Observations on intussusception, as it occurs in infants / [John Gorham].

18.

OBSERVATIONS

ON

INTUS-SUSCEPTION,

AS IT OCCURS IN

INFANTS.

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&c. &c.

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AS IT OCCURS

IN INFANTS.

About three years ago, I was informed that an infant only a few months old was dangerously ill, the prominent symptom being hæmorrhage from the intestines. This, in a patient so young, struck me as a rare occurrence; and, as the cause was unknown, a degree of interest naturally attached itself to the case, and rendered me anxious to investigate the subject more closely. Shortly after this, a preparation, taken from the patient above mentioned, was placed in the Museum of Guy's Hospital; in which extensive intus-susception, and inflammation of certain contiguous portions of the intestines, formed the striking peculiarities. Thus the hæmorrhage seemed to be, in some measure, accounted for.—Not long afterwards, I was requested to visit an infant with the same symptom, viz. hæmorrhage. This patient also died; and examination after death exhibited a displacement of exactly the same portions of intestine, with the inflammatory condition observed in the former case.—On making further inquiries, and procuring cases from different sources, I soon became still more impressed with the opinion, that a connection exists between the symptom spoken of, and the condition of the intestinal canal; and this in a more peculiar and especial manner than many would be inclined to admit, were it not substantiated by facts.

Since this period, I have enlarged my experience in infantile disease: and not trusting to it alone, I have availed myself of that of others who are well known in our profession, and who

kindly interested themselves in sending me cases illustrative of the disease in question.

These preliminary remarks being made, I proceed to give the particulars of the case that occurred in my own practice: and after this, I shall make a few observations on *intus-susception, as it occurs in the infant;* directing especial attention to the diagnosis.

Mrs. Valence's infant, at four months and five days' age, has been healthy since birth; with the exception of having one day had ten or eleven motions, which were greener than usual. The infant has lived almost entirely on breast-milk; but, three days ago, the mother was induced to give it some panada, under the supposition that the milk was not nourishing, or in sufficient quantity. The infant was generally good, and cried but little: she appeared to be well up to yesterday morning, when at eight o'clock she passed a natural motion, and was in apparent health till two P.M., when she was sick, and vomited immediately after having taken the breast. This symptom has continued ever since. Between seven and eight of the same evening, it was first observed that the evacuations per anum consisted of blood, and nothing else: three napkins were soiled during the night, and in the morning I was requested to visit the infant. The above report, joined with the appearances observable on inspection of the napkins, gave me a decided impression that the case was one of intus-susception. The vomiting, and the discharge of blood per anum without the slightest admixture of feculent matter, were the two prominent symptoms which led me to suspect the disease; so that even prior to seeing the little sufferer, my prognosis was unfavourable.

The quantity of blood passed amounted to about three or four teaspoonsful; the skin over the entire body was pale and hot; there was no emaciation; the infant lay quiet for a few minutes; and then cried out with an expression of pain in the countenance. The pupils were dilated; there was slight cough; pulse averaged, in the half-hour, 200 in the minute; the vomited matter consisted of milk, part of which was curdled. The abdomen felt soft and hot: I could not discover any unusual prominence or hardness in any of its regions. On

introducing my little finger into the rectum, nothing abnormal could be perceived: the canal was clear: whence it appeared, that if an intus-susception existed, it was too high to be explored by this means. On withdrawing the finger, some dark-coloured, thickish blood followed, in quantity about a teaspoonful and a half. The infant had vomited six or eight times within the half-hour. An enema, consisting of starch and olive-oil, was now injected cold, but returned almost as fast as it was given. I repeated it shortly after, and with the same result. A large cataplasm was now directed to be applied to the abdomen; and a quarter of a grain of extract of conium, in a teaspoonful of camphor mixture, was directed to be given every four hours, with a grain of calomel. At nine P.M. the infant was lying on her back, and appeared to be more composed: she was looking about in a disconsolate manner, and since the morning had screamed occasionally. No more blood had been passed; the vomiting had continued; she sucked less frequently, and always vomited immediately after taking the breast. Convulsions came on during the night, and were repeated frequently. At nine the following morning, a severe fit seized her; during which, her sufferings terminated in death.

SECTIO CADAVERIS, *six hours after death.* — There were four intus-susceptions of the small intestines, which were easily reduced; and the peritoneum covering these parts was slightly red. The lower portion of the ileum was of a deep-red colour, and intus-suscepted within the ascending colon; which latter was also swallowed within the transverse arch. The appendix cœci was highly injected; and it and the cœcum were occupying the upper part of the invagination (vide Plate II.) The appearances, as they presented themselves to notice during the dissection of these parts, were as follows:— The transverse arch of the colon was the outermost and containing intestine: it was very much distended (Plate I. fig. 1. *a a a*); and contained, the ascending colon (Plate I. fig. 2. *f f*), the cœcum and its appendix (Plate II. *e g*), and the ileum for the last half-inch (Plate II. *d d*). The mucous membrane of the inflected ascending colon was beautifully injected, villous, soft, and constricted in many places; that of the invaginated

ileum was intensely red, villous, and extremely irregular. The appendix cœci was of a deep reddish-brown colour, and slightly blue in many places.

The membranes were exposed in the following order:

1. The peritoneal covering of the transverse colon.
2. Its mucous membrane; in apposition to
3. The mucous membrane of the ascending colon.
4. Its peritoneal investment.
5. The peritoneal investment of the cœcum, appendix, and ileum; and,
6. Lastly, The mucous membrane of the same parts.

The stomach was empty, and appeared to be of a healthy colour. The small intestines were generally healthy in appearance, and, for the lower three-fourths, contained a yellowish watery fluid: the upper fourth was empty. All that portion of colon which was below the intus-susception, as well as the containing parts, was of a dark-bluish colour. The mesenteric glands were enlarged, some being of the size of large beans.

Intus-susception is not a very uncommon disease, and is frequently fatal*. It is produced by the passing of one portion of intestine into another†, and dragging along with it a part of the mesentery‡. The portion of gut that is received into the other is in a contracted state, and is sometimes of considerable length. It usually happens, that an upper portion of intestine falls into a lower; but the contrary likewise occurs, though rarely§. Intus-susception may take place in any part of the intestinal canal; but, as is shewn by almost innumerable instances, it happens most frequently in the small intestines‖. A representation of an invagination in the jejunum is given by Dr. Baillie¶. On taking

* Baillie Morb. Anat.

† Hunter.

‡ Dr. Velse Defin. (in Haller Disp.) may thus be shortened and improved:—"Intus-susceptio medicis dicitur, quum tubi intestinalis pars in proximam partem impulsa, in eâ absconditur" (without alluding to the cause).

§ Baillie Morb. Anat.

‖ Idem, et Monro 356.

¶ Fascic. IV. Plate VI. Fig. 1.

a hasty glance at the subject, one might be easily led to consider that it is matter of indifference whether the duodenum, jejunum, or ileum be affected: yet post-mortem examinations instruct us, that when the lower portion of the latter gut forms a part of the invagination, the disease is inflammatory—generally dangerous—frequently fatal*. Appearances, after death, then, as well as the symptoms during life, together with circumstances of practical importance, seem to suggest the division of the disease into two kinds: the first, that which is unattended with inflammation: the second, that which is attended with acute inflammation and its consequences.

OF INTUS-SUSCEPTION UNATTENDED WITH INFLAMMATION.

This species occurs more frequently in infancy than in manhood; and, in most cases, does not merit the name of a disease, as it does not derange the functions of the alimentary canal†. One rare instance is on record, where the displacement existed at birth‡. The included portion of the intestine may, in most cases, be disengaged, there being no unnatural thickening or inflammation. The extent of the intus-susception, or of the quantity of intestine received within the other, varies from 1 or 2, to 8, 10, or even 20 inches: and with the extent, so does danger become manifest. Generally, in this non-inflammatory kind, the invagination is of no considerable length. We not unfrequently meet with three or four invaginations at the same time. Sometimes there is a much greater number, and all in the natural direction. In one case, no fewer than forty-seven were found in the same body, without the slightest inflammation§. It is very frequent amongst children‖. In every instance of fatal diarrhœa examined by Dr. Cheyne¶, the intestinal canal abounded with singular contractions, and had, in its course, one or more intus-susceptions.

* See my Plates 1, 2, 3.

† Monro.

‡ Beireil de Intestinis et Intus-suscipientibus (*Helmet.* 1769).

§ Burns.

‖ Monro Morbid. Anat. 356. Edin. Med. & Phys. Essays, Vol. II.

¶ Dr. Cheyne, Essay II. on Bowel Complaints, 1802, p. 22.

Fifty cases of fatal diarrhœa occurred to Dr. Burn's brother, in all of which were intus-susceptions*. The greatest part of 300 children, who died, either of worms or during dentition, at the Hospital de la Salpétrière, and came under the examination of M. Louis, had two, three, four, or even more volvuli, without inflammation†. In opening bodies, particularly of infants, Dr. Baillie observes, that an intus-susception is not unfrequently found‡. I have opened several infants myself, who have died of different diseases; and in all but one, a volvulus, or several, existed.

There are no symptoms by which we may infer that this simple non-inflammatory intus-susception exists; yet, from its great frequency in children, I am inclined to believe that they are identical with those of colic: for colic is nothing more than a spasmodic contraction of the muscular fibres of the intestines; and the first stage of the intus-susception, the prelude of the invagination, is spasmodic contraction of the muscular fibres also§: and they are both very frequent amongst children‖. When, therefore, in infants, violent screaming occurs, without any warning, accompanied with hardness of the abdominal muscles, kicking, and often drawing up of the legs, I should consider that these symptoms were referrible to the two diseases in common; and the treatment should be conducted accordingly. Of the causes of this non-inflammatory kind, I may observe, that an infant becomes more predisposed to the disease from the natural irritability of muscular fibre; and it is more frequent in early life, though less dangerous, on account of the greater laxity of fibre, and slighter degree of stricture and swelling¶. Any unnatural irritation may excite a partial contraction, and thus produce an invagination: costiveness**, too much food, irregularities in diet, acrid purgatives—or those which produce much griping††, such as senna-tea, made by boiling the

* Burns Midwif. 1811. p. 502.
† Mém. de l'Acad. de Chirurg. 4to. Tom. IV. p. 222.
‡ Baillie Morb. Anat.
§ Vide Plate VIII. in Dr. Cheyne's Essay II. p. 49.
‖ Burns.
¶ Monro Morb. Anat. 357.
** Idem.
†† Monro. Burns.

leaves—and diarrhœa, have each been enumerated, by authors, as exciting causes.

From a collection of facts, it appears that this non-inflammatory intus-susception is not dangerous. We have Monro's authority, that it scarcely merits the name of a disease *. M. Louis observes, of the cases that occurred to him, "There were no circumstances leading to the supposition that these affections had been injurious during life; and these cases seem to prove that intus-susception may be formed and destroyed again, by the mere action of the intestines" †. Dr. Baillie also remarks, that the parts appear perfectly free from inflammation, and that the invaginations would probably have been easily disentangled from each other by their natural peristaltic motion ‡. On the other hand, we find Dr. Burns affirming, that this non-inflammatory species of intus-susception is the most frequent cause of fatal diarrhœa; not less than fifty cases having occurred to his brother, in the course of his dissections. It seems difficult to understand how the Doctor should have arrived at this conclusion; when it is considered, that diarrhœa may prove fatal without intus-susception; and that the latter affection, on the other hand, as proved by well-authenticated facts, is present in a vast number of cases, without being injurious, much less dangerous to life. No one can deny the fact of the existence of intus-susception in the cases opened by Dr. Burn's brother; but if fifty post-mortems were made of infants dying from any other disease, it is more than probable—in fact, it amounts to a certainty—that nearly all would have one or more intus-susceptions in various parts of the intestines. Dr. Dewees says, "It has been observed by almost all writers, that this form of diarrhœa (speaking of the chronic form) terminates, sometimes very suddenly, by violent vomiting or convulsions." "Now," asks this gentleman, "is it not more than probable, in these cases, that the immediate cause of death may have been the invagination of the intestines §?" I would answer from facts.—It has never been proved that infants die of this non-inflammatory intus-susception; for wherever this has been

* Morb. Anat.

† Mém. de l'Acad. de Chirurg. 4to. edit. Tom. IV. p 222. ‡ Morbid Anat.

§ Dewee's Medical and Physical Treatment of Children, p. 325, note.

found, some other disease, the existence of which was ascertained before death, and the fatal nature of which had been proved by the experience of all medical men, was always present.

If this simple invagination were dangerous, probably eight children, if not more, out of every ten, would be carried off by it; and we are certain that this is not the case. I conclude, from the foregoing facts, that no danger is to be apprehended from this slight non-inflammatory intus-susception.

INFLAMMATORY INTUS-SUSCEPTION.

Before passing immediately to the subject of the inflammatory species, I shall say a few words on the production of an intus-susception, and on the circumstances necessary to constitute such a disease. The different parts which compose it must be considered. It is made up of three folds of intestine:—

1. The *inner*, which passes in the direction of the intus-susception.

2. The *middle*, which is a reflection of the inner, and passes in a direction contrary to the intus-susception: and,

3. The *outer*, which is a reflection of the middle, in the direction of the intus-susception.

This third, or *containing* part, is always in the natural *position*. The first, or *contained* part, is always in the natural *direction*, provided the intus-susception be *progressive*—as Hunter would call it. It is, moreover, necessary to the production of an intus-susception, that there be, either, 1. A contraction of the part to be intus-suscepted; or, 2. A dilatation of that part which is to form the outer fold; or, 3. A natural and sudden inequality of calibre of some portion of the intestinal tube.

The first may be produced from *spasm;* the second, from *flatus;* whilst the third is always present in the normal condition, viz. at the termination of the ileum in the cœcum. In this situation it is that intus-susception puts on its dangerous and fatal characters; and produces such a complicated malposition of intestines, as would appear almost incredible, unless substantiated by anatomical observation.

The outward fold is the only one which is active, when the disease has once begun; and by its peristaltic motion

it squeezes down the inverted portion; and thus any length of gut may be drawn in. With regard to the circumstances necessary to its continuation, a remarkable difference obtains between intus-susception at the ileo-colic valve and that at any other part of the intestinal canal: for, as it has been stated that the outer fold is active, so will it continue to drag within it the *contained* intestine, provided that this latter always remain passive. And here appears to me to be the cause of that most uncontrollable invagination that occurs when the ileum is pushed into the colon: for it is not necessary that any preternatural contraction should be formed in the ileum ere it can enter the large intestine: in order to this, its normal size is sufficient. How different, on the other hand, is the case of invagination from spasm! It is in the nature of spasm to be paroxysmal—to go and come quickly: thus, affording a chance of the reduction of intus-susception, from the relaxation of spasm, and the comparative activity of the inner fold, and this in a direction contrary to that of the invagination. Intus-susception, then, at the ileo-colic valve, occurs without spasm, without a preternatural contraction of intestine, and, consequently, without a chance of reparation from any subsequent dilatation that might have occurred, had spasm existed. This brings me more immediately to the subject to which all the foregoing observations have been tending; viz. the inflammatory and dangerous form of intus-susception. This differs very widely, in fact, almost in every circumstance, from the non-inflammatory kind; not only in respect of its symptoms, but also in the manner of its production, its situation, and danger. As I would refer to facts upon which to ground an opinion, rather than adhere to any preconceived hypothetical custom, I have inserted some Cases in a subsequent part of this communication. From the post-mortem examinations, the usual situation of inflammatory intus-susception may be seen, and the symptom or symptoms that were constantly present are noticed. And although it has been stated that the diagnosis of this disease is very obscure, I yet hope to prove, by an appeal to facts, that it is not so in infants and young children; nevertheless, there will remain much to be done towards elucidating the subject as regards adults.

Hunter, when speaking of the diagnosis, says, "When there are violent affections of the bowels, attended with constipa-

tion, we have reason, from the cases which have been examined in the dead body, to suppose that this disease may be the cause of them:"—and, a little further on, "There are so many other diseases, though, that produce the same symptoms, that nothing can be ascertained." The term '*violent affections*,' although coming from Hunter, must be allowed to be rather vague. It is for us to study the symptoms of a particular lesion first, and theorize afterwards. *A priori*, we might be led to imagine that such a particular symptom must, or not, be present in any particular morbid development; but how often this is fallacious!

I shall now proceed to analyze the cases.—If, before having considered the subject of inflammatory intus-susception, I had been interrogated respecting any supposition I might have formed concerning the previous health in the majority of infants affected with this disease, I should have answered, "that probably it would have been delicate—that the infant would have been irritable, and subject to bowel irritation." Yet, in all the cases on record, with two exceptions, a particular statement has been made, that the "health was always good"—that the little patient had never been subject to bowel complaint—and the like. (Vide Table.) Again, nothing can be more natural, than to suppose, that if a considerable intus-susception has actually taken place, a swelling would be formed, and that this would feel like a tumor externally: yet how fallacious again is this symptom! In all the cases that were examined, some portion or other of the large intestine colon formed the containing fold of the intus-susception. In all, death happened in less than 120 hours. Vomiting was almost a constant symptom. It might, indeed, have been present in all, though not mentioned in the history of some of the cases. The pulse did not appear to afford sufficient grounds for any satisfactory inference. In Dr. Ash's case, it was below the usual number: in my own, it exceeded it, being 200 in the minute. Nothing is said about it in the other cases. (This would be considered a grand omission, in the report of an adult's disease.) A tumor could be detected in the abdomen in some of the cases. As for pain, it is almost useless to talk about such a symptom in an infant who cannot speak, and, often,

even in children who can: there were, however, strong indications that it existed; such as, *violent paroxysmal screamings, drawing up of the legs,* and *elevation of the upper lip,* &c. &c.—The constant symptom, however, was, the passing of blood per anum, in various degrees of purity; never indeed contaminated with feculent matter, but chiefly with mucus. I would insist especially on this symptom, because I believe it to be a very important one in infantile intus-susception. The blood appears to be recent, and fluid, in many cases; and in quantity varies considerably. In Mr. Muriel's case it was excessive, more than a teacupful of blood having been passed. The disease, in fact, amounted to hæmorrhage from the intestines, of which the causes were not known before death; insomuch that the infant was completely blanched and cold ere the fatal termination occurred. In my own case, I must say that I was struck with the appearance of this sort of discharge per anum, in a patient so young. It was not that of common dysentery; where the intestine seems reluctantly to supply its blood, to tinge the mucus which is generally present in that disease. It came on suddenly in infants who had previously enjoyed good health. It had nothing to do with diarrhœa; for this was not, neither had been, present in any of the cases. Neither had it occurred during a peritonitis; in which disease, sometimes, blood is passed. Purpura was not present; for this is rare in infants so young*; neither could hæmorrhoïds or organic disease be detected†. In all the fatal cases reported, the same intestine, viz. colon, had formed the *containing* fold; and this had grasped the *contained* parts (viz. the lower portion of the ileum, the vermiform process, the cœcum, and more or less of the inverted colon), which it urged onwards by its natural peristaltic motion, as if it were endeavouring to expel them by the anus. This it had almost accomplished, in Dr. Lettsom's case‡: in my own, the contained

* Of 17 patients with purpura hæmorrhagica, seen by Dr. Willan, 2 only were men: 9 were women, of whom 4 were beyond the age of 50: 3 were boys; and 3 infants not more than a year old.

† I lately had a case (which is inserted in the Medical Gazette for Feb. 10, 1838) of fungoid degeneration of the right kidney, in an infant of eight months old. Organic disease, however, in infants is not common.

‡ Phil. Trans. Vol. XXVI. p. 312.

portions had not progressed so far: in Dr. Ash's case, Mr. Blizard's, and Mr. Langstaff's, it had proceeded as low as the sigmoid flexure. Nor has the effort only been made, but the expulsion has actually been accomplished in a most astonishing manner; for the invaginated portion has sometimes sloughed, and been discharged per anum, while the agglutination of the parts has preserved the continuity of the intestinal canal. Thus, in a case related in Duncan's Commentaries, eighteen inches of small intestine were voided per anum *. Three similar instances occur in M. Hevin's Memoir: 23 inches of colon came away in one of them, and 28 of small intestines in another †. Other cases occur in the Physical and Literary Essays ‡; in Duncan's Annals §; and in the Medico-Chirurgical Transactions ‖, where Dr. Baillie states that a yard of intestine was voided. In 1823, M. Bush recorded a case ¶, in which from 15 to 18 inches of the ileum were discharged from the anus; and recovery was effected on this principle.

Although the cases that I have recorded all occurred in infants less than a twelvemonth old—having been selected intentionally, in order that the resemblance between the phænomena in infancy and those at an adult age might be rendered manifest, and that the symptoms to guide our diagnosis might spring from a practical idea of the subject—yet no age seems to be exempt from this disease. In adult life, the symptoms are more varying and distracting. Thus, in a case reported, by Mr. Bullin of Fleet Market, of an adult, in which the ileum and cœcum were found invaginated within the colon in a manner precisely similar to that of those mentioned in this Paper, the chief symptoms were, suppression of stools, and violent pains in the abdomen, quite unattended with vomiting. But, although all ages may be attacked, it seems that infancy and childhood are more especially the victims of this affection. Dr. Velse gives six cases, of various ages under five, and one adult **: and as age advances, the fatal nature of the malady does seem to diminish or become perverted, from some almost accidental causes, wonderful in their

* Vol. IX. p. 278.
† Hevin in Mém. de l'Acad. de Chirurg. Vol. IV. 4to.
‡ Vol. II. p. 361. § Vol. VI. p. 298. ‖ Vol. II.
¶ Med. and Physic. Journal. ** Haller Disput. Tom. VII. p. 101.

occurrence; and which would appear almost impossible, if well-authenticated facts did not leave us without a doubt.

The most frequent seat of the invagination appears to be at the termination of the small intestines in the cœcum; the colon generally constituting the *containing* and *middle* fold; while the *innermost* consists of the lower portion of the ileum and the vermiform process of the cœcum, as is represented with tolerable accuracy in the drawing. The disease has occurred in the small intestines entirely; but this is somewhat rare. In the Museum of Guy's Hospital there is a preparation of an intus-susception of small intestine, with a portion of coagulable lymph poured out, which had taken the impression of the intestine*. Ruysch has seen the disease in the jejunum; but he says that very numerous observations, not only by himself†, but by a very great many practical anatomists, have shewn that the ileum is the most frequent seat of this affection. Dr. Velse gives reports of six infants; and in all, this was the precise situation of the affection‡. Many observations shew that intus-susception not unfrequently attacks the human body. Ruysch has stated, that it happens much more frequently than had formerly been believed: "Familiarissimum et multò frequentius quam auditum anteà fuerit." This celebrated anatomist, amongst a great number of post-mortem examinations, found it in four cases in succession; and he says, "Many, indeed, in our cities sink daily from this depraved state of intestines, especially infants§". Of the dangerous nature of the disease there can be no doubt. All the cases formerly died; excepting those of mature years, in whom the powers were sufficient to carry them through the process which took place in order that the intestine might slough and be discharged per anum. I shall shortly have to speak of the treatment; and shall then give three cases where a successful apparent reduction of the gut has been accomplished, and complete recovery has resulted. The predisposing cause of this kind of intus-susception is tolerably evident; viz. the

* No. 1851, by Sir A. Cooper.

† "Ileum verò intestinum creberrimam ejusdem sedem, non paucis Anatomiam Practicam exercentibus, observationes quum plurimæ, et mihi ipsi singula sex infantibus corpora indicârunt." *Haller Disp. Anat.* Vol. VII. p. 102.

‡ Haller, Tom. VII. p. 101.

§ Ibid. loco citato.

unequal diameters of the end of the ileum, and the commencement of the large intestine. But if the inflammatory invagination be in any other situation, then it would seem that a continuation of spasm (so long, that too much gut has been drawn in, ever again to be replaced, even should relaxation occur) has taken a considerable share in its production. In attending to the exciting cause, a sudden change in diet seems very probably to have produced the disease in the case I have reported. For three days before, the infant had been fed on panada; the very first spoonful of which might have never passed the ileo-colic valve; and the remainder might have accumulated in the ileum, at its lower end, until suddenly, from a strong peristaltic motion, not only the contents, but the intestine itself, passed into the colon. Any unnatural condition of the mucous membrane of the ileum (a part, of all others, prone to irritation) would produce such an abnormal perversion of peristaltic motion, as to lead to the formation of an invagination.

With what disease, then, can this *inflammatory intus-susception in infants* be confounded? Mr. Langstaff, after having informed us that the symptoms of this affection are common to *inflammation of the intestines, hernia,* and *obstruction of the canal from whatever cause,* adds, "*and a volvulus is the least frequent cause of such symptoms.*"—I must entirely disagree with Mr. Langstaff in this last assertion, as far as it relates to the disease in infantile life.—Is hernia a frequent disease amongst children? Yes, it occurs constantly!—But what kind of hernia is it that is thus so frequent—*strangulated?* The answer is, No!—Mr. Pott mentions, that an infant aged one year died of *strangulated hernia;* but adds, that this seldom occurs. Gooch, in his Chirurgical Works, describes a remarkable scrotal hernia which happened in an infant at ten weeks: the symptoms were the same as those arising from intus-susception; but, in addition, there was a swelling extending from the inguen to the scrotum *. I have never seen a strangulated hernia in an infant; but three cases of inflammatory intus-susception in infants have passed before my notice. In inflammation of the intestines of infants, vomiting does not happen immediately after taking food †; the stools are not bloody at first; and some fæcal eva-

* Gooch's Chirur. Works, Vol. II. p. 207. † M. Billard.

cuations are passed. Indisposition exists previously, and marks of irritation of mucous membrane. I have, therefore, come to the following conclusions:—

When an infant under a year old is seized with symptoms of strangulated hernia, the cause will most frequently be *intus-susception.*

When dangerous intus-susception exists, its situation will most frequently be at the termination of the ileum in the cœcum.

Hæmorrhage, with absence of all fæcal evacuations from the intestine of an infant, is rare, unless it have for its cause *intus-susception.*

It was by this symptom I diagnosticated the disease in the Case reported at the commencement of the Paper; and I had no hesitation in delivering a prognosis, which, by preparing the friends for a fatal termination, exonerated me from all blame on its occurrence.

Additional facts have only tended to confirm more and more the opinion I entertain respecting the symptoms of this disease.

The subject has been discussed at the Westminster Medical Society; and it is only necessary to read attentively the Case adduced* by Mr. Clarke, in order to see the striking similarity in almost every particular with that given by myself. Mr. Clarke very properly observes, "He did not think the hæmorrhage had been sufficiently dwelt upon, though it was mentioned by some authors." *In the case which I have reported, it formed one of the most prominent features.*

In the treatment of this disease, *bleeding*, to lessen the inflammation, and quicksilver, to remove the cause, have been recommended. Forcible clysters have been used, as a mechanical means; and some have proposed the employment of a long bougie, or piece of whalebone, to push back the intestine. *Anodyne medicines*, the *strongest purgatives*, the *warm bath, blisters over the tumor* where it has been detected, and *emetics*, have all been tried in their turn, without benefit.

The operation of opening the abdomen, in order to disentangle the intus-suscepted intestine, has also been spoken of. M. Hevin, sanctioned by Mr. Samuel Cooper, condemns the proposal. The former gentleman also remarks: "If the equivocal and uncertain nature of the symptoms of volvulus

* Lancet, Feb. 19, 1838.

were not sufficient to deter us from undertaking an operation which, under the most favourable circumstances, would be extremely difficult and imminently hazardous to the patient, the state of the invaginated parts will entirely banish all thoughts of such an imprudent attempt. The different folds of intestine become agglutinated to each other, so that they can hardly be withdrawn, even after death*;" and it is affirmed by many other authors, that a stricture on the intus-suscepted part causes it to inflame†, and even to mortify‡.

However, a case is recorded§, in which an operation was resorted to by Dr. Wilson, and with success. The subject was a Negro, aged 20. He had laboured, for seventeen days, under bilious colic and stercoracious vomiting. An incision was made along the linea alba, commencing above the umbilicus, and extending to two or three inches below it. The ileum was found involved in the stricture: it was adherent; and the adhesion gave way, after several efforts of considerable force: the strangulated bowel was dark livid. His recovery was rapid, and entire.

I certainly should not be inclined to operate in infants, at all events; for it is more than probable that convulsions would destroy them, even ere the operation was finished.

But of all methods of cure, that which I am now about to notice seems entitled to our most careful and attentive consideration: I allude to the treatment by *inflation*. Three successful cases are to be found reported in the American Journal of Medical Science, treated after this manner. I may remark, that it consists merely in introducing the nozzle of a common bellows into the rectum, and gradually inflating the intestines.

The first case that I shall give extracts from, is that treated by John King, esq. The patient was a female, aged 26. After having uneasy sensations in the stomach, obstinate vomiting succeeded, which consisted, at a subsequent period, of yellow matter. A violent screwing pain was also com-

* Ed. Med. Essays, Vol. VI. Dr. Simpson. — M. Hevin, loco citato. — Malcolm's Phys. and Lit. Essays, Vol. II. 360.—Hunter.

† Hunter. Trans. for Improv. of Med. and Chim. Knowledge, I. 108.

‡ Blizard's Med. Chi. Trans. I. 169.—Langstaff's Ed. Med. and Surg. Journal, No. XI.—Sœmmering's Trans. of Dr. Baillie's Work, 490-91, note 103.—Moron.

§ American Journal of Med. Science, 1835, p. 262.

plained of, situate between the sternum and umbilicus: it came on in paroxysms, and ended in vomiting. Calomel, jalap, castor-oil, laudanum, the warm-bath, and effervescents, were all useless; and after five days passed without a dejection, the common bellows was used; and it is stated, that "as soon as air entered the rectum the countenance lost its anxiety, and the patient said she felt quite relieved. In a minute she passed a stool; and complete recovery resulted*." —The second case is that reported by Dr. Wood. The patient was a male, aged 35. The symptoms were, first, dry retching, and hiccup; afterwards, vomiting of a large quantity of green bile, mixed with feculent matter: violent pain was complained of in the umbilical region; the pulse was small, frequent, and irregular. Superficial examination detected no peculiarity in the form of the abdomen, till the fourth day, when an unusual fulness and firmness was first discovered in the right iliac region; but the hand lying upon the spot, a paroxysm of pain occurred, and an elongated tumor was felt to rise, with an erectile motion. Purgatives of croton-oil combined with laudanum, fomentation, enemata of tobacco infusion, and copious bleeding, were all of no avail; and on the fifth day, as a last resource, the bellows was used. After the first inflation, there was no occurrence of violent pain; the patient said he felt much easier, and wished to pass a motion: a large quantity of air, however, came away, and about a gill of very fetid bloody water. In about five hours after this, two copious dejections were passed; and complete recovery ensued†.—The third case is reported by Dr. Janeway. The symptoms were, vomiting of a dark, fetid, oily fluid; hiccup; with severe pain round the navel: no motion was passed for four days, at the end of which time the bellows was used. Six dejections followed in the course of the day. The patient recovered‡.

This mode of treatment certainly does appear to me to be deserving of regard. Water, or enemata, would return; but the effect is totally different, when air is used: its freedom from all irritating qualities, its elasticity and expansibility give it a decided preference over enemata.

The report of the case given at the commencement, com-

* American Journal of Med. Science, XXVI. 542.

† Ibid. XXX. 556. ‡ Ibid. XXV. 271.

bines, it is imagined, a pretty faithful portrait of the disease under consideration, with the post-mortem appearances. The second case will be found to possess all the essential symptoms; and, in fact, bears such a resemblance to the first, that it would be tedious to offer any detailed account of it. However, I have placed it in a concise form; and the abridged report from my Case-book is as follows:—

Case II.

This occurred in the practice of — Muriel, esq. of Wellington Street, London Bridge. The infant was three months and a half old, and had always been extremely healthy, never having had even a bowel complaint. Violent vomiting and screaming were amongst the first symptoms: fluid blood now passed per anum; and, during the course of the disease, more than a teacupful escaped. There were frequent convulsions. Enemata were returned, by the side of the pipe. The infant died in seventy-two hours. The ileum, cœcum, and appendix formed the contained portions of intestine, while the containing consisted of the transverse colon. The preparation may be seen in the Museum of Guy's Hospital.

Were I to transcribe the other Cases, it would be found that I was merely recapitulating. It will probably suffice, when I state that the symptom to which I have directed peculiar attention was present in all. The age of each was under the twelvemonth. Some portion of the colon formed the outermost or containing intestine in every case; while the lower part of the ileum, to a greater or less extent, was the most internal or contained gut. — I shall therefore merely refer to the reports contained in the Table.

Mr. Finch, a general practitioner, residing at Greenwich, informs me he has treated cases successfully in the following manner. Injections of warm thin gruel are used; and if any advantage be expected to be derived from them, they must be prevented returning. In order to this, Mr. Finch causes the pipe to assume a conical shape, by binding lint, or some soft material, round it. The piston is then pressed with considerable force; and the return of the intestine is known to have taken place by the want of resistance suddenly communicated to the hand. Mr. Finch has treated two cases successfully in this manner. The disease is fraught with danger, if left to itself; and any hint connected with its treatment appears entitled to attention.

A TABLE, *which gives, in a Concise Form, the Particulars of* NINE

No.	Authority.	Age.	Stomach Symptoms.	Intestinal Symptoms.	Form of Abdomen.	Pulse.	Previous Health.
1.	The Author	4 months	vomiting, first symptom	fluid *blood*	no tumour discovered	200	always healthy
2.	—— Muriel, Esq. Wellington Street, London Bridge	3½ months	violent vomiting and screaming, first symptoms	a large quantity, more than a tea-cupful, of fluid *blood*	.....	....	always healthy never had bowel complaint
3.	Dr. Ash, Trans. for Improv. of Medical & Surg. Knowledge, I. 108.	9 months	.....	"mucous slime, covered with little streaks of recent fluid *blood*"	deep-seated hardness felt (or thought to be felt) in left hypo. region	below usual number	"healthy, well-looking, never indisposed from birth"
4.	T. Blizard, Esq. Med. Chir. Trans. I. 169.	5 months	vomiting, first symptom	"at first constipation, then discharge of mucus, afterwards of *blood*"	tumour on left side, size of an egg	....	"always healthy, and free from bowel complaint"
5.	Mr. Langstaff, Edin. Med. & Surg. Journal, No. XI.	3 months	violent vomiting, first symptom	nothing but *blood*	hard tumour on left side	....	healthy
6.	Monro, sen. Morbid Anatomy	4 months	.....	slime, slightly streaked with *blood*	.....	....	.....
7.	Mr. Clarke, Lamb's-Conduit St. Lancet, 10th Feb. 1838.	11 months 3 weeks	vomiting	"*hæmorrhage*, most prominent feature"	.....	quick, feeble	.....
8.	M. S. Baer, M.D. American Journal of Med. Science	16 months	violent vomiting	watery evacuation, tinged with *blood*	large tumour in left iliac region	....	rather indifferent, more or less diarrhœa
9.	Mr. H. Cunningham, Camberwell, Med. Gaz. Sept. 15th 1838.	9 months	vomiting	mucus and *blood*. At times, merely pure *blood*	tumor felt in left iliac region.	full, soft	well, in every respect, since birth, excepting tendency to relaxation

Cases *of* Intus-susception *occurring in* very young Infants.

Duration of Disease.	Symptoms of Pain.	Convulsions.	Enema.	Intestines contained.	Intestines containing.	Treatment.
19 hours	violent screamings, in paroxysms, at first	died in convulsions	returned almost as fast as given	end of ileum, cœcum, appendix, ascending colon	transverse colon	enemata, ext. conii, camphor, calomel.
72 hours	violent screaming	frequent convulsion	returned	ileum, cœcum, appendix cœci	transverse colon	placebo.
60 hours	.....	stretched himself out suddenly in a strong spasm: this the first symptom	....	ileum, mesentery, cœcum, ascending colon	sigmoid flexure of colon, and upper part of rectum	purges, fomentations, balneum, calidum, enemata, emp. lyttæ.
120 hours	.....	.....	....	ileum, cœcum, appendix cœci, ascending and transverse colon	sigmoid flexure of colon, and upper part of rectum	.....
120 hours	griping pain in bowels, and excessive crying	.....	....	ileum, cœcum, colon	sigmoid flexure of colon	cathartic medicines, warm fomentations.
68 hours	seemed to be in great pain, and cried incessantly for a considerable time	.....	little could be thrown up	ileum end of, ascending and transverse colon	descending colon	strongest purges, enemata.
62 hours	violent screaming	.....	brought away *blood* and mucus	ileum last four inches, cœcum, ascending and transverse colon	descending colon	gums lanced, calomel, antimony, rhubarb, enema, warm fomentation.
48 hours	violent screaming	.....	Unable to throw them up	ileum portion of, cœcum, ascending, transverse, and descending colon	sigmoid flexure of colon	calomel, sinapisms, anodyne fomentations.
about 40 hours	violent screaming	gradually slept away	returned by the pipe	cœcum, ileum considerable portion of, ascending, transverse, descending, & part of sigmoid flexure of colon	lower part of sigmoid flexure of colon, and rectum	enema, balneum, calidum, hirudines regioni tumoris

PLATE I.

Fig. 1.

a a a Transverse arch of colon, which contains the inflected ascending arch, the cœcum, its appendix, the ileum for the last half inch, and the ileo-colic valve.

b b The remaining portion of colon, passing to terminate in the rectum at *c*.

c The rectum, cut off close to the sigmoid flexure of the colon.

d d The last portion of the ileum, seen entering the colon at *e*, where it begins to be intus-suscepted.

e Highly-injected state of peritoneal covering of the ileum, where it begins to be intus-suscepted.

f The terminal half of the vermiform process of the cœcum, of a deep reddish-brown colour, and slightly blue in many places.

Fig. 2.

a a a Transverse arch of the colon, as in Fig. I.; but slit open longitudinally, to expose its contents.

b Descending colon.

c c The last portion of ileum seen entering the colon, as in Fig. I. at *d*.

d The commencement of the invagination.

e e e The mucous membranes of the transverse, and part of the descending colon.

f f f The mucous membrane of the ascending colon, which is inflected, and thus forms a part of the invagination. It is beautifully injected, villous, soft, and constricted in many places.

g The terminal half of the vermiform process of the cœcum; the first portion being intus-suscepted.

[In Table I. the ileum is placed anterior—in this, posterior—to the colon; so that a view might be procured of the extent of the invagination.]

Plate 1.

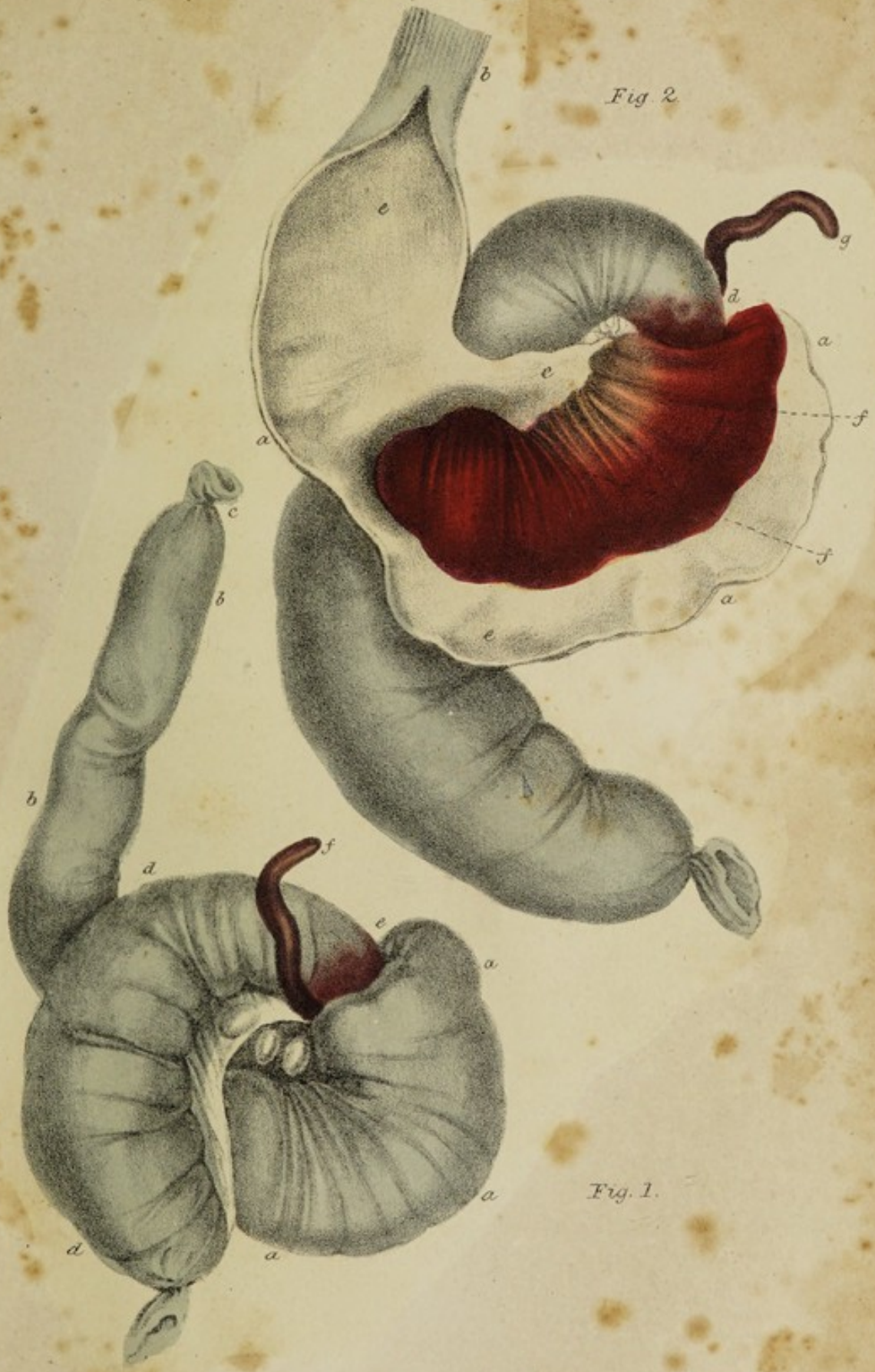

Fig 2.

Fig. 1.

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PLATE II.

a a a The transverse and descending colon slit open, as in Fig. II.

b b b The ascending and invaginated colon slit open; thus exposing its peritoneal investments, which is now on the interior, and its contents.

c c The peritoneal covering of the inflected ascending colon.

d d The ileum—its peritoneal aspect, seen lying within the inflected colon.

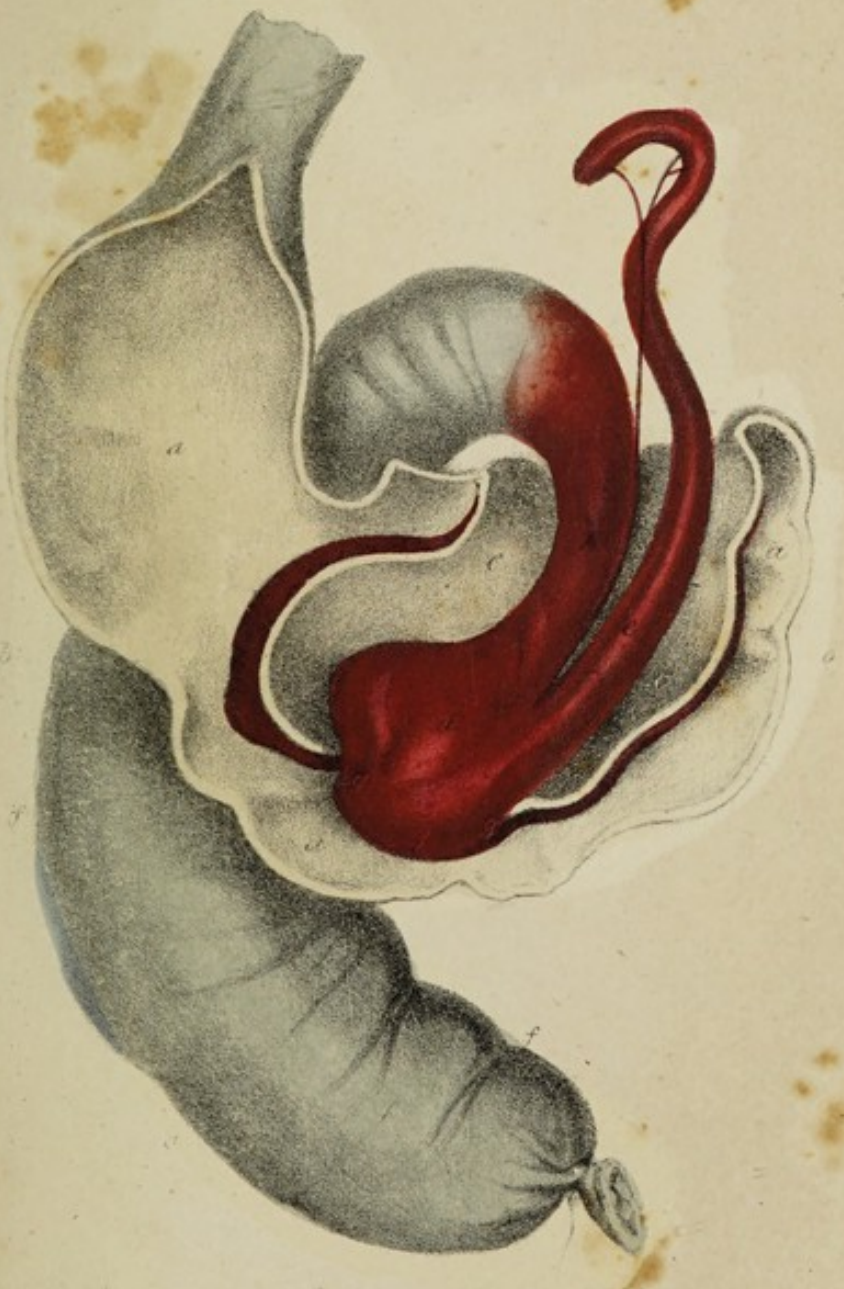
e The appendix cœci—its peritoneal aspect, which also is seen lying within the inflected colon.

f f f The ileum passing behind the colon, as in Fig. II.

g g Parts in the neighbourhood of the ileo-colic valve; which appear spoiled, and rendered useless.

Plate II.

Fig 3.



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