

Some observations on the duodenum, or second stomach ... / extracted from the Gulstonian Lectures ... May 1817.

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SOME
OBSERVATIONS
ON THE
DUODENUM, OR SECOND STOMACH,
WITH PLATES,
DESCRIPTIVE OF ITS SITUATION AND CONNECTIONS.

EXTRACTED FROM THE
Gulstonian Lectures.

READ AT THE COLLEGE, IN MAY 1817,

BY G. D. YEATS, M. D. F. R. S.

FELLOW OF THE ROYAL COLLEGE OF PHYTCIANS, HONORARY
MEMBER OF THE DUBLIN SOCIETY, &c. &c.

FROM THE SIXTH VOLUME OF THE MEDICAL TRANSACTIONS OF THE
COLLEGE.

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1820.

VOLUME

OF OBSERVATIONS

ON THE

PROBABILITY OF SECOND SIGHT

WITH PLATES

DESCRIBING ITS SITUATION AND CONSTRUCTION

AND THE

PROBABILITY

OF THE

BY G. D. YATES, M.D., F.R.S.

FELLOW OF THE ROYAL SOCIETY OF PHYSICAL OBSERVERS

AND MEMBER OF THE LINCOLN SOCIETY, &c.

FROM THE PRESS OF THE ROYAL OBSERVATORY, GREENWICH

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*Some Observations on the Duodenum, with
Plates descriptive of its situation and con-
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Lectures. By G. D. YEATS, M. D. F. R. S.
Fellow of the Royal College of Physicians,
&c. &c.*

Read at the COLLEGE, in May 1817.

WHOEVER examines with accuracy and attention the situation, structure and connections of the intestinal canal, must be immediately struck with the appearances in these different respects of the duodenum. In the various systems of physic which have been published, the diseases to which this intestine is likely to be and is in fact often subject, are not at all noticed. A detached essay or two have in former periods been published; one valuable one by Hoffman*, replete with many excel-

* In the sixth volume of his works published at Geneva, 1740.

lent remarks, and another by Dr. Claussen in 1757*.

Previous to the publication of Claussen, but subsequent to that of Hoffman, Dr. Monro published a description and an account of the uses of the intestinum duodenum†; the earliest account I have read, and an accurate one it is though very concise, is that which was published by Bonnazoli in 1732‡. He seemed very sensible of the importance of this intestine from the remarks he has made. Notwithstanding these several treatises however, an account of the diseases of this intestine is still a desideratum. Bonnazoli indeed and Hoffman and Monro and Claussen have

* Republished in a collection of Medical Dissertations by Dr. Sandifort, in the third volume of his Thesaurus in 1778.

† In 1752, in the fourth volume of the Edinburgh Medical Essays.

‡ Republished in the second volume of the Transactions of the Bologna Academy in 1745.

given us some very valuable observations, both practical and anatomical, but the path they have laid open has been untrodden; I believe therefore in a practical point of view both its functions and diseases have been very much overlooked, insomuch that diseases have been referred to other organs particularly the liver, and have been treated as such although they have most certainly taken their origin from a morbid condition of the duodenum itself.

It will better illustrate its nosology if a few observations respecting its functions and uses are premised.

After the food in the stomach is reduced into a pultaceous mass, it is past into the duodenum very much lessened in bulk both by the liquid absorption and the diminished state of aggregation of the solid parts, in consequence of being broken down and digested by the agency of the gastric solvent; the functions of the

duodenum now commence. As soon as the chyme has past the pylorus, it becomes mixed with the liquid poured from innumerable glands more particularly situated at the commencement of the duodenum ; and from the tortuous tract through which the chyme has to travel, it is intimately blended with this liquid and becomes in fact perfectly churned by the agitations it has undergone, so that, I believe, it becomes in qualities a different mass to what it was when it first passed the pylorus, and before the chyle is separated from it.

Being propelled by the action of the intestine and in part by that of the diaphragm during respiration, the chyme is brought to the sacculated angle of the duodenum where it is attached to the capsule of the right kidney. In this most depending part of the intestine, the chyme must be delayed for a time from its situation, and here meeting with the pancreatic
and

and biliary liquids, it is not only intimately mixed with them, but undergoes a change by which is produced the chyle.

And here perhaps it is deserving of remark, that the agitation of the contents of the duodenum, by which their several parts become more intimately united, not only takes place from the action of the duodenum itself, but as it is tied to the colon, whatever action takes place in this intestine, must more or less be communicated to the other; a circumstance which I believe has been overlooked, but upon which I am disposed to lay some stress. In this way it is probable a great part of the evil arises, which takes place in constipation; for when the colon is much distended with hardened fæces, it must press with some force on the ascending part of the duodenum, thus still further impeding the progress of the contents of the latter which have also to rise
against

against gravity, when the body is in an erect position or recumbent on the right side. For this reason, it is always adviseable, previous to giving an opiate glyster where there is violent pain and vomiting from a gallstone sticking in the duct, especially if the bowels have not been recently evacuated, to direct an opening enema to be injected, to unload the colon of those contents which, by distending it, cause pressure on that very part of the duodenum where the ductus communis opens, and thus impede the passage of the stone into the intestine. Be it recollected too that this bend of the duodenum is exactly between the right kidney and the ascending part of the colon, and that therefore much distention of it would in fact force the duodenum against the hard substance of the kidney, and would contribute to obliterate its cavity by the pressure of its sides against each other. The contents of
the

the duodenum being properly mixed and digested in this bend, and the chyle prepared by a process with which we are totally unacquainted, are propelled through its ascending part into the jejunum which begins where the duodenum makes its exit from the ring in the mesentery; (H. Plate I.) During the transmission of these contents a considerable absorption takes place, for this intestine is thick set with lacteals; and this absorption occurs before the complete formation of the chyle, for turgid lacteals have been seen passing in great numbers from its commencement in its course under the liver*. Thus then the duodenum is an organ of considerable importance in its functions, and that the Divine Author of our Being intended it for pre-eminent

* I have seen the lacteals full of white chyle in the *very beginning* of the duodenum, and through its whole length. Cruikshank's Anatomy of the Absorbing Vessels, page 149.

uses is evident, I think, also from the peculiar manner in which it is protected. It is more covered and guarded than any one of the intestines, and indeed than almost any viscus of the abdomen; it lies concealed deep under the liver which forms an anterior protection to it, all the muscles of the back, the spine, the ribs and the right kidney protect it behind; again when it emerges from its concealment, it takes the protection of the colon which lies over it: it escapes our sight again by dipping under the soft bed of the mesentery, and is, moreover, nearly throughout its whole extent, covered with the mesocolon and with a considerable quantity of fat and cellular membrane, which lies between the lamina of the mesocolon and peritonæum. All the other intestines with the stomach may be called floating viscera, this on the contrary is securely tied to the liver, right kidney, colon and back: by its envelopement

lopement in the mesentery its extremity is kept more steady where it passes through the ring ; it is studded with innumerable glands for the secretion of its own peculiar fluid ; it is extremely vascular and the nerves which belong to it have an extensive communication with the rest of the body by a connection with the par vagum and great sympathetic, through the medium of the semilunar ganglions. Its internal coat is thrown into numerous folds like the stomach, and there are poured into it very important fluids from the pancreas, gall-bladder, and liver. Very wise purposes to are answered by the manner in which the duodenum is tied down and connected. Had it descended immediately from the pylorus without being attached to the liver by the omentum minus, it would not only have drawn down the small end of the stomach out of its proper place, but when the stomach contained food there would be always
danger

danger of its passing into the duodenum whenever the pylorus was relaxed; as it is, the food can for certainty remain the necessary time in the stomach for solution. Had the duodenum too been a loose and floating viscus like the other intestines, it would frequently become entangled with the pancreatic and biliary ducts, thus impeding its own action and also the transmission of the necessary fluids through these ducts, and moreover the food would pass quickly through it in its pendulous state instead of being detained the proper length of time to undergo the change into chyle. It is the most important recipient in the human body, receiving more various kinds of ingesta than any other organ: and notwithstanding it is less than the stomach, it has a greater capacity than the other intestines except the colon. It was necessary that the stomach should not only be greater because it receives the food in the gross, if I may

so express it, but on account of the large quantity of ingesta, particularly of liquids which is sometimes thrown suddenly into it. The duodenum on the contrary receives the food gradually through the pylorus and in a small quantity at a time and in a more homogeneous state. The greater size of the colon is evidently intended for the accumulation of fæces previous to their discharge, and it may very well be considered as the excretory reservoir to the digestive organs. From this general view of the functions and connections of the duodenum, it may very justly be regarded as a second stomach in which the process of digestion is as much carried on as in the first, that it serves very important purposes in health, and that consequently it is the seat of some painful and dangerous diseases.

In considering the diseases of the duodenum, it is evident that it must be liable to all the consequences of an
imperfect

imperfect digestion in a similar manner as the stomach, with this difference that the symptoms will vary from its situation and immediate connections anatomically considered as well as from its own peculiar functions. It appears to me indeed that the consequences of a long continued indigestion in this intestine will be more distressing than in the stomach itself; for from the elaborate manner in which this intestine is constructed, from the important fluids poured into it, and from the care taken to confine it in its course, I am inclined to believe that the proper digestion in it, has the power of correcting, in a great measure, what has been improperly performed in the stomach. On the contrary should a very imperfect digestion take place in the duodenum, I do not perceive, from their anatomical structure or from their probable functions, that any improvement can occur in any subsequent part of the alimentary canal;

canal; hence it becomes a matter of the first importance to the proper nourishment of our whole frame, and to the comfort of all our feelings, that the duodenum should be in a perfectly healthy state: for from the sympathy which exists between the chylipoietic nerves and almost every part of the body, distant symptoms are produced of a very painful nature; and from the morbid condition of the duodenum, irregular peristaltic action takes place, torpor in one part, spasm in another, and perhaps a retrograde action in a third, with constipation and a morbid appearance of the fœcal discharge.

One of the most constant effects of the indigestion of our food is the extrication of a considerable quantity of gas, because then a fermentation takes place instead of the proper assimilation by the living powers. I have no doubt that under the circumstance of much flatulence gas is actually secreted.

ted. From the particular situation and connection of the duodenum, more distressing effects will arise in it than in any other part of the alimentary tube. Its distension by extricated air will cause very great pain by stretching its nerves, and the irritation will be immediately propagated through these nerves to very important parts.

The duodenal nerves come off from the right hepatic plexus, which also supplies the gall-bladder, biliary ducts, pylorus, pancreas and kidneys, and then they pass on to the substance of the liver; hence we see that duodenal distension will by nervous connection (independent of mechanical effects) produce irritation in all these parts. The intestines have their healthy peristaltic action maintained by the nervous influence from the solar plexus, through the nerves distributed to their fine and beautiful vascular coat; an irritation of these nerves will not only

only cause spasm, but by continuance inflammatory action. The duodenum is extremely liable to the same effects: it is supplied with nerves directly from the eighth pair which communicate with the stomach and pylorus; thus besides the universal connection between the par vagum and sympathetic, it receives some filaments from the semilunar ganglions and hepatic plexus; and as at its lower end it receives nerves from the superior mesenteric plexus which communicates with the renal plexus, it is clear how a morbidly irritated duodenum will produce uneasiness in nearly the whole of the abdominal viscera, causing irritation in the intestines, stomach, œsophagus, kidneys, the right particularly, liver, &c. &c. and as the hepatic plexus is formed from the semilunar ganglions, in which are concentrated not only the nerves which supply the chylopoietic viscera, but in which terminate those nerves which, in their progress from the brain, either give branches to, or inosculate

inosculate with, nerves which supply the œsophagus, lungs, heart, diaphragm trachæa, larynx, pharynx, chest, muscles of the face, lower jaw, and neck; hence the headach, vertigo, contortions of the countenance, rolling of the eyes, asthma, cough, pains about the chest and shoulders, which accompany duodenal irritation. And that while oily emulsions and expectorants, which only add to the mischief, have been prescribed in such coughs and asthmas, medicines of a very different class should be given*.

In addition to these distant symptoms produced by nervous sympathy, painful sensations of a more local nature, arising from mechanical pressure from distension of this intestine, will take place, first great pain and spasm in itself: pressure will be caused upon the pancreatic and biliary ducts, preventing the flow of the fluids of their

* See pages 91, 92, of my Letter to Dr. Wall on Hydrencephalus, with the quotation from Hoffman in the note.

glands into the duodenum ; hence if the pressure be continued, a soreness and sense of fulness will be felt below the pit of the stomach in the situation of, but deeper seated than, the arch of the colon, a jaundiced appearance of the skin will take place with a puffiness and uneasiness on pressure just before the cartilage of the eighth rib, arising not only from the fulness of the duodenum itself, but from the distension of the biliary and pancreatic ducts. I have no doubt that under such circumstances patients have been treated for a liver disease by salivation, with a perfectly sound liver, not only without any advantage, but with positive detriment to the constitution. I have seen cases which have created this belief in my mind.

Much is said by different writers of the repletion of the duodenum by food, causing the bile to flow from the gall-bladder for the purposes of digestion ; I believe the very contrary effect takes place from its distension, and the ana-

tomical position of the parts will shew this to be the case. (See C. C. D. and E. E. of Plate I.) The gall-bladder lies rather in a slanting direction, with its neck upon the duodenum, and the side of its fundus upon the colon; now if the duodenum press the neck against the liver, it must confine the bile in the sac instead of discharging it according to the generally received opinion, more especially when we consider that the cystic duct at its commencement goes off, ascending at right angles from the bladder. So that did the quantity of food in the duodenum cause pressure on the gall-bladder, it would prevent the flow of bile from it; but under ordinary circumstances I do not think that the food in this intestine is in such a quantity as to produce this effect: in great feeders it appears sometimes to occur; with such persons how often do we see a jaundiced appearance of the eyes, produced probably in part by the cause just mentioned. These people also
very

very often suffer from the dyspepsia crapulosa, whence will arise additional causes giving rise to this effect. Should it so happen that calculi are contained in the gall-bladder, the pressure from the distended duodenum will cause additional pain by rubbing the rough stones against its sides. A great deal of pain will be felt across the back, and especially in the region of the right kidney, from the connection which the duodenum has with its capsule, and a quantity of pale urine is often past from irritation of the renal vessels both locally and through the medium of the renal plexus of nerves. Pressure will also be made by this distension upon the lacteals and glands of the mesentery, and will interrupt the ready transmission of the chyle to the thoracic duct.

With all this distension and pressure, a good deal of interruption must be given to the supply of the blood by the arteries and its removal by the veins of

the intestine itself. From this interruption, obstruction and inflammatory irritation will arise; and it is very probable the Infantile Remittent is produced in this way. The best mode of practice for the complaint, with the symptoms which take place in the protracted disease, confirms this opinion, for the food comes away perfectly undigested, which would not be the case if the duodenum were in healthy action. Other mischiefs will arise giving considerable interruption to the more general as well as to the local circulation. That part of the vena cava inferior, which lies under the duodenum, will be prest upon and will form an impediment to the returning blood, and if this pressure be often repeated and long continued, it will probably cause varicose veins in the legs.

It is not uncommon for persons, troubled with what is called flatulent distension of the stomach, to feel faint with a fluttering pulse. I can readily conceive
that

that the pressure of the cava against the spine by the distended duodenum, will cut off such an immediate supply of blood to the heart as to produce this effect. The great meseraic vein too which rises above the transverse ascending portion of the duodenum, will also suffer by pressure, though in a less degree according to circumstances, and produce accumulation there and in the splenic vein, hence the pain which persons who are dyspeptic, and said to labour under liver complaints, feel in the region of the spleen. The force with which the aorta and its immediate branches beat, will probably not admit of their being much affected by the pressure; but the resistance to the passage of the blood in the meseraic vein, will in some degree impede the transmission of it from the corresponding artery, and will assist in accounting for that throbbing frequently met with and easily felt in the epigastric region of dyspeptics.

I have

I have witnessed it so strong as to create a suspicion of aneurism.

As this morbid state continues it will affect the adjoining organs, and unhealthy discharges will take place from the liver and pancreas, and from the duodenal glands, causing a great accumulation of irritating matter in its sacculated dependent part, which the intestine will not easily propel, not only as it has to carry it against gravity in a direct ascent to its jejunal termination, but because from over distension it will be less able to contract with sufficient force; hence a torpid state takes place in it with a corresponding effect in the alimentary canal, and languor and lassitude prevail. I wish also to call the attention to another cause of difficulty in the propulsion of the duodenal contents, particularly under the circumstances above stated; namely, the confinement at its termination within the ring at the root of the mesentery which will
not

not admit of the diameter of the intestine being much increased at that part. At this confined point the more indigestible and fœcal portion of the food will sometimes lodge and produce a temporary plugging up of the passage, especially if the food has been glutinous, and has been rendered more solid and firm by any cause. With children, who often swallow cherry and plumstones, it is not improbable that this state does at times occur, and this cause of the retardation of the propulsion of the duodenal contents does not appear altogether theoretical. The indigestibility of nuts, and the distress in the bowels produced by eating a quantity of them, are proverbial. It is very probable that the inconvenience arises from the difficulty which the hardened indigested mass, formed into a ball with the mucus of the intestine, finds in passing this part; should it stick there inflammation will occur with vomiting,

vomiting, which, inverting the intestinal action, will bring the mass back again into the body of the duodenum, where by the afflux of more fluids from the pancreas, liver and duodenum, it will be softened and more reduced, and will thus ultimately pass, if it be not in the meantime thrown into the stomach, and rejected amidst its other contents by vomiting: here a caution presents itself respecting active purgatives in obstinate constipation, which, by irritating the intestine above the obstructed part, where the obstructing matter is too large to pass the narrowed channel, must increase the mischief. Obstructions thus frequently occurring to the passage of the duodenal contents, will of course cause distension in it above the mesenteric ring, producing all the consequences of irritation with increased acrimony of the contents by stagnation.

A repetition of this morbid condition of the duodenum, alternating
with

with partial discharges of its contents by occasional vomiting, producing only temporary relief, will sooner or later induce very serious evils, especially in children, whose appetite in such a state is often bulimious, not arising from healthy hunger but from irritation. I have no doubt that the repeated absorption by the lacteals of the acrid contents of the duodenum, produces disease and enlargement of the mesenteric glands, and ultimately tabes mesenterica. It is well known that the conveyance of acrid matter by the lymphatics causes enlargement, pain and inflammation of their glands; it is remarkably instanced in the knotted and enlarged appearances of the lymphatics of the sides of the neck by the absorption from the sore heads of children. In the same way diseased mesenteric glands occur in them from the acrid condition of the duodenal contents.

The

The liver, pancreas, and duodenal glands, will become diseased from congestion and irritation, and this irritation will be propagated by nervous communication to the brain; it will sooner or later run into inflammatory action and produce effusion there, or the irritation will chronically continue giving rise to spasms, convulsions, vomiting, contortions of the countenance, affections of the sight, violent headaches, faltering voice, chorea and palsy. I am inclined to believe that the disease described in Case X. of the Appendix to the Pamphlet on Water in the Brain was connected with duodenal irritation; see page 83.

Such then are the effects which digestive irritation produces in children; effects frightful in their appearances, painful and very often fatal in their consequences. I would not lay so much stress upon these circumstances,

cumstances, were I not fully convinced from observation of the great good to be derived from attending to the derangement of this intestine. In adults too I have noticed a disease of the duodenum, which from its being often overlooked, and in fact mistaken for a liver disease, claims considerable attention. The appetite gradually declines in some, in others it is very various, flatulence is troublesome, considerable languor and lassitude, accompanied by a feel as if the legs would give way, take place; occasional chills, feverish heats, pain with a sensation of weight in the right hypochondrium and across the loins, bowels torpid with dark coloured fæces, and they are often past without being figured and in small quantity twice or thrice in the day.

Urine of a mahogany colour, sometimes transparent and sometimes with a lateritious, but oftener with a white sediment, and thick throughout like
gruel

gruel and water, a little nausea; nights past in a restless manner, tongue covered with a white crust, brown towards the roots; thirst is not much complained of, giddiness at times with headach, or rather an uneasiness in the head, with an unpleasant state of the sight, vision being at times obscured with motes dancing before the eyes; the pulse is not generally quickened; sometimes I have observed it to be preternaturally slow: there is frequently an intermission in it, and the patients are harassed to a very great degree with those symptoms usually termed nervous*.

Food is not stated to cause particular oppression, except that it gives the sensation of not being moved forwards so easily as formerly; in fact no complaint is made of any distress in the region of the stomach. A

* See pages 12 and 13, of the Appendix to the Pamphlet on Hydrencephalus.

dyspnœa,

dyspnœa, with sometimes a troublesome cough, adds to the restlessness at nights, the sleep of which is also disturbed by disagreeable dreams; and uneasiness is complained of over the pectoral muscles, which are sore to the touch, from which the patient imagines he is consumptive. There is a despondency of spirits, a forgetfulness takes place, subjects pass across the mind with rapidity, for the mind cannot dwell long upon any subject. After a continuance of these symptoms for a time, a yellow tinge takes place in the tunica adnata of the eyes.

Upon examining patients with the above symptoms, a fulness and puffiness will be sometimes perceived to the right of the pit of the stomach. I say sometimes, because it will depend upon the quantity of extricated gas confined in the duodenum, or upon the existence of morbid action at the time, whether this symptom be present

sent or not. By pressure *on* the region of the liver no uneasiness will be complained of, but if the pressure be made with the edge of the open hand under the ribs with the palm of it flat upon the abdomen, considerable uneasiness will be complained of up towards the liver and down towards the right kidney, a soreness too is felt an inch or two to the right just above the navel. Such patients will trace with most anatomical accuracy, the course of the duodenum with their finger from the stomach to the loins on the right side and back again across the abdomen to the umbilicus.

In the second volume of his *Medical Histories*, pages 27, 8, 9. Dr. Ferriar has given us an account of his own case, which he believed to be a disease of the duodenum. Many of the symptoms coincide with those which I consider as indicative of a morbid state of this intestine. It is not a little curious as well as satisfactory
to

to find that the plan he states to be useful was "to keep the body rather loose," which corresponds with what experience has taught me to be most advantageous, viz. to keep the intestines gradually and mildly excited as I have frequently inculcated. It is not uncommon to consider such a condition as indicating a primary disease of the liver, and if as is sometimes the case a swelling about the ankles should occur, it is regarded as a confirmation of the opinion which has been adopted. I believe this state to arise from a want of healthy action or from a total inactivity of the duodenum.

Under such circumstances the general practice of giving a dose or two of calomel with purgative salts, and subsequently stimulants and tonics produce no permanent good effects, for the duodenum relapses into its inactivity after a brisk purge; I have particularly remarked this of calomel, and all the

symptoms

symptoms recur. The stimulus of the ammoniacal salts only relieves the present languor without enabling the duodenum to discharge its morbid and distressing contents; and should it so happen that spirits are unfortunately resorted to, they only hurry the morbid action into obstruction and inflammation, without ultimately removing the evils of accumulation and torpor. The preparations of steel create nausea and are sometimes vomited up, the simple bitter infusions lie cold and heavy on the stomach, and the addition of aromatic or spirituous stimulants do not remove the difficulty. Notwithstanding however that bitters disagree, yet when combined with a cathartic in such quantity as to give a gradual evacuating movement to the intestinal canal, they produce the happiest effects, ℥j. of quassia, and the same quantity or ℥ij. or ℥i. rarely the last, of senna infused in a pint of boiling water for
an

an hour, produce the composition I employ; fʒiss. of this infusion taken in the morning and repeated at noon, with pil. hydrarg. gr. iij. every night for about a fortnight, most generally remove this uneasy state of the duodenum.

In 1813, I was consulted by a clergyman of the county of Huntingdon who had laboured for a considerable time under all the above symptoms, except the swelling of the ankles. He had taken various tonics and purgatives and bitter infusions with no advantage. After premising an emetic it was, with some difficulty, I persuaded him to repeat the quassia he had formerly taken, as he not only had not found any relief, but was disgusted with any bitters from the uneasiness he felt after taking them. After having, however, taken the above formula for about ten days, he returned to me considerably relieved of his complaints, with the observation

D that

that the quassia had agreed with my amendment. The infusion should not be prepared stronger than here directed, which is half the strength of that of the Pharmacopœia, for I have found that *strong* bitters are not salutary in their operation on the digestive organs, particularly that part of them I am now considering.

When this morbid condition of the duodenum is attended with some feverish heats and urine somewhat high coloured and rather scanty, instead of senna, I add some neutral salts to the bitter, and if I am not deceived in my observation, I can scarcely speak too highly of the sulphat of potash as the best. It appears to me to have a more specific effect upon the duodenum, than the sulphat of magnesia. I give ℥j. of it twice a day in the quassia infusion, and gr. iij. pil. hydrarg. with or without two grains of extract. aloes according to the state of the bowels. If much feverish irritation prevails arising,

sing, as I imagine, from some slight inflammatory action in the duodenum, the saline draught in a state of effervescence is substituted with the sulphat of potash, for the bitter infusion, with the happiest effects, and the pil. hydrarg. is given without the aloes. These may seem small doses, but the object is not to purge; the ratio mendendi being merely to give evacuating movements, that the peristaltic action may be kept gradually and healthily excited, until the duodenum recovers its functions. In some cases there is a general torpor and coldness of the system with much pale urine and with the local symptoms already described. The evacuations are of the same dark colour with the addition of much mucus. Under such circumstances the neutral salts are not given, but to the quassia and senna infusion is added ʒss. of the sp. ammon. aromat. or fʒj. of some aromatic tincture, not omitting the mercurial aloetic pill at night. Under

such a state too, very excellent effects are produced by taking in some inf. anthemid. every morning fʒj. vini aloes with m. xv. liquor-potassæ. The pil. hydrarg. is then given without any combination. In some instances I give this pill only every other night, and sometimes, though rarely, not at all. By managements of these kinds, suited to the impression which the constitution has received from the varying state of the disease, in a few days tranquil sleep, a more cheerful mind, regular bowels, and healthy evacuations succeed to the mental agitation and irritability which had previously prevailed. A proper attention to diet and exercise is of course necessary. They will vary in their kind and degrees according to the different states of the disease as just described. I have known persons afflicted with this disease who were in the habit of taking frequent horse exercise. The clergyman above mentioned,

tioned, was accustomed to take horse exercise frequently.

It is here a matter of more than medical curiosity to form a discrimination between a liver disease on one hand, and a simple dyspeptic state of the stomach on the other, as contradistinguished from a morbid state of the duodenum simply. In some cases where the duodenal disease has existed for a considerable time the diagnosis becomes almost impossible, although an experienced practitioner may form a very good opinion ; because a morbid train of symptoms takes place, by which liver, duodenum, and stomach are blended in one affection, emphatically termed a disease of the digestive organs. In a simple disease of the stomach we have very little swelling or puffiness in the epigastric region, and when it does take place it is more to the left side. We have also eructations of wind and of acrid matters. These circumstances vary very

very considerably in a diseased duodenum ; a swelling is very apt to occur, the extricated gas finding a greater difficulty to escape either by regurgitation through the pyloric orifice, or downwards, from the particular situation of the intestine at the mesenteric ring. There are therefore no eructations of wind or of acrid matters in a dyspeptic state of the duodenum ; and when the puffiness is detected, it is a diffused swelling towards the right hypochondrium, being lost under the liver, and not extending to the left side, and circumscribed in that direction.

A diagnosis between affections of this intestine and the liver is more difficult, on account of the latter being so readily affected by a disease of the former, particularly when a slight jaundice has taken place, not from a diseased liver, but from the bile not finding a ready passage into the ill-conditioned duodenum ; an experienced physician must then form his
opinion

opinion from the accumulation of symptoms, and from his recollection of similar cases. If the symptoms of a liver disease, particularly the yellowness of the eyes, tension of the side, and lateritious sediment of the urine speedily disappear by the treatment, we may be perfectly satisfied that these hepatic symptoms are produced by duodenal irritation, and that the patient may be safely tranquillized on that ground by his anxious physician; if on the contrary, these symptoms are obstinate, and they seldom are without having so much disordered the general system as to awaken very early the suspicions of the physician, then that science and accumulation of facts, which taught him the discrimination, will immediately suggest to him the more active and appropriate remedies for the liver disease according to its kind and degree. With respect to the green urine mentioned by Dr. Ferriar, I have never witnessed it. I am not disposed

disposed to consider it as diagnostic, and probably it may be an accidental tinge of the urine, by the bile which produces the green jaundice*.

It has often happened that in a person, who labours under a chronic affection of the liver from some part of its substance being in a diseased state, and who will enjoy tolerably good health by care and management, this duodenal irregularity shall occur from causes which produce it in others independent of the condition of the liver. Experience has taught me to be very cautious here in analysing the true nature of the disease. The professional attendant, under the idea that the liver disease, which indeed does exist, is the cause of the distress, will give doses of calomel with active purges, but to his surprise finds, not only perhaps that no relief is obtained,

* See Dr. Baillie's paper on this subject. Page 143, Vol. V. of the Transactions of the College.

but

but that there is a jaundiced appearance of the skin on a subsequent visit; arising from the excited liver having poured out more bile into the biliary ducts and duodenum, than has been carried off. I have frequently witnessed this in practice, and in the case of a lady whom I visited at Highbury in the winter of 1815, this was very remarkable. I was first called in to her some years previously, when under a salivation for a liver disease, which left, as is very often the case, an imperfect condition of that organ. She was attacked in the winter of 1815 with languor, fulness of the side, and with most of the symptoms I have already described. She had taken purgatives, and was told that she was again seized with her liver disease; she was, however, soon relieved by the senna and quassia infusion. I may add, that in describing her symptoms, she traced with great accuracy the course of the duodenum.

Periodical

Periodical mucous collections sometimes take place in the duodenum, with all the symptoms I have already described. I have a patient in Buckinghamshire, a farmer's daughter, between 20 and 30 years of age, who had been twice salivated for a supposed liver complaint. I was first consulted for her in 1812. She has, at different times, past much mucus by stool, after being distressed with uneasiness in the right hypochondrium, and with the other symptoms I have already detailed. She has been always relieved by the plan above-mentioned, when attacked with the duodenal disease; but as it sometimes attacks her with, and sometimes without, the feverish state, she varies her plan of management accordingly, and for which she and her apothecary have the necessary directions according to the above prescriptions. She very lately past, in one of these attacks, such a great quantity of mucus of a purulent appearance,

ance, as to induce her apothecary to think that an abscess had burst internally. She now enjoys much better health than she has done for many years; and since delivering these lectures I have been informed that this patient is now in good health.

I have sometimes found it necessary with this duodenal irritation, to give a few minims of laudanum occasionally at night, to quiet the irritation, even after the other symptoms are subsiding, the morbid action appearing to continue from habit after the cause is removing or removed. Perhaps from a similar cause Dr. Butter found it useful to give the extract. conii in the infantile remittent fever, which I believe to be very much connected with this duodenal irritation. At other times, when the torpor does not appear likely to yield speedily to the plan, an ipecacuanha emetic has excited the chylopoietic organs, although

although nothing very particular shall be brought up by its operation.

Much has been said and written respecting the colour of the fœcal discharge being indicative of the colour of the hepatic secretion. A great deal of deception will, however, take place, particularly with persons who do not consider the effect which indigestion in, and a morbid affection of, the duodenum will have in altering the colour of the bile, however healthily it may be secreted. Different kinds of food, especially if not perfectly digested, will vary its colour and appearance very considerably; salads, greens, spinage, and French beans will give a morbid green appearance to the fœces, as if the hepatic secretion was much vitiated. On the contrary, persons who take a considerable quantity of milk, either from choice or on account of disease, will pass pale coloured whitish evacuations,

tions, as if the secreting actions of the liver were deficient in their functional powers, and I know that magnesia will give a uniform white colour to the fœcal discharge. These facts if not attended to especially in children, will certainly lead to erroneous and hurtful practice.

If under such circumstances there should be much derangement in the chylopoietic organs, particularly in the duodenum, a yellow tinge will be observed in the eyes with high coloured urine and uneasiness in the right hypochondrium, it will be believed that the patient suffers under a liver disease; active remedies will be had recourse to instead of the plan already described, which gives a gradually exciting movement to the intestinal canal, and relieves the duodenum.

I do not mention these facts to undervalue the information to be acquired

quired by inspecting the fœces, but to point out the necessity of inquiry into the kind of food taken, before a determination is formed upon this point. As a proof too that the colour is a fallacious sign and likely to lead to erroneous practice, I cannot avoid mentioning that different purgatives will produce a different colour in the evacuations, from exciting different glands to pour forth their contents. Whatever important information, as to medical practice, is to be derived from inspecting the fœces, it is of some consequence to remark, that the fœces of apparently healthy persons sometimes assume a dark slate colour a few hours after they are past; and again if the bowels have been costive for a day or two previous to the evacuation, the delay in the colon and rectum produces also what might be considered a degeneration in the appearance of the stool.

It

It is necessary in the first instance, particularly with children, to be somewhat minute in the examination; and in the second instance to examine the subsequent discharges in order to see the nature of the secretions recently made higher up the intestines, and which have not been delayed by constipation in the colon and rectum. To those who are desirous of considering the study of the profession as a medical science, and not as a conjectural art, and are anxious to detect the precise nature of diseases, the symptoms of which, particularly in the abdominal viscera, are often involved in much obscurity, these observations will not appear trifling or unimportant.

Having thus made some observations on the diseased condition to which the duodenum is more particularly liable, it may be of use briefly to notice how it is affected by the morbid condition of the adjoining organs. A
greatly

greatly distended stomach from flatus or other causes would press the colon against the part where it enters the mesenteric ring, and impede the discharge of its contents into the jejunum; and this effect would be more completely produced if the colon contained hardened fœces: in like manner the weight and bulk of enlarged mesenteric glands which lie so numerous about its termination, would also cause inconvenience by pressure. A greatly enlarged liver, or distended gall-bladder would cause distress in it, and I have already noticed the manner in which its important angulated bend would be confined between the right kidney and distended colon, and as the ductus communis enters here, would be the cause of jaundice. Under all or any of which circumstances a perplexity in the diagnosis would be added.

In whatever point of view therefore, the duodenum be considered, whether
as

as to its situation, connections, tortuous course or functions, it is an organ of very great importance, and one which particularly claims attention, and that therefore a consideration of its functions, uses and diseases cannot fail to be of much utility.

Mode of examining the Tract of the Duodenum, with an Explanation of the Plates.

TRACE the intestines backwards, beginning at the ileum where it enters the colon, gradually and slowly unfolding their convolutions in a retrograde direction, till you get to the part where the duodenum emerges from the ring in the mesentery. It is here where the jejunum begins, around this part throw a ligature, tightly secured, then make a small opening into the stomach about two or three inches from the pylorus, and introduce the nozel of a small pair of bellows about one inch from the pylorus, passing a ligature round the nozel and that part of the stomach in which it is included. This is a better and a more convenient mode than making use of the blow-pipe, as it keeps the intestine more uniformly and permanently distended for the purpose of taking a drawing, and for more accurately delineating the state of parts, because the air from the lungs soon losing its caloric to the cold body, and the carbonic acid gas with which it is charged, being

being absorbed by the moisture of the parts, the intestine becomes flaccid by the loss of the rarefaction, and the absorption of the carbonic portion, of the air blown into it; the *relative bearing* of parts is not then so clearly seen.

The duodenum is thus inflated cautiously and slowly, so as to remove it as little as possible from its natural situation. After having so done, a ligature is then past round that portion of the stomach which lies between the pyloric orifice and the nozel of the bellows which is now withdrawn. The colon is then divided in the centre between two ligatures to confine the dirt which would otherwise escape. After being thus divided and separated, one portion is thrown to the left and the other to the right side of the body, as is represented in Plate I. The omentum of course being removed; now upon raising the great curvature of the stomach and the liver, you will have a very good view of those parts of the duodenum which are not covered by the envelopments of the mesocolon and mesentery. By cautiously dissecting the mesentery, and by dissecting out the mesocolon where it envelops this intestine, you are much rewarded for your pains in having an opportunity of observing its really beautiful and tortuous course from its commencement at the pylorus, to its termination just below the centre point of the arch of the colon. As the pylorus is situated about the height and to the right of the tenth dorsal

dorsal vertebra, and as the duodenum terminates to the left of the twelfth dorsal vertebra, after having taken a curvilinear direction to the right, it almost describes a complete circle in its course.

PLATE I.

This Plate represents the duodenum in its proper situation, the parts which exclude it from the sight being removed—from Claussen. I am indebted to Mr. Charles Bell for permission to copy this Plate in Sandifort's Thesaurus.

a a a a a. The colon bisected and thrown to the right and left side with the mesocolon attached to the left portion.

B. The stomach with its great curvature raised.

C. C. The Liver.

D. The Gall-bladder.

E. E. The Duodenum descending by the side of the gall-bladder, the indented part just above the first E. being the pylorus.

F. The angulated part of the duodenum where it is attached to the capsule of the right kidney, and where the biliary and pancreatic ducts empty themselves.

G. That portion of the duodenum which ascends from the kidney, passes across the abdomen and under the mesentery.

H. The end of the duodenum coming from under the mesentery at its ring.

I. Aorta.

I. *Aorta.*K. *Bladder.*L. *Pancreas.*

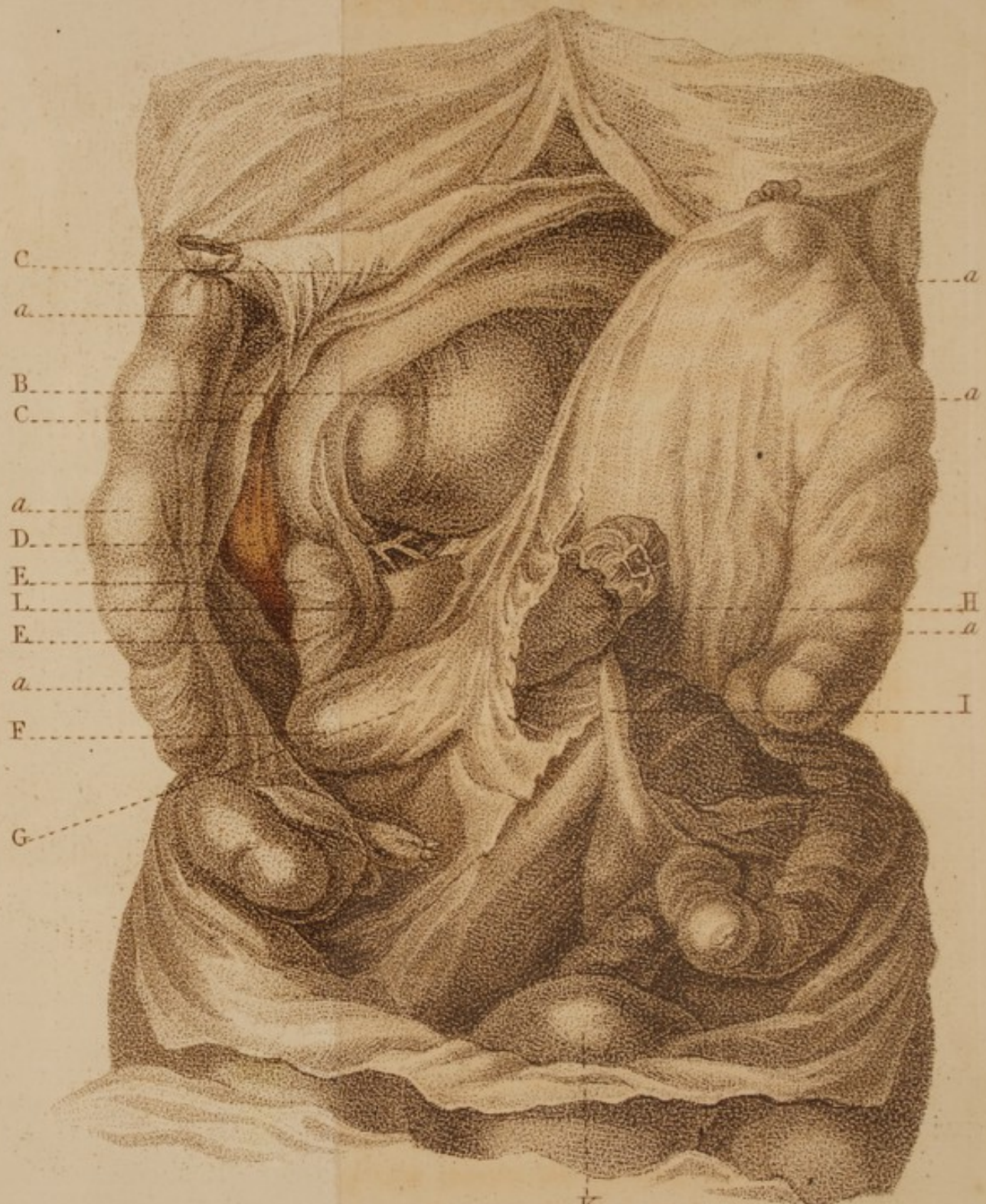
PLATE II.

This Plate represents the duodenum very much distended with air blown into it through the cardiac orifice of the stomach, which is itself thereby inflated. The preparation was made after the manner described above, by the kind permission of Mr. Carpue at his dissecting room, and the drawing was taken from the body by Mr. Paris, an ingenious anatomical draughtsman, 29, Hyde Street, Bloomsbury. It will be seen by the Plate how a greatly distended duodenum will rise and press against the liver and gall-bladder, as well as against the colon which passes directly across and above it; and on the contrary, how a distended colon as it rises from its head at the right hip, will press the angle of the duodenum (F. of Plate I.) against the right kidney. The colon is here, Plate II., very small, because it was punctured with the intention of letting out all the air, that the inflated duodenum might be brought more distinctly into view. The duodenum is seen rising from its concealment from under the colon where the jejunum begins, represented where the ligature is tied.

* * Both these Plates are taken from adult subjects. In young children, the liver projects a great deal

deal more over the duodenum than in adults, as that organ in them bears a larger proportion to the other viscera: and from what observations I have been able to make, the duodenum in them is more horizontal in its position before it makes its descent to the kidney; consequently any distension or irritation of the duodenum will in them have a greater effect upon the liver and gall-bladder.

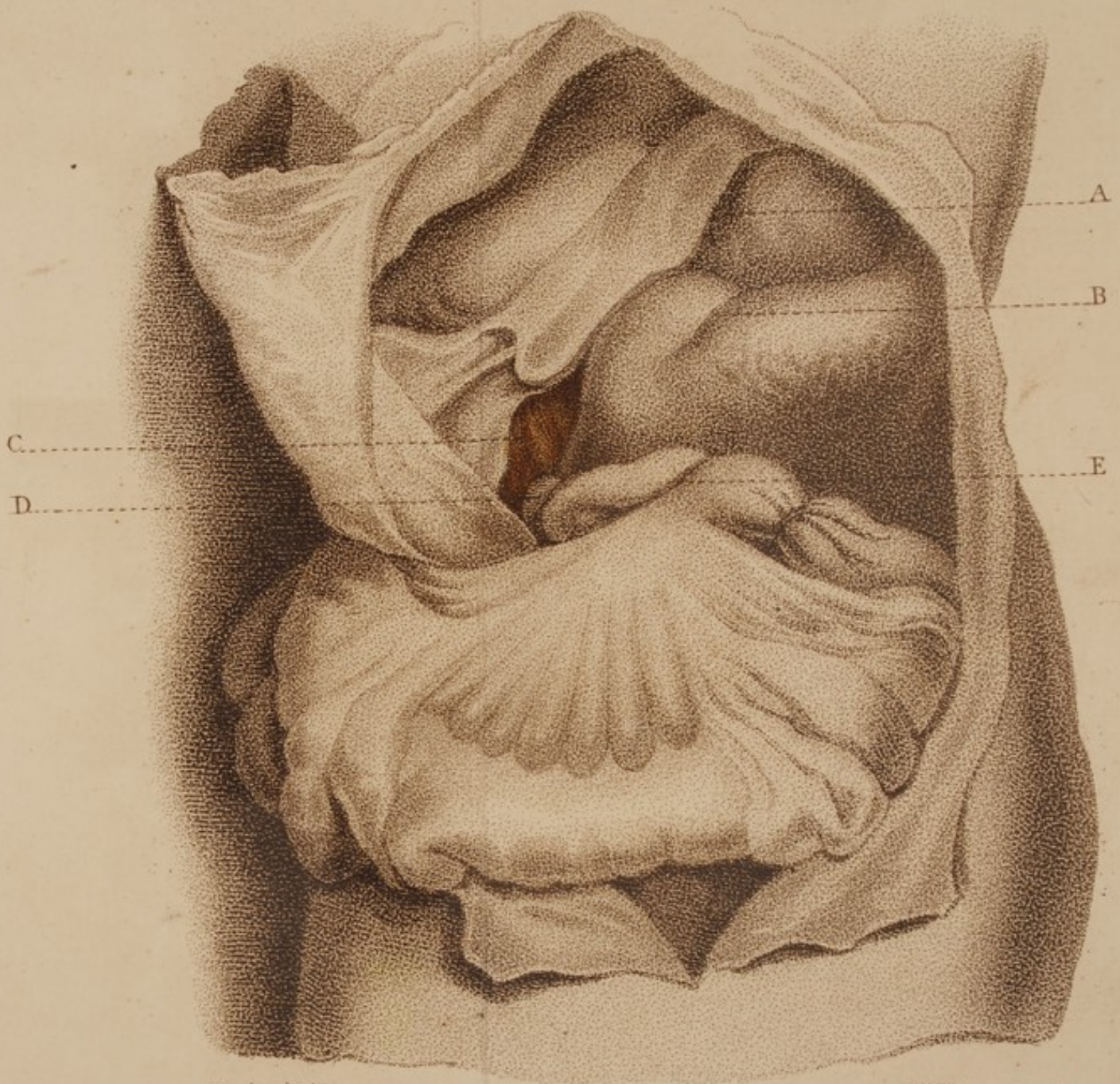
THE END.



From Clayson

J.T. Wedgwood sculp.





Parris pinat.

J. Wedgwood sculp.

A. The portion of the body, over which the other end of this dotted line passes, is the posterior part of the stomach greatly inflated & pressed upwards. The Duodenum is seen rising above the pyloric indentation. The great curvature of the stomach & the lower part of the Pylorus being covered by the Mesocolon.

B. The Pylorus, C. Gallbladder. D. at the other end of this dotted line is a fold of the Colon, behind & above which the Duodenum is seen descending, passing under & pressing against the Gall bladder. E. at the other end of this dotted line the Duodenum is seen passing from under the Colon thro' the Mesenteric ring.

