inasmuch that the administration of a narcotic for this purpose, involves some risk and delay, as simulated stimulation is not so rapidly

* Experimental investigation has shown that mechanical interference with nerve-centres and trunks sometimes produces shock, and at other times excitement. This makes observations taken during direct interference with the parts experimented upon, indecisive. Again, in very many instances, observation of the effect of direct interference is made while the subject of experiment is under the influence of an anæsthetic, the toxic action of which introduces another source of error.

induced. And, again, it may be rapidly followed by the true narcotic action over too large an area, and this in a critical case may further arrest life previously threatening to eddy—especially if the subcutaneous method of the administration of remedies is practised. For instance, a subcutaneous dose of either opium or belladonna acts rapidly, commencing after a period of fifteen or twenty minutes has elapsed, one-fourth of the period required when given by the mouth, while after the introduction of alcohol or æther subcutaneously, their action is not as rapid as when given by the mouth. The practice, introduced of late, of injecting ether under the skin in collapse, is certainly wrong, for when thus administered, its action being much more slowly developed than even when given by the mouth, if it were otherwise it would be almost certain death to the patient.

In diseases arising from the action of septic poisons, of which tetanus and hydrophobia are examples, there may be noticed signs similar to those which follow the administration of certain inhibitory drugs, those which cause inhibition and those which cause the so-called defect of inhibition. My reason for selecting these two, is the fact, that the signs of each are very well authenticated. An analysis of the symptoms attendant upon true or septic tetanus strongly supports the views here advanced. In tetanus, the most prominent and very obvious signs, are excitement of the striated muscles, but by careful attention other signs can be detected, which indicate inhibition of the non-striated muscles and viscera. The condition of the striated muscles in this disease is so plainly discernible and generally known that it need not be detailed here. It corresponds with the phenomenon termed defect of inhibition in the nerve-centres controlling the striated muscles. But if the condition of the non-striated muscles is carefully noticed, they appear to be inhibited, through probably their ganglionic nerve-centres. *Evidence of this is presented to us by the tendency to constriction of the pupil, so long as death is not imminent; this being brought about by the same physiological cause which induces diminution of the pupil during the action of some inhibitory drugs. Further, there is to be noticed signs showing that peristaltic action of the intestine is deteriorated, as shown by constipation and its evils, retention of solid and gaseous gut contents. Along with these there is retention of urine and diminished visceral excretory products. Thus during the action of the poison of tetanus there can be noticed signs of inhibition of certain nerve-centres and the signs of simulated stimulation of other nerve-centres, and during the action of this poison there may

* South's Chelius, vol. I, page 377. Wood's Practice of Medicine. vol. II, page 784. Copeland's Dictionary, Tetanus, page 1012.

also be noticed one very distinctive difference between its effect and that of any inhibitory drugs, that the action of this virus *never extends beyond the area of nerves distributed to the non-striated muscles.*

This is the probable explanation of the persistent severity of the excitement produced in the striated muscles up to the last moment of life in fatal cases. The patient in very rare cases dies exhausted, but generally dies from the intense excitement of certain important striated muscles disturbing co-ordination, so that life is interrupted ere the vitality of the system has been exhausted. If the poison of tetanus had an affinity for, or could exercise any inhibitory power beyond, the sympathetic nerve-area, the excitement of the striated muscles would not be so persistent. In hydrophobia the signs of what has been mistermed defect of inhibition, exist "all round," the septic matter being a true or direct stimulant. To explain all the phenomena characteristic of this disease so as to be consistent with the defect of nhibition theory, we must suppose every nerve in the body to possess inhibitory fibres, and that no nerve is truly automatic, but requires each a "governor."

Most authors, who have written upon the etiology and treatment of tetanus and hydrophobia, have pointed out that these two distinct diseases have symptoms with similar features, and so close in character, that some authors have suspected them to arise from causes not far allied. But in my opinion there exists not the slightest evidence of relationship beyond the fact that they each have a septic cause of orgination. Tetanus is a disease in which limited inhibition decides the cast of symptoms, while hydrophobia is a disease in which true stimulation, not co-ordinately acting, gives character to the present signs.*

*The pupil is generally said to be contracted in tetanus and dilated in hydrophobia. Of the last disease I have but little experience, but I have had very many opportunities of observing and treating tetanus, aad have tried frequently, separately and conjointly, the following drugs:—Indian hemp, calabar bean, opium, calomel, and belladonna, but on reviewing my past experience, I am unable to strongly recommend any one of these drugs, though inclined to favour belladonna most, and Indian hemp the least. In tetanus there exists a wonderful tolerance of belladonna or its alkaloid, and my experience of its use in this disease has convinced me that it aids recovery, It has never been used by me in idiopathic cases, in all of the cases in which belladonna was tried the disease had commenced within seven days, but in most instances at or nearer the third day of injury some recovering, the latter being cases in which it was observed that more than forty-eight hours elapsed ere opisthotinos followed after the appearance of trismus. In the rapidly progressive cases drugs of the sedative class relieve the distress, which belladonna or any stimulant can not be expected to do.

APPENDIX C.

On the Physiology of Vomiting; and on the Causes of its Difference in Adults and Children. By Professor C. H. SCHULTZ, M.D.

THE great frequency of vomiting in infants at the breast, and the spontaneousness and facility with which this process takes place, are well known. It seems to occur without any previous nausea, as the infants, generally speaking, exhibit no signs of uneasiness. The case, as is well known, is very different with adults, in whom nausea and retching will, in certain cases, exist in a great degree for days, or even weeks, without any evacuation of the contents of the stomach. The facility of vomiting in general remains with children for some years after weaning, although this is effected with somewhat greater difficulty than during the period of nursing. The causes of this difference in the readiness to vomit at different ages has not, as far as I know, been yet closely investigated.

To enable us to prosecute this inquiry with advantage, it is necessary that we should have a perfect understanding of the causes of vomiting in general; and to this point I shall address myself in the first place.

The opinion first advanced by Boyle, that, in the act of vomiting, the stomach is passive,—the evacuation of its contents being effected by the contemporaneous contraction of the abdominal muscles and diaphragm,—has been adopted and powerfully advocated by physiologists of the greatest name, more especially of late years. Chirac confirmed the fact stated by Boyle, that no convulsive motions are felt in the stomach during vomiting in the case of dogs, when the hand is placed in contact with the organ through a wound made in the abdomen. Van Swieten, Senac, and others, adopted the opinion of Boyle on other grounds; and, in later times, Magendie has proved beyond question, that, in the case of dogs, not only are no convulsive motions of the stomach *felt* during vomiting, but none are *seen* when the stomach is laid bare; and, moreover, that when the abdominal muscles are removed, and the contractile power of the diaphragm destroyed, the act of vomiting in dogs, if not entirely prevented, is, at least, rendered extremely difficult. It accords with this view of the process that, in man, vomiting becomes easier in proportion as the stomach is distended, and is thus more exposed to compression between the above-named muscles.

The objection to this explanation, derived from the fact that vomiting takes place in birds and amphibia which have no diaphragm, as also in certain cases in the human subject in which an abnormal position of the stomach had removed it from the pressure of this muscle, is not valid, since in such cases the thoracic viscera, during inspiration, present sufficient resistance to allow the stomach to be compressed between them and the abdominal muscles. It is indeed obvious, that the same muscular action takes place in the act of vomiting as in labour, cough, and the evacuation of the bowels and bladder, &c. ; and that the discharge of the contents of the stomach by repeated fits or impulses, corresponds exactly with the spasm-like contractions of the abdominal muscles and diaphragm.

It has not, however, escaped the opposers of Magendie's theory, that if vomiting were effected exclusively by the abdominal muscles and diaphragm, it ought to be a purely voluntary act ; whereas, it is known that only very few animals, such as frogs and birds of prey, can evacuate the contents of the stomach at pleasure. It results from this fact alone, that the before-mentioned muscles are not exclusively those which are active during vomiting ; and we are hence led back to the old doctrine of the anti-peristaltic motion of the digestive organs. Maignault and Beclard have attempted to prove that, although the stomach is not spasmodically contracted, still that the œsophagus is thus affected, by fits, during vomiting in the dog ; and everyone who has experienced vomiting in his own person must have felt that these reverse spasmodic efforts of the muscles of deglutition commence in the pharynx. These gentlemen were further of opinion that, in the act of vomiting, no anti-peristaltic movements take place in the stomach, but that this organ presents a state of equable tonic contraction, and that it is only by means of the fitful contractions and expansions of the œsophagus, aided by the action of the abdominal muscles, that the stomach is emptied of its contents.

While acknowledging our obligations to the French investigators, we must admit that there are many phenomena attending the act of vomiting which prove their theory to be at least insufficient. If the œsophagus and abdominal muscles are the only parts active during vomiting, how is the phenomena of fæcal vomiting to be explained ? I consider this morbid state sufficient proof in itself that an anti-peristaltic action both of the intestinal canal and stomach does exist, while, on the other hand, no one can deny that there may and do exist contractions of the abdominal muscles, diaphragm, and œsophagus, without any vomiting. This is evident in the case of the horse, rabbit, hare, guinea-pig, and several other

herbivorous animals, which cannot be made to vomit even by the strongest emetics, although the strongest retching and contractions of the abdominal muscles take place, and although they possess the same organs as the dog, which vomits on the slightest occasion. It is the more important to investigate the cause of this difference in animals, as it will lead to the explanation of the much greater facility of vomiting in children than in adults.

The cause of these differences lies in the particular shape of the stomach in different animals, a circumstance, as far as I know, hitherto unnoticed by comparative anatomists; and the same cause operates in producing the difference in the facility of vomiting in the infant and the adult; since there exists the same analagous difference of form between the stomach of the child and the adult man, as between the stomach of animals which vomit with facility, such as the dog and cat (and we may say carnivorous animals in general), and the stomach of those which vomit not at all or with extreme difficulty, as the horse and rabbit (and herbivorous animals generally).

Before proceeding further in the enquiry, I think it necessary to state that my experiments and observations lead me to decide positively in favour of the existence of anti-peristaltic motions of the stomach during the act of vomiting. Boyle, Chirac, and the recent observers in France, hastily concluded that, because they could discover no *convulsive* movements of the stomach, that therefore there were no anti-peristaltic movements of any kind: they found the stomach contracted and motionless. I admit that there are no convulsive movements, but I cannot concede that in the dog, for instance, the stomach is at rest during the act of vomiting. On the contrary, I maintain that decided anti-peristaltic movements are perceptible, but these are not stronger than the ordinary peristaltic motions of the same organ. They are, moreover, not very distinct in the middle portion and fundus of the stomach, but only at the two extremities near the cardia and pylorus. The whole pyloric portion is strongly contracted when the cardiac portion expands; and, while this is going on, there is no perceptible motion in the fundus and larger curvature, and assuredly no convulsive one. But, it may be asked, what considerable effect can so slow an anti-peristaltic motion have in vomiting? The answer is briefly this,—that, by this anti-peristaltic motion (no doubt assisted by the abdominal muscles), the *direction* is given to the food which is to be ejected by the act of vomiting, or which is to be forced from the intestines into the stomach in the case of fæcal vomiting. If the

abdominal muscles alone acted on the perfectly passive stomach, the food might, by this pressure, be driven into the intestine as well as into the œsophagus; if, then, the contents of the stomach are to be ejected in a particular direction, it is requisite that the cardiac and pyloric portions should possess a distinct active motion.

I now return to the various forms of the stomach occasioning the differences in vomiting: and here I may take for granted as understood what I have detailed in the work '*De Alimentorum Concoctione*,' concerning the forms of the stomachs of carnivorous and herbivorous animals. It is demonstrable that a child's stomach is as different from that of an adult as a pole-cat's is from that of a rat; and, if the difference between the form of a child's stomach and that of an adult has not been sooner recognised, it is only because their very different functions and importance in the preservation of life had not previously been suspected; for this difference will not fail to strike everyone as soon as his attention is directed to it. But, to make these differences still more conspicuous, I will introduce an outline of the form of a child's stomach, and that of an adult.

The stomach of a child (*Pl. 3, Fig. 2*) is more of a conical form, drawn out lengthwise, and gradually narrowing towards the two extremities, inferiorly towards the pylorus (*b*), superiorly towards the cardia (*a*). The œsophagus is inserted into the fundus at the left extremity, and at a distance from the pylorus; the small curvature is stretched out lengthwise (*c*), the large curvature (*dd*) is less developed, and runs almost parallel with the small; in short, the stomach of a child resembles that of the carnivorous mammalia.

The form of the stomach of the adult is very different (*Pl. 3, Fig. 3*): it is more circular; the œsophagus (*e*) is not inserted into the left extremity, as is the case with the child's, but into the middle between the left extremity and the pylorus (*b*). The pylorus itself is drawn back towards the cardia, and both brought very near to each other; on this account, the small curvature is very short (*c c*), while the large curvature, on the contrary, is disproportionately extended (*dddd*), forming not only the entire lower circumference of the stomach, but also surrounding that part of the fundus situated between the cardia and the left extremity; so that the large curvature alone forms about four-fifths of the whole circumference of the stomach. It must also be added, that the fundus does not pass into the pyloric portion gradually and gently, as is the case with the child's, but that the latter is separated from the former by a sort of neck or contraction (*c c*), sometimes more, sometimes less, strongly marked. In

consequence of this the left part of the stomach assumes an almost circular form, and the whole very much resembles the form of the stomach of the rat or rabbit, although in a less marked degree in these animals.

To each of these different forms of the stomach, an entirely distinct motion, peristaltic as well as anti-peristaltic, has been given. In the child's stomach, where the small curvature is extended almost parallel with the large one, the food is expelled with nearly equal power by the undulating motion of both curvatures, and forced towards the pylorus by the peristaltic and towards the cardia and œsophagus by the anti-peristaltic. In consequence of this, vomiting in children is very easy, because the œsophagus is situated at one extremity of the stomach, towards which the food is forced, at the same time that the pylorus closes and the cardia opens. But the process is very different in the stomach of the adult; in this, the small curvature is so much shortened, and the large one so much extended, that the food is not equally propelled from both sides, but the motion is almost confined to one side, and is effected principally by the large curvature, which embraces almost the entire circumference of the contents of the stomach; by this partial action, the contents of the stomach are moved rather in a rotary direction, which completely stops toward the contracted pyloric portion, turning round in the fundus from the left side to the right when urged by the peristaltic motion, and from the right to the left when by the anti-peristaltic. In consequence of this, during the act of vomiting, the anti-peristaltic motion does not direct the food towards the cardia and œsophagus, but merely communicates to it a motion contrary to that given by the peristaltic; and herein the reason is to be sought why, notwithstanding the pressure of the abdominal muscles and the diagraphm, the contents of the stomach are so difficult to be voided, and that, in many herbivorous animals, where the small curvature is still more shortened, the evacuation is impossible. The evacuation of the contents of the stomach of an adult can be effected only by a strenuous effort, produced by the strong pressure of the diaphragm and abdominal muscles at the same time that the œsophagus opens and shuts alternately; the stomach itself would be incapable from its anti-peristaltic motion alone to discharge its contents upwards. In this respect there exists a completely different state of things in the pyloric and cardiac portions of the stomach. The pyloric portion from the point *(c c)*, where it is so much reduced in diameter, exhibits a more regular or intense-like form of both curvatures, and the contents are on that account easily urged forwards into the duodenum; but, in the other direction, the contempo-

raneous motion of the two sides ceases beyond the contracted part becoming, as already stated, rotary, in the cardiac portion.

These details satisfactorily explain the differences so often referred to between children and adults. The former can discharge the contents of their stomachs by the anti-peristaltic motion alone, without any perceptible assistance of the abdominal muscles; and the least pressure from these will increase the discharge. Animals whose stomachs are cylindrical, and in which, consequently, the ordinary relation between two curvatures entirely ceases, such as frogs or fishes, can, as it appears, with facility empty their stomachs by means of the anti-peristaltic motion alone, without any co-operation of the abdominal muscles; and it is thus that they often throw up pieces of food merely on account of their inconvenient position in the stomach, and swallow them again in a more acceptable direction; even dogs after having swallowed a piece of bone frequently adopt a somewhat similar method. The human stomach in the earlier stages of its formation puts on the cylindrical form of the stomach of fishes and amphibious animals; in the embryo it appears only as a slight enlargement and elongation of the œsophagus in the abdominal cavity, with the cardia directed upwards and the pylorus downwards, as is the case with frogs. The stomach assumes its horizontal position only at a later period when the curvatures become developed.

There are naturally an endless number of transitions and intermediate stages of development, between the cylindrical, conical form of the stomach of the infant and that of the adult; and these numerous transitions will be accompanied by as many degrees of facility or difficulty in vomiting. What appears to me particularly interesting in a medical point of view is, that the round stomach of the adult is frequently seen in children of a diseased or merely of a disordered condition at a much earlier age than usual, and that such children also generally vomit with much more difficulty. I have had opportunities of making this observation in several post-mortem examinations of scrofulous children; and in one instance was able to describe before death the probable form of the stomach from the extraordinary difficulty with which the child vomited. On the other hand, the fundus of the stomach of adults is not always found to extend, in a like degree, beyond the insertion of the œsophagus towards the left side. There are human stomachs with the fundus so much developed, as to be with difficulty distinguished from those of herbivorous animals; and others, again, which approach nearer to the form of the dog's stomach from their imperfect development.

The question naturally here suggests itself:—What is the cause, not only of these differences, but of the changes in general, to which the stomach is subject at different periods of life? To me it appears that the cause is principally to be sought in the nature and quantity of food. The cylindrical form of the stomach in children continues only while they are fed on milk, consequently on purely animal food; as soon as they receive vegetable food in any quantity, the fundus begins to develope itself. On that account, even in the first year, a strong development of the fundus is found to have taken place in such children as have been weaned immediately after their birth and fed on soft pap made of flour, potatoes, or bread. The influence of the food on the form of the stomach is distinctly observable in older persons. The stomachs of such persons who live principally on potatoes and other vegetables are found to resemble most those of herbivorous animals; while the fundus in individuals who live more on rich animal food is less developed. I have shown in my paper '*De Alimentorum Concoctione*,' that the stomach of dogs and cats (animals purely carnivorous,) will assume the circular form after they have been fed for some time on messes of potatoes, meal, and bread; but that their stomach will retain its original oblong form if fed on animal food alone. On this account, the round form of the stomach observed in the domesticated carnivorous animals is never found in wild animals of the same class, such as, for, example, the pole-cat.

Man, as an omnivorous animal, certainly possesses the type of the more rounded form of the stomach; but the extent of the development until it attain the form of the stomach of animals purely herbivorous, will, however, in a great measure, be determined by the degree of preponderance of vegetable over animal food; and the development may be increased till it become morbid. The reason why vegetable diet should develop the fundus to such a degree that the stomach assumes the circular form (and the rotary motion be in consequence given to its contents), is, I believe, the following: I have shewn elsewhere, in speaking of animals, that vegetable food is of much more difficult digestion, and consequently is retained much longer in the stomach. The food requires to be moved about longer, and not immediately propelled into the intestine; hence the rotary motion, by which it is agitated in the stomach without being directly emptied into the pylorus. By this action the digested part of the vegetable food is gradually separated by layers on the surface of the mass, and is conducted into the pyloric division, in order to be passed into the intestine, while the undigested part continues in rotary motion in the

centre of the stomach. In carnivorous animals the process is very different: the animal food, being soon digested, is directly propelled towards the pylorus by the united action of both curvatures, and does not require to undergo a prolonged rotary motion; whereas, if vegetable food be received in a stomach so constituted, it will necessarily pass into the intestine in a raw or only partially digested state. On the other hand, herbivorous animals cannot perfectly digest animal food unless the form of he stomach undergo a change, as, by long detention in the organ, the food, instead of being digested, becomes putrid. The attempts, therefore, which have been made in some places to feed sheep, horses. and oxen, on fish or other animal matter, must ever fail. The enquiry whether the stomach of these animals might not be transformed by gradually accustoming them to animal food, is foreign to the present subject. But, even with dogs and cats, experience shews that purely vegetable food does not succeed, as it almost invariably renders them subject to the mange (*raude*). But, to return to the cause of vomiting in children and adults.

Although the form of the stomach plays the principal part in vomiting, there seems to be another agent strongly co-operating with it, namely, the sensibility of the organ itself, particularly in respect of the nausea or sickness which produces the motions of the stomach in the act of vomiting. This is the reason why I do not assert that lunatics, who generally vomit with so much difficulty, experience this difficulty only because they have a herbivorous stomach; in such a case, we must consider the state of the brain as well as the sensibility of the stomach; the torpidity of the brain being often such as not to admit the perception of nausea; these persons, perhaps, frequently do not vomit because they do not experience nausea.

We have been endeavouring to shew that the food is detained longer in the stomach of the herbivorous form, because it is kept longer in action there, without passing directly into the intestine, and that this form is adapted only to the more indigestible quality of vegetable food. If a stomach so constituted be suddenly filled with animal food, this food will be detained longer by the rotary motion than is necessary for the purpose of digestion, and the consequence will be, that the whole process will be disturbed, and the food, instead of being digested, will undergo a chemical decomposition. From this we may also conclude, that nothing will disorder the stomach sooner than sudden repletion with animal food after long use of a diet in which the vegetable preponderated. Excess of vegetable food is much less injurious in such cases, as undigested vegetable matter is, in the intestine, not so easily decomposed, and excites the

peristaltic motion more than animal food. It follows that we ought carefully to avoid sudden change of diet from vegetable to animal. To this may be ascribed the greatest part of the gastric diseases prevalent in summer, and still more in autumn, when the stomach, after having been for some time accustomed to vegetable diet, is suddenly charged with large quantities of animal food.

The only remaining question is, whether we can produce excessive retching by larger doses of emetics, as a substitute for the want of peristaltic expulsory motion in persons having stomachs of the herbivorous form? On closer observation, however, we shall be induced to believe that large doses of emetics in such cases would fail in producing the intended effect. There are persons in whom very powerful emetics would sooner produce death than vomiting, as is the case with rabbits. In such cases, I think, the greatest assistance will be afforded by such means as will facilitate vomiting, by increasing the pressure of the abdominal muscles on the stomach, such as filling it with fluids, particularly gelatinous fluids, or anything calculated to increase the elastic tension of the parts: perhaps, after all, the best means of facilitating vomiting in stomachs of such a conformation will be starch-flour or arrow-root boiled to a paste, as formerly recommended by Hufeland.—*Hufeland und Osann's Journal. Marz, 1835.*

This contribution concerning the movements of the stomach, is here reproduced as an appendix, as it is, in my opinion, the most convincing and lucid exposition on the subject ever published.—H. O. T.

APPENDIX D.

CASE OF M. GAMBETTA.

AT the close of last year died Leon Gambetta, and, as he had beneficially and greatly influenced the destiny of a great nation, his death was a subject of keen interest to the inhabitants of the civilized world, whilst concerning the leading and immediate cause of his death, there was at the time and is now some diversity of opinion among the public, and even of medical critics. Happily, Dr. Lannelougue, one of his medical attendants, had the courage, despite of very unjust comments in regard to the treatment of his illustrious patient, to publish a candid and full report of the case. From this report it appears that M. Gambetta first suffered in consequence of a wound from a pistol shot. This was so skilfully managed that rapid recovery followed. During the treatment of the wound his diet had been partially restricted in quality, and, probably also in quantity, though this is not stated.

Dec. 8th—The patient was judged to have so far recovered from the injury that a restricted dietary was no longer thought to be necessary,—and I think, from the report, that his condition certainly warranted this conclusion. On this day he partook of a hearty meal of soup, eggs, oysters, and game, but soon after complained of much discomfort from gas distension; for this a purgative was taken, which did not operate.

Dec. 9th—The abdominal distress continued. As yet there was nothing notable in either the pulse or temperature, the appetite was excellent on the previous day, but now there was loathing of food.

Dec. 10th—Further aggravation of abdominal symptoms, and during the night, whilst M. Gambetta made an effort to visit the water closet, he felt a

pain in the right hypogastric region, which hindered his sleeping and was present in the morning. This day Professor Charcot visited him and prescribed an enema; no tympany. It was proposed to apply counter-irritation to the seat of pain, but ultimately a laudanum compress was substituted.

Dec. 11th—No desire for food; he was given given forty grains of citrate of magnesia, pain on pressure in right flank, bowels acted this day, and the patient sat some time in an arm-chair.

Dec. 12th—Passed an excellent night, rested during the day in an arm-chair and felt improving, *and had a better appetite, the patient boasting that he had taken a hearty breakfast and smoked a cigar afterwards.*

Dec. 13th—*Much improved.*

Dec. 14th—*Ordinary meals.*

Dec. 15th—*He again complained of the abdominal malady,* frequent eructations, which were distressing, and the patient on his own responsibility took a dose of pulna water; went out of doors for twenty minutes.

Dec. 16th—Temperature 102°, pulse 88, no appetite, had slight shivering, violent colic, frequent eructations, and the abdomen became tympanitic. Patient thought he only required fresh air and took carriage exercise, enjoyed his drive and appeared better, remaining a short time in the garden, nevertheless the tendency to vomit remained. Was ordered a dose of pulna water.

Dec. 17th—On this day a painful and dull area was detected in the right iliac region, and typhlitis was diagnosed.

Dec. 18th—Pulse and temperature better in the morning, but the temperature rose to 104° in the evening, with pulse 96; diet was now restricted. At this visit all the medical attendants concurred in the opinion that an abdominal difficulty confronted them, because, *although a purgative given the previous day, had acted freely, yet the abdominal swelling still remained.* During this day there was an intense and very persistent rigor, with evening temperature of 104°, perspired freely and was ordered quinine.

Dec. 19th—Morning, pulse and temperature nearly normal; in the evening pulse 80 to 72, and the temperature varied from 104° to 100°, chills with intense reaction, less distension, slight pain in right iliac region, colon dulness with long sausage-like swelling, movement of the lower limb perfectly free; diet milk, nausea towards evening.

Dec. 20th—Temperature varied during the day from 97° to 100°, pulse from 68 to 75, passed a good night, feels better, no pain except from firm pressure on the right iliac region, milk diet with broth continued, vomited this day. All of those in charge of the case concurred in the opinion that it was a case of perityphlitis and extra-peritoneal perforation was also suspected.

Dec. 21st—Pulse 68 to 80, temperature 97° to 104°, tongue moist, patient feels well, abdomen more distended, pressure indicating more tenderness, was ordered an enema and also vichy water, milk diet continued, slight rigor. The injection brought about an excellent operation, ung hydrag with belladonna applied over the right flank.

Dec. 23rd—Improved. At a consultation the existence of pus was mooted, but suppuration was not thought to have occurred, and it was decided *to blister the right iliac region* and to give calomel in three doses, but as this did not produce an evacuation an enema was also given.

Dec. 24th—Temperature 98° to 100·5°, pulse 80, excellent night, no pain, diet milk with sago, enema given in the evening.

Dec. 25th—Temperature from 98° to 100·5°, pulse 76 to 80, the highest temperature and acceleration of pulse always occurring in the latter part of the day, passed a good night, enema given again this day which was effective, *and a more liberal allowance of food was permitted the patient.*

Dec. 26th—Temperature 100°, pulse 80, had slept well, calomel was again given followed by an enema, the latter being very effective, abdomen tympanitic, skin very *irritable after the blister.*

Dec. 27th—Temperature 100°, pulse 80, passed a bad night, now the right thigh is slightly flexed.*

* Limited motion as is characteristic of typhlitis.

Dec. 28th—Had a good night, took pulna water which operated. Pulse 80 to 100, temperature 100°.

Dec. 29th—Tongue dry for the first time, abdomen still distended and tympanitic, two evacuations this day, now the region blistered became affected with erysipelatous, which gradually extended up to the hour of his death.

Dec. 30th—Temperature 98° to 100·5°, pulse 110, bad night had been passed, became indifferent to all around him, vomited once, he coughed much, with eructations.

Dec. 31st—Night quiet, but low, slight delirium, slightly conscious up to a quarter to 11 p.m., when he died.

The distinguished patient, long previous to his injury, had suffered from frequent attacks of violent colic with constipation. To relieve himself while under a colic attack he was accustomed to take a walk in the open air; this, while relieving him, also abated the tendency to vomit which accompanied these attacks, and to correct the tendency to constipation he would take occasionally pulna water. This statement M. Gambetta made to one of his immediate attendants.

"The *post-mortem* revealed the following facts:—The termination of the ileum was found so much contracted, that the finger could hardly be passed into it. Bands of adhesion bound down the vermiform appendix, and there were traces of old inflammation in the cellular tissue around the cæcum. Along the course of the ascending colon the cellular tissue was infiltrated with pus, which nowhere formed a distinct abscess. In the substance of the abdominal wall, immediately adjacent to the ascending colon but not communicating with the collection of pus around that portion of intestine, were sloughs of connective tissue, and also purulent infiltration around them, but no true abscess. There was no visible disease of the mucous membrane of the intestines. A "certain quantity of, but very little," purulent fluid was found lying free in the peritoneum, due, it was considered, to local extension of inflammation from the region of the cæcum and colon."—*British Medical Journal.*

The medical history of this case present no point of interest beyond the fact that it undoubtedly represents the amount of knowledge possessed in France by representative medical authorities, in regard to the etiology and treatment of intestinal diseases. Here is presented to us a case in which the antecedent history of the patient indicated some intestinal lesion, and in further corroboration of the existence of this lesion we find that an ordinary dietary induced signs admitting of no interpretation, except that of an abnormal condition of some portion of the intestine. These signs reappeared on several occasions, but the advice and treatment, except the anointing and blistering, were those given in cases of ordinary constipation. One of these remnants of past ignorance—the blistering—ultimately became the immediate cause of death, in a case in which despite many errors of management, was otherwise doing well. No blame is here attributed to the medical management of the case, as the surgeons in charge brought all the information generally known to influence the treatment. The repeated constipations, which are possible of being prevented, were treated by what is ordinarily termed mild purgatives; but in intestinal disease the mildest purgative, as Sydenham has remarked, becomes harsh in its action. The reason why purgatives succeeded so well in this case undoubtedly was, that the intestine from habituation was not very sensitive at the diseased portion,—a portion in which

there appears to have been an ileo-cæcal intussusception from which, unconscious of its existence, the patient had recovered at a period long antecedent to his last illness. This is the only interesting clinical fact discovered at the *post-mortem.* The other abnormal conditions observed at the *post-mortem*, may as reasonably be attributed to faults of omission and commission in treatment as to any other cause. The conclusion arrived at by his medical attendants, not to interfere directly in search of pus, was in my opinion a proper decision,—as perityphlitic abscesses do best when interfered with after presenting cutaneously, whether the knife or aspirator be used. The repeated omission to so advise, that secondary, tertiary, and more constipations would have been impossible, probably lead to the formation of pus.

The case of M. Gambetta like that of President Garfield are examples of symptoms recognised but not interpretated, though in both cases the sufferers had the benefit of a "multitude of counsellors" of more than ordinary ability.

In the *British Medical Journal*, Dec. 9th, 1882, there are published the particulars of a case of chronic obstruction, presenting many phases in common with that of M. Gambetta. The signs of chronic obstruction had existed for more than two years, without being recognised, and when finally diagnosed the treatment was not much modified. Again, it is remarkable that each of these sufferers had from his own observation noted

the relief to be obtained by a method akin to the natural method of resolution of constipation. The personal experience of one lead him to resort to a method of dilution; the second patient "expressed the greatest dislike to physic, especially if aperient."

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PLATE 1.

Illustration of the mechanism of vomiting, see pp. 53-63.
Figs. 1 & 2 copied from Brinton.

PART I.

PLATE I.

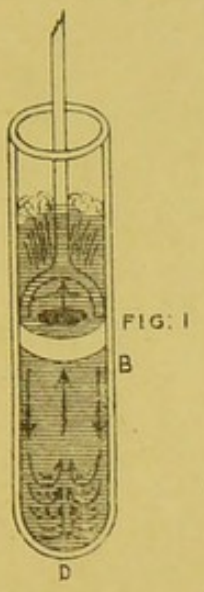
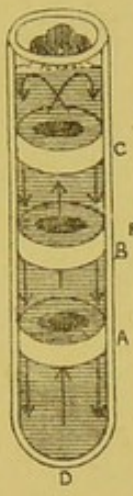


FIG: 1



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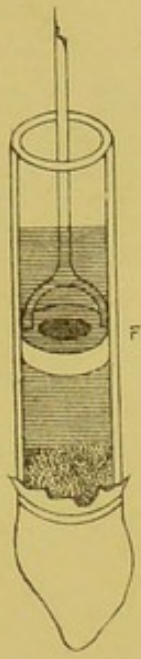

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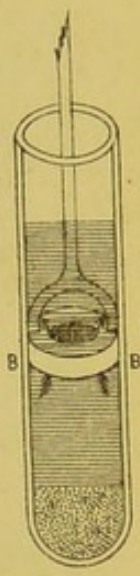

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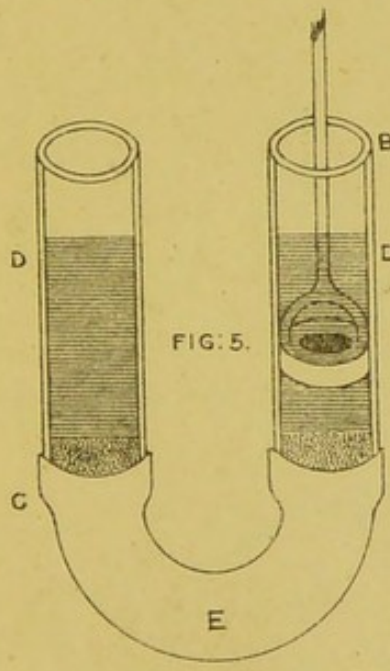

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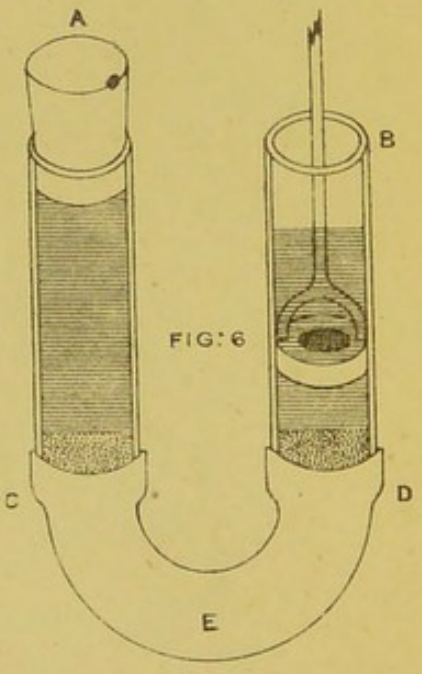

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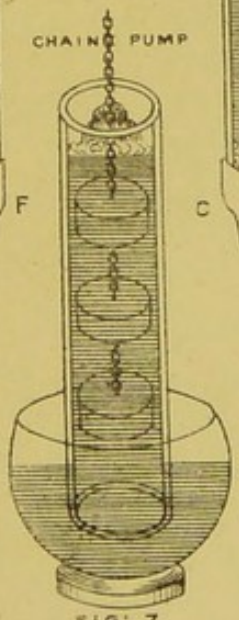


FIG: 7.

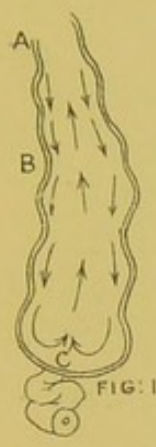
PLATE 2.

Fig. 1 & 2. Illustration of vomiting, from Brinton.

Fig. 3, 4, 7, 8, 9, Intussusception " "

Fig. 5 & 6. Annular stricture " "

Fig. 10. Stricture from band " "



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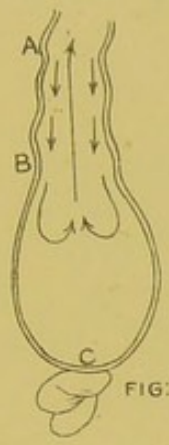
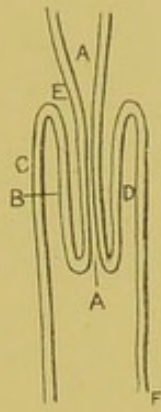


FIG: 2



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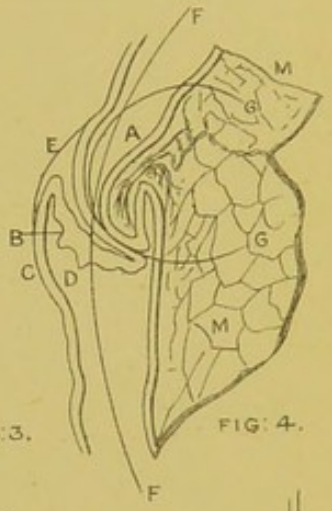

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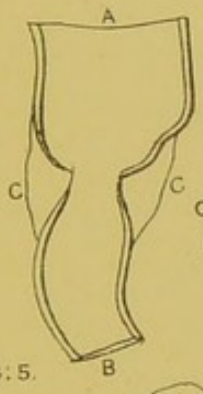

FIG: 5.

FIG: 6.

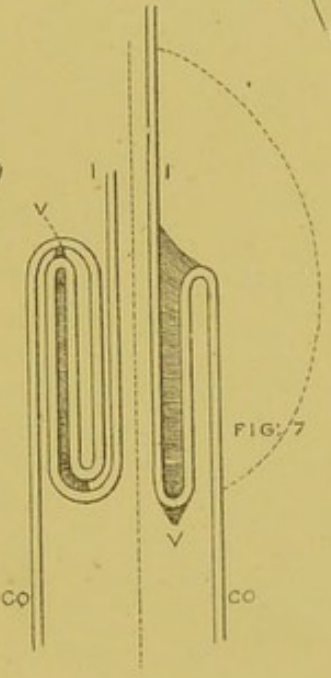

FIG: 7

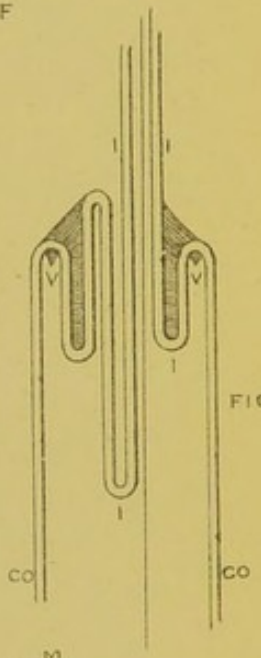

FIG: 8.

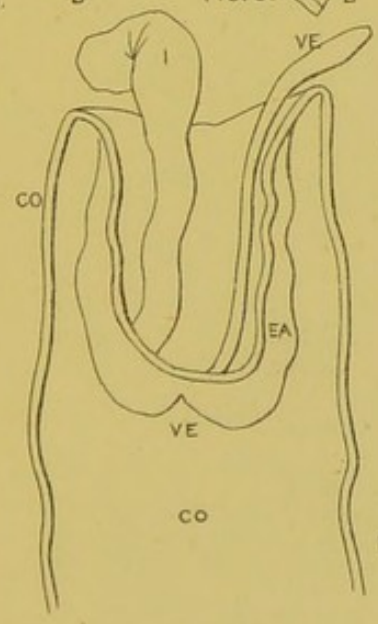

FIG: 9.

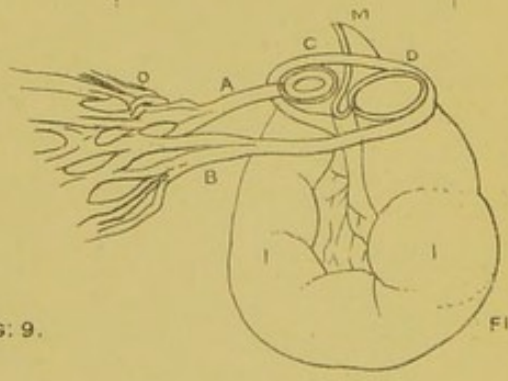

FIG: 10.

PLATE 3.

D. Large and small intestine of horse with blind gut. (Case 23.)

Fig. 2 & 3. Illustration of Appendix C.

PART I.

FIG: 1.

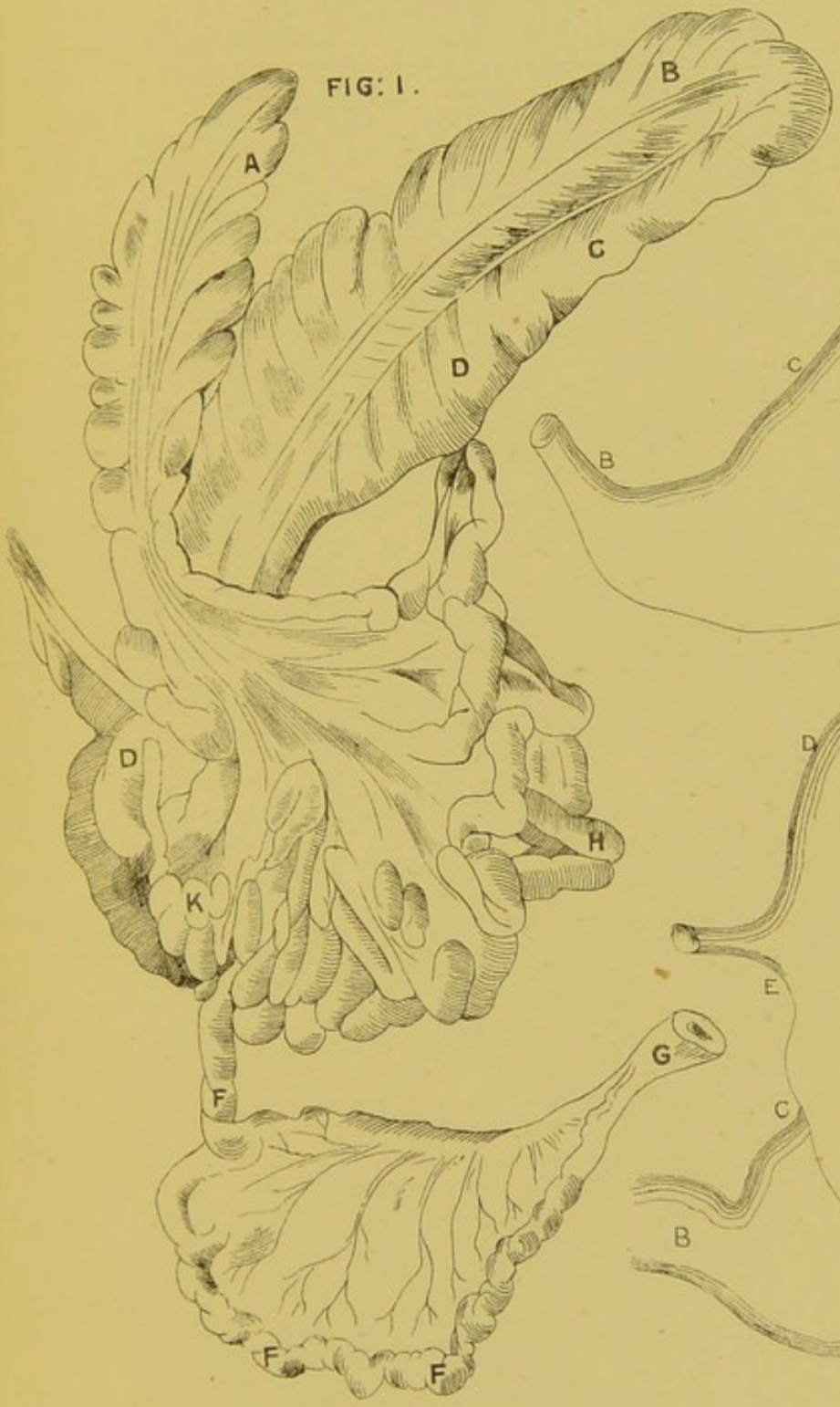

FIG: 2.

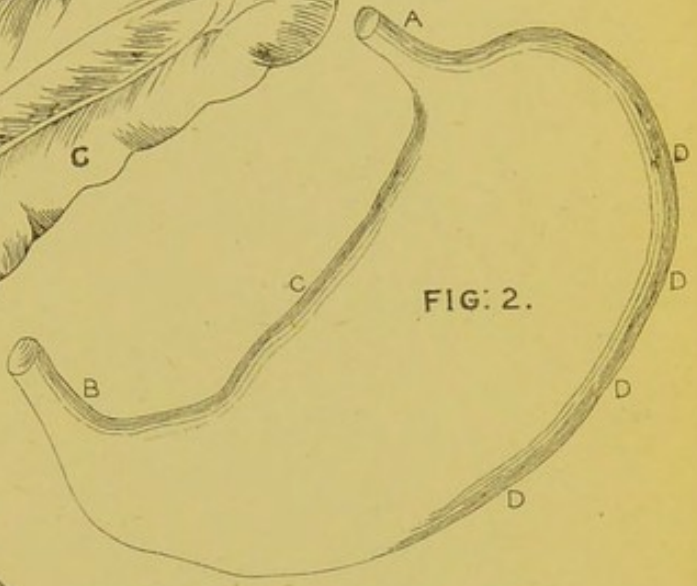

FIG: 3.

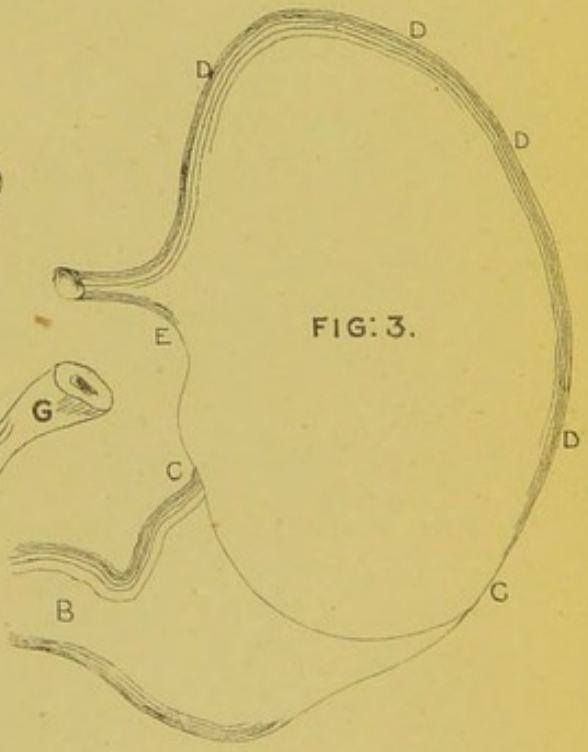

PLATE 4.

Illustration of Case 25. Section showing interior of cæcum and remains of its valve.

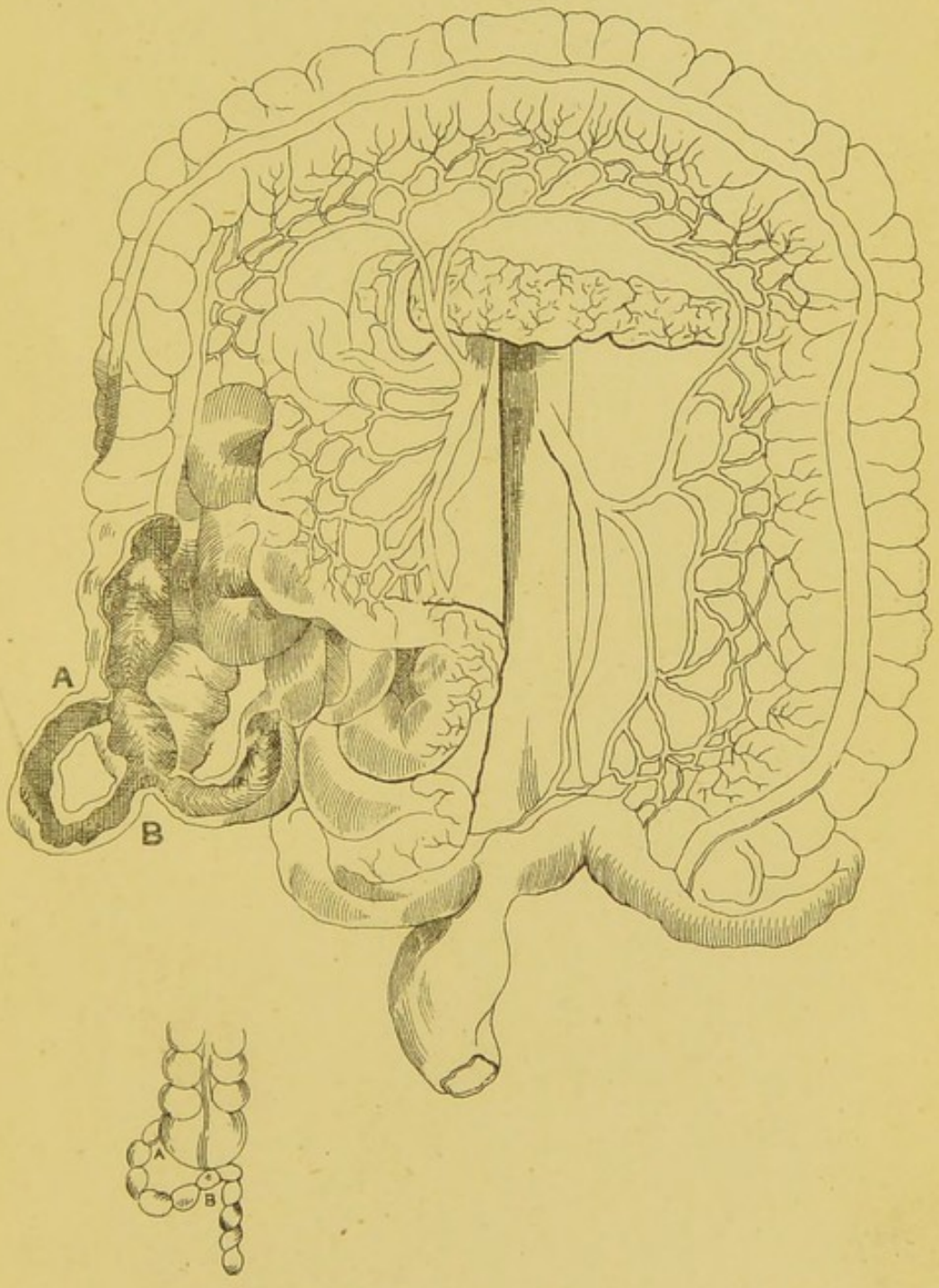

ILLUSTRATION TO CASE Nº 25.

PLATE 5.

Fig. 1, 2, 3. Intestinal trocar and canula.

Fig. 4 & 5. Reservoir subcutaneous syringe.

Fig. 6. Three-way aspirator, stomach and enema pump.

FIG: 1.

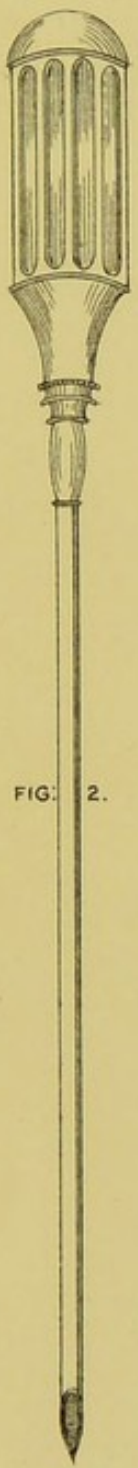

FIG: 2.

FIG: 3.

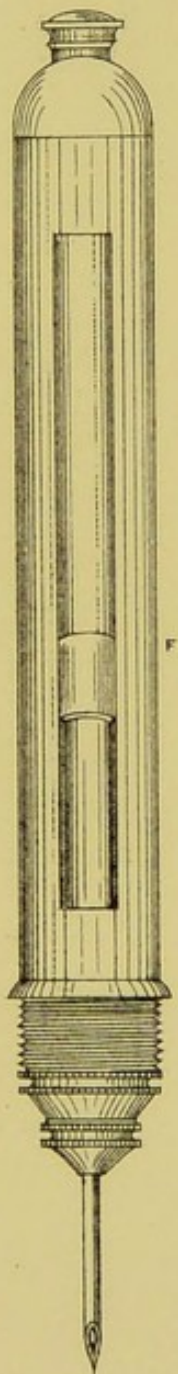

FIG: 4.

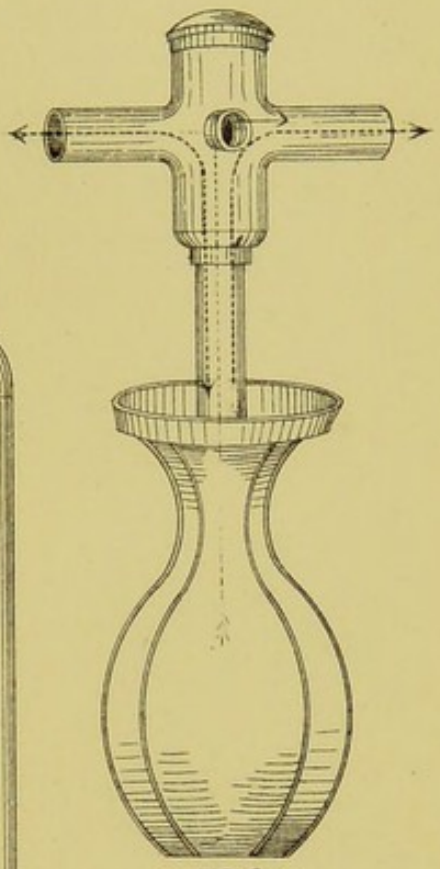

FIG: 6.

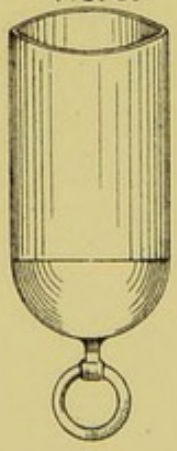

FIG: 5.

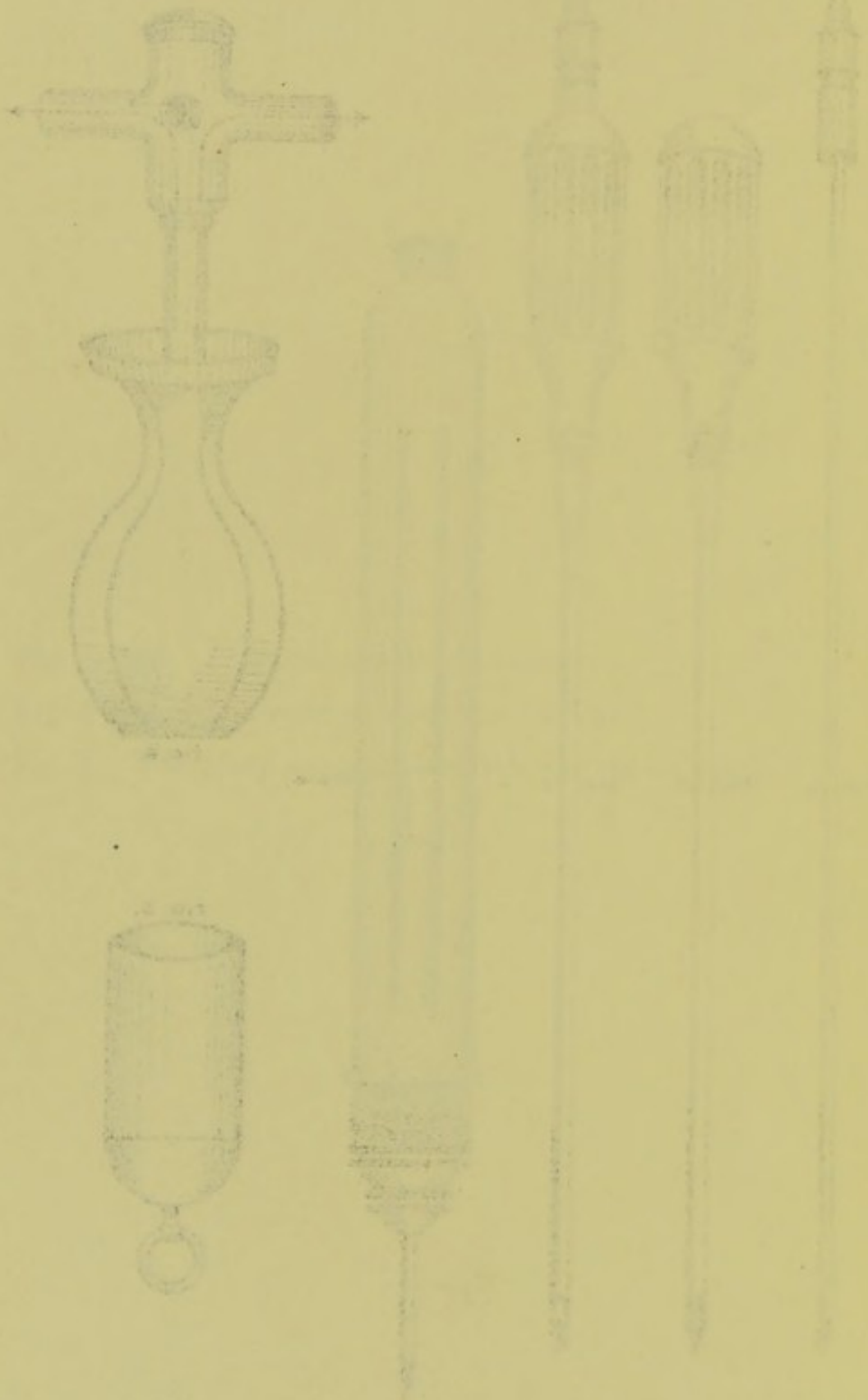

Plate 6.

Fig. 1. Diagram of a femoral or umbilical hernia; its coverings, sac and contents.

Fig. 2. The same in herniotomy; the sac opened, the contents reduced.

Fig. 3. The sac tied, at the inner surface of the abdominal wall, and inner end of the hernial canal.

Fig. 4. Similar ligature of the sac together with a pedicle of omentum.

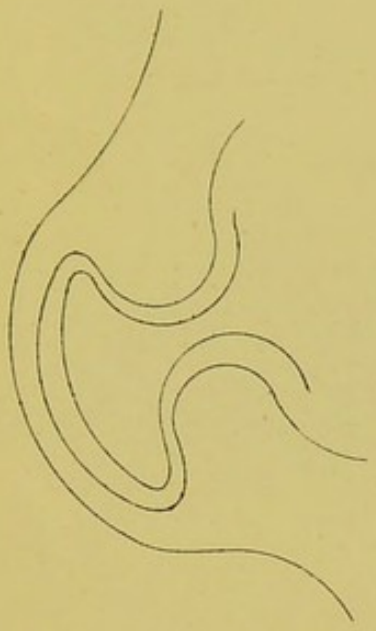

FIG: 1

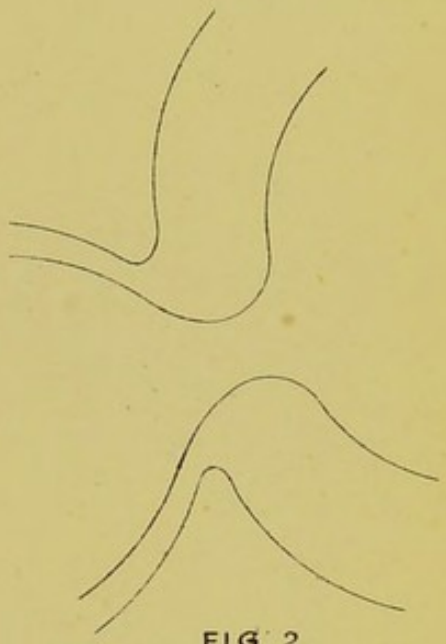

FIG: 2.

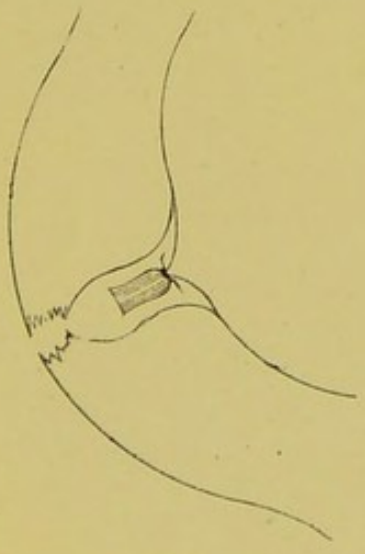

FIG. 3.

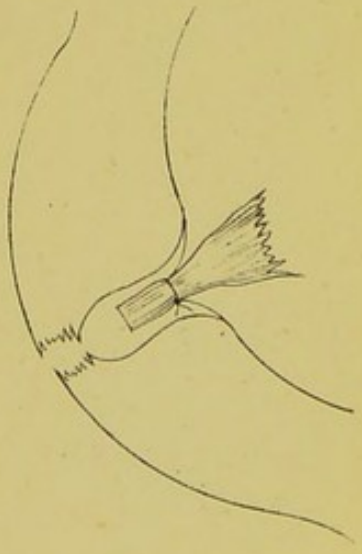

FIG: 4.

Plate 7.

Fig. 5. Diagram of inguinal hernia; its coverings, sac, and contents. An "acquired" sac indicated by the presence of the dotted line; a congenital sac, by its absence.

Fig. 6. The same after herniotomy; the sac tied in front of the spermatic cord. The dotted line absent in a "congenital" sac.

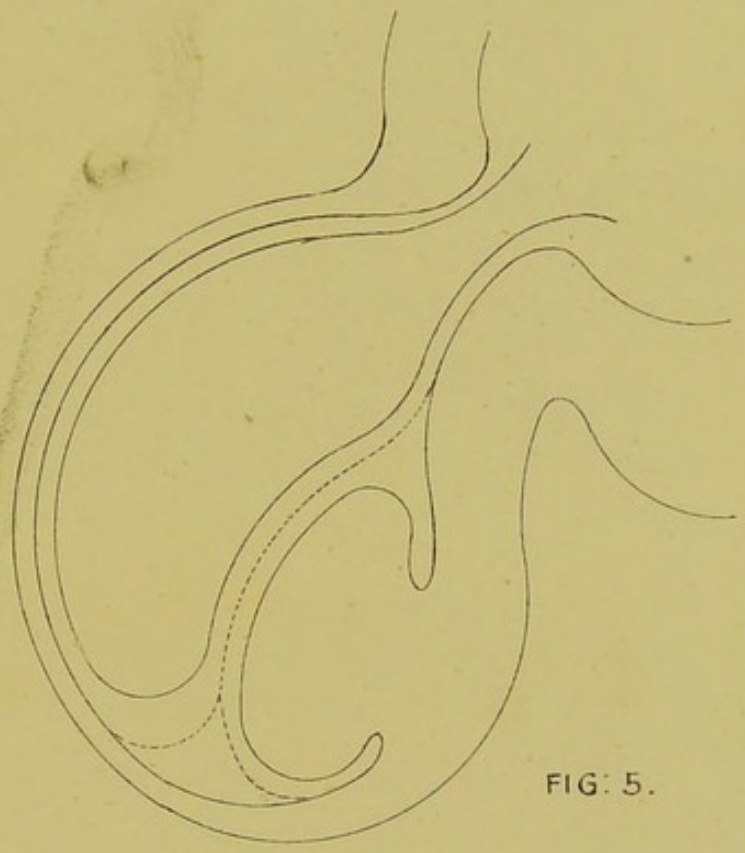

FIG: 5.

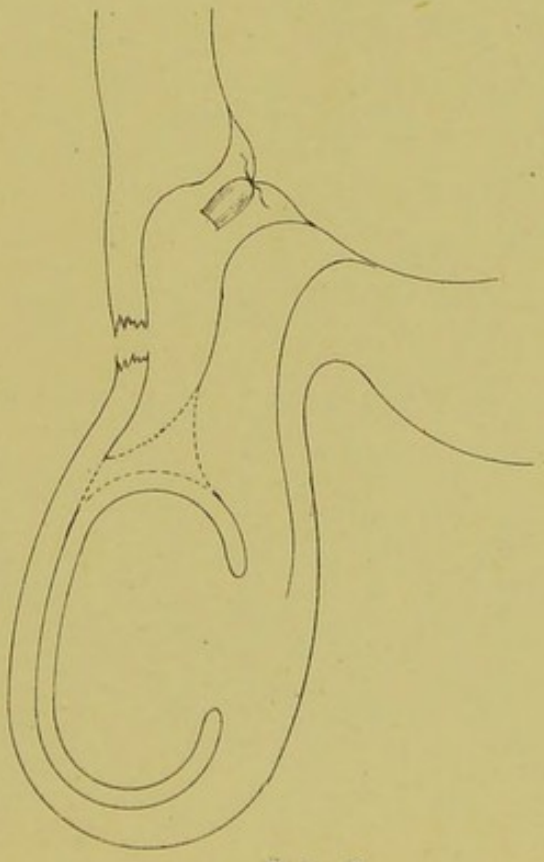

FIG: 6.