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ON

DISEASES OF THE ABDOMEN

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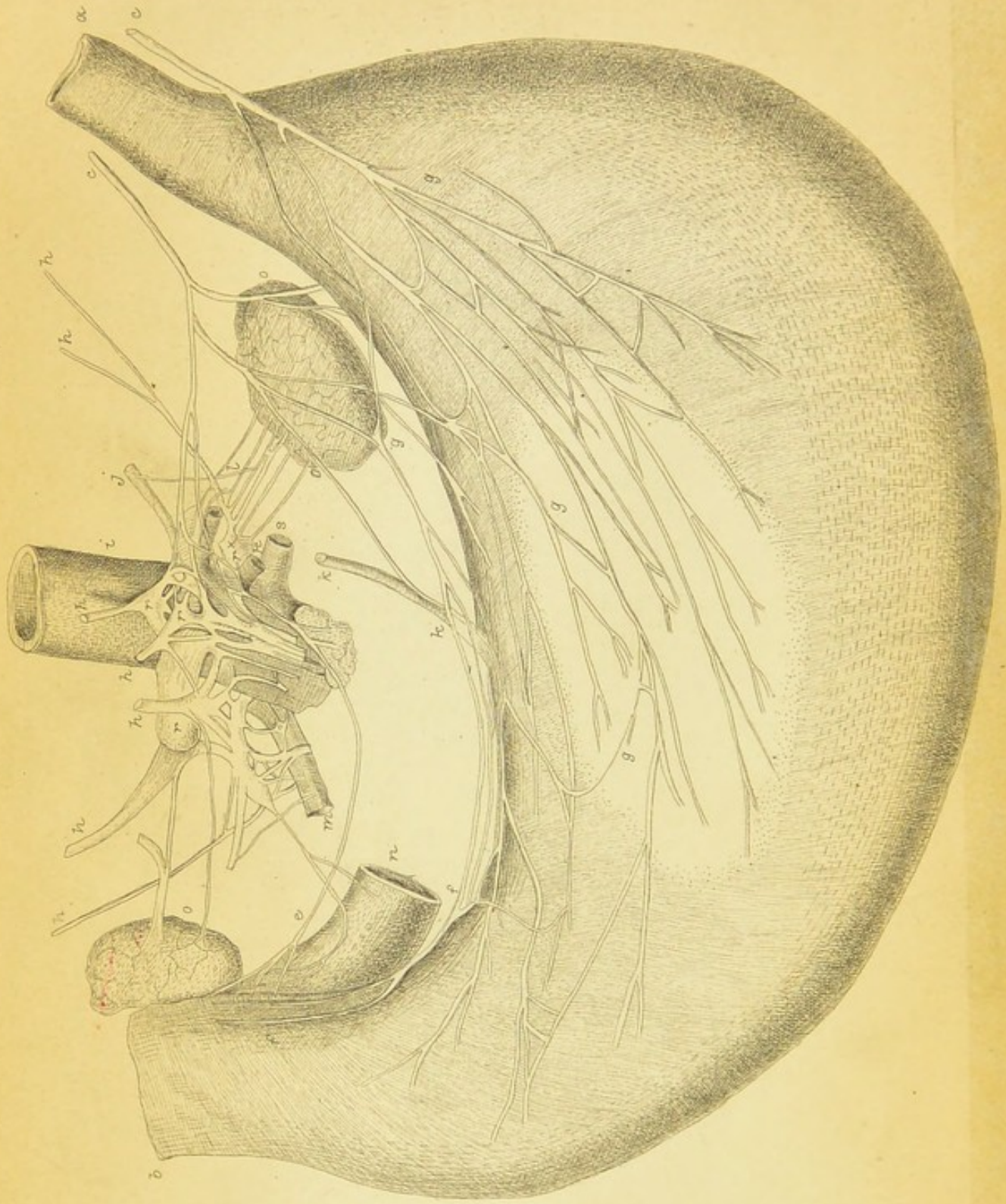

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PATHOLOGICAL AND PRACTICAL OBSERVATIONS

ON

DISEASES OF THE ABDOMEN,

COMPRISING THOSE OF THE

STOMACH, AND OTHER PARTS OF THE ALIMENTARY CANAL, ŒSOPHAGUS, CÆCUM, INTESTINES, AND PERITONEUM.

BY

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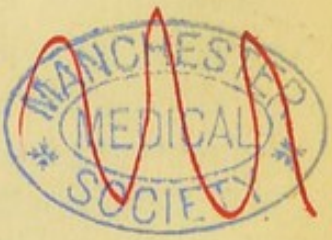

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PREFACE.

Diseases of the Stomach have, during the last few years, received considerable attention, and our medical literature has been enriched by the labours of Budd, Handfield Jones, Chambers, Brinton, Wilson Fox, Leared, Fenwick, and others. Much, however, still remains to be done; and whilst some of the facts contained in the present volume will tend to confirm what is already known, other new ones will be found, which, we trust, will repay an attentive perusal of its pages.

The design in this work has been to illustrate the diseases treated upon, by cases which have come under our personal observation, with a few remarks upon them, and some general deductions. During the period of my curatorship of the Museum at Guy's, and of my demonstratorship of Morbid Anatomy for several years, very numerous opportunities were presented of noticing diseases of the stomach and intestines in their varied phases; and I would tender sincere thanks to those of my colleagues who have permitted the mention of instances under their care. Although I have sought definitely to distinguish some classes of diseased conditions, I should be very unwilling to regard them as entities superadded to the human frame, but rather, to quote the words of Sir John Forbes, "as new phases of vital manifestations.".

Life may be considered as the resultant of certain forces, manifested in the performance of functions, which are combined harmoniously for one purpose; it has received varied appellations, each indicative of our inability to discover its

real character; thus we have had vital force, power of growth, nutrition, development, organization, nature, &c., each new observer considering himself more clear-sighted than his predecessor, although he has merely substituted one term for another.. This living force is in close correlative relation with other physical forces, and the fuller investigations of physiological science show that the same forces are in operation, namely, gravitation, chemical action, &c., in the living organism, as external to it; modified, it is true, by another force, namely, life. And as in the science of physics generally, so in the study of living phenomena, we must ever bear in mind that a like cause always produces a like effect. Vague observation, and the superficial remarks of some writers, would lead us to suppose, that, in living phenomena, the same cause is followed, at first by one effect, then by another; interpreting fixed realities by prejudice rather than by reason.

Some phraseology is necessary to express our meaning and ideas, and one great difficulty is overcome, if we can understand that the same words convey to each the same thought. It may be convenient, as we have mentioned, to regard life as the resultant of certain forces, and disease as a deviation from the normal direction. If any of the forces which are in natural operation be modified in intensity, a deviation is the result, and diseased action is produced, the resultant being necessarily changed; still the tendency is such that on the withdrawal of the modifying force, the normal course is reassumed. Not only may it be natural force which has led to this departure from the healthy state, but new force may be added, as much as when the earth in its orbit is disturbed by the attraction of some other celestial body.

In diseases, many sources of change arise—modifying forces—thus syphilitic or miasmatic poison, small-pox &c., alter the character of every function; a new substance is added as much as in the voltaic battery, when the fluid in one or other cell is changed by the admixture of any substance; this may

be merely of the kind already existing, or a foreign substance may have been introduced; in any case, the phenomena are modified. Such, to some extent, is the case in pathological changes. These changes, produced by perverted nutrition, or altered vital forces, are in many instances of such a character, that no examination of the structure itself could discern the state which had been produced; as fruitless would it be to search in the nerve of a limb for the altered force which had led to spasm, as to expect to find a telegraphic message by a microscopical examination of the wire, although the structure of both had been transiently modified by the disturbance of the forces they transmitted. If the character of the disturbance in disease is one, which, like a polar force, reverts to its former condition, no trace can be found on inspection, but, in many instances, obvious structural modifications are the result.

Diseased action, however, as generally manifested, is the resultant, not of one, but of several changes in the normal condition, and very few persons are literally in perfect health. The living forces are modified by hereditary tendency, as struma; to this, perhaps, is added, syphilis, to that miasm; still further, sudden changes of temperature, improper supply of nourishment, of heat, and light, may be causes of disease; each of these may act as fresh sources of deviation from the normal healthy direction of living action, superadded to the resultant produced by the previous combination.

Some have supposed that acute disease quickly passes off, and that with the subsidence of the more marked symptoms no trace is left behind, but very generally this is not the case; the attentive study of pathology will soon convince us of the contrary; new exciting causes of disease arise, perhaps of a different character, but the resultant (to revert to the previous phraseology of forces) is not precisely the same, the former diseased state acts as a modifying force. This course may be often repeated, and if the changes have been such as to entail

discomfort or weakness, chronic disease is said to exist; but if without these, the patient generally passes for one in sound health. It is the acumen of the practical physician that detects the traces of previous morbid action, and he alone knows how rightly to estimate the course likely to be assumed by any new addition to a state widely diverse to that of health; hence, also, the variety of diseases by which the same organ is affected, the causes are different and so of necessity their effect.

It is the province of medical science, rightly to estimate the effects produced on vital action by any disturbing causes, and to study their almost endless varieties; several general characters lead us to group these effects into classes; and although in this volume we have spoken of diseased action as manifesting itself especially in the alimentary canal in the changes described, and the symptoms detailed, it will be found that these parts are in many cases only affected in common with the whole economy, whilst in others, that the special manifestation of morbid action is in the abdomen.

Numerous means are available for checking and modifying diseased action, and we must protest against the ignorance of those who regard the draught of medicine as the only important agent. The skill of the physician is often most manifest in the suggestion of hygienic measures which by many may be assumed as of trifling moment; and whilst it is perfectly true that many morbid conditions cease after a time, or that the frame becomes so accustomed to perverted action that the balance of functions is apparently maintained without cognizance on the part of the patient, still the aid of medical science is most important. The first agents to which we must refer are those which are in constant operation in the maintenance of life—in one state preservative of health, in another the the cause of disease—as the character of the air breathed, whether saturated with moisture, poisoned with miasm, or with the decomposing effluvia of crowded cities, as compared

with that found in more elevated situations, on the sea or its coasts, &c.; so also with reference to diet, to light, to clothing, to temperature, to habits of mental or bodily training or exercise; the right use of all these is not less important in the restoration to health, than in the maintenance of it, and in both cases alike, is within the province of medical science.

Too frequently medicine is taxed to obviate the disease whilst its cause is pertinaciously adhered to. It is in vain to recommend to the dyspeptic patient remedies which would certainly mitigate his disease, whilst intense anxiety remains, and hurried, half masticated meals, are taken at irregular hours and without due moderation—or, again, it is useless to direct means to relieve a disturbed brain, whilst excitement is added to excitement, the senses stimulated by light, noise, animated conversation, and active thought—or to give opium to check peritonitis, to quiet muscular movement, when the patient is allowed to move from the recumbent position.

The consideration of the fundamental conditions of life demands strict attention, not only as indicating the tendency vital action has to assume its natural direction, but also in enabling us to use and apply effective means for the removal of morbid processes; and we are at no great loss to understand the intellectual power and acumen of those who, because everything is not known in the pathology and treatment of disease, would contemptuously discard that which is known and established. We deplore the ignorance of those who know not the value of opium in peritonitis, &c., of iodide of potassium in secondary syphilis, of purgatives and mercurials in hepatic engorgement, of preparations of steel in many forms of anæmia, of quinine and arsenic in intermittents; our object is not to confute errors which arise from wilfully closing the eye to light already attained, but to seek to add facts upon which science may safely advance.

We have generally divided the chapters according to the anatomical divisions, rather than in a strictly pathological

manner. The first chapter is on diseases of the Mouth and Throat, and the next on those of the Pharynx, but I have not dwelt upon those maladies which more especially come under the care of the Surgeon. The chapter on disease of the Œsophagus, contains many interesting cases, some of them obscure in their pathology, and very insidious in their origin; some instances of ulceration, perforating the trachea or bronchi, which we have described, have generally, and we believe incorrectly, been considered as instances of cancerous disease. The diseases of the stomach constitute the subject of the next section, and have obtained from authors very considerable attention; we believe that there are forms of ulceration, superficial and evanescent, which leave scarcely more trace in the mucous membrane of the stomach than the aphthous ulceration of the mucous membrane of the mouth, whilst others are permanent, and are manifest after death; and indeed we find the same forms of diseased action in the mouth as in the stomach; thus both are affected by inflammatory congestion, perverted epithelial growth and secretion, sluggish condition of the circulation, acute inflammatory disease, as well as by fibroid and cancerous disease. Ulceration of the stomach is probably a more common condition than is generally supposed, and in many instances yields to judicious treatment; the instances we have adduced show that there are several distinguishing marks by which it may be known from cancer. Fibroid degeneration of the pylorus has generally been considered as of a cancerous nature; and whilst we are unable to remove this almost certainly fatal form of disease, we may, as in cancer, do much to mitigate the symptoms and to prolong life.

In the so-called functional disease of the stomach, chemical research has removed much that was obscure, and will do still more to explain the pathological changes which are induced; the investigation of the physiological connections of the pneumogastric nerve, as well as of the sympathetic nerve

and the branches of the semilunar ganglia will enable us more correctly to estimate the very diverse symptoms produced in dyspepsia, many of which have their origin in this source. The right estimate of such symptoms as pain in the region of the stomach and vomiting are most important in the diagnosis, and equally so in the treatment of gastric affections.

The chapter on the Duodenum presents us with instances of disease which closely simulate maladies of the pyloric extremity of the stomach.

The next chapter is on Gastro-Enteritis and Enteritis, diseases in which correct diagnosis is very important; in the latter class of diseases especially, life may be easily sacrificed by time being thrown away, and by improper treatment; in the former with judicious diet, warmth, demulcents, &c., recovery generally takes place. Whilst we strongly recommend, in many of these instances of gastro-enteritis, the avoidance of mercurials, the value of salines, as of bicarbonate and chlorate of potash, and carbonate of soda, are well known to those who have carefully watched the effect that has followed their administration.

In the chapter on Strumous Disease of the Intestine and Peritoneum we have sought to show that these diseases are only part of a general perverted nutrition, and that, in many instances, disease in other organs is entirely obscured by the more marked affection of the abdominal viscera; here, also, we should strongly urge the avoidance of mercurial medicines and of drastic purgatives; the lives of many delicate children are sacrificed by worm powders and quack nostrums administered in these diseases.

The diseases of the Cæcum and its Appendix are next dwelt upon. We have shown that unusual freedom of the cæcal attachments may determine intestinal obstruction from rotatory movements of the intestine; the symptoms and treatment of cæcal distension and of local enteritis are described, as well as the more serious consequences of perfora-

tion of the appendix; we have given numerous instances of these forms of affection, and their perusal will show the great similarity in the symptoms and their general course. Dr. Burns, in a valuable paper in the 'Medico-Chirurgical Transactions,' described, several years ago, some of these affections. It would appear that the symptoms of cancerous disease of the cæcum are different from simple cæcal enteritis and perforation; and that in many cases we may discriminate the character of the complaint. It will be found that treatment may do much to relieve and to assist the cure of cæcal disease; the pain demands rest, and it is well after the acute pain has subsided, still to maintain absolute repose for several days. The bowels are often confined, but the use of purgatives generally aggravates the disease without effecting the desired operation; this is better obtained by the application of warmth and by opium; those remedies, which diminish the enteric inflammation lead most speedily to the subsidence of the morbid symptoms.

We have next pointed out the characters of the several forms of Diarrhœa, but we are well aware that diarrhœa is merely a symptom of very different conditions, and that in many instances it passes almost imperceptibly into dysentery.

Dysentery and Catarrh of the Colon are the subjects afterwards considered, and the instances we have adduced show that inflammation of the colon, of a most severe form, arises in our own country. Most of the writers on this subject are those who have observed it in its worst forms abroad or in Ireland. In some of the cases typhoid fever was simulated; in others, perforation of the colon had taken place; in one there was pyæmia and commencing suppuration in the liver; in several chronic cases the secondary effects were shown in producing contraction of the intestine, perforation, and artificial anus, &c.; as regards abscess in the liver, in one case the abscess had dried and contracted; in another, fresh diseased action was set up around it, and abscess in the brain was the result.

We must confess, that in some of the most severe forms all treatment is ineffectual to cure, whilst it partially soothes and relieves; but in the great majority of instances means may be used which effectually combat the symptoms of disease.

We had intended to give some observations on Asiatic cholera, but for several reasons have not done so; first, because although the disease manifests itself more apparently in the disturbed functions of the alimentary canal, it has not been clearly shown that the disease is really one affecting alone or even principally the abdomen; and secondly, all the facts known in reference to this disease are better and more clearly given in the report drawn up by Dr. Baly and Sir W. Gull.

In the chapter on Typhoid Fever, we have merely described the condition of the abdominal affection, without entering into the general question of fever, and its treatment; in the latter, it is well to guard against the danger of so freely administering opiates to check diarrhœa as to lead to cerebral oppression, and excessive engorgement of the lungs, from imperfect performance of the respiratory function.

In the chapter on Colic I have cursorily spoken of the simpler forms of the disease, and have separated the more severe varieties of ileus—internal strangulation, intussusception, and cancerous disease of the colon. It will be found that whilst the latter conditions bear a strong general resemblance in producing fatal constipation, they may, in many instances, be distinguished the one from the other; intussusception closely simulates simple colic, but, in not a few instances, it is accompanied by discharge of bloody mucus, or with actual diarrhœa; and this latter symptom sometimes arises even with cancerons disease of the sigmoid flexure. We have very strongly urged the avoidance of drastic purgatives, calomel, colocynth, and even milder purgatives, and as

strongly recommended the free administration of opium; the cases detailed almost uniformly show that, where purgatives were given, vomiting, pain, and distress were increased, whilst these and other symptoms were, on the contrary, relieved by opium. Opium, in such cases, appears to be the best means of procuring relief to the bowels, if an action be possible. In the chapter on Worms, we have designedly been very brief in our remarks.

The cases of Suppuration in the Abdominal Parietes, and of Perforation of the Intestine from Without, are an interesting series; many of them are obscure in their diagnosis, and different in their course. Great care is required in watching the symptoms as they become fully developed' and in avoiding the aggravation of them by too active treatment.

The serous membrane of the intestines, the peritoneum, is so intimately connected with the morbid conditions of the alimentary canal, that we have appended some remarks on its diseases. In very many instances the serous membrane is implicated by direct extension of disease; in other cases, the peritoneal change is the expression of a general morbid condition of the whole system; in addition to a chapter on Peritonitis, I have appended remarks on Ascites, and also on Abdominal Tumours.

The cases I have recorded might have been given at greater length, and on each one fuller remarks might have been made; but the design of the work has been, in a very few words to point out the peculiarities of each instance, embodying in more general deductions the apparent conclusions derived from the whole. My desire is to shed some light on the difficulties which often present themselves in the daily practice of the profession, and to suggest means whereby the alleviation of disease may be promoted.

The former editions of my work on 'Diseases of the Abdomen' have been exhausted for several years, and I regret that so long a time has elapsed in the preparation of

the present edition. The whole work has been carefully revised; several chapters on important subjects have been added; and, I trust, that it will be found helpful in clinical study, as well as in the treatment of disease. I have derived valuable assistance from my friend and colleague, Dr. Goodhart, both in examining the later records of the Guy's pathological department, and also in the revision of the work.

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DESCRIPTION OF PLATES.

PLATE I.

Stomach presenting a chronic ulcer; at its upper margin the pneumogastric nerve is shown extending into dense fibrous tissue. The pancreas and the left lobe of the liver formed the base of the ulcer; the latter presented fibroid degeneration of its structure.—Case XLIII.

PLATE II.

Stomach exceedingly contracted from chronic ulceration, with villous growth Simulating cancer.—Case LVIII.

1. External view, resembling the colon in appearance.
2. Internal surface, showing ulceration near the pylorus, and villous growth near the centre of the stomach.

PLATE III.

FIG. I. Section of the mucous membrane of a portion of the ileum in acute inflammation of the colon and ileum, showing the surface covered with false membrane (diphtherite) and continuous with the mucous follicles.—Case CXXIX.

FIG. II. Section of a solitary gland from the cæcum, from the same Case, CXXIX, showing (*a*) the edges of a raised portion intensely injected from distended capillaries; (*b*) surface of mucous membrane covered with diphtheritic granular membrane; (*c*) opening into the gland; (*d*) small phosphatic crpstals.

FIG. III. Appearance of inflamed colon in Case CXXXIX; (*a*) false membrane composed of granule cells; (*b*) surface of a portion of the colon beneath the false membrane; (*c*) follicle or crypt containing cells similar to those composing the false membrane.

FIG. IV. Colloid cancer of the sigmoid flexure × 400 diam.; (*a b*) columnar epithelium; (*c*) nuclei with granular blastema; (*d*) large cells, with large nuclei, and some with several nuclei in them; (*e*) intervening delicate tissue; (*f*) elongated fibre cells. —Case CLXIV.

FIG. V. Obstruction of the sigmoid flexure by cancerous growth; (*a*) columnar epithelium and nuclei; (*b*) fibrous tissue beneath the mucous membrane; (*c*) interspaces filled with nuclei; (*c*) surface of mucous membrane composed of dense fibre tissue.—Case CLX.

PLATE IV.

FIG. I. Cæcum inverted, appendix towards the pelvis, where it was adherent; ascending colon commencing opposite the ileum.—Case CV.

FIG. II. Cæcum inverted and twisted on its own axis into the left hypochondriac region, appendix close to the spleen; ascending colon constricted; constriction increased by band of adhesion to the sigmoid flexure, which appeared to have been the primary cause of the fatal twist and obstruction.—Case CVI.

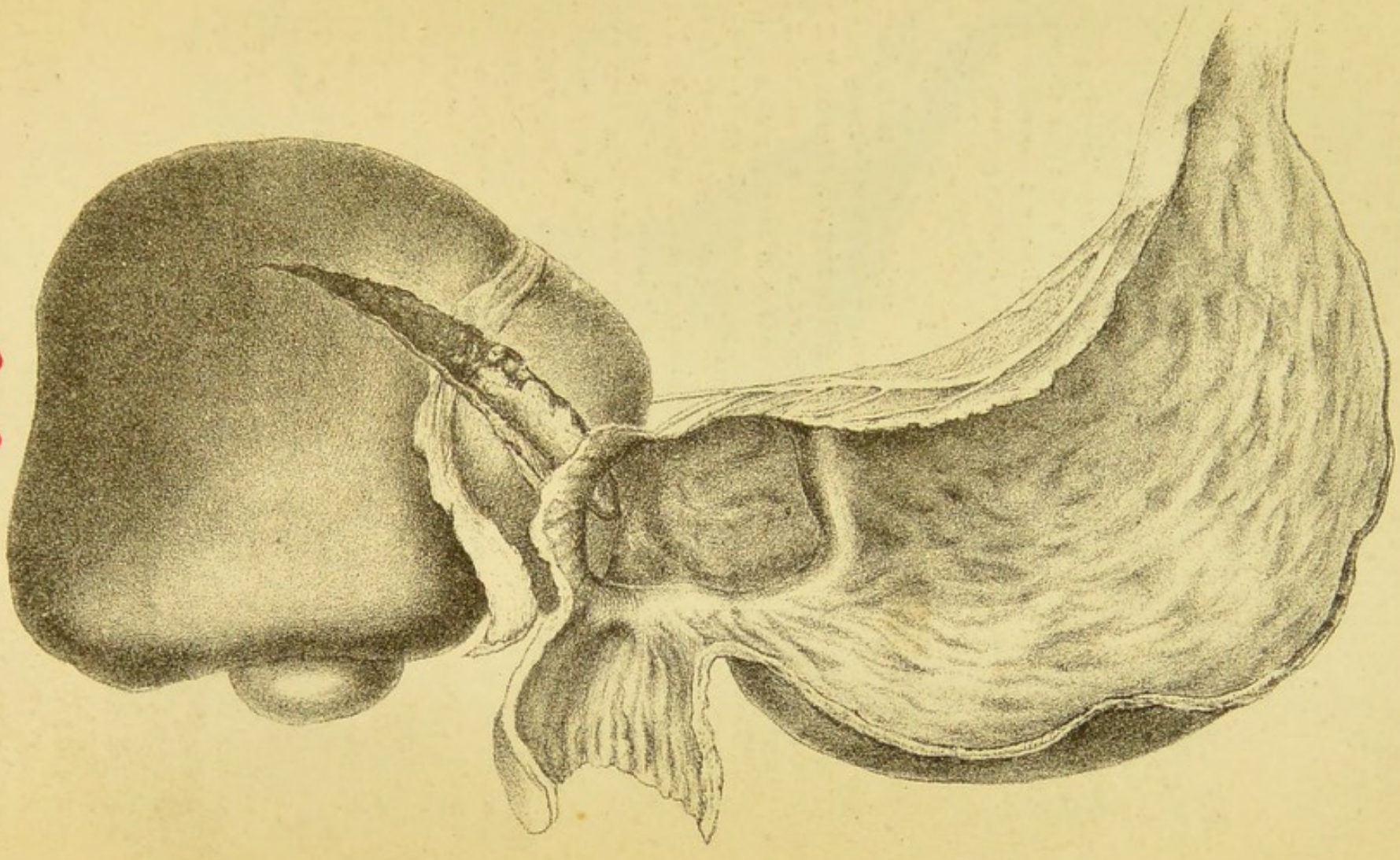
FIG. III. Position of intestines in a case of intussusception of cæcum and ascending colon into descending colon and sigmoid flexure; the commencement of the rectum is drawn from its position, to show the strangulated bowel within. Dr. Hughes' case, No. CLII.

PLATE V,

Dissection showing the distribution of the pneumogastric nerve on the anterior surface of the stomach, its extension to the pancreas and pylorus, and its connection with the semilunar ganglia, &c. (*a*) œsophageal extremity of the stomach; (*b*) pylorus; (*c c*) pneumogastric nerves; (*e e*) branch of the pneumogastric to the pancreas, connected also with the sympathetic, and then passing onwards to the pylorus; (*f f*) other branches to the pylorus; (*g g g g*) branches of the pneumogastric nerve distributed on the anterior surface of the stomach, presenting a peculiar dichotomous division, and repeated union of its branches; (*h h h h h h*) splanchnic nerves; (*i*) aorta; (*j*) diaphragmatic artery, with a filament of nerve upon it; (*k k*) coronary artery; (*l*) splenic artery; (*m*) hepatic artery turned aside from its position *in front of the aorta*, and from its origin at the cœliac axis; and thus it appears to be behind the aorta; the large branches of the sympathetic nerve upon it are continuous with the portion of ganglion (*r**) close to the coronary artery; (*n*) vena portæ; (*o o*) supra-renal capsules receiving numerous nerve filaments; (*r r*) semilunar ganglia, and descending branches to the mesenteric artery and renal plexus, &c.; (*s*) mesenteric artery drawn aside.

In this distribution of nerves, the close sympathy of the stomach with the parts supplied by the semilunar ganglion is explained; thus, it is brought into connection with the liver by its hepatic branches with the pancreas, with the diaphragm and phrenic nerve, with the supra-renal capsules, and by its descending branches with other abdominal viscera.

PLATE I



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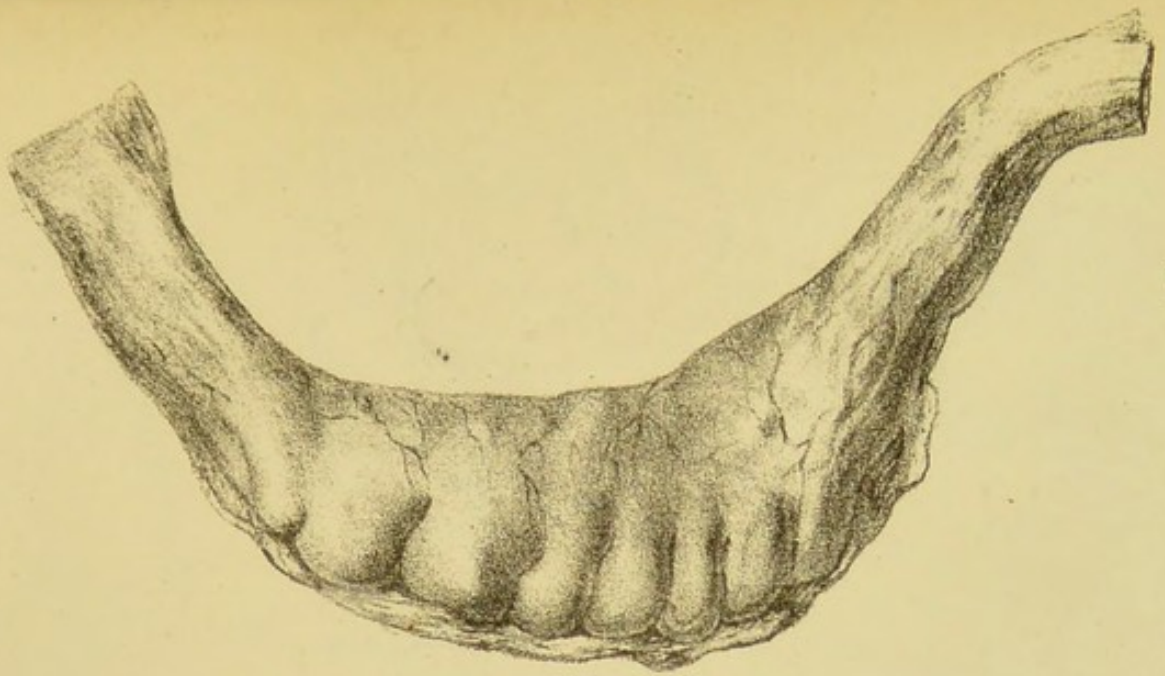
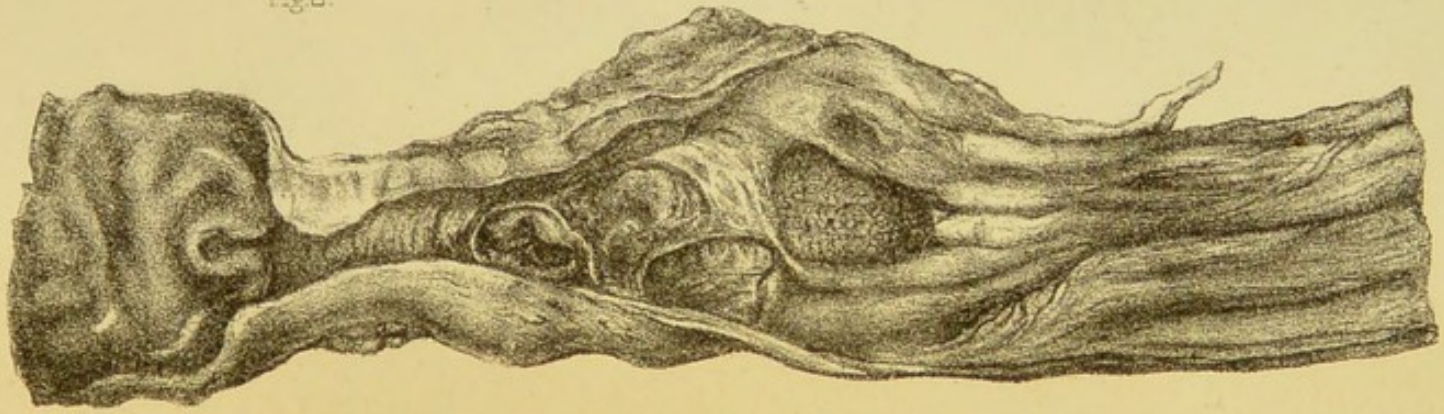


Fig 1.

Fig 2.



W. Hurst del. Tuffen West lith.

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PLATE III.

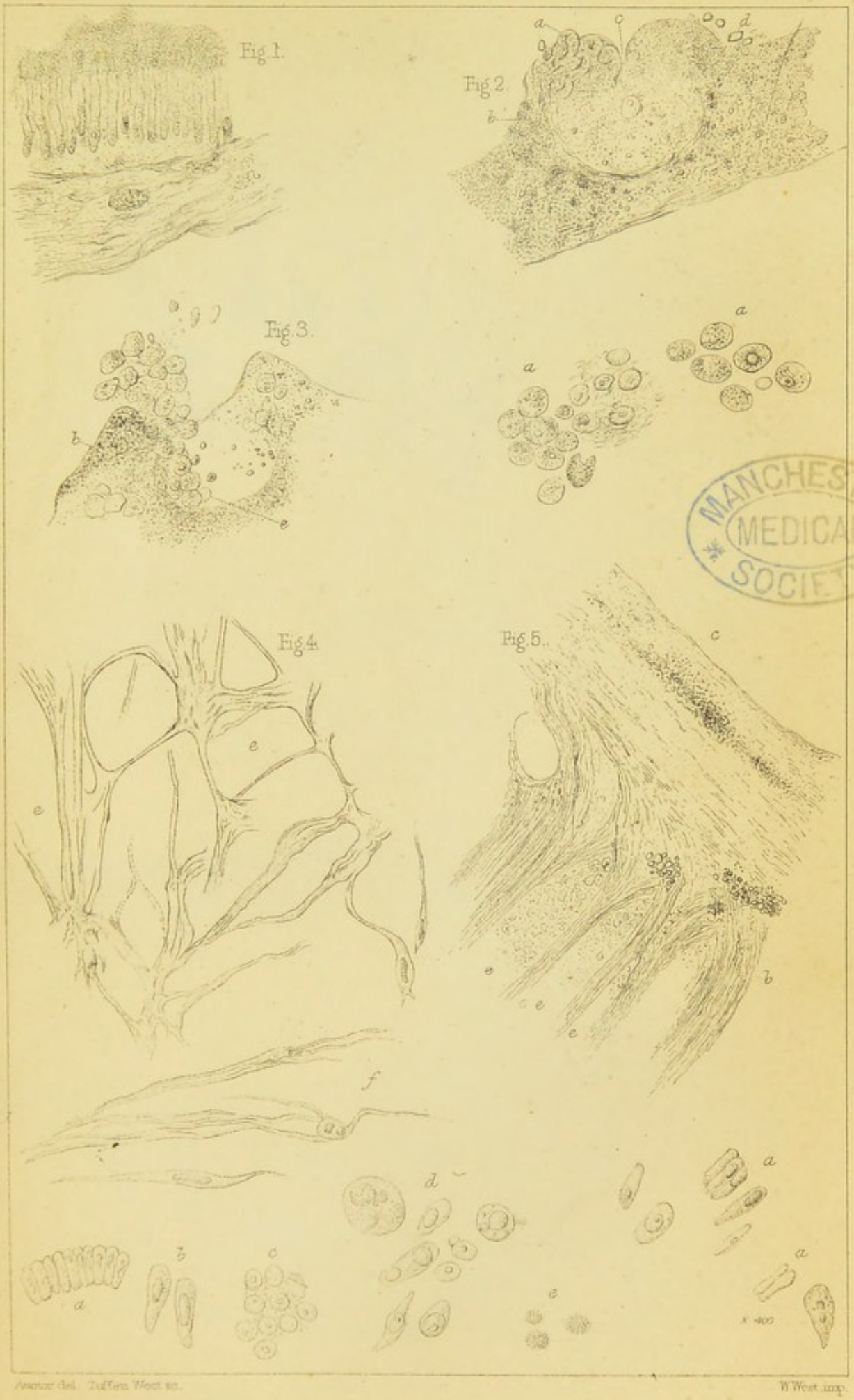

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Fig. 2.

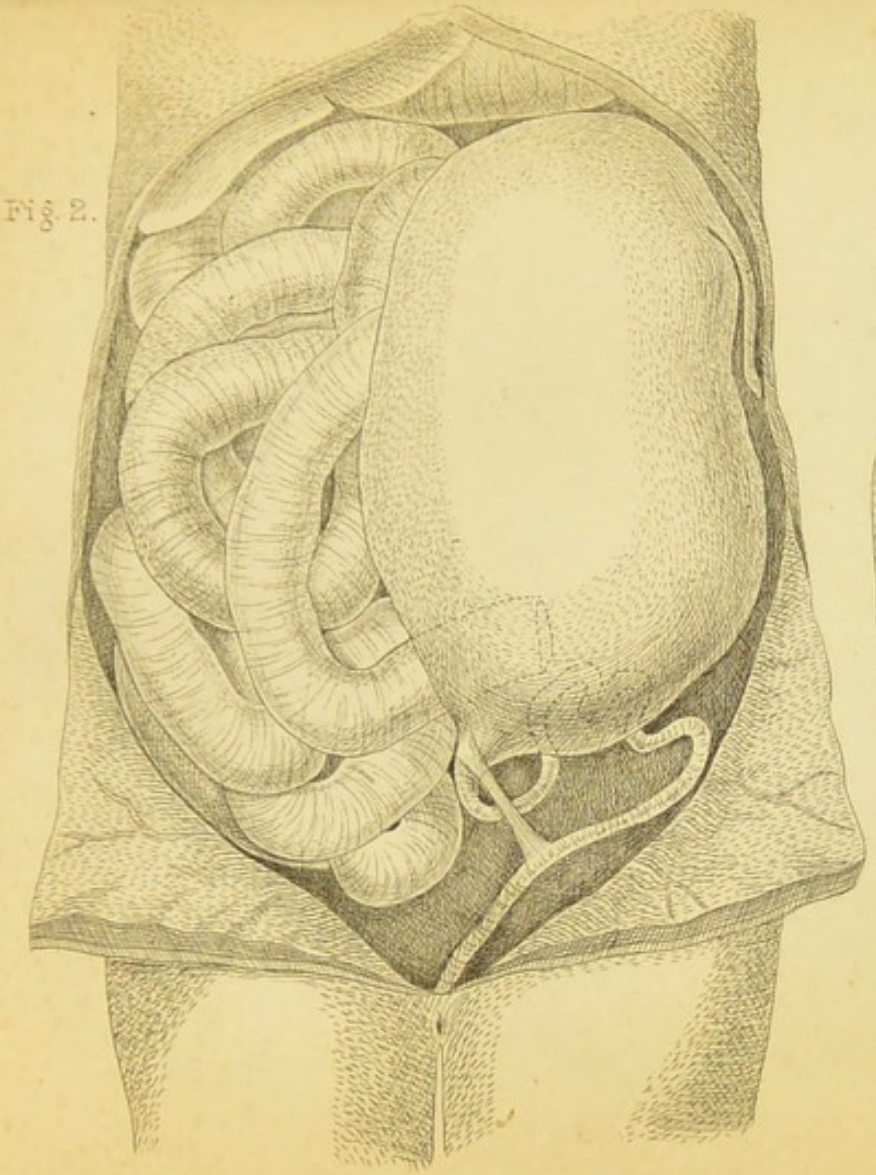


Fig. 1.

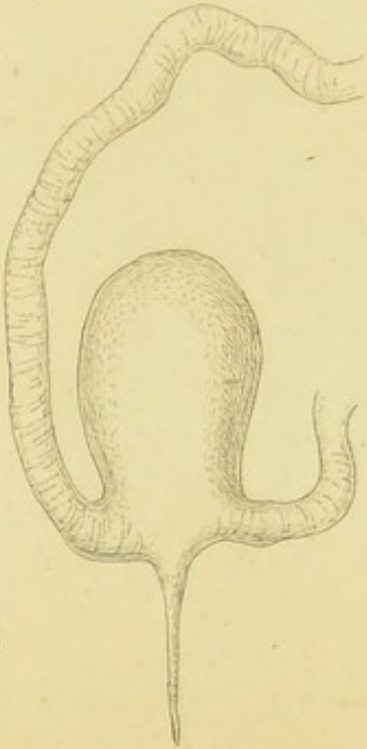
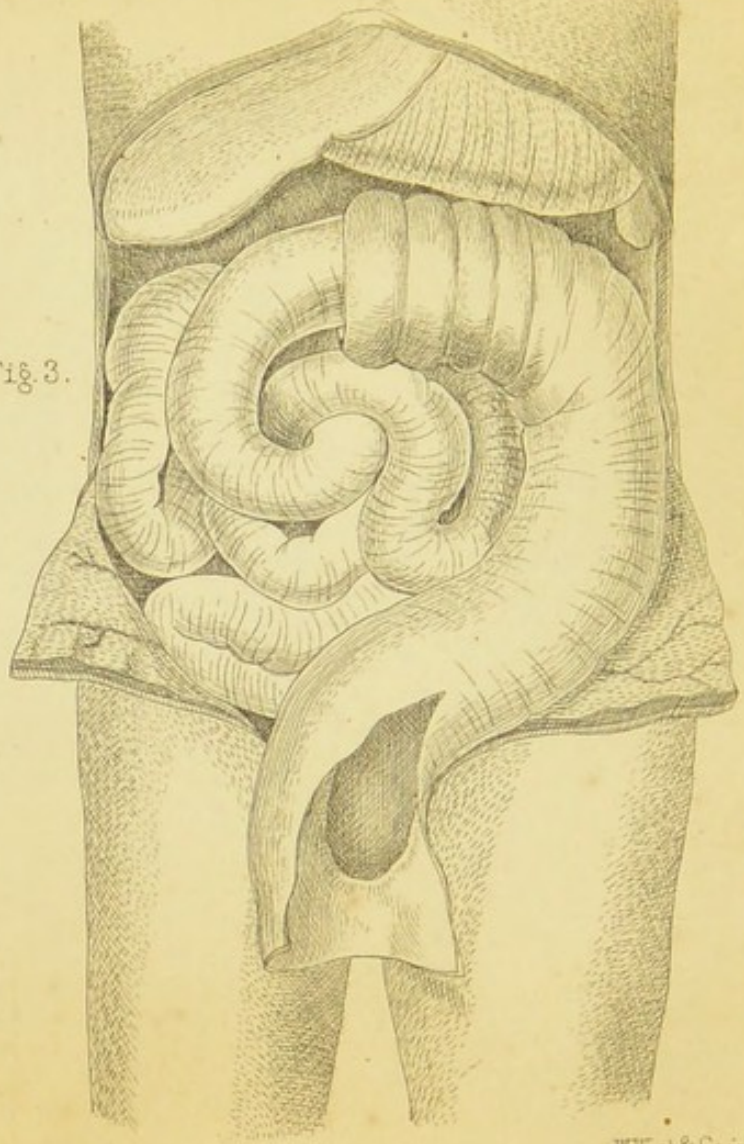


Fig. 3.



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ON

DISEASES OF THE STOMACH.

CHAPTER I.

INTRODUCTION.

The function of digestion is essentially connected with life and health; and slight deviations from its normal performance produce suffering in a greater or less degree. He is, indeed, fortunate who can pass through his daily duties without having the thoughts and attention directed to those operations for the solution, absorption, and assimilation of nourishment, which in health are completed unconsciously, without attention, or sense of pain. If there be severe derangement of the digestive functions, not only is the attention directed to them, and discomfort entailed, but there is reaction upon the higher capabilities of man's nature: the energies of the brain are enfeebled, the memory is defective, the will vacillates, and the intellectual powers are less free to guide in daily duty, avocation, and research. The strength and muscular movements are diminished, and the enjoyment of life changes to daily suffering and anxiety. Contrast the vigour of mind and body during health, with the enfeebled energy of the dyspeptic and hypochondriac. In the former state there is no impediment to the exercise of deep thought and labour, in any sphere to which the mind may be directed; the whole attention in the latter is absorbed by those functions, which are at best only subservient to the manly exercise of mind and will.

If the digestive process be altogether checked, and no new

supply of nourishment be absorbed and assimilated; if no restoration be made to the waste entailed by the exercise of every function, life must sooner or later cease; and disease, in its ravages, presents few spectacles more distressing to witness, than the gradual wasting of the frame, and cessation of life itself, from the non-supply of food. Thus the whole system sympathises with disorder of the alimentary canal.

A knowledge of the structure and functions of each part of the digestive apparatus, is necessary for the right comprehension of its diseases. The structures of the alimentary canal are various, and their sympathies universal; but in health these are so combined as to form a beautiful and harmonious whole: thus, 1st, we find a mucous membrane richly supplied with glands, lining the alimentary canal throughout its course; these glands are for secretion and excretion; the secretions from these act physically or chemically in the digestive process, whilst the excretory glands separate noxious or effete principles from the blood. 2nd. Beneath the mucous is the muscular coat, essential for the execution of the required movements, and for the propulsion of the contents of the canal. 3rd. The peritoneal or serous covering, which by its smoothness permits of the movement of one portion of the intestine upon another, and allows distension to take place. 4th. The binding tissues, which are found between these previously mentioned tunics, and which support other equally essential parts, namely, 5th, the blood-vessels and lymphatics; and, 6th, the nerves supplied by the sympathetic and cerebro-spinal. As Abercrombie has remarked, in reference to diseases of the stomach, so also, it may be added, in reference to every part of the alimentary canal; that for the proper performance of the function of digestion, the mucous membrane must be in health, the secretions normal, the supply of blood and of nervous energy such as is required, and the movements free. It must, however, be borne in mind, that the alimentary canal contains substances which are, strictly speaking, external to the living agency and beyond the control of animal life; and that those chemical forces, which we find in operation external to the body, act in the same manner within the stomach and small and large intestines: the food becomes dissolved when the

same solvents are provided, and other circumstances adapted, as to temperature, movements, &c., whether it be put in a phial or in the stomach. The fermentation of its contents takes place in the stomach and canal, as well as in any chemical receiver; and these facts have to be remembered in the study, as well as in the treatment, of disease. Chemical force is in operation throughout the whole animal economy; it is modified and controlled by the living power, or it is free to act alone.

Each of the parts which have been mentioned, may be alone diseased, or all conjointly; the symptoms arising from each are in some cases distinct, in others we cannot separate the one from the other.

1st. The mucous membrane and its secretions. The derangement of these constitutes, perhaps, the greater part of the milder ailments of the alimentary canal. The symptoms vary according to the part affected: in the stomach, producing some of the forms of dyspepsia; in the intestines, constipation, diarrhœa, &c. But, when the mucous membrane alone is affected, it appears probable that pain is not produced, and this circumstance we must regard as a merciful arrangement. The lining membrane is exposed to varied causes of irritation, but we do not experience pain; if such were the case, every portion of undigested food might produce suffering; in some cases severe pain is found in indigestion, but this arises from an extreme sensibility of the sympathetic and other nervous supply of the stomach, &c., and, is not due to the mucous membrane alone.

Dr. Beaumont, in his observations on the stomach of Alexis, sometimes observed the mucous membrane dry, injected, and much irritated without the production of pain; so, also, I have observed actual inflammation of the stomach, as found in cases of poisoning by oxalic acid, by chloride of zinc, and even by arsenic, without pain from first to last.

2nd. The muscular coat we find so stimulated, that it rapidly contracts, and impels onwards its contents; or, it is so enfeebled as to retain them; sometimes it is spasmodically contracted, or again, dilated, as in the forms of colic and flatulent distension. These conditions appear to be productive of pain, sometimes of a very intense form, as we

find in the griping of colic, and in enteritis, &c. As long as the peristaltic action is uniform, regular, and healthy, we are unconscious of the movement; but as soon as it becomes irregular or tumultuous, retarded or spasmodic, we are sensible of uneasiness, or even of severe pain; the muscular coat of the intestine is probably excited to contraction by the direct stimulus of its contents, but the harmony of its movements is due to the supply of nervous influence which it receives.

3rd. The peritoneal or serous investment also manifests its derangement by pain; and here, again, is a wise provision, for as its disorders require rest, or rather an absence of movement of the coils of intestine one upon another, and the pain of peritoneal disease is increased by muscular exertion, so the patient becomes prompted to assume that position, and to retain that state, which is the best suited for the restoration from disease. The observant pathologist and physician know, practically, the importance of rest in the recumbent position, and they follow the teaching of nature in their stringent directions: by this means inflammation is localized, and when perforations of the intestine have taken place, the injury is limited and life may be prolonged.

4th. The state of the investing or binding tissues; and, 5th, the supply of blood, are important considerations in the study of these diseases of the intestine. The connective tissue, for instance, is in some cases the seat of fatal malady, in constriction of the pylorus, and in cancer. Still more does the supply of blood call for attention: it may be in excess, as in active or passive hyperæmia; in pulmonary, cardiac, and hepatic diseases the engorgement of the mucous membrane leads to peculiar and characteristic symptoms; the rupture of vessels, or ulceration into them, causes hæmorrhage into the canal; and again, a scanty supply or depraved condition of blood prevents the proper performance of digestion, as after great hæmorrhage, in over-lactation, in purpura, scurvy, or in starvation. The appearance of the blood discharged into the several portions of the canal greatly differs; thus, in disease of the stomach, it is generally ejected as dark semi-coagulated blood; sometimes, as in the latter stages of cancer, as coffee ground substance; or, in the acute disease of the stomach and duodenum, according to Dr. Fraser and

others, as a green fluid. If, however, blood be passed into the duodenum, and discharged per rectum, it has a black and tarry character; and in proportion as the source of the discharge is near or more distant from the rectum, a sanguineous appearance is retained.

6th. The state of the nervous supply is often lost sight of; this is a most complicated system of nervous fibrils and ganglia, which are intimately connected with the cerebro-spinal centres, and with the ganglionic centres of other parts, as of the lungs, the heart, and the urino-genital organs. Many of the signs of intestinal disease arise from this cause, and they have been dwelt upon by various authors. In the 'Guy's Hospital Reports' of 1856, I have described some dissections and observations on this supply of nerves; they surround the vessels, are distributed with them, and reach every part of the intestine. The sympathy of other organs in abdominal disease is due to this supply. In indigestion, we find cephalalgia, depression of spirits, impaired mental energy, disordered sensations of general or special sense; and all these arise from the connection of the sympathetic and the cerebro-spinal nerves. So again, the throbbing of the vessels, the excited or irregular action of the heart in dyspepsia, proceed from the union of the cardiac ganglia with the solar plexus of nerves. With the lungs, the kidneys, the uterus, we notice similar sympathetic disturbance; and oftentimes, in a most marked manner, the skin is observed in close connection with the internal mucous membrane; this disorder of the alimentary canal induces many forms of cutaneous eruption, as urticaria from partaking of mussels; or the more chronic diseases of psoriasis, eczema, &c. These sympathies may, however, be due to the vascular condition, as well as to the nervous relation, of one structure with another. This relationship of parts, however, sometimes acts in a reverse direction; the alimentary canal is affected secondarily, from disease of other structures; for example, vomiting is a symptom of disease of the brain, of the kidney, and of the uterus. But beside these, there appear to be symptoms of primary disease of the alimentary canal, which are due directly to the sympathetic nerve. 1. A remarkable depression of the pulse, which we often find in these diseases of the

abdomen, when the pulse becomes soft and compressible, and often irregular. 2. A sense of sinking and exhaustion is one of the most marked signs of abdominal disease; and in some cases this exhaustion leads to sudden death, not only in cases when a person may have died from a blow on the epigastrium, but in other instances. I remember the case of a man suffering from aneurism of the descending aorta; he endured very severe pain, and the pulse became much enfeebled; in a few days he died with comparative suddenness. On examination, an aneurism of the aorta was found at the diaphragm; it had led to absorption of the bodies of the vertebræ, but there had been no extravasation of blood into the peritoneum, the cellular tissue, nor into other parts. The aneurismal sac was about four inches in length, and one and a half in height; it had pushed aside the pillars of the diaphragm, which were white and degenerated; the splanchnic nerves were stretched across the sac, and the semi-lunar ganglion was pushed considerably forward and pressed upon. I think we were justified in believing that in this case the depression, and comparatively sudden death, were in great measure due to the pressure on the great sympathetic nerve centre of the abdomen. I have, also, often observed in cases of gastritis from poisons, as arsenic, sulphuric acid, chloride of zinc, oxalic acid, that the pulse becomes remarkably depressed; and sometimes, where we might have been led, from the absence of pain and other symptoms, to have given a favorable prognosis, the patient has suddenly died.

The pneumo-gastric nerve has an important influence on the stomach. This was shown, in a marked degree, by the experiments of Dr. Wilson Philip, who demonstrated the effect of section of the pneumo-gastric nerve on digestion, in checking its progress: section does not, however, completely prevent but only for a time checks the secretion of gastric juice. The irritation of the gastric branches of the pneumo-gastric sometimes leads to symptoms indicative of disturbance of the pulmonary branches of the same nerve: cough may be set up; and it is probable that the converse takes place; the pulmonic branches may cause reflex influence on the stomachic branches, and produce violent vomiting. In the 'Medical Times and Gazette,' there is a very interesting paper

by Mr. J. Hutchinson on the "Dyspepsia of Phthisis;" and many have found in the early stage of phthisis that the power to digest food is impaired, the diminished nutrition tending greatly to promote the formation of low organised products in the lungs.

Not only do the signs of abdominal disease arise from the derangement of the structures of the canal, and from changes in the secretions and contents of the same, but the administration of remedies is guided by similar considerations. Many may be led to the use of means by mere empiricism, but the observations of Chambers, Turnbull, Budd, Handfield Jones, Wilson Fox, Pavy, &c., suggest a more scientific and correct treatment, by directing to the physiological chemistry of digestion or to a more correct pathology.

Remedies may be classified in the following manner :—

1. Those agents which are used to check fermentative and chemical action.

2. Those which remove offending or injurious materials, and excreta.

3. Those which correct or improve the secretions from the mucous membrane, or those poured into the canal.

4. Those which affect the muscular coat, and its movements.

5. Those which alter the state of the circulation and vessels or absorbents.

6. Those which act on the abdominal sympathetic nerve.

7. Those which promote the solution of food and the digestive process.

Dr. Headland has directed attention, in his valuable essay on the action of medicines, to their mode of operation, considering them chemically or mechanically, prior to absorption; then, after entering the blood, as influencing either its constituents or the muscular or nervous structures to which it is supplied; and lastly, in their eliminition from the body. These remarks forcibly apply to the action of agents in the treatment of abdominal disease. It is, however, often lost sight of, that whilst the alimentary canal is the structure by which remedies can be most easily made to enter the blood, and there exert their curative influence, it may be in such a condition from morbid changes, that no absorption can take

place; and the administration of remedies by the stomach may become almost useless, as far as regards their ultimate action after absorption.

1. Agents which are used to check fermentative action or chemical decomposition.

Chemical science has done much, and will do still more, to suggest means of counteracting changes of this character. Dr. Turnbull has dwelt, in his work, on the varied forms of fermentative action, and has shown that some agents possess in this manner considerable power: as carbolic acid, creasote, sulphurous acid and sulphites, charcoal, so also alcohol, &c. We have had much to learn on this subject; and it would well repay the labour of some one well versed in chemical science to extend these researches.

2. As agents for the expulsion of injurious matters, or excreta, we have the whole class of emetics, of laxatives, of purgatives, and the different forms of enemata.

3. Other remedies change the character of the secretions from the mucous membrane, for the mucus in the canal is sometimes of an irritating character, and we may do much to change its state after secretion, at the same time that we use means to prevent such abnormal secretion from taking place: demulcents of the following kind, as milk, arrowroot, gum acacia, linseed, sheath the mucous membrane; whilst lime water, chalk, solution of potash, carbonate of soda, lessen the irritating character of the secretion. At the same time, to diminish inflammatory congestion, other agents are called for, as ipecacuanha, potash, soda, magnesia, and some of their salts, or mercurials, antimony, &c. If the object is to correct secretions arising from an enfeebled or relaxed state of the membrane, we have vegetable and mineral astringents and tonics, mineral acids, &c.; others stimulate to greater secretion, when there is deficiency, as some irritants, ipecacuanha, salt, capsicum, pepper, &c.

4. Among remedies which act on the muscular movements of the intestine, I may enumerate the class of purgatives, magnesia, nux vomica, and strychnia, as increasing peristaltic action; and conium, opium, henbane, as diminishing these intestinal movements.

5. The state of the vessels of the stomach is affected by

remedies which directly act upon the portal circulation; thus, purgatives, mercurials, &c. by unloading the bowels, relieve the tension of the vessels.

6. Those which act on the sympathetic nerve, diminishing its sensibility, are chloroform, hydrocyanic acid, opium, bismuth, oxide and nitrate of silver; those tending to increase its sensibility are steel, quinine, vegetable and mineral tonics, alcohol, &c.

7. Remedies which promote the solution of food are hydrochloric acid, nitro-hydrochloric acid; pepsine and several compounds which contain it are regarded as powerful assistants to digestion.

These remedies are variously combined in the treatment of abdominal disease; and by combination their action is modified, or their efficiency is increased; their presence may thus be better tolerated, and their absorption be facilitated.

The dietetic regimen is one of the most important subjects in diseases of the stomach and intestine; as in other visceral diseases we cannot obtain rest of the affected organ, but we can shield it from unnecessary irritation and fresh excitement.

It will, often, however, be found, that the state of the nervous system modifies the effect of remedies. If a highly sensitive patient, hysterical or hypochondriacal, be led to suppose that a medicine will produce a certain effect, the mind is so directed and influenced, that a powerful action may be produced; or, if a patient firmly believe that a particular medicine or plan of treatment will do him injury, we shall, in all probability, find that the symptoms are described as greatly aggravated thereby, and no argument will remove this persuasion. Thus, in a patient who had suffered from hemiplegia, and was in a nervous condition but who could not be persuaded to discontinue medicine, two table-spoonfuls of spring water were followed by violent purging, and when changed for a pill of bread the same effect was produced; and nothing could induce her to take a second pill. She believed them to be powerfully aperient, and purging took place. Hence a wide field is opened for the charlatan and the quack; while the experienced practitioner often finds, that in many ailments he will in vain

prescribe remedial agents, unless he acquire the confidence of the patient.

The connection of one disease with another is a subject of great importance, and of much interest to the practical physician. We rarely find that a patient has died free from all disease, except the one which has been the immediate cause of death; such a case, is, indeed, exceptional. It may be that an acute inflammation of the lungs has led to fatal results, whilst chronic disease may have been going on in the abdomen, the heart, or the brain, perhaps quite independently, but having an important influence on the curability or non-curability of the acute attack: chronic disease creeps along with unobserved step, till some acute affection proves fatal. This relation of disease is worthy of our consideration, in studying the affections of the alimentary canal; and we may find that the diseased conditions arrange themselves in the following manner:—

1. They take place simultaneously in the same body, without any connection, as mere coincidents.

2. The connection may be that of different manifestations of the same disease in its progressive action, rather than a really different diseased condition.

3. One disease may have important modifying or predisposing influence upon another.

4. Several organs may be affected simultaneously by one exciting cause.

5. One disease may be antagonistic to another; and,

6. Diseases or abnormal conditions are conservative, or preventive from other maladies.

I might enumerate many instances of these associations, in diseases of the nervous system, or of the thoracic viscera, but must content myself with a few illustrations from disease of the abdomen.

1. As instances of coincident disease we may mention the following:—A patient who had been employed in working lead, and was affected with severe colic, was partially relieved; but he suddenly had intense collapse, and died with all the symptoms of perforated intestine. We found, on inspection, that there was in the stomach a large chronic ulcer, and at its base a minute perforation, which had extended into the

peritoneal cavity. A child affected with chorea was relieved by sulphate of zinc, and was about to go home, when it was seized with severe dysentery during the time that cholera prevailed; and the little patient died in three days. In another patient who lately died under my care, affected with phthisis, we found a large hydatid cyst close to the kidney, in addition to advanced degeneration of the lungs. These diseases could not be looked upon as cause and effect, and were correctly regarded as coincidents.

2. As manifestations of the same disease in progressive action, and which ought not to be considered as two but as one disease, we may enumerate the sympathetic vomiting which we find in hydrocephalus, and in diseases of the kidney and uterus; the diarrhœa in albuminuria, which follows an anasarcous condition of the mucous membrane; the constipation in diseased spine; and the extension of strumous disease, one organ or viscus after another becoming affected, as the intestine and the larynx in phthisis. So, again, the severe neuralgic pain in the parietes of the abdomen, simulating colic, but arising from disease of the spine, may be only the early manifestations of the spinal disease, though preceding its more marked indications by several months or years. Numerous instances might be adduced in the progressive symptoms of spinal disease, or of valvular disease of the heart, or of chronic disease of the lungs.

3. One disease predisposes to, or modifies another disease. Thus, in affections of the lungs, of the heart, and of the liver, the circulation through the vena portæ may become exceedingly impeded, and the whole of the mucous membrane engorged and turgid with blood; in this stage, a slight exciting cause will set up distressing flatulence and distension of the abdomen; chronic catarrh of the mucous membrane is produced, or hæmorrhage, or ulceration. A patient in incipient phthisis, with tubercles or slight ulceration in the mucous membrane of the intestine, is exposed to cold and wet, to hardship and miasm, and very severe diarrhœa or dysentery is set up; whilst his friend, who has had no such predisposing cause, escapes, though exposed to the same exciting influence.

The instances which Dr. Budd has deduced, of abscess in

the liver following ulceration of some part of the tract of the canal which supplies the vena portæ, are also illustrations of one diseased state exciting another; here it does not follow as a necessary sequence, or a continuance of the same diseased action, but new morbid changes are produced.

Again: a strumous subject, after recovering from typhoid fever, may become affected with tubercular disease of the intestine. The previous exhaustion has rendered the patient already of feeble power, subject to another disease; and the typhoid ulceration of the intestine is sufficient to excite the manifestation of its action: these are by no means rare occurrences.

A sailor was admitted into Guy's, a few years ago, with Asiatic cholera. He died, and in his colon a large circumscribed ulcer was found, about the size of a crown piece, and covered by a slough, with adherent cherry-stones; the presence of such irritation and inflammation in the colon would render him more amenable to an attack of the disease, although it would not produce it.

A young man fell into the Thames, and afterwards was seized with diarrhœa; he was shortly attacked with typhoid fever, and admitted into Guy's. He quickly died; the dysenteric diarrhœa rendered the fever more severe in its character; and perhaps was the immediate cause of the fatal termination.

4. Two diseases sometimes arise from the same exciting cause, or rather two organs become affected: thus, acute inflammation of the colon sometimes comes on with pneumonia. Of these cases we shall speak more fully in our remarks on dysentery.

5. Diseases are in some instances antagonistic. Cancerous disease and struma appear to be in this relation; or it may be that they are so diverse in their mode of operation that they cannot exist together. We sometimes find in cancerous disease of the abdomen that the mesenteric glands are contracted, and calcareous, as the result of old strumous change; this evidently indicates that one mode of action has given place to another of a different kind; and the same kind of deposit is occasionally found in the lung when cancerous disease has proved fatal.

6. Disease may be conservative in its character. We

have many instances of this in the abdomen. A chronic ulcer of the stomach is oftentimes prevented by adhesions from perforating the peritoneal sac, so that the liver, or the pancreas, forms the base of the ulcer. So, again, in ulceration of the ileum and colon, in disease of the cæcum, and in gall-stone, adhesions prevent extravasation, or limit it after it has taken place. Many instances of this kind might be adduced in which life has been prolonged by these adhesions.

These associations of disease have an important bearing on the correct diagnosis, and still more on the prognosis, of disease; they may oftentimes serve to explain its intractable character, as well as to account for the different effect of remedies under apparently similar circumstances; and the complication of disease should place us on our guard in making close observation of every sign which presents itself to us, and should lead to a strict inquiry into the history of the patient, and the previous ailments to which he may have been subject.

CHAPTER II.

ON DISEASES OF THE TONGUE AND MOUTH.

The unqualified acceptance of the commonly received opinion, that the state of the tongue is a guide to the condition of the digestive organs would lead us into many mistakes; and it is therefore important to know to what extent the appearances of the tongue will serve us in the investigation of abdominal disease. It gives valuable indications, 1st in regard to the general state of the whole system, and 2ndly as to the condition of particular parts or organs. Thus the growth, or the state of nutrition of the body generally may be seen in the condition of the epithelium of the tongue; the furred state of the surface may show a febrile condition of system; and as nutrition as a whole is checked it becomes dry and brown, and even black; or the alterations may be of a merely local character, as from inflammatory disease of the mouth alone, or a partial fur may be due to contact with a carious tooth, or there may be papillary hypertrophy from persistent local irritation.

But the tongue is a complex organ, and its morbid conditions may be connected with alterations in any one of its different structures; it is composed of several muscles and nerves; it receives a large supply of vessels, and has a complex epithelial investment.

In reference to the *muscular* condition of the tongue we may find that *one side of the tongue is wasted* and paralysed, whilst the other side is plump and strong; this state is found in paralysis of the hypoglossal nerves, it was well marked in a patient under my care in Guy's Hospital some years ago; the breast had been removed two years previously for cancer, and disease of the brain subsequently supervened,

there was severe pain at the back of the head, and the side of the tongue was irregularly flaccid and flabby, whilst the other was strong and active. After death a small growth was found directly implicating the origin of the ninth nerve.* Mr. Hilton † has also drawn attention to the effect of disease implicating the second or third divisions of the fifth nerve in producing furring of the side of the tongue.

2nd. One side of the tongue may be weakened as in ordinary hemiplegia; the tongue is protruded to the opposite or weakened side by the increased action of the sound side.

3rd. The tongue is protruded slowly in cases of general weakness and paralysis; or—

4th. The patient may be quite unable to move it from extreme exhaustion. The organ remains at the floor of the mouth in a powerless state.

5th. The opposite condition is found in cases of chorea, the tongue is sharply protruded and as quickly drawn in, as if from spasmodic action, reminding one of the movements of the tongue of the frog, or of the chameleon.

6th. The tongue is sometimes pale and flabby, and indented with the markings of the teeth, indicating its want of tone and muscular contractility; or we find it small and contracted, and the tip almost drawn to a point, as in irritability of the nervous system.

In reference to the *vascular* condition, the tongue is pale in states of anæmia, but, on the contrary, in hyperæmia it is red and injected, a state which may be especially noticed at the tip and edges; it is this condition which is found in irritable states of the intestinal tract, and in enteric fever. The red and distinct appearance of the papillæ of the tongue, as observed in states of angina and scarlet fever, indicate active hyperæmia; whilst, in diseases of the lungs and heart producing obstruction of the circulation and imperfect aëration of the blood, the venous condition of the tongue induces a passive hyperæmia or lividity.

* An interesting case of this kind is published by Sir James Paget in the 'Clin. Soc. Trans.,' vol. iii, p. 238. A man, æt. 27, injured the back of his head, and part of the foramen magnum became necrosed, and coincidently half of the tongue wasted. Recovery ensued on the removal of the bone.

† 'Rest and Pain,' p. 194 *et seq.*

The *epithelium* of the tongue undergoes constant change of waste and repair; its growth may be checked as that of other cellular structures, and it may be reproduced with great rapidity; it may be scarcely developed at all, or when produced, degenerative changes may quickly ensue. To these various changes in the epithelial coat are due the different kinds of fur, and a furred tongue is generally caused by the excessive formation of the epithelial coat, and the consequent degeneration of the redundant cells. But although an overgrown epithelium is the common anatomical basis of a furred tongue, there may be considerable difference in the characteristics of colour and thickness, association with papillary enlargement, growth of fungus, &c., serving to distinguish various states of systemic and abdominal disease.

With regard to the causes of the changes of colour noticed on the tongue, but little is known beyond the fact that a brown or yellow colour is in great part caused by decomposition of epithelial growth or of food, saliva, mucus, &c., in the mouth, and therefore may be independent of any derangement of the viscera.*

The *white* tongue of the febrile state, and the white creamy fur of acute rheumatism, depend probably upon some alterations of the secretions acting upon the epithelial coat. Allied to these is the so-called strawberry tongue of scarlet fever differing only in the additional enlargement of the fungiform papillæ and their projection from the surface. This state has been said to be only part of a general disease of stomach although always present in scarlet fever.†

Brownness of the tongue is found in states of exhaustion and is sometimes denominated the "Typhoid" tongue; the fallacy of brown discoloration, from coffee, tobacco, or liquorice &c., must always be borne in mind. The *black*

* Wilson Fox states that a large proportion of the coloured furs are produced by slight hæmorrhages from the gums.—'Dis. of Stomach,' p. 19.

† Fenwick, "On the Condition of the Stomach and Intestines in Scarlatina," 'Med.-Chir. Trans.,' vol. xlvii, p. 210. In this paper Dr. Fenwick attempts to show that inflammation of the œsophagus, the stomach, and the intestine usually accompanies scarlatina; that desquamation of the epithelium of these parts takes place; that, notwithstanding the anatomical changes in the stomach, the formation of pepsine is not prevented; and that in this disorder the condition of the mucous membrane is similar to that of the skin.

tongue arises from a more complete state of exhaustion, and still further degeneration; with it sordes are observed on the gums and teeth, the surface becomes irregular and fissured. The later stages of severe fever present us with this change.

We sometimes find *deficient* epithelial growth; there is then a scanty fur, and this is often associated with injection of the substance of the tongue; there is weakness, with irritation of the mucous membrane. In this state a "patchy" condition is often observed, and when there is still further loss of power, with irritation, a red beef-like tongue, which may assume a glazed appearance, is found, as in the later stages of abdominal disease, and of phthisis, &c., sometimes with aphthous secretion and with ulceration. The tongue becomes sore, mastication is difficult, and deglutition painful. In the condition that we shall presently have to notice as chronic inflammation of the tongue, there is a red and glossy appearance; the whole of the mucous membrane appears raw and sore and oozing, as if there were an eczematous state of the surface.

The *irregular growth* of the papillæ of the tongue leads to warty conditions which may be harmless, or the precursors of malignant disease. The irritation of a decayed and roughened tooth, when long continued, may give rise to excessive sprouting of the papillary structures, and present appearances with difficulty distinguished from cancerous disease. The morbid growth of epithelium, when more general, gives rise to an appearance which has been called "ichthyosis of the tongue." This condition is found not only on the tongue, but also on the inner surface of the lips and cheeks; it consists of milk-white patches, which have a tough appearance, and sometimes are not at all unlike white leather. It is said to be invariably followed by cancer, though opinions differ as to its curability in its earlier stages. All, however, are agreed as to its exceeding intractability, and for this reason it is of interest to the physician, for he will probably detect the disease in its earlier stages and when it is more likely to be amenable to treatment. It was first recorded by Hulke in 1864, and again accurately described by Bazin in 1868, who

called it buccal psoriasis.* It was considered by him as a squamous affection of the buccal mucous membrane allied to arthritic psoriasis;† and he states that, although very intractable, an alkaline treatment, local and general, has produced some cures. It is not unfrequently associated with syphilis, though it is not benefited by anti-syphilitic remedies.

Stomatitis, or inflammation of the mucous membrane of the mouth, is often present in young children, especially during weaning. The gums become red, the mouth is hot, the tongue swollen and furred, with whitish covering and with red papillæ observable through it. There is a general febrile state; the child becomes fretful, and its sleep is disturbed. Other portions of the mucous membrane may be affected at the same time and symptoms of diarrhœa may come on, or severe irritation of the stomach, so that food is at once vomited or the bowels acted on as soon as food is taken. This state quickly leads to exhaustion and rapid emaciation; and, unless it is checked, a fatal result may soon follow. It may be produced by cold, by improper food, by inattention to proper hygienic measures, by impure air. We shall have again to refer to this condition in speaking of inflammation of the stomach.

As to the treatment of stomatitis, pure air and proper diet are essential; milk with lime water or asses' milk may be tried, and, if absolutely necessary, a wet nurse procured. Much relief may, however, be afforded by medicine; chlorate of potash should be given internally, and it may be used as a wash to the mouth; or borax with honey may be employed, and if the bowels are confined, a teaspoonful of castor oil, or small quantity of citrate of magnesia, or of rhubarb and carbonate of soda, may be given.

This form of disease is, however, not confined to children, for in adults we find that the mucous membrane of the whole mouth becomes inflamed, extending backwards to the tonsils and fauces, and implicating the tongue. A person may be

* For a very good account of this disease see a thesis by M. le Dr. Debove, Paris, 1873; also Fairlie Clarke, 'Med.-Chir. Trans.,' 1874; H. Morris, 'Brit. Med. Journal,' 1874.

† Sir James Paget also considers this to be connected with gout. "See Lectures on the Surgical Aspect of Gout," 'Brit. Med. Journal,' vol. i, 1875, p. 737.

exposed to cold or wet or to a fog, and be seized with soreness of the mouth and throat, the mucous membrane becomes red and swollen, the tongue is enlarged, and sometimes is so much swollen that it is protruded beyond the teeth, the throat is reddened, and swallowing is difficult. The patient becomes very feverish, the temperature is raised, and there is general distress. This is not a specific or contagious form of malady, but appears to be due to shock from cold; sometimes the whole mouth, at other times only the posterior fauces and the tonsils are affected, and we then have acute tonsillitis, or a condition which is with difficulty distinguished from true and contagious diphtheria. Acute stomatitis, extremely severe in its onset, subsides after a few days, with very little treatment beyond warmth and bland nutritious diet; it is well to act gently on the bowels and to administer saline medicine, such as the citrate of potash and acetate of ammonia; and, if the circulation is depressed and the pulse compressible, then wine and alcoholic stimulants are called for.

In *stomatitis* the follicles are sometimes especially affected, small vesicles are observed, round, transparent, and elevated, and when broken, leave an irregular grey surface, resembling a small ulcer; this condition is spoken of as follicular stomatitis; * the mouth is painful and mastication interfered with. These vesicles occur on the tongue, on its sides, its frænum, on the lips, &c. The constitutional symptoms may be very slight, but there is generally interference with digestion, and the condition is ascribed to that cause. Whether this be the case or not, it is generally associated with faulty nutrition, and may occur after any of the eruptive fevers. In the treatment it is well to act gently on the bowels by saline aperients as carbonate of magnesia, dilute acid with sulphate of magnesia, rhubarb with magnesia, &c. Salines

* Aphthæ are considered by some as vesicules; but according to Bohn, quoted by Niemeyer, no fluid can at any time be obtained from them, and they are rather croupous exudations on the surface of the mucous membrane, and the disease is therefore called croupous stomatitis (Niemeyer, vol. i, p. 421). Rindfleisch, however ('Path. Histology,' vol. i, § 354, Syd. Soc.), describes a vesicular condition due to serous exudation in a membrane covered by scaly epithelium. These vesicles subsequently rupture, and a small sore is formed. Thus the aphthous state may be considered as the later stage of the vesicular.

may also be advantageously given with bark; a chlorate of potash gargle should be used, and care be paid to the diet, so as to avoid food that is likely to ferment, such as sugar, acescent fruits, &c. The application of caustic, as nitrate of silver, is often recommended; it relieves pain at the site of the ruptured vesicles, but there is often an increase in the abraded surface, and greater subsequent pain. If there be impaired general health, it is very desirable that a change of air to a warm locality be tried.

The *Thrush* or Muguet is a peculiar form of disease of the mouth occurring in some states of exhaustion and of chronic disease. It consists in a white or pultaceous secretion, which is found either in patches or is generally diffused upon the mucous membrane of the tongue, the mouth and the pharynx; the mucous membrane is red, and there is tenderness of the surface and some pain on movement; the deep redness of the mucous membrane is hidden by the thick white or aphthous covering; sometimes vesicles are present, and the glands are enlarged, and the papillæ congested; there is distress and febrile disturbance. The white patches increase in size and are renewed after removal. This aphthous condition occurs in young children and also in adults in exhausted states of the system, as in the last stages of phthisis; it is often looked upon as an indication of the approach of a fatal termination. It is a disease which is said to have its seat only on mucous surfaces which are covered by pavement epithelium,* thus affecting only the mouth, fauces and œsophagus, but it is frequently associated in the severer cases with well-marked evidence of general derangement of the intestinal tract and it is common to have vomiting and purging with it. It is also in children very commonly followed by an erythematous or eczematous state of the buttocks and genitals.† Mastication is difficult, and in the infant suction is painful. If the white deposit be examined by the microscope it is found to consist of mucous cells, spherical cells, epithelium, and sometimes the torula of the oidium albicans. The torula is not always present, and

* Trousseau, 'Clinical Medicine,' Syd. Soc., vol. ii, p. 619.

† Valleix, 'Clinique des Maladies des Enfants nouveau-nés.' Paris, 1838, chapitre 3me.

it is, on the other hand, sometimes found when the condition of the mouth is only part of a general state.

In the treatment of the disease, it is most important to improve the general health and sustain the strength ; the mucous membrane of the mouth should be cleansed by a dilute solution of the permanganate of potash, or of borax, or of chlorate of potash ; the sulphite or hyposulphite of soda may be employed, ʒj to ℥j of water, or astringent gargles of alum, catechu or oakbark.

In *Ulcerated Stomatitis* * we have a more severe affection, which, unless it be produced by mercurial salivation, is especially seen in young children of from four to ten years of age. The gums become red and swollen, and then ulcerate ; they quickly assume a grey and sloughy appearance and the alveolar processes are exposed ; they readily bleed, and the ulceration extends from the gums to the cheeks. The teeth become loosened and are lost ; the submaxillary glands are enlarged. The child, for the disease is more especially observed in early life, is seen to be pale and cachectic, the mouth is hot, and there is a general febrile state ; but, even severe forms of ulcerative stomatitis are not usually associated with any marked constitutional disturbance ; children do not appear to be suffering severely, and the pain during mastication, with swelling of the cheek and with fetor and hæmorrhage, are the prominent symptoms. The cause of this severe disease may generally be traced to poor and improper diet and to an impure atmosphere; sometimes it is attributed to mercurial medicine, but it may occur quite independently of any such exciting cause ; it is more likely to occur after exanthems, such as measles or scarlet fever, and it is a wise precaution never to administer mercurial medicine to young children during the course of or the convalescence from these diseases. In the treatment nourishing diet and a pure air are most important ; stimulants are advisable, if there be much prostration of strength. Chlorate of potash should be

* The disease termed pseudomembranous stomatitis appears to correspond in part to this form and in part to that known as follicular stomatitis. Ulcerative stomatitis is also called diphtheritic stomatitis and cancrum oris by Niemeyer and other German authors; but since both terms are otherwise interpreted by English readers it appears unadvisable to accept the altered nomenclature.

used as a wash and also given internally, borax dissolved in glycerine may be applied, or a solution of carbolic acid, or of permanganate of potash, and cinchona bark or quinine should be administered. If the ulceration assume a phagedænic form and spread rapidly, it is well to apply a strong solution of nitric acid to the part.

In this absence of constitutional symptoms and also of rapid extension, ulcerative stomatitis differs from cancrum oris, which we have presently to notice; as far as the ulceration itself is concerned nothing could have a more unhealthy aspect than the diseased surface, though it is devoid of the livid redness, the angry tumefaction and the ashy slough of the latter disease. The one, however, is a purely local disease, the other is attended by the severest constitutional symptoms. The two diseases bear a close analogy with other so-called sporadic and epidemic affections, with fatal and non-fatal influenza or cholera. They thus have more than their own share of interest, and have a bearing upon one of the vexed pathological questions of the day, viz. the relation of cryptogamic organisms to the origin and extension of local inflammations and the causation of febrile conditions. The more simple form of the disease has many points in favour of origination in some local cause, such as fungus growth,* while the more malignant type is also closely similar in its onset, progress and result to severe septicæmic conditions, which are thought by many to be associated with the development of vegetable organisms in the blood and tissues. No positive evidence, however, can be adduced from cases of ulcerative stomatitis, for no adequate examination of the tissue bordering on the ulcerated part can be made, and the mere scrapings from the sore, though often containing fungus-spores, are of no value because similar results may be obtained from the mouth of any healthy person.

* A disease which seems to consist in a derangement of the alimentary canal, accompanied by fever and the presence of vesicles on the mucous membrane of the tongue and mouth, which rupture and leave superficial ulcerations, appears to have been sometimes produced by the consumption of the milk of cows suffering from the foot-and-mouth disease.—'Rep. Med. Officer of the Privy Council,' 1869, Dr. Thorne.

In many patients suffering from early phthisis the edges of the gums become red and slightly swollen; this was noticed some years ago by Dr. Th. Thompson, and we find a similar but more spongy condition in those who for many weeks are fed upon a diet destitute of fruit or of vegetables. In the treatment of irritable conditions of the stomach and other forms of disease the necessity of some vegetable diet is often lost sight of, and the general health of the patient suffers in consequence. This state is, in fact, the incipient stage of the spongy and granulating gums seen in true scurvy, a state which often leads to hæmorrhage, and is one of very great diagnostic value; similar hæmorrhage * occurs in the less severe condition of spongy gums from mal-nutrition. The hæmorrhage in purpura hæmorrhagica is of an essentially different character. Whilst referring to the state of the gums we may mention a change which is due to alteration in the gum, a deposit in it, namely, the lead line in chronic poisoning by that metal;† it is a granular deposit in the gum of the sulphite of lead, from the decomposition of the lead absorbed into the system by the sulphuretted hydrogen from decomposing food. The black pigmental patches observed on the lips, gums, and tongue in Addison's disease are, on the contrary, a more diffused pigmental change in the substance of the mucous membrane. They are, however, sometimes present without any disease of the supra-renal capsules.‡

Mercurial stomatitis hardly needs a separate description; it is an ulcerative form of disease attended by profuse salivation. Regarded merely as an ulcerative disease of the mouth it is best treated by the remedies applicable to simple cases, and chlorate of potash is all that is requisite, both given internally and used as a gargle. For profuse salivation, however, belladonna has recently been recommended. Heidenhain§, in some experiments on the influence of belladonna on the salivary gland, has found that the fibres of the chorda tympani which act upon the secreting gland-cells

* "Hæmorrhagic Sudamina," described by Pye-Smith, 'Virchow's Archiv,' vol. i, p. 452.

† Dr. Hilton Fagge, in 'Med.-Chir. Trans.,' 1876, vol. lix, p. 327.

‡ 'Path. Trans.,' 1873, p. 94.

§ 'Pflüger's Archiv,' vol. xl; also Lauder Brunton, 'Lond. Med. Rev.,' i, 17.

are paralysed by its administration, and this has subsequently been corroborated in actual practice.* Carbolic acid lotion will also be found to be of service in checking ulcerative action. Gentle magnesian purgatives should be given to remove the mercurial from the intestinal tract, and the health should be invigorated by a nourishing diet and by fresh air.

Still more severe is *gangrenous stomatitis*, or *cancrum oris;* it is one of the most terrible forms of disease ever observed in young children. It occurs more especially between the ages of two and five; the little patient, thin, weak, and cachectic, has some swelling of the gums and mouth; on examination one cheek is found to be especially affected, there is a hard and diffused swelling, and on the inner side a dark ashy spot is recognisable; this is a minute slough, and rapidly spreads in depth and in extent; it reaches to the external surface, and the cheek becomes perforated. As the sloughing spreads the cheek is more and more destroyed, and the whole cavity of the mouth is laid open; a miserable condition is thus presented, the alveoli are laid bare and seen from without, and a ghastly spectacle is witnessed; with this destruction of parts there is offensive smell and breath, there is much constitutional exhaustion, and fatal bronchitis or pneumonia supervenes. Such patients are also liable to die from pyæmia, since there is a great risk in all diffuse inflammations about the face of plugging of the facial vein (thrombosis), and secondary infection of the lungs. The part appears to die from the commencement. Unless the disease be very speedily arrested the most disastrous results follow either in the destruction of the face or in the death of the patient. The best plan of treatment is to destroy the slough by strong nitric acid, and to apply carbolic acid lotion; to use a stimulating and nourishing diet, port wine or brandy, milk, eggs, and strong soup; and as to medicine, bark or quinine with dilute hydrochloric acid and chlorate of potash are the best remedies to employ.

We have thus several forms of inflammation of the mouth of different degrees of severity, simple inflammation, or in-

* Ebstein, 'Berliner Klinische Wochenschift,' 1873.

flammation with severe and phagedænic ulceration, or lastly of a gangrenous character.

Inflammation of the *tongue* or *glossitis* is also a disease which varies greatly in severity; sometimes it is only an accompaniment of general stomatitis, or of catarrhal inflammation, and the tongue is but slightly swollen and injected, but at other times the whole substance is involved. It is œdematous and so much swollen that it protrudes beyond the teeth, and cannot even be retained between the lips; there is profuse secretion of saliva, the respiration is obstructed, and death may take place from apnœa. There is febrile disturbance, the pulse is compressible and dicrotic; the patient is scarcely able to swallow, and there is dyspnœa with inability to lie down or to sleep from the interference with free respiration; under these circumstances the mind becomes depressed, and the patient forbodes a disastrous termination.* Acute glossitis has been known to occur in association with granular kidneys. A man was admitted into Guy's Hospital under Mr. Birkett's care in 1863 for glossitis; the tongue filling up, and protruding from the mouth. There was no apparent danger of suffocation, but the symptoms increased during the night and he was found dead in the morning. The post mortem showed cystic and granular kidneys, much swelling of the tongue, and œdema also of the palate. This state of acute glossitis may also be caused by irritant poisons, such as mercury, the dust of ipecacuanha, of croton oil seeds, or it may be produced by catarrh and the exposure to fog and damp. A case of this kind was admitted under my care at Guy's Hospital. A young man after exposure to cold was seized with symptoms of catarrh and inflammation of the mouth; the tongue became swollen, there was profuse secretion of saliva, and the respiration was interfered with; the tongue never, however, became inordinately enlarged, and although for two or three

* A case of *sub*glossitis is described by Mr. Holthouse in the 'Clinical Society's Trans.,' vol. ii, p. 140, which appears to be a less severe state than that here described as acute glossitis. A man of 31 was suddenly attacked by swelling of the tongue, which formed a hard, solid lump, filling up the posterior part of the mouth from floor to roof. He had much salivation and difficult deglutition, but no dyspnœa. It appeared to be a solid œdema of the subglossal region. It lasted four days, and appeared to be relieved by quinine, but not by incision.

days the patient was unable to sleep, the disease soon subsided without any untoward symptom. This might be regarded as catarrhal glossitis.

In another case more recently, a youth about sixteen years of age was admitted under my care with acute inflammation of the tongue; there was much swelling, and an incision was ordered to be made; the distress increased, and again an incision was made on the other side; a third time a deeper incision opened a large abscess near the base of the tongue and extending towards the left tonsil. The abscess was washed out with Condy's fluid, and there was speedy relief to the severe distress, but several days were required for the closure of the abscess. The patient left the hospital well.

Glossitis, although at first severe and distressing to the patient, generally subsides in mild cases after a few days, and the tongue regains its normal suppleness; in other cases suppuration follows and an abscess is formed, or chronic thickening of the organ may supervene.

In the treatment of this disease ice may be applied to the tongue; it is refreshing to the patient and relieves the hyperæmia of the parts. Saline medicines may be administered, such as the nitrate and citrate of potash; the bowels should be freely acted on, and if medicine cannot be swallowed a castor oil or colocynth enema should be used. If, however, the swelling of the tongue increase to such an extent as to interfere with respiration, free incisions should be made in the organ, and, if necessary, even tracheotomy should be performed.

Chronic inflammation of the tongue is a very troublesome form of disease. I have especially seen it in women advanced in life; in many cases the age is between sixty and seventy. There is general feebleness, but the especial complaint is of the tongue, which is swollen and red, some parts being of a more deep colour than others; the movements of the tongue and deglutition are painful, and there is increase in the quantity of the saliva; the health is not otherwise much disturbed. In some instances the mucous membrane of the nose is affected, and some have traced the disease in the mouth to irritation commencing in the nose. Diseases of the teeth or

jaws may set up the mischief in the mouth, and the composition of the setting of false teeth may be a source of irritation. An interesting paper on this subject appeared in the 'Medical Press and Circular'* by the late Dr. Woodman.

The appearance of the tongue in these cases suggests the idea of a local form of inflammation resembling eczema of the skin. In the treatment it is most important to remove every source of irritation, but treatment is very unsatisfactory. Demulcents should be used, such as mucilaginous drinks, with borax and chlorate of potash; tonics should be given, such as quinine and steel, and they are best administered as pills; but all these remedies are often quite unavailing, and we find only very slight relief is afforded. The most soothing combination for local application I have found consists of small doses of carbonate of soda with hydrocyanic acid in the emulsion of sweet almonds. I have often thought of administering small doses of arsenious acid, with the idea of the eczematous character of the disease. Hypertrophy of the papillæ of the tongue is often found to be produced by some prolonged local irritation, as a roughened tooth, &c., and the appearance may be a general or a local one; in the latter case, if warty in character, it is sometimes with great difficulty distinguished from epithelioma. The symptoms are pain during mastication and deglutition, and in some cases, to use a patient's expression, "an aching of the tongue itself." There is, however, no glandular enlargement, the disease persists for a long period without spreading, and there is less tendency to degenerative or ulcerative change.

Another very important condition requiring a short separate consideration is the ulcerated state of the tongue found in phthisis. I am not now alluding to the merely aphthous state observed in its later stages, but to a condition which may be present even before the disease in the lung is of sufficient advancement to enable it to be detected by the stethoscope. Two cases of this kind have lately been under my colleagues Mr. Forster and Mr. Bryant at Guy's Hospital. In the one, a woman, there was sufficient chest complication to make the diagnosis easy, though she only applied for treatment on account of her tongue; there was no evidence of syphilitic

* 'Medical Press and Circular,' December 9, 1874.

poison. The other, a man, æt. 50, had a swollen and ulcerated tongue, in one or two places it was deeply excavated, in others fissured, in other parts superficially ulcerated and coated with lymph. The whole organ thus presented a swollen and livid red appearance, dotted over with yellow lymph spots quite characteristic of the disease and suggesting phthisis. The chest was examined carefully to corroborate the diagnosis, and with the result of only finding some dulness and doubtful tubular breathing at one apex, indicative of old disease, and it seemed as if in this instance the features of the disease had failed for a diagnosis. The patient, however, died in less than a month with extensively distributed and recent disease of the lungs.*

With regard to syphilitic affections the simple forms of ulceration frequently come before the physician generally as an irregular form of ulceration, serpiginous and superficial, on the tongue, tonsils, and fauces. Occasionally we meet with mucous patches and gummata, which may be mistaken for abscesses or subacute glossitis. In children, also, the subjects of congenital syphilis, an intractable form of ulceration of the tonsil is occasionally found. It would be difficult to single out any special characteristic as attaching to a syphilitic ulcer on the tongue or fauces. As on the skin it has a tendency to great irregularity of border, such as is seen in few other instances of ulceration, and this, with other syphilitic traces elsewhere, which will in most cases be present, must suffice for the diagnosis. The fibroid growth in the tongue in syphilis is generally easy of recognition, and also the irregularly puckered and white condition of the surface due to a similar disease. As to other diseases, Fairlie Clarke† mentions neuralgia of the tongue as occurring occasionally and being exceedingly painful. As a rule this affection generally affects only one side, and is due to teeth irritation or some gastric disturbance. Faradisation, and even excision of portions of the nerve, have been recommended for its relief.

* A somewhat similar case is reported by M. Trelat in the 'Archives Générales de Méd.,' January, 1870.

† 'Diseases of the Tongue.'

Spasm of the tongue is also described by Romberg.* It is said to be associated with hysteria, neuralgia, and meningitis.

Lastly, Paget† has described a condition of ringworm of the tongue, a state due to the growth of a fungus in curved undulating lines on the dorsum, and shortly described by Dr. Fairlie Clarke. M. Maurice Raynaud‡ has also described patches on the tongue in character exactly resembling those of tinea tonsurans.

It is not necessary for me to enter upon the consideration of such diseases as congenital hypertrophy, hydatid diseases, hypertrophy of one or more of the component tissues of the tongue, of fibroid growths, or of cancer; these are all strictly surgical, and are beyond the limits of this work.

Inflammation of the parotid gland; parotitis; cynanche parotidea.—The parotid is the largest of the salivary glands, and consists, not only of glandular structure, but of loose binding tissues. 1st. The disease occurs as a simple inflammation; 2ndly, as disease of a specific form, the mumps; and 3rdly, as a complication of typhus and sometimes of other fevers.§ The symptoms which usher in this disease are febrile disturbance, a sensation of stiffness about the lower jaw, quickly followed by pain, especially during movement, and swelling; the pain extends, not only along the jaw, but into the ear and over the head; the swelling is generally limited to one side, but sometimes both glands are affected at the same time; the skin is tense, and there is an inflammatory blush.

* 'Diseases of the Nervous System,' Syd. Soc. Trans.

† It is thus given in Sir James's own words:—"This patient, a healthy gentleman, had observed the disease more than a year. On his tongue there was a bare purplish-pink patch over nearly half the right side. This patch was all bare, *i.e.* it had a very thin cuticle and no fur; but it was intersected by two curved lines, and at its posterior boundary was a white ring. The curved lines were undulating, map-like, looking as formed of low banks of heaped-up cuticle." Fairlie Clarke, 'Diseases of the Tongue,' p. 88.

‡ 'Archiv. Générales de Médecine,' 1872.

§ Virchow distinguishes two kinds of parotitis—idiopathic and symptomatic. The former being what is popularly termed "mumps," only occasionally leads to *abscess*, but not infrequently it shows a disposition to metastasis. The symptomatic form results from severe disease, as typhus, &c. He regards both as a catarrh in which the gland-cells take part in the diseased process.

The submaxillary and lingual glands may be also involved. The febrile symptoms continue for three or four days, and then gradually subside. In rare cases suppuration takes place in the cellular tissue of the gland; but this result is less frequent in simple parotitis than in cases where the throat has been affected and suppuration has extended in the course of the Eustachian tube, or has burrowed amongst the muscles of the back of the neck.

Specific inflammation of the parotid or mumps is a contagious form of disease, and is generally observed in children. The symptoms are at first severe, and there is considerable constitutional disturbance; the mammary gland in girls, or the testicle in males, occasionally becomes sympathetically affected, and there is pain and swelling in them; in other cases the nervous system becomes implicated in a marked manner, and restlessness, insomnia, or even maniacal symptoms are produced. Again, the general mucous membrane of the digestive tract may also be inflamed, and gastro-enteritic symptoms result.

As a complication of typhus fever the enlargement of the parotid gland is an unfavorable indication, and is sometimes associated with sallowness or duskiness of the countenance; this condition of the parotid occurs in the second week of typhus.

With the exception of the last class of cases the prognosis of inflammation of the parotid of a simple character is always favorable. The diagnosis is only difficult when deep-seated mischief about the pharynx or Eustachian tube has taken place, and when the tissues about the gland are only secondarily affected; so also when disease has extended from the mastoid cells or from the teeth.

The treatment consists in the application of warmth, in the use of gentle saline aperients, effervescing draughts, and unstimulating diet. Time is required, for the disease in most cases runs a definite course, and cannot be obliterated by medical treatment. Convalescence may, however, be promoted by the use of tonics, such as quinine and steel. If there be excitement of the nervous system then bromide of potassium, with chloral hydrate if there be sleeplessness, will be of service.

The *tonsils* are the next structures that we have to notice;

they are situated between the anterior and posterior pillars of the fauces and immediately beneath the soft palate, and they become affected by various morbid processes.

The tonsil is composed of several tissues, each of which must be taken into consideration when speaking of the diseases attaching to it. Externally, *i.e.* on its pharyngeal aspect, it is a rounded projection which is covered over by scaly epithelium and has many depressions on its surface into which this scaly lining passes. Thus its surface is studded with small pouches or follicles. Enclosed in this external membrane are numerous lymphatic follicles arranged in groups and with fibrous trabeculæ, blood-vessels and lymphatics running between them. These various parts are not at all equally affected in tonsillar disease; in one there is affection of the epithelial surface, in another of the whole substance, and lastly the interstitial stroma is involved. In each form, however, all the component structures of the glands participate, although the structural change is predominant in one.

They may be classified in the following manner:

Catarrhal inflammations { Acute. / Chronic.

Parenchymatous „ { Acute = Quinsy. / Chronic = Hypertrophy.

1. *Acute catarrhal inflammations* are characterised by general swelling of the mucous membrane with injection and excess of mucus, sometimes of glairy, sometimes of an inspissated character.

To this group belongs *acute œdema*, generally an extension of disease from the soft palate or the mouth.

Erysipelatous inflammation, acute catarrh, diphtheria.

2. *Chronic catarrhal inflammations*, attended by more or less thickening of the mucous surface, although not of the whole gland, and by plugging of the glandular crypts with effete epithelial products.

3. *Acute parenchymatous inflammation*, where the whole substance of the gland is swollen and may rapidly suppurate —Quinsy.

4. *Chronic parenchymatous inflammation* is a disease which is said to be productive of true hypertrophy of the gland, but it

is more especially dependent upon fibrinous overgrowth of the interglandular trabeculæ, with enlargement of the vessels.* The whole gland is enlarged and more solid than normal. This state is commonly known as chronic enlargement of the tonsil.

In addition to these more common forms of disease the tonsils are not uncommonly subject to ulceration similar to that seen in other parts of the mouth in ulcerative and syphilitic stomatitis, and they are occasionally the seat of severe forms of ulceration and sloughing, which are sometimes called phlegmonous inflammations, sometimes diphtheritic, but which would appear to occur under a variety of morbid states. This state is sometimes seen in severe forms of pneumonia, in typhoid fever, in dysentery; and it is of especial interest to note that these severe affections of the fauces are to be found more especially in association with sloughy or phlegmonous states of intestine.† Besides these we also find strumous, syphilitic and cancerous diseases.

(1) In *acute catarrh* the tonsils and the mucous membrane become œdematous and congested; the colour of the mucous membrane is changed, it is reddened and the line of demarcation is sometimes as defined as with erysipelas affecting the skin, the swelling may be so great that the soft palate and the uvula are twice their natural size, and the parts almost come in contact the one with the other; in erysipelatous inflammation the œdema is very marked and the colour is dusky; if, however, the œdema is passive and chronic the colour is less dark. The extent of the elongation of the uvula and its shape are very different in the cases of passive œdema; sometimes the extremity of the uvula is rounded and swollen, at other times elongated, pointed, and a quarter to half an inch beyond its proper proportions. It will then reach the tongue or the posterior

* "Microscopic Examination of an Enlarged Tonsil," 'Path. Soc. Trans.,' vol. xix, p. 211, showing it to be a true hypertrophy; the Malpighian corpuscles were closely packed, with very little stroma. Mr. W. J. Smith.

† In reference to cases of this kind *vide* 'Path. Soc. Trans.,' vol. xxvi, p. 84, "Acute Enteritis," by Dr. Goodhart; vol. xix, p. 217, "Sloughing of Tonsils," by Dr. J. Osier Ward; vol. xi, p. 106, "Calculus from Tonsil," by Dr. Silt, for Dr. Baker.

portion of the pharynx and produce violent dry retching or cough.

Sometimes in acute inflammation of the tonsil the secretion is altered and thin white patches are observed on the gland, resembling diphtheritic exudation, or there is a raised portion of the mucous membrane, whitish in colour, which leaves a raised irregular edge and is often mistaken for an ulcer; this condition is an acute one, and subsides after three or four days, but it is not true diphtheria. (2.) If the disease be less acute, the secretion is altered and a white secretion appears in the crypts of the gland, as if the extremities of the follicular ducts were distended; this condition also is often mistaken for one of ulceration. With this follicular inflammation of the tonsil the mucous membrane of the pharynx is also affected; it becomes congested, the surface appears irregular and granular, the veins are enlarged and sometimes lead to hæmorrhage. It is this condition that is sometimes called clergyman's sore throat, and it is a state of chronic congestion with follicular inflammation. When the glands behind the pharynx become enlarged, they may push forward the mucous membrane on one or other side, so that the canal appears narrowed and one-sided. (3.) If the whole gland is inflamed and the parenchyma affected—acute tonsillitis—there is general swelling of the gland; the anterior fauces are greatly narrowed, and the tonsils nearly meet. If suppuration ensue, the swelling is till greater; there is softening of the part, and fluctuation can be felt, unless the affection be confined to the posterior region; as the acute disease subsides it often leaves chronic enlargement of the gland (4), which is increased by each subsequent attack, especially in weakly and strumous children.

The symptoms produced will vary according to the severity of the attack; in *simple œdema*, the febrile disturbance is often severe, the temperature may suddenly become high, from 103° to 105°, there is much irritation, dysphagia, pain towards the ear on swallowing, the tongue is furred and generally the whole mucous membrane of the mouth is affected. If the uvula be elongated, then there is dry cough and vomiting, and these symptoms are often especially observable

in the morning; patients are sometimes supposed to have severe bronchitis, whereas the mischief is simply in the throat.

In *erysipelatous* inflammation, in which there is duskiness with œdema, there is great prostration with the febrile symptoms and more distress, the attack comes on suddenly, and if it extend to the epiglottis and glosso-epiglottidean folds of mucous membrane these parts become œdematous and dyspnœa of a dangerous character is produced. In *follicular* inflammation the symptoms are more chronic; there is hoarseness, cough, and much distress, but without febrile symptoms. In *acute* inflammation of the tonsils, there is also much febrile disturbance, with pain and distress, deglutition is difficult and very painful, and food is sometimes rejected by the nares, or the patient is unable even to swallow saliva; he cannot sleep, for the disease in the throat interferes with respiration; the tongue is much furred, it is swollen, and in fact the whole mucous membrane of the mouth is involved; the breath becomes offensive, and the gums covered with concretion; this condition may gradually subside, or with increasing distress rigor comes on, and after a longer or shorter interval the pus which has formed finds a free vent and there is sudden relief to the urgent symptoms; in some cases a fatal termination suddenly supervenes from suffocation or from exhaustion; suppuration, however, in some cases reaches to the loose cellular tissue external to the tonsil, and it may burrow among the muscles of the neck; ulceration also ensues, and there is then an excavation on the surface of the tonsil sometimes extending into its substance.

In *syphilitic* and in *strumous* subjects this ulceration has a peculiar and characteristic appearance, in the former having a somewhat circular margin, serpiginous in outline, in the latter with irregularly raised edges and extending in both cases to the soft palate, leading to its destruction and often to perforation. In syphilitic ulceration of the tonsil the disease sometimes extends to the soft palate, and a circular red line of inflammation may be seen across the soft palate after ulceration has ceased, the disease spreading in the same manner as psoriasis of the skin.

In *chronic hypertrophy* of the tonsil the glands present an irregular and pitted appearance; the enlarged glands, when increased by a sudden accession of acute disease, almost meet, and all the symptoms of the acute disease may be produced. Very slight causes suffice to produce this aggravation of symptoms when the tonsils are chronically affected, and what is often of great annoyance to the patient the Eustachian tubes are pressed upon, and the sense of hearing is interfered with. In many instances, as the acute disease subsides, the partial and temporary obstruction of the tube causes some deafness, but in chronic hypertrophy the deafness is more permanent. Another consideration must be borne in mind, namely, that persistent enlargement of the tonsil interferes with the voice, and with the entrance of air into the lungs; hence in children it is not unlikely to interfere with growth and may lead to imperfect nutrition.

In investigating the causes of these inflammatory diseases of the tonsil we find that strumous subjects manifest greater liability to them, and also in such patients a recurrence of disease is very apt to take place. Cold is the most common exciting cause, but there is a greater tendency to disease of the tonsil, especially of an acute kind, when the nervous system is exhausted and nutrition is impaired.

There is much difference of opinion amongst medical practitioners as to the best mode of treating acute disease of the tonsils. The application of warmth to the throat in the form of cotton wool externally, or a hot linseed poultice, or the "wet pack" in the form of a cloth wrung out of water, will often suffice to relieve the disease without any other treatment. Stimulating liniments may be used, such as the compound camphor liniment applied on lint or rubbed in, or a mustard poultice may be used.* In the mouth itself ice is often very grateful, but as a rule warmth is more pleasant. Lunar caustic or nitrate of silver may be useful, if the disease is circumscribed; but unfortunately, in most instances, the mischief is more extensive and the relief thus afforded is only temporary, and in some cases it aggravates

* Dr. S. H. Roberts strongly recommends the use of turpentine externally in tonsillitis, 'London Med. Record,' vol. i, p. 395, and Dr. Handfield Jones the internal use of belladonna, 'Lancet,' 1871, vol. i, p. 12.

the disease and increases ulcerative changes. It is better to use glycerine of tannin alone, or diluted with water as a gargle, or as a vapour with a spray apparatus; solution of chlorate of potash or of borax, may also be used, and if there be any tendency to ulceration, a dilute solution of carbolic acid, gr. iv to ʒj, is a good remedy for vaporization. If there be much febrile excitement saline effervescing medicines may be given, or the acetate of ammonia, or dilute hydrochloric acid with chlorate of potash; if there be weakness, a frequent and irritable or compressible pulse, then the fluid extract of cinchona bark or quinine should be used. In nearly all these cases it is very important to sustain the patient by good nourishment, such as milk, eggs, good soup, and wine or ardent spirits may be required. The prostration of strength is often very great, and the stimulant effect of alcohol is of great service. The application of tincture of iron is a favorite remedy with some physicians, especially if the disease be of a diphtheritic character, but more soothing remedies are preferable.

In chronic disease of the tonsils with hypertrophy the application of caustic tends to increase the flow of blood to the part, and in this manner augments the disease; the employment of solution of iodine is objectionable for a similar reason; but the long-continued application of nitrate of silver is still more objectionable, for it may become absorbed and produce discoloration of the skin. This would scarcely be regarded as possible, unless it had really occurred. A lady, whom I saw in consultation for severe colic, was found to have a peculiar indigo discoloration of the skin, and upon inquiry I learned that a strong solution of nitrate of silver had at one time been prescribed for enlarged tonsils; this solution had been zealously applied by the patient and her nurse for a period of two years, and with the effect of producing discoloration of the skin. The constant employment of tannin, either dissolved in glycerine and used with a camel-hair pencil, or as a gargle, or with a spray apparatus, is generally sufficient to lessen the size of the glands. For a like purpose also a strong solution of alum may be used. A residence at the sea-side or in dry and bracing air, nourishing diet, the administration of cod-liver oil with quinine and steel, will

help to relieve the mal-nutrition connected with hypertrophy of the tonsils, and to lessen the growth of the glands themselves. In other cases iodide of potassium may be given with iodine or the iodide of iron, and iodine may be painted on the skin. It is, however, well not to employ iodine in too concentrated a form, for on a delicate cutaneous surface it produces much irritation, pain and even vesication; the iodine may also be used by inhalation. Excision of the tonsil should only be practised after astringents and general remedies have been fully employed; but in young subjects it is especially important not to allow these hypertrophied glands to remain, for the reasons already stated.

The hasty removal of the uvula, however, for prolongation and relaxation is very much to be deprecated; other measures may suffice, and its excision may interfere with the process of swallowing and with the voice.

In œdema of the tonsils and soft palate the inhalation of soothing remedies is grateful to the patient, and even simple steam is of much benefit. Astringents may be similarly employed with advantage, but if necessary the parts should be scarified or incisions made, and this is the more necessary when the œdema extends to the epiglottis and glosso-epiglottidean folds—cases in which fatal dyspnœa sometimes supervenes. Such cases require to be watched very carefully, for after sudden excitement perfect freedom of respiration may give place to irregularity of breathing and to urgent dyspnœa, and the immediate performance of tracheotomy may become necessary for the preservation of life.

If the œdema be associated with asthenic or erysipelatous inflammation stimulants, with good nourishment, are of great value. Beef tea, with port wine or champagne, should be given frequently; and astringents, with the tincture of iron, are often of great use as local applications. As regards other forms of medicine, perhaps bark, with hydrochloric acid, is productive of the most benefit. When abscess in the tonsil is present, the sooner it is opened the better; if it be left, the dyspnœa and distress increase, and the local mischief becomes more extensive by burrowing among the loose tissue of the posterior pillars of the fauces.

An abscess protruding into the fauces may sometimes be opened by the pressure of a sharp finger nail.

Cancerous disease of the tonsil is a rare form of disease, and is associated with enlargement of the cervical glands. In an obscure case of this kind that I witnessed some years ago, nearly every fortnight or three weeks swelling of the neck and extreme dysphagia came on; the cause was not apparent, but it was found after death that cancerous disease of the glands had exerted pressure on the pneumogastric nerve, and thereby caused the dysphagia and other symptoms of disease.*

Paralysis of the soft palate must also be mentioned in connection with diseases of the tonsils and adjoining parts. In paralysis from disease of the brain, ordinary apoplexy with hemiplegia, the diminished power of the tongue and muscles of deglutition leads to marked dysphagia; sometimes also local growth of a syphilitic or cancerous character exerts pressure on the hypoglossal and other nerves, and leads to diminished power; this is especially observed in that interesting class of cases designated labio-glosso-laryngeal paralysis. The spinal accessory nerve is probably in these instances implicated, the muscles of the face are weakened, so also the tongue, but it is especially in the soft palate and in the muscles of the pharynx that the loss of power is observed; the soft palate remains powerless and flaccid, and sensibility is lost. The attempt to swallow may be followed by the passage of food into the larynx, and in a case of this kind under my care in the clinical ward of Guy's in 1874, recorded in the 'Guy's Reports,' directions had been given to feed the patient by the stomach-pump, but in the attempt to swallow milk a portion passed into the larynx and greatly hastened a fatal termination. Loss of power of the soft palate is also observed to follow diphtheria. These latter cases slowly recover, so also where the weakness is consequent upon the full use of bromide of potassium; such patients complain of inability to

* A valuable collection of cases of primary disease of the tonsils is to be found in a paper by Mr. Poland, "On Cancer of the Tonsil Glands," 'Medico-Chir. Review,' 1872, p. 477. Three cases of cancerous disease of the tonsil have recently occurred in Guy's Hospital, and for a very interesting case with cancer of the spleen and lymphatic glands see 'Path. Soc. Trans.,' vol. xx, p. 369, by Dr. Moxon.

swallow, with weakness and mental inertia. The voice is altered, especially so where the tongue is affected, as in cases of labio-glosso-laryngeal disease.

The treatment in these maladies necessarily varies according to the nature of the case, but Faradisation is often of great value in strengthening the muscles of the soft palate. The semi-paralysed condition of the palate found after the free use of bromide of potassium soon disappears with a cessation of the remedy. We have already referred to a similar condition of atrophy of the tongue dependent upon disease of its nerves or of the central nervous centres (see page 15). In progressive muscular atrophy the muscles of the tongue share in the general disease,* and they may at times be found wasted on one side or the other in consequence of disease in the brain or at the origin of nerves.

Such, unhappily, do not admit of much treatment, but a case of Sir James Paget's, already referred to, shows that unilateral wasting of the tongue is quite remediable should it happen that the cause which produces it can be removed.†

* 'Archives Générales de Médecine,' series 5, vol. i, p. 571, Cruveilhier.

† For other cases see Hughlings Jackson, 'Lancet,' 1872, vol. ii, p. 770; Buzzard, 'Clin. Soc. Trans.,' vol. v, p. 146; "Case of Unilateral Face Atrophy, dating from an attack of Chorea."

CHAPTER III.

ON DISEASES OF THE PHARYNX.

The pharynx is continuous by the fauces with the mouth, by the posterior nares with the cavities of the nose, by the Eustachian tubes with the ears, by the superior opening of the larynx with the respiratory organs, and by the commencement of the œsophagus with the rest of the alimentary tract; and disease of any of these contiguous parts may interfere with healthy pharyngeal action. The mucous membrane of the pharynx is loosely connected with the muscular coat, and important vessels, nerves, and numerous glands are placed on the external aspect. The part is richly supplied with nerves, from the pneumogastric, the glosso-pharyngeal and spinal accessory nerves, and this abundant supply has an important bearing upon some pathological conditions.

Spasmodic irritation.—Any one who has repeatedly examined the pharynx is well acquainted with the varying sensibility of the part, and that great irritability may be consistent with ordinary health. The most intense excitability with true spasm of the pharynx is observed in hydrophobia. Cases of this kind are occasionally seen, and I have witnessed three instances, two in young men, and a third in a little girl. In the first case, some years ago, the pharynx presented a very peculiar appearance on inspection; its cavity appeared more than twice its natural size; the constrictor muscles were retracted to the utmost, and the fauces were exceedingly large from the rigid contraction of the soft palate; the spasmodic condition of the muscles rendered every part of the pharynx as dilated as possible, whilst from similar muscular spasm the œsophagus was contracted. The mucous membrane of these parts was injected and covered with tenacious mucus. There was great congestion of the membranes of the brain and spinal cord, and the lungs were

in a similar state of engorgement. The other viscera were healthy, but there was emphysema of the cellular tissue of the neck. The symptoms during life indicated extreme irritability of the nerves supplying the pharynx, as indeed, of all the branches of the fifth and pneumogastric nerves.

Inflammatory diseases of the pharynx may be of an *acute or chronic catarrhal* character, or the inflammation may be *follicular, membranous,* or *phlegmonous.*

The *catarrhal* states scarcely require a separate description, for the mucous membrane is continuous with the tonsils and palate, and disease extends by continuity of tissue. This is also the case with diphtheritic inflammations, and also in the exanthems, as scarlet fever and smallpox, for in the former the mischief extends into the pharynx, and in the latter pustules have been observed on the mucous membrane of the fauces. In œdematous and erysipelatous states the tonsils, palate, and pharynx are generally affected. In catarrhal inflammation of the throat the mucous membrane is red, injected, and swollen, and dysphagia is a common symptom; the movement of the parts produces pain in the direction of the Eustachian tubes, and deglutition is difficult.

Chronic catarrh is characterised by thickening of the mucous membrane, with redness and slight hoarseness; there is occasional irritation, which is relieved by the expectoration of a small quantity of mucus. This troublesome affection is usually described by the patient as a relaxed throat, and it is closely associated with *follicular* inflammation, with which many of the symptoms are identical. This is a less severe condition, but is even more chronic; the mucous membrane is red and granular; the veins are enlarged and varicose, the adjoining part being in a similar state; irritable cough, hoarseness, and dysphagia are induced. If with these symptoms the uvula is relaxed, vomiting, especially in the morning, is easily induced. Over-speaking, as with clergymen, may be the cause of this follicular disease, and it is greatly relieved by astringents used as a gargle, or with a spray apparatus, as alum, tannin, krameria; and sometimes by stimulants, such as capsicum, guaiacum, &c. Tobacco produces a relaxed condition of the mucous membrane, and cough is a common symptom of this state. The best remedy

is to give up the exciting cause. A somewhat similar, if not identical disease, is sometimes found in delicate patients of a strumous tendency or with chronic chest disease. It shows itself in such persons chiefly by an excess of viscid mucus, slightly offensive, about the posterior nares and fauces, and which is most troublesome in the morning. The efforts at clearing the throat under such circumstances are often productive of vomiting. The posterior aspect of the soft palate and posterior nares appear to be equally implicated with the pharynx.

Membranous inflammation of the *pharynx* occurs in the form of croupous or of diphtheritic disease, and although in true croup the larynx is first affected, the disease may extend to the pharynx, whilst in diphtheria, in which the pharynx is first attached, the mischief often reaches the larynx; still we regard the diseases as essentially distinct. This opinion is, however, controverted by eminent physicians, who maintain that the diseases are identical. The pathological character, as well as the clinical history, is different in the two diseases. In croup we have a false membrane consisting of epithelial cells and inflammatory product, based upon a congested membrane; in diphtheria the membrane is also composed of cellular elements and fibrinous material, exudatory in character, and the result of inflammatory change, but the morbid effusion is more adherent to the structures beneath, and the subjacent tissues are often sloughing. Some also assert that the diphtheritic membrane is fungoid in character. In the fauces and tonsils the membrane has a yellowish colour, it is tough, and is adherent to the surface beneath, and its separation leads to abrasion and to bleeding. The croupous membrane in the larynx is less consistent and less adherent to the tissues beneath. It is not, however, that every membranous exudation in the fauces and pharynx is diphtheria; on the contrary, many acute diseases already described have this character, and in general exhaustion of the system the throat becomes injected, granular, and may have an inflammatory exudation upon it. In true diphtheria there is, then, greater tendency to slough, there is general prostration of strength, the urine becomes albuminous, and there is a liability to subsequent paralysis. In croup there may be

slight albumen in the urine from inflammatory congestion, but this is very different from the albuminuria in diphtheria.

As to the general symptoms, there is febrile excitement, sudden elevation of temperature, uneasiness in the throat, difficulty in swallowing, and great prostration of strength; if the disease extends into the larynx, the interference with respiration becomes a symptom of the greatest importance, as death often takes place from apnœa.

The extent of the diphtheritic disease is very different, at one time being located merely upon the tonsils and soft palate, at another extending into the fauces, and even reaching the œsophagus, or the larynx, as we have just remarked; the extension into the larynx, with its attendant serious symptoms, may come on suddenly or insidiously.

The treatment consists in relieving the local disease and in sustaining the strength of the patient. Some advocate the application of lunar caustic, others use the solution of perchloride of iron, but these means are often ineffective, they can only be applied partially, and it is better to soothe the mucous membrane by demulcents, by warm applications, and by keeping the fauces as free and clean as possible by washing with a dilute solution of the permanganate of potash. Warm applications should be applied externally. Chlorate of potash with bark are the best remedies internally, and a liberal supply of nourishment in the form of milk, eggs, good soup, &c., port wine or brandy should also be given.

If the glands in the neck or the cellular tissue in the course of the Eustachian tube become affected, then warm applications are necessary, and it is well to give quinine more freely as well as stimulants.

In diphtheria, after the subsidence of the more urgent symptoms, a peculiar form of paralysis is occasionally developed, and dysphagia results from the loss of power of the pharyngeal muscles. This condition is very fully dwelt upon by Maingault in his valuable treatise on "Diphtheritic Paralysis." This author states that "the symptoms of paralysis of the soft palate are a nasal voice, pain on deglutition, difficulty or impossibility which the patients experience in exercising suction, in distending the cheeks, in blowing with the mouth, and in gargling; and, on examining

the throat, we find immobility of the soft palate, a lengthened condition of it, numbness, absence of pain, and a diminution or loss of special sensibility. These various phenomena supervene a longer or shorter time after the acute affection of the throat has been cured; and when the pain having already completely disappeared, and the deglutition having become easy, the convalescence is apparently established." Maingault gives the following table to show the relative frequency of the different forms of paralysis which come on after diphtheria:—

Paralysis of the lower limbs	13
General paralysis	64
Paralysis of the soft palate	70
Disordered sensibility without muscular weakness	8
Amaurosis	39
Strabismus	10
Paralysis of the muscles of the neck and trunk	9
Anaphrodisia	8
Paralysis of the bladder	4
Paralysis of the rectum	6

He also adds, that "dysphagia never fails to come on whenever diphtheria is followed by general paralysis." In the treatment of these cases a very generous diet is necessary; and, if deglutition be impossible, an œsophageal tube should be used; electricity has been found of great service, and tonic remedies, as quinine, steel, &c.; others speak very favorably of the efficacy of strychnia, and of nux vomica. In very many instances recovery slowly takes place, but a fatal result occasionally ensues from this complication of a disease terribly fatal in its primary effect. Sir W. Gull* has recorded an instance of this kind in a child aged 12; and he attributes these forms of secondary paralysis to the extension of disease to the spinal nerve centres.† In the young patient just referred to, drooping of the head came on five weeks after the attack of diphtheria. The child could utter no sound, and the diaphragm was unmoved in

* 'Lancet,' July, 1858.

† Some observations have lately been made in Germany which, so far as they go, seem to corroborate this opinion. See "Letzerich on Diphtheritic Encephalitis," 'Virchow's Archives,' 1875, p. 419.

respiration, indicating a loss of power in the phrenic nerves. Fearful attacks of suffocative dyspnœa were produced when the head was moved in particular situations, and in one of these paroxysms he died.

Phlegmonous inflammation or diffuse suppuration is a very severe form of disease, and is generally the result of erysipelas, of pyæmia, sometimes of diphtheria and of scarlet fever.* The patient rapidly passes into a typhoid condition, the dysphagia becomes extreme, the respiration is impeded, and on examining the neck we find either erysipelatous redness of the skin or a fulness and tenderness among the infra-hyoid muscles, impeding the free movement of the parts concerned in deglutition. The examination of the neck will generally enable us to distinguish the dyspnœa arising from this cause from that produced by disease of the larynx or trachea, as well as from that consequent on pressure or injury of the nerves of respiration.

Diffused inflammation of the cellular tissue may also be produced by ulceration in the mucous membrane of the pharynx.

The following is an interesting case of *diffused inflammation of the throat :*

Case I.—Abraham S—, æt. 36, a sailor of intemperate habits, was admitted into Guy's Hospital, October 13th, 1847. On the 5th, whilst unloading coals, he received a blow on the back of the hand, and on the following day rigors ensued, with pain in the axilla, but the skin of the arm did not become inflamed. On admission, on the 13th, he presented the appearance of a man suffering from typhoid fever; there was delirium at night, and the respiration was much oppressed; no fluctuation could be found under the pectoral muscle, nor any suppuration detected in the neck; the wound on the hand was dry. Stimulants and opium were administered. On the 15th the respiration was difficult and laboured, 42 per minute; there was evident obstruction of the larynx and some tenderness existed about it, but scarcely any swelling, and neither fluctuation nor suppuration could be detected on very careful examination; there was great difficulty in swallowing. On the 16th the respiration and deglutition were somewhat easier, but the skin was clammy and the tongue dry. He died on the following day, after vomiting some blood. On inspection the whole of the cellular tissue surrounding the muscles of the neck was found infiltrated with pus, but there was no suppuration below the pectoral muscles.

* It is called by German authors angina Ludovici, especially when it attacks the neck.

Case II. *Diffused inflammation of the throat. Ulceration of the pharynx.*—A woman admitted into Guy's, in May, 1847, æt. 66, had sore throat with pyrexia; typhoid symptoms quickly followed and she died on the fifth day. On inspection suppuration was found among the muscles of the neck, and around the œsophagus as low as the root of the lung. In the pharynx there were several superficial ulcers, and one opposite the arytenoid cartilage had extended into the cellular tissue.

These diseases appear to be due to an erysipelatous form of inflammation, and are generally so severe as to be beyond the reach of remedial measures. Ammonia with stimulants should be freely administered; quinine in full doses may be tried, or large doses of the tincture of iron. The suppuration is not sufficiently localized to admit of relief by incisions, nor can remedies be efficiently applied to the mucous membranes of the throat.*

Syphilitic ulceration is often observed in the throat; it attacks the tonsils, the soft palate, the uvula, the posterior nares, and it extends from these parts to the posterior wall or to the pillars of the fauces; when the ulceration extends from above it is well to raise the soft palate, otherwise the ulceration may not be seen. If the mischief extend from the epiglottis the posterior part of the tongue is implicated. The ulceration is seen to be circular in form, and often serpiginous in character. The disease is sometimes located quite at the commencement of the œsophagus, and is the cause of severe dysphagia.

In the severe forms of secondary ulceration the perchloride of mercury is a valuable remedy, given alone or with iodide of potassium. Where there is chronic and tertiary disease the iodide is of especial service. Tonics alone will not effectually relieve this form of disease, quinine, nitric acid, steel, &c., may be used for weeks without any beneficial

* Only three well-marked cases are to be found in the Guy's post-mortem records in the last ten years. One in a male, æt. 19, under my colleague Dr. Wilks, in whom the whole pharynx was much swollen and sloughing; the urine was albuminous; death occurred suddenly on the seventh day. The second case, under Dr. Fagge, occurred six weeks after scarlatina. The sloughing process had laid bare the muscles of the pharynx. The patient died of pyæmia. The third was an interesting case on account of the extensive ulceration of the bowel with which it was associated. A full report of it is published in the Pathological Society 'Transactions' for 1875.

effect, when the bichloride will relieve in a very short time. In scrofulous subjects * the disease may attack the soft palate or commence in the larynx. If the latter, it extends to the laryngeal side of the epiglottis and reaches the edge. Dysphagia is very severe, and if the epiglottis is affected food may be rejected even with violence through the nares. In phthisis this ulceration of the pharynx is sometimes a most troublesome and distressing symptom; and as the pneumogastric supplies both the epiglottis, the lungs, and the stomach, irritation at the throat in swallowing, will produce cough, violent retching, and vomiting.†

Cancerous disease often attacks the commencement of the œsophagus and the larynx at the cricoid cartilage. Diseases of this character extend from the larynx into the pharynx. They are insidious in their commencement, and may be partially relieved by demulcent and by soothing treatment. Epithelial cancer and medullary cancer are the varieties most frequently met with; if the dyspnœa be urgent, life may be prolonged by the performance of tracheotomy, but little, however, can be expected from the operation of œsophagotomy, were such an operation feasible.

Suppuration behind the pharynx sometimes occurs in young children and in disease of the vertebræ. The symptoms produced are extreme dysphagia, febrile excitement, and exhaustion; the respiration is, however, less impeded in these cases than in primary disease of the larynx. If suppuration have taken place below the level of the soft palate, a projecting tumour is observed on examination of the throat. The diagnosis is then sufficiently clear; and, when it is possible, puncturing the abscess relieves the urgent symptoms. Abscesses of this kind arise from disease of the vertebræ or from local sources of irritation. Bleuland‡ mentions fatal dysphagia "a collectione puris inter spinæ vertebrarum corpora atque inferiorem pharyngis superioremque œsophagi partem," and Dr. Fleming§ narrates

* A scrofulous angina of follicular origin is described by Isambert, 'Gazette Hebdom.,' p. 757, 1871.

† Ulcerative angina sometimes complicates ulcerative stomatitis in soldiers. An epidemic of this kind is recorded by Lubanski, 'Lyon Médicale,' viii, p. 426.

‡ Bleuland, 'De sanâ et morbosâ œsophagi structurâ.'

§ 'Dublin Quarterly Review.'

several interesting cases of the same kind. One of them took place in a strumous child, aged 11, in whom there was tenderness at the central part of the cervical vertebræ; the tonsils were enlarged, the voice was nasal and muffled, and the muscles spasmodically contracted. Those at the back of the neck were rigid, and, in speaking, the contraction of the labial and nasal muscles produced a sort of tetanic expression; the jaws could be separated a little, and the tongue could be slightly protruded. The abscess was opened by a bistoury, and the child recovered. A still more remarkable instance occurred in an infant aged two months; there was peculiar snuffle, difficulty in deglutition, so that the child could scarcely take the breast, with occasional dyspnœa, aud these symptoms were followed by convulsion and a semi-comatose state; by pressure of the finger against the swollen part in the pharynx the abscess ruptured; its contents were discharged through the nose, and the infant recovered.

Cysts or *pouches* are found especially at the posterior part of the pharynx, and form cavities varying in size from that of a pea to a pigeon's egg. They are probably the sequel of glandular disease and suppuration, and do not lead to any symptom. The pharynx is sometimes seen to be one-sided when examined through the mouth, and this distortion is found in most cases to arise from enlarged glands on the outer side of the canal, or, again, the fauces may be narrowed by adhesion of the posterior pillars to the sides of the pharynx.*

Cancerous disease in the pharynx is observed at the commencement, when the disease is found to extend from the tongue or the fauces, or it is situated at its termination in the œsophagus, near to the cricoid cartilage. Several instances of the latter form of the disease are mentioned with diseases of the œsophagus, but the following is one in which cancerous disease began in the soft palate and was associated with phthisis. Epithelioma is the most common form of malignant disease affecting this part, but both medullary and scirrhous disease are sometimes seen.

* In Virchow's 'Archives,' 50, 161, is a paper on warty tumours of the pharynx. For an interesting paper on post-pharyngeal abscess in children, see Bökai, 'Jahrbuch. für Kinderheilkunde,' Band x.

Case III. *Carcinoma of the Throat. Tubercular Pneumonia.*—Martha M—, æt. 31, admitted December 5th, 1855, and died on the 20th. She was a short woman, married, and had been confined fourteen months previously, but since that time had not been well, having suffered from a slight cough. For three weeks she had had difficulty in swallowing, and this had increased to such an extent that she was, on admission, unable to swallow food, except with extreme difficulty. She could, with much distressing pain, swallow solids, but fluids were at once regurgitated through the nose. She had suffered from hunger, but still more from thirst, and she was extremely emaciated. The glands at the angle of the jaw on the right side were much enlarged, giving her emaciated countenance a miserable appearance. Her voice was nasal, and she was extremely exhausted. She was too ill to allow the chest to be examined, and died on the 20th. Her relatives, brother, &c., died of phthisis. On removing the larynx and tongue the soft palate was found to be about twice its natural thickness, irregularly tubercular, and brawny; the posterior pillars of the fauces were affected in a similar manner (Preparation 1785[70]). On the right side there was a communication from the pharynx into an irregular cavity, situated opposite or rather behind the angle of the jaw, about two inches and a half in length, and half an inch in breadth, and containing almost black sloughy substance. The glands were infiltrated with firm, cancerous product. The tissue of which the soft palate was composed consisted of an immense number of nuclei. In the lungs, there were firm adhesions at the apex of the right lung, the pleura being semi-cartilaginous. In the remaining part of the lung numerous minute tubercles were observed beneath the pleura, and at the lower lobe there were also moderately firm adhesions. The left pleura was free. At the apex of the right lung was an irregular vomica, capable of holding about two drachms of fluid, with a smooth lining, and surrounded by iron-grey lung, with several opaque tubercles. At the lower lobe a considerable portion of the lung was red and consolidated; and several lobules were infiltrated with pale yellow low organized deposit, which was breaking down in several parts, and precisely resembled the lung observed in cases of acute pulmonary phthisis. There was considerable congestion of the bronchi, and they contained tenacious mucus. The left lung was congested, but was otherwise healthy. The bronchial glands were black from pigment, and those quite at the base of the neck were firm, white, and dense, consisting of nuclei resembling those in the palate. In the lung, the tubercles presented none of these nuclei nor did they consist of cancerous growths, but were composed of imperfectly developed nuclei, dark pigmental granules, and some nucleated cells. The tissue of the thickened pleura consisted of fibrous tissue. The *heart* was exceedingly small and destitute of fat; its cavities contained moderately firm clot, and the valves were healthy. The *liver*, and also the spleen, were healthy. The stomach and the intestines were contracted and healthy, except the rectum and sigmoid flexure,

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the mucous membranes of which were congested in longitudinal stripes; and numerous minute superficial ulcers were scattered along these patches.

This case is one of great interest in the connexion of cancerous disease of the pharynx with tubercular pneumonia, diseases rarely conjoined, as they occur at different periods of life, and are considered to be antagonistic the one to the other. In advanced life, when death has resulted from cancerous disease, we sometimes find the remains of tubercular disease in the form of calcareous deposit at the apex of the lung, or in wasted glands, but such cases are rare and exceptional.

CHAPTER IV.

ON DISEASES OF THE ŒSOPHAGUS.

In the study of any local disease it is important to recognise the tissues of which that part is composed, and to note the structures with which it is in contact. Morbid processes extend to contiguous parts, and the knowledge of the diseases of one organ may serve as an important guide in the investigation of a neighbouring one into which the structures merge. In the last chapter we described the diseases of the mouth and throat, and there is much similarity in some of the tissues prolonged into the œsophagus; but whilst the mucous membrane is covered by the same kind of scaly epithelium, it is of a more simple character. It has a large number of conical papillæ, which project into the epithelial layer, but it is destitute of the abundance of secreting follicles existing in the mouth and throat, although some isolated submucous glands of an acinous character may still be found. The mucous membrane is more free, and is separated by a layer of connective tissue from the muscular coat, which is composed of longitudinal and circular bands. With this greater simplicity of structure there is associated less activity of function, and diminished severity of disease; thus, some of the affections of the mouth and throat which are dependent upon abnormalities of the secreting parts are entirely absent, whilst the greater predominance of muscular action, which may be regarded as the prominent function of the œsophagus, leads to alterations of muscular energy and to obstruction of a functional or organic character.

The œsophagus extends from the fifth cervical to the ninth dorsal vertebra, and it is in this region that auscultation, if of any practical value, may be applied to the

elucidation of its diseases. Inclining a little to the left of the vertebral spine soon after its commencement, the œsophagus gradually passes again to the median line, and afterwards a second time to the left as it reaches its diaphragmatic termination in the stomach. The canal is narrowed at the latter part, at the diaphragm, so also at its commencement behind the cricoid cartilage of the larynx, and again at the root of the lung. It is in relation in front with the trachea, with the arch of the aorta, the left bronchus, and with the posterior surface of the heart (left auricle); at its upper part, on either side, the recurrent laryngeal nerves are placed between it and the trachea, and below, the pneumogastric nerves descend in close contact with it. At the posterior part of the œsophagus the nerves unite to form a plexus (plexus gulæ), and they also receive filaments from the cardiac nerves of the sympathetic.

In the consideration of the diseases of the œsophagus we shall describe—

I. *Diseases of the mucous membrane.*
   Inflammation.
   Ulceration.
   Abscesses and cysts.
   Warty growths.
II. *Alterations in the muscular coat.*
   Spasmodic contraction.
   Paralysis.
   Hypertrophy and dilatation-pouches.
III. *Obstructions.*
   Internal.
   From annular constriction.
   From syphilis.
   From ulceration and cicatrices.
   From cancerous disease.
   External.
   From pressure of aneurismal or mediastinal tumours.
   From disease of the glands.
   From effusions into the pleura and pericardium, and from inflammation in the mediastinum.
   From abnormal arrangement of vessels.

IV. *The effects of corrosive poisons.*
V. *Foreign bodies producing obstruction.*
VI. *Hæmorrhage and ecchymosis.*
VII. *Rupture.*
VIII. *Gastric solution.*

The function of the œsophagus is of so simple a character, and the transit of food over its mucous surface is so rapid, that it is less subject to organic disease than some other parts of the alimentary tract. The process of swallowing is dependent in great part upon its functional integrity, and cannot indeed be said to be completed till the food reaches the stomach; hence it is that dysphagia becomes one of the most prominent symptoms of disease, not only of the pharynx, but also of the œsophagus.

In the diseases of the mouth, the tongue, and the fauces, which we have already mentioned, there is an interference with the first part of the act of deglutition, so also in morbid conditions of the pharynx and also of the larynx; but in the affections of the œsophagus it is the latter portion of the process of swallowing that is hindered.

I. *Diseases of the mucous membrane.*—Acute inflammation of the mucous membrane of the œsophagus is a very rare disease. It is described by some authors,* and dysphagia is mentioned amongst its symptoms. Excepting those cases in which irritant substances have been swallowed, and others also of gastro-enteric inflammation in children, we have only seen two instances in which acute œsophagitis could be said to exist. One, a man, æt. 38, had gangrene of the penis associated with purpura and a diphtheritic state of the fauces. The œsophagus was much thickened, its longitudinal ridges were too distinct, and its colour was of an inky black. The stomach was much injected and the intestines throughout were in a state of acute inflammation. The second case occurred in association with phthisis in a boy, æt. 10, who gave no history of dysphagia; yet the

* Cases of diphtheritic inflammation extending to the œsophagus are to be found in 'Path. Soc. Trans.;' Galen-Bleuland, 'De sanâ et morbosâ structurâ œsophagi;' Mondière, 'Arch. Gén. de Méd.,' tom. xxx; Dict. de Méd. et de Chir. Pratique;' Copland, 'Med. Dict.'

œsophagus throughout its whole length was yellow and shaggy, and in a state precisely corresponding to that known in the urethra as strumous disease. The larynx was in a like state. The stomach was healthy. A similar case is recorded by Abercrombie, in which a soft adventitious membrane could be traced from the pharynx to the cardia, and the pharynx and epiglottis were covered with a similar membrane. The patient, a gentleman, æt. 26, had swelling of the side of the neck, hoarseness, some dyspnœa, dysphagia, and febrile excitement, followed by typhoid prostration. The throat was red, and aphthous crusts were observed on the mucous membrane. Death took place in three weeks.

In a case of acute inflammation of both the small and large intestines of a diphtheritic character, admitted under my care into Guy's Hospital, during 1855, the mouth was inflamed, and the pharynx and tonsils were covered with a white film, spread upon an injected mucous membrane. This white film consisted of a beautiful torula, interlacing in all directions, constituting the "*muguet;*" it extended downwards to the commencement of the œsophagus, and some traces of it were found in that canal. In this instance, the symptoms were those of dysenteric diarrhœa, which had come on several months before the woman's admission into Guy's, and had persisted without any intermission for seven weeks. The disease was attributed to her removal into a damp house. The patient was exceedingly prostrate; she had severe vomiting, and whenever she attempted to take food retching and acute pain were produced. No medicines nor injections had any effect in checking the diarrhœa, and she died on the third day after admission. The mucous membrane of the œsophagus was, perhaps, equally affected with that of the mouth and pharynx; and, indeed, it appeared that the whole tract of the alimentary canal from the mouth to the rectum was inflamed.*

It is probable, that in some of the cases of severe gastro-

* See *dysentery*, for a more full account of this case. Steffen ('Jahrb. für Kinderheilkrank.,' vol. ii, p. 143) gives forty-four cases of disease of the œsophagus in children; hyperæmia, catarrh, and follicular ulceration were present several times, as well as croup and diphtheria; thrush was found twice, and when this existed a similar state was also found in the stomach.

enteritis in children, in whom the mouth as well as the intestine is evidently inflamed, the whole of the alimentary tract is affected, and would present before death a condition quite abnormal. At the close of chronic disease, we find a similar condition of the pharynx, rendering deglutition both painful and difficult; aphthous inflammation of the mouth having extended into this part. In these conditions, I have not seen any remedy followed by such beneficial effects as the chlorate of potash, associated sometimes with borax and honey; but alone it often acts apparently in a most marked manner. This remedy in stomatitis, introduced I believe by Hunt, was very extensively used by the late Dr Golding-Bird, and subsequent observers have confirmed the favorable opinion which he entertained. It appears to act partly by its local effect, and also as a saline after its absorption into the system.

Ulceration is generally due to syphilis or to cancerous disease, but it occasionally occurs without any evidence that it is due to either of these diseases; still, whatever may be the cause of the ulceration of the œsophagus, its close proximity to the trachea leads occasionally to perforation of the latter and to consequent symptoms.

In the Museum at Guy's Hospital, there are several specimens showing ulceration of the œsophagus, of a non-cancerous character, extending into the trachea, and there is some obscurity as to their correct pathology.* Difficulty of deglutition is the most prominent symptom during life in these cases; in some, dysphagia is gradually developed, in others, deglutition suddenly becomes impossible. The patients complain of pain at the sternum or between the shoulders; and on attempting to swallow urgent dyspnœa comes on, with the forcible ejection of food through the nares. The patients become emaciated, and life is only prolonged for a short time by the use of nutrient enemata. On inspection after death, the only disease found has been a perforation of the œsophagus opening into the trachea; the openings, two or three in number, extended over one or two inches, their edges were smooth, and without any thickening; and in several cases the opening into the trachea was smaller

* Case by Dr Peacock, 'Path. Soc. Trans.,' vol. xvii, 1866, p. 119.

than that into the œsophagus. The examination of these cases does not give any evidence of cancerous disease; nor do we find other signs of disease, either in the larynx or in the lungs; the early symptoms appear to arise from the œsophagus, the difficulty in respiration following that of deglutition. These facts appear to show that the disease has not commenced either in the mucous membrane of the trachea nor in disease of its cartilages; and we are led to suppose, either, that an abscess has formed between the œsophagus and trachea, and led to fistulous openings into those canals, or that ulceration has taken place in the œsophagus, and gradually extended in depth through the adjoining structures. It sometimes, however, happens that ulceration extending into the œsophagus arises from disease of the tracheal cartilages, and the following remarkable specimen is of that kind:

Case IV. *Diseased Cartilages of the Trachea. Ulceration of the Œsophagus.*—A carrier, æt. 42, at Hampton, came under the care of Mr. Holleston and Mr. Jepson, in 1853, for crowing respiration, with abundant expectoration, but no very urgent dyspnœa, nor difficulty in swallowing. He gradually sank; but six months before his death he expectorated a portion of ossified tracheal cartilage (Preparation 1711[87]), and six weeks later a second portion. On inspection, at the commencement of the œsophagus, immediately beneath the cricoid cartilage, a vertical opening, half an inch in length, with smooth and rounded edges, was found to extend into the trachea; there were three other communications resembling fissures, merely separated from each other by shreds of mucous membrane. The cartilages of the trachea were ossified, and there was ulceration of the mucous membrane of the larynx at the cricoid cartilage. The inferior lobe of the right lung was consolidated, but no other part of the body was diseased; and there was no trace of cancerous nor of strumous disease.

Dysphagia was almost absent, as far as can be learned, in this case, and the symptoms were those indicative of disease commencing in the larynx; thus differing remarkably from the cases presently to be recorded, where dysphagia was the most prominent complaint of the patient. It is probable that their pathology is also different. No history of syphilis is given, but the expectoration of a portion of diseased cartilage, six months before death, indicated the character of the disease.

Case V. *Ulceration of the Œsophagus. Perforation of the Trachea.*—A married woman, æt. 24, who had never enjoyed robust health, about a year previous to her admission under Dr. Barlow's care, had enlarged glands of the neck, which diminished under the use of iodine. Six months afterwards she began to experience difficulty in swallowing, with pain in the chest, uneasiness in the throat, and shortness of breath. These symptoms increased in severity till admission, but a short time previously they had suddenly become very much aggravated. She was much emaciated; no swelling could be found about the neck, nor any disease detected in the chest. She experienced the greatest difficulty in swallowing fluids, and food was at once forcibly ejected. Mr. Hilton passed an œsophageal tube, and found that when the patient breathed, air passed through the tube, indicating a communication with the trachea. She was fed for six weeks entirely by injections. On inspection, the trachea and œsophagus were found extensively diseased from the level of the cricoid cartilage, nearly as far as the bifurcation of the trachea, and the two canals communicated by three openings. The anterior wall of the œsophagus near its commencement was destroyed, with the exception of two slips of muscle, which still remained; and at this part there was an oval ulcerated opening passing into the trachea; below this a small portion of the calibre of the œsophagus was considerably contracted; still lower the œsophagus was again destroyed, and two more openings passed into the trachea. At this latter part, the posterior wall of the œsophagus was also destroyed, and the body of the last cervical vertebra was exposed; so that an abscess had been formed bounded by the cellular tissue of the trachea, by the remains of the œsophagus, and by the muscles of the neck. The openings into the trachea were oval, transverse, perfectly smooth, and covered with mucus, and not the least thickening nor heterologous deposit could be detected by careful examination, aided by the microscope. In the ovary, and in an adhesion on the surface of the liver, there were slight strumous granular deposits; the other viscera were healthy, and there was no evidence of cancerous disease. There was difficulty in breathing, and Mr. Hilton performed tracheotomy, but without any permanent advantage to the patient. (See Preparation 1714[10], and Drawing 264[24].) The stomach was small, contracted, and almost perpendicular; it contained a small quantity of bilious-looking alkaline mucus. The large intestine was dilated, and contained healthy fæces; the cæcum contained some acid mucus; the rectum presented several small ulcers, and was covered by a firmly adherent diphtheritic deposit.

The following case occurred in Guy's, in the year 1840. There is no history of the symptoms on record; but the patient was a man æt. 33, and he died four days after admission. The post-mortem inspection was as follows:

The body was exceedingly emaciated. Near the middle of the œsophagus the mucous membrane, for about two inches, was of a very

red colour, and irregular from ulceration; the canal was much contracted, and would have scarcely admitted the end of the little finger. Below the stricture the œsophagus was much dilated, and an abscess had formed behind it, containing four ounces of a dark fluid of a sour odour; there was a small sinus leading to the abscess; the mucous membrane, both above and below the diseased part, was quite healthy; there was no evidence of cancer in the affected part, nor was any other organ diseased, except that the kidneys were found to be granular. (See Preparation 1789[57].) It was supposed that a corrosive poison must have been taken, but of this there was no evidence.

An exceedingly interesting record will be found in the 'Pathological Transactions' for 1852, by Mr. W. Trotter. A young woman, in St. Mary's Hospital, æt. 25, had ulceration of the œsophagus, which extended into the pericardium, and led to sudden syncope and death. For three months she had had nausea, dysphagia, occasional vomiting, and pain at the top of the sternum, and at the epigastrium. Solids were swallowed with much difficulty. There was found, after death, simple ulceration without contraction; the ulcer had extended from the bifurcation of the trachea nearly to the diaphragm, and had perforated the pericardium. No other organ was diseased.

The last two cases were instances of simple ulceration below the bifurcation of the trachea; in the others the disease was above this part; still, they appear very similar in character, and the modification in the symptoms arose from the difference of the adjoining structures which were implicated.

There are many instances of pain at the upper part of the sternum on swallowing, when no trace of pressure nor aneurism can be found; and I have seen this symptom disappear under the use of tonics, sometimes with iodide of potassium. The idea of cancerous growth has been precluded, and it has been therefore a question whether some abrasion of the mucous membrane, or slight ulceration, such as we sometimes find in the pharynx, had not led to this complaint.

It is exceedingly difficult, during life, to decide as to the character of these cases of simple ulceration: the emaciation, dysphagia, and distress, being the same as in cancerous disease. In all the cases which have come within my

notice, the age of the patient has been very much less than in those instances in which cancer occurred. This alone, however, is not sufficient to enable us to decide with certainty as to the character of the disease.

The treatment is exceedingly unsatisfactory; the spasmodic contraction of the ulcerated part prevents the passage of œsophageal tubes; no food can be swallowed, and the administration of nutrient enemata prolongs life only for a few days or weeks. It is painful to find, after death, that simple ulceration of the œsophagus, or a fistulous communication with the trachea, is the only existing disease; and that if food could have been introduced beyond this point, life might have been prolonged. The operation of œsophagotomy is a very difficult one, and in many of these cases, if performed, would be quite ineffective, because the disease is often situated at the root of the lung, or behind the first bone of the sternum; in either case, the operation could not be performed below the seat of stricture. Now that it has been practically shewn that the peritoneum may be divided without fatal result, and without the terrible effect seen to follow from ruptured viscera, the propriety of forming a gastric fistula in some of these cases is worthy of very serious consideration. An operation of this kind appears certainly warrantable, as it would afford a chance of life to those who have only the prospect of certain death. In the human subject, several cases of gastric fistulæ accidentally produced have been recorded, and experimenters on animals have purposely made such openings, under the influence of chloroform, without the production of severe peritonitis. Since the first edition of this work was published, a gastric fistula has been made in many cases, although as yet only in one or two instances with success; the first was upon a patient of my own, and I suggested the operation to relieve the agonising distress of starvation in a man dying from cancerous occlusion of the œsophagus. (See cases of cancer.)

Syphilitic ulceration so generally leads to more or less obstruction that it may advantageously be left till we come to treat of stricture.

Abscesses.—Local suppuration in the submucous tissue of the œsophagus sometimes occurs and produces dysphagia,

or rather the regurgitation of food, as in cases of organic obstruction. Two such are recorded in the Guy's post-mortem records; both were of small size and of no real moment. They are rare and obscure in character, and the febrile disturbance is not sufficiently distinctive of the nature of the affection. Diseased glands may set up this local abscess, as well as the annular stricture to which we have presently to refer.

Cysts in connection with the œsophagus rarely occur; but small pouches dependent upon local dilatation of follicles may be found, and occasionally a cyst is discovered full of mucus; a case of this kind was observed at Guy's last year, in which the contents of the sac were mucoid, but the swelling had not given rise to any symptoms.

Warty conditions of the lining membrane are of pathological rather than of clinical import; it has not been found that their presence has caused serious obstruction, or that any symptom indicating their existence was produced. They are for the most part small, and consist of flat, grain-like projections from the surface, which may easily be overlooked by a casual observer. These warty growths are not uncommon; of thirteen cases recorded in our reports, they occurred no less than eight times in association with heart disease; in one instance the patient suffered from phthisis, in two from Bright's disease, and in one from some form of psoriasis. This large preponderance in heart disease suggests that chronic congestion of the coats of the œsophagus from the disturbed circulation acted as the predisposing cause; in other instances there is an abnormal tendency to the growth of the papillary structures in this part. In the lower animals a very remarkable condition of the kind has been found, especially in oxen, the whole mucous surface being covered over with larger or smaller pedunculated cauliflower excrescences, of very horny texture. One of these cases is to be found in the Museum of Guy's Hospital, a second in the Hunterian Museum of the Royal College of Surgeons, and a third was in a man, whose case is published by Luschka.* These instances correspond to the papillary tumour of the pharynx previously alluded to.

* 'Virchow's Jahrbuch,' loc. cit.

II. Another important class of œsophageal diseases includes affections of its *muscular and external coat.* All disordered muscular action of the œsophagus produces dysphagia, but this important symptom arises from various causes, which may be classified in the following manner: dysphagia arising from

1. Diseases of the structures connected with the first part of the act of deglutition, affecting the tongue, the tonsils, the fauces, &c.

2. Diseases of the pharynx.

These two groups include glossitis in its several forms—tonsillitis, scarlatinal and diphtheritic affections, acute inflammatory states of the fauces, strumous, syphilitic, and cancerous ulcerations; these have been already described.

3. Diseases of the larynx, as laryngitis and croup; ulcerations of the epiglottis and laryngeal cartilages, whether strumous, syphilitic, or cancerous; tracheal affections.

4. Inflammation and ulceration of the mucous layer.

5. Functional disorders of the muscular coat, especially cases of spasmodic stricture of the œsophagus and pharynx.

6. Paralysis of the muscles of deglutition.

7. Organic stricture from annular constriction, from syphilitis, from cicatrices, from cancerous disease.

8. Obstruction by pressure from without.

9. Contraction as the effect of corrosive poisons.

10. Mechanical injury and foreign bodies in the passage.

Dysphagia from several of these causes has already been noticed, and we shall now have to consider the same symptom under other conditions of disease. Before, however, speaking of difficulty of deglutition as due to a changed state of the muscular fibre, it may be well to advert to those instances where it is produced by affections of the larynx and trachea.

Laryngeal Dysphagia.—In acute laryngitis and in croup, it is the exception to find deglutition performed in the normal manner; and sometimes, especially in laryngitis, dysphagia is an urgent symptom. In these cases, however, the dyspnœa and cough are the earlier and the more marked indications of disease. The epiglottis is found to be injected and tumid, and the branches of the superior laryngeal nerve are

rendered intensely sensitive. This abnormal sensibility affords an explanation of the dysphagia which is generally present, even if the mischief do not spread directly to the pharynx.

Diseases of the laryngeal cartilages rarely extend to the pharynx, unless the malady be of a cancerous character; more frequently, as in necrosis, suppuration takes place among the muscles of the neck, and chronic laryngitis of a most intractable form is produced. But although dysphagia is not a prominent symptom of disease when only the cartilages of the larynx are affected, the reverse is the case when the fibro-cartilage, the epiglottis, is also implicated, whether in syphilitic, in strumous, or in cancerous diseases.

In syphilis, both the glossal and laryngeal surfaces of the epiglottis become involved, and sometimes nearly the whole of the fibro-cartilage is destroyed, leading to distressing dysphagia; and in phthisis ulceration of the epiglottis is one of the most trying complications of the complaint, the ulceration extending on its inner surface as far as the margin, which becomes eroded and gradually destroyed, and the contact of food with this irritated surface sometimes leads to the instant rejection of it through the nares. In chronic phthisis I have seen this condition attributed to organic disease of the œsophagus itself, on account of the extreme urgency of the dysphagia, and because the food appeared to have passed below the pharynx before it was forcibly ejected. It sometimes happens that solids are more easily swallowed than fluids; and this is the case in some instances where the dysphagia arises from disease of the larynx; a solid will pass over the diseased epiglottis and fall beyond it, whilst a fluid comes in close contact with it.

Laryngeal dysphagia is often greatly mitigated by the inhalation of steam, or of the fumes from conium or stramonium. In less severe cases astringent gargles, and in syphilitic ulceration the application of a strong solution of nitrate of silver, afford relief by diminishing the extreme sensibility of the diseased surface. Counter-irritation may occasionally be applied with advantage, as the tincture of iodine, hot fomentations, cantharides, &c. The improval of health by residence at the sea coast, by cod-liver oil, by preparations of iodine, and of steel, and by the use of such

forms of nutritious diet as can be taken by the patient, are the means most likely to be followed by enduring benefit.

With this form of dysphagia may be associated those instances in which inflammation of the trachea is the cause of the symptom, and this has been described by Dr. Hyde Salter* as "Tracheal dysphagia." The complication of a purely œsophageal disease has been referred to a stretching of the inflamed tracheal surface during deglutition; but this would equally apply to inflamed and swollen bronchial glands, in which condition no such symptom is produced; and it is more probable that this symptom is due to the reflex action of the pneumogastric nerve. Tracheal dysphagia is best treated by inhalations of soothing remedies, as steam, alone or with ipecacuanha, or with hemlock juice, and by the internal administration of salines, with ipecacuanha or antimony.

The affections which now come before us are connected with the nervous supply of the part, and with the mental condition of the patient; they are spoken of as *spasmodic dysphagia* or *spasmodic stricture*. In globus hystericus a sensation is produced as of a ball being lodged in the throat, with a painful feeling of suffocation; it comes on suddenly after emotional excitement or distress, and is often a symptom of an attack of hysteria, in persons suffering from general debility, and especially where there is disturbance of the uterine functions. The supposed obstruction to the passage disappears when the attempt is made to swallow food. In other cases the sense of œsophageal obstruction is due to flatulence and to distension of the stomach, and is relieved by the removal of flatus. Again, in irritability of the heart with exhaustion, we occasionally find the same sensation of obstruction and spasmodic choking. It would seem that in these latter cases the recurrent nerve as well as the œsophageal branches are implicated, for there is greater and more sudden distress of breathing than in simple flatulence. The condition here referred to is one quite distinct from angina pectoris, as well as from the severe dyspnœa of organic disease of the heart and cardiac asthma. It is a curable state, and one that ceases when strength is restored. It is found sometimes in patients who have suffered from, meno-

* Dr. Hyde Salter, 'Lancet,' 1864, vol. ii.

rrhagia or other causes of exhaustion, and in whom the heart is free from organic disease, although the vessels may be more rigid and atheromatous than in earlier life.

In severe spinal disease there is also occasionally present a nervous dysphagia, which aggravates the distress of the patient. Another class of cases is connected with mental disease; for instance, a patient may state that he cannot possibly swallow, that the throat is entirely occluded; but the malady is in the brain rather than in the gullet; no attempt is made to perform the act, and the passage of an œsophageal bougie will prove that the fears are groundless. These cases may be mistaken for true paralysis. With great feebleness of muscular power the will is unable to excite muscular action; the muscles of the pharynx appear to be paralysed, because they are not stimulated to healthy contraction, and hence deglutition cannot be performed. This condition is very different from the disease of the soft palate already referred to in connection with labio-glosso-laryngeal paralysis. The following interesting case, which was admitted under my care into Guy's Hospital in July, 1856, was a well-marked instance of functional dysphagia from the state of the nervous system:

Case VI. *Dysphagia. Mania.*—A. B— was an emaciated man, æt. 60, of a dingy and sallow appearance, a gas-fitter, who had resided at Deptford. His wife stated, that for several years he had suffered from attacks of extreme irritability; but that his only complaint was of pain in the region of the transverse colon. On the 18th July, he appeared to lose the power both of speaking and swallowing, having previously said, "that he did not know what was coming over him." On the 23rd, he was brought to Guy's Hospital; he was then prostrate and unable to stand, but could slowly move his legs and arms; his countenance was not without intelligence, and he appeared to understand questions slightly; he could not protrude his tongue, which remained almost motionless at the floor of the mouth and was dry on its surface; fluids put into the mouth were retained for a short time, and then ran out again at the angles of the lips, but he could not be induced to attempt to swallow; placing a teaspoon at the back of the mouth excited some action of the muscles; the pupils were active, the right was rather larger than the left; the pulse was 56, and compressible; the heart's action was very feeble; the respiration was normal 20 per minute, but the air could scarcely be heard to enter the chest. The abdominal muscles were exceedingly rigid, but the abdomen was not distended. Half a drop of croton oil was placed on the back of the tongue, and after-

wards, a nutrient enema was administered. On the 24th, my colleague, Mr. Cooper Forster, passed an œsophageal tube into the stomach without any difficulty; some beef tea thickened with arrowroot was in this way administered; the patient afterwards swallowed milk and beef tea, &c., with less difficulty, and on the third day began to speak; he rapidly improved. His mind, however, was not in a clear state, for as soon as he was able to eat, he had the idea that no other patient in the ward had any food. This case closely resembles some of those found in lunatic asylums; but this patient was unable to make the attempt to swallow; a condition which might easily have been mistaken for paralysis of the muscles themselves. I have since learned that after leaving the hospital he became violently maniacal.

A similar condition of nervous dysphagia is observed in hysteria, and occurs in young women of an excitable character, who are suffering from leucorrhœa, or painful menstruation, and impaired digestion. The same strong language is used by these patients to express their inability to swallow, and they show the greatest unwillingness even to make the attempt. A young woman about twenty-three years of age, was thus reduced to the greatest prostration, resembling a case of fever. On passing an œsophageal bougie, no obstruction whatever was found; she afterwards swallowed food in small quantities, which was increased day by day until she took the usual amount. Fright, terror and cold are found to produce spasmodic dysphagia, and we have seen instances of this kind after violent storms of thunder and lightning; but in lesser degrees it is not unfrequent in hysterical subjects.

Spasmodic stricture of the œsophagus is not limited to women, but may come on suddenly in men, with a sense of extreme dysphagia, almost without apparent cause, and continue for several days, so that the attempt to take food is followed by extreme pain and distress, and the instant rejection of any portion that is swallowed. This spasmodic obstruction of the œsophagus may be superadded to partial narrowing of the tube, and be almost a constant condition for many years, so that great care is required during the process of deglutition, which must be performed slowly.

In an instance of this kind, a gentleman found that if he swallowed slowly, and took a deep inspiration at the close of the process, the food passed the diaphragm into the stomach,

as if the act of inspiration enlarged the œsophageal opening in the diaphragm.

The following is a remarkable instance of *spasmodic affection of the œsophagus:*

Case VII.—A gentleman, æt. 65, had enjoyed good health till he was thirty years of age without any difficulty in swallowing. One day whilst taking food he suddenly felt something stick in his throat, and he believed he would be choked. He became blue in the face, and the dyspnœa was great and noisy. By a great effort he managed to force on the morsel of food; but for months afterwards he had the greatest difficulty in swallowing, and could only take the smallest sips. He improved somewhat, but still had to take his meals with great caution, so much so that he was quite unable to dine even with his family, as he had to masticate over and over again, and he always finished his meal with the feeling of thankfulness that one more was over without a stoppage. He was worse at times, and anything cold seemed to excite spasm and almost prevent deglutition; warm substances were more easy to swallow, and even capsicum lozenges assisted the process. He had never consulted any one, and his condition, described almost in his own words, was mentioned accidentally as explaining a meal of dry bread with gentian and ammonia, which he was taking by sips.

Spasmodic stricture of the œsophagus is very irregular in its recurrence.

A patient, æt. 75, with degeneration of the vessels and albuminuria, had a peculiar condition of the pharynx. The uvula had been removed many years previously, and the posterior pillars of the fauces were adherent to the posterior part of the pharynx, so as almost to obliterate the opening of the posterior nares. He had neither headache nor cough, neither palpitation nor dyspnœa, but every three or four days suddenly whilst at dinner flatulence appeared to cause obstruction in the gullet, then sudden sickness came on and the inability to swallow; after a short time the passage became free and he could swallow as usual. The peculiar condition of the pharynx in interfering with the first part of the process of deglutition did not wholly account for this dysphagia.

A young gentleman called upon me in great alarm, stating that he had obstruction of the throat, and that he could not swallow. Without knowledge of the physiology of deglutition he had been making incessant attempts to swallow during eighty miles of railway journey, and the failure had only led to increased efforts, but of no avail because his saliva was exhausted; a glass of water enabled him to complete the act, and assured him of the absence of disease.

Abercrombie* gives the case of a lady, æt. 40, in whom stricture of the œsophagus was supposed to exist. The symptoms continued for a year, and were entirely relieved by passing "an egg-shaped silver ball attached to a handle of silver wire."

This state, however, is not limited to one sex. Mayo† mentions a remarkable instance of spasmodic stricture of the œsophagus in a gentleman, æt. 60, who had sudden obstruction of the œsophagus whilst at dinner. It was relieved by the passage of a bougie. The brother of the patient, who had suffered from gout, had had a similar seizure. The same author narrates a case of spasmodic stricture in a young man, produced by ulceration of the interior of the larynx. It must be borne in mind also, that spasmodic contraction of the œsophagus tends to increase the obstruction arising from organic causes, so that the degrees of dysphagia in the same case may vary, being modified by this spasmodic complication.‡

The general symptoms and history aid us in the diagnosis of these diseases: thus, there is an absence of emaciation; the attack comes on suddenly after a slight cause, as from nervous shock or slight catarrh; there is freedom from pain, but nervous excitement is always present.

Hot fomentations, the use of fluid instead of solid food for a short time, aperient or antispasmodic enemata, as of turpentine or rue, will afford relief in these cases. Tonics are often of service, as the compound iron mixture with decoction of aloes, or the compound steel pill, with aloes and myrrh; so also quinine, zinc, valerian; vegetable tonics may be used; and the shower bath, good air and exercise, and cheerful occupation of the mind will greatly assist in the restoration to health.

Bougies are often employed, but their use is not generally

* Abercrombie on 'Diseases of the Stomach.'

† Mayo, 'Outlines of Pathology.'

‡ See also Sir James Paget, 'Lancet,' Jan. 7th, 1871. He considers hysterical or spasmodic stricture of the œsophagus as the homologue in the pharynx or œsophagus of that want of harmony between the organs of speech and respiration which produces stammering, and that it is due to unruly contraction of certain fibres of the œsophagus. The degree of contraction varies in different cases, in some only compelling them to take their meals apart, in others bringing about starvation and requiring the use of enemata.

beneficial, and may be detrimental by tending to perpetuate and aggravate a state of spasmodic irritation and contraction; but in cases where the muscles of the pharynx have lost their contractile power, the direct introduction of food is absolutely required. In some hysterical patients, the refusal to swallow arises from a disordered will rather than from any disease in the œsophagus itself.

Hulke, under the term œsophagismus,* describes the case of a pale emaciated boy, æt. 10, who had vomited both solid and fluid food for four months immediately after swallowing. The ejecta were so unaltered that it was thought they could not have passed into the stomach, and a probang seemed to meet with obstruction a short distance from the cardia. Before his illness he had been healthy and stout. He was very excitable and his mother was hysterical; he was quite cured by careful feeding and moral suasion.

Paralysis of the muscles of deglutition may be either functional or due to organic disease of the nervous centres.

A good instance of the functional disease is found in diphtheritic paralysis described on p. 44. When due to organic disease of the brain the paralysis of the muscles of deglutition is generally observed immediately to precede the paralysis of the respiratory muscles, and is looked upon, correctly, as a common sign of approaching death. The nervous centre of the function of swallowing is close to that of respiration, and there is an intimate connexion between them. Where there is loss of the power of deglutition, the placing of fluid in the mouth will be followed by its entrance into the larynx, or by violent cough, or it may even hasten death.

We not unfrequently, however, observe, in cases of cerebral disease, when the muscles of the tongue are paralysed, that the swallowing, especially of solids, becomes exceedingly difficult. This difficulty arises from the movements of the tongue being restrained, for the bolus of food cannot be formed, nor pushed back into the fauces; fluids are more easily swallowed, because more readily brought within the action of the true muscles of deglutition. Under such circumstances the introduction of nourishment by an elastic tube has been the means of prolonging life; it is probable that the

* 'Clinical Soc. Trans.,' vol. vi, p. 52.

muscular fibres of the œsophagus have diminished contractile power in these cases. The most severe instances of this condition are to be found in glosso-laryngeal disease already referred to.

Another class of cases are those connected with mental disease, some of which may easily be mistaken for true paralysis. With great feebleness of muscular power, we may find that the will is unable to excite muscular action; that the muscles of the pharynx appear paralysed, because they are not stimulated to healthy contraction, and hence deglutition cannot be performed.

Hypertrophy of the muscular coat requires no lengthened description, since it is invariably associated with obstruction in some part of the tube; for the obstruction is almost always caused by stricture, which leads to the hypertrophy; but there is a case in the Guy's Post-mortem Records of a very much hypertrophied œsophagus where the only explanation was a large heart with mitral imperfection. The muscular coat was especially thick opposite the enlarged heart.

Dilatation of the Œsophagus. Pouch.—Three forms of dilatation of the coats of the œsophagus and pharynx are met with; in the 1st the canal is uniformly dilated; in the 2nd a pouch or bag is formed, consisting of all the coats; and, in the 3rd, there is a hernial protrusion of the mucous membrane penetrating through the muscular coat.

The *first* is found occasionally present in organic occlusion of the œsophagus, especially where it is of a non-malignant character, and of slow formation. Mayo, in his 'Outlines of Pathology,' narrates a remarkable instance of œsophageal dilatation. "Mary B—, æt. 33, ill for ten years, was in a state of extreme debility and emaciation; the food was returned in three or four minutes mixed with mucus, and death took place from inanition. The œsophagus from its junction with the pharynx, which was rather less capacious than usual, was enlarged to an extraordinary degree of dilatation. The greatest width that it attained exceeded two and a half inches when distended, and occurred about four inches above the cardia. The tube then narrowed more abruptly, so as to render the cardiac termination like the pharyngeal of nearly the usual dimension. The structure of

the cardiac end for about an inch, and that of the pharyngeal end for about an inch and a half, was healthy. Intermediately the lining tunic was thickened and opaque; the mucous membrane had the appearance of having yielded or opened into flat shallow depressions, which followed a longitudinal direction above, and below formed irregular pits. At the depressed surfaces, the membrane had the natural colour; between them, it was opaque and whitish. The muscular fibres were normal in colour and thickness; they had grown with the expansion of the canal."

In vol. x of the 'Pathological Transactions' Dr Barker has recorded an instance of dilatation of the œsophagus commencing two inches below the rima, and forming an ovoid swelling the size of a swan's egg in the posterior mediastinum. There was a strumous deposit in the bronchial glands forming masses as large as the fist, and firmly adhering to the front of the œsophagus and of the trachea, and connected with fibrous tissue surrounding the origin of the great vessels. There was also a perforating ulcer in the duodenum, communicating with a small abscess in the peritoneum.

As to the *second* form, consisting of a muscular pouch, Mr W. C. Worthington, in vol. xxx of the 'Trans. of the Royal Med. and Chir. Society,' narrates an instance under his own care. A gentleman, æt. 60, three years before his death, suffered from slight dysphagia, which gradually became extreme, with progressive emaciation, and for three weeks he was sustained by injections. The œsophagus was constricted at the commencement, so that an urethral bougie was alone capable of being passed. Opposite the cricoid cartilage, between the trachea, the œsophagus, and the cervical vertebræ, was a pouch three and a half inches in length, like the finger of a glove; two thirds of it were covered by the muscular fibres of the constrictors; the opening into the pouch was free. The mucous membrane of the œsophagus at the constricted part was healthy. The same author quotes from Sir Charles Bell an instance of Mr. Ludlow's of a muscular pouch, between the œsophagus and vertebræ, in a man æt. 60, who had dysphagia for five years; and also mentions from Sir Charles Bell one of the *third* form of pouch, consisting only of mucous membrane protruded through the muscular layer.

This last form may be free from any symptom. A case of this kind recently occurred at Guy's Hospital; J. C—, æt. 28, was brought in a dying state with peritonitis from perforation of the ileum during typhoid fever. At the commencement of the œsophagus was a pouch, half an inch in length, consisting of the mucous membrane, and very slightly covered at the neck of the pouch by a few muscular bands; it was full of mucus. (Prep. 1784[72].)

An interesting case of pouch-like dilatation of the lower part of the pharynx in a man, æt, 63, who had suffered from dysphagia for many years, is recorded in the 'Path. Soc. Trans.,' vol. xvii, p. 141. The upper part of the pharynx was enlarged, with the muscles hypertrophied. At the lower border of the inferior constrictor of the pharynx was a pouch of mucous membrane, the size of a bantam's egg, projecting downwards behind the œsophagus.

Some of these œsophageal pouches are probably of congenital origin; two interesting cases of congenital defect were brought before the Pathological Society by Dr Herbert Ilott, and are published in the 'Transactions' for 1876. The œsophagus terminated in a thick pouch on the posterior surface of the trachea, a little below the cricoid cartilage, and a probe could be passed from the stomach upwards through the terminal portion of the œsophagus into the trachea, and it is this state that is usually observed in malformation of the œsophagus.

III. *Organic obstruction* of the œsophagus arises from conditions which may be *internal* in their character or they may be produced by *external* pressure. The former, *internal*, may be from annular constriction, from syphilis, from ulceration and cicatrices, and from cancerous disease.

External obstruction arises from pressure of aneurismal or mediastinal tumours, from disease of glands, from effusions into the pleura and pericardium, and from inflammation in the mediastinum and abnormal arrangement of the vessels.

The history of the symptoms will alone enable us to distinguish these cases from each other. In some of them, we may hope that remedial means may be successfully used which have hitherto scarcely been fairly tried; in other cases, it

is evident that nothing can be done for cure, but the pain and the severity of the symptoms may be mitigated.

Annular constriction of the œsophagus consists in the formation of inflammatory material in the submucous cellular tissue; the new tissue contracts, and becomes exceedingly dense, forming a firm constricting band, whilst the tube above dilates, and this obstruction increasing, at last the passage of food becomes impossible.

The cause of simple contraction of the œsophagus is very obscure; it generally occurs towards the lower part, and sometimes the history shows that dysphagia had been present in early life.* Sir Everard Home † also refers to instances in which difficult deglutition has been present from infancy, or, as in a case recorded by Dr. Fagge,‡ only from middle life.

The œsophagus is developed by the formation of a groove in the layers of the germinal membrane, and this groove is subsequently converted into a tube. Interference with the process of development may lead to irregularities in the size of the tube and occasionally also to its complete obliteration, and in this way some cases of simple narrowing of the œsophagus may be explained, as well as those instances of rare occurrence in which the canal ends in a blind extremity.§

In reference to congenital defect, we may mention that an obstruction sometimes exists at the upper part, and is due to a membranous fold across the canal;‖ but this is easily explicable when we remember that the pharynx is formed separately from the œsophagus, and afterwards opens into it. Any failure of perfect obliteration of the intervening septum will lead to the condition referred to, and in a similar manner, but more frequently, malformation is observed in the rectum, which being developed on the same plan remains as a blind pouch.¶

* 'Path. Soc. Trans.,' vol. xvii, p. 138.

† 'Practical Observations on the Treatment of Stricture in the Urethra and in the Œsophagus.' ‡ Guy's Hospital Reports,' 3 ser., vol. xvii, p. 413. § Porro, 'Syd. Soc. Bien. Retr.,' 1871-72, p. 152. ‖ Crisp, 'Path. Soc. Trans.,' vol. xxii, p. 128.

¶ For some further information on this point and on that of œsophageal fistulæ, their origination in permanent conditions of the branchial clefts and the likelihood of the existence of a communication between the trachea and the œsophagus in such cases, the reader is referred to the 'Surgical Diseases of Childhood' by Mr Holmes.

When the dysphagia has not appeared till late in life the constriction may still have been due to congenital defect, the compensating hypertrophy of the muscular coats having for a time overcome the impediment. At length, failing to do so, or ordinary senile changes leading to the degeneration of the muscular fibre, dilatation of the canal and obstruction ensue.

Syphilitic stricture of the œsophagus is not a common disease, and the pathological evidence of the existence of such a condition is still imperfect. In the 'Dublin Quarterly Journal of Medical Science,' of February, 1860, Mr. J. West describes two cases of dysphagia occurring in young girls where the symptoms gradually increased, and at length led to a fatal result; four inches down the œsophagus there was a constriction arising from the formation of fibrous material in the submucous tissue. Disorganization of the lungs had taken place. Mr. West believed that the disease in each case was of syphilitic origin. The same author makes a further contribution on the same subject, in the 'Lancet' for 1872,* supporting his previous views and quoting from various authors. Reference to the post-mortem records at Guy's Hospital gives three cases which were probably of a syphilitic character.

The first case was a woman, æt. 32, in whom a firm stricture was located at the termination of the pharynx; the second case was a woman, æt. 43, pregnant at the time of her death. Around the pharynx opposite the mucous folds of the glottis were irregular excavated ulcers with thick margins.

The third case I give in more detail.

Case VIII.—A man æt. 48, who was under my care in Guy's, had been a tobacco-cutter by trade, and when seventeen years of age had rheumatic fever. When twenty-seven he had syphilis; he had been intemperate in his habits. His illness commenced four months before admission into the hospital, and it was attributed to cold. He experienced soreness of the throat, which gradually became more severe and was accompanied with difficulty in swallowing. The dysphagia soon became so extreme that he could only swallow a small quantity of fluid food. Two months later he became affected with severe pain on the right side of the neck; the pain passed upwards in the course of the lesser occipital nerve, cough also came on. He was pale and had a cachectic appearance, and emaciated rapidly. His voice was weak, but

* "On Syphilitic Constriction of the Œsophagus and Pharynx," 'Lancet,' August 31st, 1872.

not hoarse. There was an enlarged very hard gland, situated beneath the right sterno-mastoid muscle; other smaller glands could also be felt. The breath was offensive and the tongue furred. When deglutition was attempted he experienced great pain, and only a very small quantity of food passed down the œsophagus, and very frequently it was forcibly ejected through the nares. There was no stridulous respiration, but the throat was too sensitive to permit an examination to be made with the laryngoscope. When the finger was introduced as far as the pharynx the epiglottis was found to be free from disease, but beyond it at the posterior and lower part of the pharynx a raised and hard swelling could be felt; this was at the commencement of the œsophagus opposite to the cricoid cartilage. There was dulness at the apex of the lung on the right side, with bronchial breathing and bronchophony. He was unable to take cod-liver oil, but the avoidance of solid food afforded some relief. The dysphagia again increased, but was relieved by the use of nutrient injections, thus allowing the throat to rest. These injections were after a short time quite ineffective, and as the distress and emaciation became extreme, gastrotomy was proposed. The patient suffered from pain in the course of the descending branches of the cervical nerves from the pressure of the enlarged glands in the neck. It was felt that unless some relief was speedily afforded the patient would rapidly sink, and on the 24th Mr Bryant proceeded to open the stomach. For twenty-four hours the stomach was allowed to rest and nutrient injections were given by the rectum; food in small quantity was then introduced into the stomach. The patient was free from pain, and said that he felt better for the food. On the 28th he became very prostrate and occasionally delirious; food introduced by the opening into the stomach flowed out, but nutrient injections were continued into the rectum as long as they could be borne. He died on the 30th, 5½ days or 130 hours after the operation. On *inspection*, ten hours after death, the wound in the parietes was perfectly united to the stomach, and there was no peritonitis; the serous membranes had become adherent. At the commencement of the œsophagus and the termination of the pharynx was an oval ulcer about two inches in length; it was hard and its edges were slightly raised and puckered; its surface was granular, and it had extended forwards to the larynx, leaving, however, a strip of healthy mucous membrane. In the larynx on the left side was a small ulcer one eighth of an inch in diameter on a raised base, and the thickening extended to the posterior part of the left vocal cord. There were several glands in the neck filled with yellow low organised deposit. The right pleura was adherent at the upper part, and at the apex of the lung was a small irregular cavity bounded by dense iron-grey deposit. The whole of the lower lobe of the right lung was acutely diseased, consolidated, and in a state of red and grey hepatization. The left lung contained some softening patches of pneumonia, resembling pyæmic inflammation. The heart was atrophied; the kidneys were small, but healthy; the colon contained fæcal matter in its whole length, but the small intestine was contracted.

The following instance was probably due to syphilitic disease; the very gradual onset, the long duration, the partial recovery under anti-syphilitic remedies, tended to support this opinion.

Case IX.—A lady, æt. 40, for many years had suffered from water-brash, and for six or seven years before death had had pain in the œsophagus on swallowing. She stated that the food appeared to stop at the centre of the œsophagus; for two years she had suffered from the excessive discharge of mucus and saliva, with thirst. These symptoms and the dysphagia were relieved by the use of myrrh and aloes; the dysphagia, however, increased, and a year before her death she was unable to swallow any solid food. In May, 1874, she vomited an elongated clot the size of the finger. In July dysphagia increased in severity, but her principal complaint was of flatulence and the discharge of mucus. The mucous membrane of the throat was granular, the abdomen was contracted, and there was no pain at the region of the stomach. Mr. Durham passed a bougie nearly into the stomach on July 13th, and a few days later a smaller one into the stomach. The size of the bougie was increased, and soon afterwards the patient could swallow much more easily. There was a suspicion, from the fact of her having had miscarriages and no living children, that the disease might be syphilitic in character, and perchloride of mercury with iodide of potassium were given. The relief was considerable, and for several months she was in comfortable health. During the spring of the following year the dysphagia returned, with the same complaint of mucous secretion. She was urged to allow the former treatment to be followed, but it was postponed till the June of 1875, when exhaustion had become extreme, and she sank at the beginning of July. No inspection was made.

The relief that was afforded by perchloride of mercury and iodide of potassium, and the introduction of the bougie, as well as the very gradual onset of the complaint, led us to suspect syphilitic disease as the cause of the obstruction; and, it is to be regretted, that the same plan of treatment was not pursued when the symptoms returned.

Three other cases of simple stricture are recorded in the 'Pathological Society's Transactions,' the ages of each being respectively fifty-five, fifty-four and forty-four. In these cases, two males and one female, tho disease was in the middle or in the lower part of the tube. Dr. Moxon mentions, that he has once met with syphilitic gummata in the œsophagus. It is, however, probable that many instances of syphilitic obstruction occur which are cured by the use of

perchloride of mercury and iodide of potassium; for it is well known that these diseases affecting the pharynx as well as the larynx, rapidly improve under treatment. Bougies may be of great service in restoring the calibre of the canal, but great care must be employed in their introduction; for disastrous consequences have followed their injudicious use in cases of ulceration.

Whilst referring to syphilitic disease we may mention a specimen in the Hunterian Museum of the Royal College of Surgeons, in which a gummatous tumour in the liver had pressed upon the œsophagus, and had caused obstruction.

Another form of organic stricture is from the *contraction of cicatrices*; some of these cases may be from old syphilitic disease, or they may result from ulceration originating in other causes, as disease of the bronchial glands. The most frequent cause is the contraction consequent upon the action of corrosive poisons or hot liquids in early life. Of thirty-five cases of stricture of the œsophagus met with by Keller * in five years, all were traced to the action of caustic potash. A case of cicatrix in the œsophagus was under my care some time ago in a man, æt. 62. He had had some œdema of the arms, as if from venous obstruction. A cicatrix of an ulcer was found in the upper part of the œsophagus. Its surface was hard and puckered, and tough fibrous tissue was observed on the outer side. These cases, like the instances of congenital stenosis already recorded, survive for a considerable period. An instance is mentioned in the 'Lancet' of a gentleman who had swallowed sulphuric acid when two years of age, and for thirty years did not require any treatment. We shall again have to refer to these cases in speaking of the action of poisons.

In recorded cases of annular stricture, the obstruction has gradually increased in severity, and unless we have a history of poison having been taken, or of the discharge of pus from an abscess, we know of no direct symptom by which this form of obstruction can be distinguished from that

* This author states that most of these cases were in children from two to four years of age; 23 were cured, 3 improved, 4 remained under treatment, 5 died. They were treated by bougies, and the duration of the treatment was from three months to one year and a half. Keller, 'Schmidt's Jahrbuch.,' vol. 118, p. 35.

arising from cancerous disease. The passage of a bougie may reveal to us the presence and position of the obstruction without indicating its true character, but the mucus from the bougie should be examined, and this may sometimes guide to a correct diagnosis. A further means of diagnosis and also of treatment has lately been advocated in auscultation of the œsophagus by Dr. Hamburger ('Wien Med. Jahrb.,' xv, 2). Dr. Clifford Allbutt ('Brit. Med. Journal,' Oct., 1875); others have also confirmed the value of the suggestion, and I have no doubt that the passage of fluid may be heard passing down the tube and impinging against a definite obstruction.

In Cancerous Disease of the Œsophagus and Pharynx the symptoms are very similar to those mentioned as occurring in ulceration of the œsophagus; the patients are generally beyond the middle period of life, but it occurs at an earlier period in women than in men, and difficulty in swallowing, which gradually increases in severity, is the most prominent symptom. In some instances, however, the dysphagia does not become extreme till the extension of the cancerous ulceration to the lungs, or to other structures, leads to symptoms which almost mask the original disease; vomiting, or rather regurgitation of the food, is always present in a greater or less degree. The commencement of the disease is often very insidious, and attributed to indigestion; flatulence may be complained of, and this is often regarded by the patient as the cause of the food not reaching the stomach. There is also pain at the sternum, in the back, and sometimes in the upper part of the throat, of a dull or burning character; but its intensity varies greatly. The obstruction of the canal leads to the regurgitation of the saliva, and as this fluid accumulates it at length reaches the epiglottis and cough is then produced; patients often complain of these symptoms as their sole malady, and also of flatus regurgitated from the stomach. Dyspnœa comes on when the trachea or bronchi are involved, and is occasionally associated with loss of voice, especially in those cases in which the disease is situated at the base of the pharynx, when it extends into the larynx. The dysphagia and emaciation increase, and after six or seven months the disease generally proves fatal.

In organic obstruction of the œsophagus, and especially in that of a cancerous kind the dysphagia is very peculiar; the patient hesitates in making the attempt to swallow, he takes a considerable time, as it were, to prepare the muscles of the pharynx for the effort, and when the attempt is made, the food or fluid is at once rejected; and sometimes severe suffocative cough is produced.

Mr. Travers * thus describes cancerous disease of the pharynx and œsophagus, "Scirrhous strictures followed by ulceration and cancerous fungus are met with in the pharynx and the top of the œsophagus in elderly persons, chiefly *females*, in my experience. They are productive of constant nausea, dry burning sensation in the throat and stomach, difficult breathing, frequent spasms and alarms of suffocation, and excessively impeded deglutition; upon the gentlest introduction of the finger or bougie, hæmorrhage follows, which afterwards becomes spontaneous. The patient has a faded sallow countenance, a disturbed circulation, and is emaciated to a skeleton."

Hæmatemesis is sometimes a symptom of cancer of the œsophagus. Dr. Bristowe exhibited at the Pathological Society a specimen of ulceration of the œsophagus, extending into enlarged veins, and causing fatal hæmorrhage; and in another instance recorded by him, the superior intercostal artery was opened by cancerous ulceration. The hæmorrhage produced by the extension of cancerous ulceration is occasionally repeated several times in the progress of the disease, it indicates its progressive character, and is often the precursor of a fatal result. Dr. Balding, at the same Society in 1857, showed an ulcer of the œsophagus of doubtfully cancerous character, in which a sloughing cavity connected with the œsophagus had also formed a communication with the right subclavian artery. The walls of the aorta are often partially injured, and in some cases perforated, thereby leading to sudden and fatal hæmorrhage.

Sometimes the lymphatic glands are enlarged in the neighbourhood of the cancerous mischief, and is is well always to examine the neck and axilla for evidence of glandular disease. Pressure on the bronchi from similar enlargement leads to

* 'Med.-Chir. Trans.,' xv, p. 252.

greater distinctness of respiration in one lung than in the other; this, however, is also a sign of aneurismal, or, in fact, of any kind of tumour exerting direct pressure on adjoining structures, and is only of corroborative value.

In cancerous obstruction of the œsophagus we do not generally find much distension of the canal above the seat of the disease; for the ulcerated surface leads to excessive irritability, and food is very quickly regurgitated; or a state of spasmodic contraction equally favours the instantaneous rejection of ingesta. Dr. Alderson, however, in writing on Carcinoma of the Œsophagus, mentions that "immediately after deglutition, there is a remarkable bulging out or protrusion of the œsophagus above the strictured point; it is, in fact, a bag or pouch, which is formed by the effort of the patient to swallow a larger quantity of food than the œsophagus, in its natural state, can contain." In annular obstruction of a non-cancerous nature, the canal becomes more enlarged and dilated; the disease is of a more chronic character, and there is less sensibility of the surface than in true cancer. Monro* mentions an instance in which as much as a pint of fluid could be retained for ten minutes. This general dilatation of the œsophagus above an obstruction must be distinguished from pouches connected with the canal, and already mentioned.

Epithelial cancer is the most frequent form of disease, but medullary and scirrhous cancer also occur, the latter being the more rare of the two; adenoid tumours are also observed. In numerous instances, the growth has presented modifications of epithelial scales; some cells had very large nuclei, other growths showed large nuclei thickly set together, or brood cells. Papillæ are sometimes observed on the surface of the growth, covered by healthy squamous epithelium, and containing capillaries filled with blood or leucocytes. Other papillæ closely resemble brood cells, their central portion containing nuclei and nucleated cells, and surrounded by flattened scales or cells resembling epithelium. It appears probable, that in some cases degeneration of papillæ may lead to the formation of these clusters of cells, rather than endogenous growth or other methods. The dis-

* Monro 'On Morbid Anatomy of the Gullet, Stomach, and Intestine.'

ease generally extends by mere contiguity of structure, involving the adjoining bronchial glands at the root of the lungs, and thereby encroaching upon the bronchi; pneumonia is thus frequently set up, and if sloughing occur gangrene of the lung follows. I have several times found the pneumogastric nerves destroyed on one or both sides; and this destruction of nerve supply induces congestion of the lungs, which is followed by pneumonia, without actual extension of disease into the lung passages.

The glands and other viscera are less commonly implicated in epithelial cancer, although cases occur in which cancerous elements are discovered in other structures besides that primarily affected, as in the liver, pancreas, stomach, suprarenal capsules, &c. In the liver, lungs, and pancreas, cells of an epithelial character, and precisely similar to those found in the ulcerated œsophagus, have been observed. In the lungs cancerous tubercles may exist with pneumonic deposit. Mr. H. Gray records a case of villous and epithelial cancer at the termination of the pharynx, in the 'Pathological Transactions' of 1855; and at the termination of the œsophagus colloid cancer has been observed.

Sometimes the cancerous ulceration extends through the diaphragm after destroying the œsophagus. In a case of this kind a large sloughing cavity was formed, bounded by the pancreas, spleen, and diaphragm, and it communicated with the posterior mediastinum by an opening in the diaphragm. Immediately behind the pericardium was a large sloughing cavity, presenting above the truncated œsophagus and pneumogastric nerves, and terminating below as just described. It was surprising that the patient could have lived as long as he did, but only three days before death he took a railway journey, and was not at all aware of his perilous condition. In another case there was remarkable absence of pain, although food was liable to be at once rejected.

Mondiére, in 'Arch. Gén. de Méd.,' tom. xxx, mentions from Keppelhont a case in which ulceration of the cardia and œsophagus communicated with an abscess of the liver; and also from Dr. Anesant, an instance of scirrhous ulceration of the inferior part of the œsophagus, rendered fatal by extension to the spinal cord.

The fatal issue arises from several causes, but these may generally be arranged into two divisions. 1st. Inanition, the dysphagia having become complete; and 2ndly, from the extension of disease to the lung or the surrounding tissues. The character of the disease of the lung deserves our especial attention. In only 12 instances out of 59 did death result from simple inanition, and even in these the lungs were not altogether free from disease. In these cases the wasting may produce mental disturbance or even delirium.

The mind is sometimes found to wander in consequence of the imperfect supply of nourishment to the brain, or septic changes take place, and the blood is thereby rendered impure; again, inflammation of the lung may prevent the arterialization of the blood, and hence the cerebral symptoms.

Pneumonia was found in . . .	20 cases.
Gangrene of the lung in . . .	11 „
Pleurisy in	1 „
Secondary cancer of other viscera . .	10 „
Inanition	12 „
Hæmorrhage	2 „
Local suppuration round growth . .	3 „
	59

As to the causes of the pneumonia,—1st. The pressure upon or destruction of the pneumogastric is followed by acute pneumonia on the same side, or by gangrene; as we observed in several cases mentioned in the annexed table. 2nd. The pneumonia appears to result from the extension of disease into the bronchi, setting up, if not pneumonia, acute bronchitis or laryngitis. 3. The sloughing of the cancer is followed by septic changes in the blood, and consequent inflammation of the lungs. 4th. Cancerous growth or tubercles in the lung acts as the cause of congestion and inflammation. 5th. Strumous disease of the lung may already exist.

Table of Cases of Cancer of Œsophagus and Pharynx.

No.	Sex.	Age.	Seat.	Complications.
1	M.	45	Upper part to root of lung	Sloughing pneumonia; pneumogastric involved.
2	M.	50	An inch from tracheal bifurcation	Communication with trachea; pneumonia; granular kidneys.
3	M.	73	Opposite root of lung	Gangrene of lung; cancer of thyroid and cervical glands.
4	F.	63	Whole length of tube	Cancer of stomach, liver, pancreas, and lung; chronic pneumonia; destruction of the pneumogastric nerve; disease of semilunar ganglion; granular kidneys.
5	F.	32	Commencement	Laryngitis; death from apnœa.
6	F.	38	At bifurcation of trachea	Trachea opened; cancer of lung and kidney.
7	F.	54	At bifurcation	Inanition.
8	M.	45	Ditto	Gangrene of lung.
9	M.	66	Upper part ?	Acute pleurisy; granular kidneys.
10	M.	49	Two inches above bifurcation of trachea	Trachea perforated; gangrene of lung.
11	M.	57	Cardiac end	Gangrene of lung.
12	M.	64	Bifurcation of trachea	Trachea opened; pleuro-pneumonia.
13	M.	71	An inch above bifurcation	Pneumonia; pneumogastric nerve involved.
14	M.	63	At centre	Pneumonia; pneumogastrics involved; pericardium opened.
15	F.	31	Pharynx and palate	Strumous (caseous) pneumonia.
16	M.	50	From commencement to bifurcation of trachea	Pneumonia; pneumogastric nerve involved.
17	M.	53	From three inches down, to cardia	Left bronchus opened; pneumogastric involved; extension of disease through the diaphragm.
18	M.	45	Root of lung	Pneumogastric nerves truncated; sloughing extending into the lung and through the diaphragm.
19	M.	69	From cricoid to root of lung	Acute and chronic pneumonia; pneumogastrics free.
20	M.	47	Above the root, behind manubrium	Inanition; slight lobular pneumonia; gastrotomy.
21	F.	60	Centre	Perforation of he aorta; fatal hæmorrhage.
22	M.	68	Pharynx	Sloughing lung.
23	M.	45	Ditto	Pneumonia.
24	M.	39	Ditto	Hæmorrhage; dyspnœa.
25	F.	30	Ditto	Sloughing lung; tracheotomy.
26	F.	57	Ditto	Local suppuration.
27	F.	35	Upper œsophagus	Local suppuration; sudden death.
28	F.	60	Ditto	Inanition; lobular pneumonia.
29	F.	—	Ditto	Secondary cancer of the bones.
30	M.	71	From cricoid downwards three inches	Lobular pneumonia; perforation of trachea.
31	F.	43	Upper œsophagus	Pneumonia.
32	M.	52	Ditto	Inanition; gastrotomy.
33	M.	39	Ditto	Gangrene of lung; secondary cancer of serous membranes.
34	M.	48	Ditto	Perforation of trachea; broncho-pneumonia; cancer of lung.

No.	Sex.	Age.	Seat.	Complications.
35	F.	35	Upper œsophagus, three inches	Mediastinal suppuration; pleurisy; pericarditis.
36	M.	—	Long stricture from cricoid	Perforation of trachea; broncho-pneumonia.
37	F.	31	Ditto	Pneumonia; ulceration into trachea.
38	F.	38	Ditto	Broncho-pneumonia; bronchi full of fœtid pus.
39	M.	65	Ditto	Trachea perforated; secondary cancer of lung and kidney.
40	M.	59	Ditto	Cancer of kidney.
41	M.	70	Mid œsophagus	Inanition.
42	F.	30	Ditto	Inanition; trachea opened.
43	F.	58	Ditto	Pneumonia; bronchus opened.
44	M.	70	Ditto	Trachea perforated; gastrotomy; exhaustion.
45	M.	63	Four inches at lower end	Cancer of thyroid.
46	M.	63	Four inches from middle downwards	Inanition; left bronchus opened.
47	M.	61	Two inches below bifurcation of trachea	Cancer of bones, pleuræ, liver.
48	M.	47	Two inches below bifurcation	Gangrene of right lung; perforation of pleura.
49	F.	51	Three inches long opposite bifurcation	Sloughing lung.
50	M.	38	Lower two inches	Cancer of liver.
51	M.	50	Lower end	Extension to the right lung; sloughing pneumonia.
52	M.	73	Ditto	Cancer of lung, pericardium, kidneys.
53	M.	53	Ditto	Cancer of liver; gangrene of the lung.
54	M.	50	Ditto	Cancer of glands, lungs, liver.
55	M.	64	Near cardia	
56	F.	31	Upper part	
57	F.	42	Ditto	
58	M.	63	Whole tube affected	
59	M.	45	Lower seven inches	
60	M.	59	From cricoid downwards	
61	F.	64	Ditto	
62	M.	51	Behind cricoid	
63	M.	54	Near cardia	
64	M.	55	Middle	
65	M.	56	From sixth tracheal ring downwards	
66	F.	60	Bifurcation of bronchi	Trachea perforated; exhaustion.
67	M.	64	Upper end	Hæmorrhage.
68	M.	66	Cardia	Still alive when reported.
69	M.	47	Middle	Recurrent nerve implicated.
70	F.	54	Ditto	
71	F.	42	Ditto	Inanition.
72	M.	63	Lower third	Bronchitis and inanition.
73	M.	30	Cardia	Inanition.
74	F.	33	Upper end	Exhaustion; trachea opened.

For other cases of gastrotomy in cancer of the œsophagus, see Durham, in 'Holmes' System of Surgery.'

Of 85 cases collected from the 'Guy's Post-mortem Records,' the 'Pathological Society's Transactions,' and other sources, 59 cases occurred in males, 26 in females. This proportion of rather more than 2 to 1 of males over females closely agrees with that obtained from a smaller number of cases in the previous edition of this work. Crisp,* in tabulating 21 other cases, gives a still larger preponderance to the males affected. Richardson,† however, states, that both sexes are affected equally, an assertion apparently founded on a very small number of cases. The average age of 57 males gives 55½ years, again closely agreeing with a former result, and also with that given by Crisp.

Of 25 women, the average is 44½ years. It thus appears quite evident that women become affected with œsophageal cancer at a much earlier date than men, the average being 11 years earlier. This is quite borne out by examining individual cases; thus, of the females, 2 cases occurred at 30; 3 at 31, 6 more between 32 and 38; or a total of 11 out of 25 under 40 years of age.

From 30 to	40	11
40	50	4
50	60	8
60	70	2
		25

Of the males—

30		1
38 to	40	5
45	50	14
50	60	14
60	70	19
70	75	4
		57

The youngest patient I find recorded as having had cancer of the œsophagus was aged 22, mentioned by Dr. Richardson in his paper before the Medical Society; ‡ but the sex of this patient is not stated.

Chronic affections of the lung are interesting in relation to cancer; the tubercles may be of a cancerous character,

* 'Lancet,' vol. ii, p. 628, 1873. † Ibid., p. 596. ‡ Ibid., loc. cit.

and set up chronic pneumonia; or with true cancer in the œsophagus the lung may be affected with ordinary strumous disease, and the most careful examination may fail to detect any trace of carcinomatous product in the lung, the two diseases existing independently at the same time.

Again, the vomica may exist at the apex of the lung, evidently of a chronic character, or with dense iron-grey lung tissue around it, and calcareous degeneration. In another instance under my care there was a vomica at the apex, and the history indicated that cough had existed long prior to the dysphagia. There were evident signs of phthisis in the flattened apex, loud bronchial and amphoric respiration and bronchophony; had there not been present the cancer of the œsophagus, it would have been considered as an ordinary instance of pneumonic phthisis. In the exhaustion which was consequent on the obstruction of the œsophagus, the cough continued troublesome, and a few days before death acute disease of the lung was set up, arising, perhaps, at the time the cancerous growth began to disintegrate, or from atmospheric changes.

Among the 85 cases, the longest period which elapsed between the commencement of dysphagia and death was about two years, several were three to seven months, and in two still less, the interval being only five and seven weeks.

The *diagnosis* is sometimes obscure; this has been mentioned in reference to annular stricture, and perforating ulcer into the trachea. Where we find chronic disease of the lung with dysphagia, the diagnosis is much increased in difficulty, because, in ordinary phthisis, the dysphagia is sometimes exceedingly severe. This remark applies especially to the bronchitic phthisis of advanced life.

Dysphagia with chronic emaciation is the prominent symptom of cancerous disease, but sometimes the dysphagia is very slight, and the sudden onset of acute secondary disease masks the primary mischief; and, again, very extensive sloughing of the œsophagus may render the rejection of food from the stomach almost impossible. It is sometimes very difficult also to distinguish between cancerous disease of the œsophagus and pressure upon the tube by aneurismal or other tumours; in the latter instances the dysphagia is less persistent, and

often varies according to the position of the patient, the œsophagus falling away from an aneurismal tumour of the aorta as the patient leans forward; paroxysms of dyspnœa are also frequently present in cases of arterial disease. Flatulent distension of the stomach and disease of the cardiac orifice may simulate disease of the œsophagus itself.

The *prognosis* is in all these cases very unfavorable; but in some, after the avoidance of irritating and solid food, or after the use of nutrient enemata for several days, the dysphagia becomes diminished in a marked degree, the patient is able to partake of solid food, and we may be led to take a more favorable view of the case than is warranted by the nature of the malady. Two cases admitted into Guy's Hospital with symptoms of cancerous disease of the œsophagus, men about sixty years of age, with nearly complete dysphagia, were so much relieved as to leave the hospital; when, however, we find the disease extending into the respiratory passages, or into the large vessels, we may fear a speedy and fatal termination.

These remarks suggest to us the proper mode of *treatment*. The most bland and unirritating diet should be given, as milk, eggs, jellies, soups, &c. Solid articles of food should be abstained from, at least for a time, for the attempt to swallow solids produces distressing spasm of the œsophagus; and if the dysphagia be very severe, nutrient injections should be administered, so as to allow complete rest to the diseased structures. Stimulants and cod-liver oil afford partial relief, and check the progress of disease.

Solution of potash and iodide of potassium, with vegetable infusions, afford relief in the earlier stages of the complaint; so also, nitric and hydrochloric acids, with morphia or opium. In advanced cases, where there is extensive cancerous ulceration and excessive irritability from exposure of the branches of the pneumogastric, internal remedies are of no avail, and nutrient injections are the only means of prolonging life.

Opium in one form or other is the best remedy for the secondary pneumonic or bronchitic complications; to give mercurials and antimony, &c., is to exhaust still more rapidly the already ebbing life of the patient.

It is a question of great importance how far bougies may be used with advantage in the treatment of cancerous obstruction of the œsophagus. The frequency of communication between the œsophagus and the trachea or bronchi, the occasional entire destruction of the canal, and the injury which sometimes results to the walls of the aorta, are each of them serious objections to its use; and I have very frequently seen instances in which a bougie would certainly have passed into the bronchus, and led probably to speedy death. In the earlier stages the bougie may usefully serve to indicate the precise character and seat of the disease, and also dilate the narrowed passage, but it should always be used with extreme caution. The cauterization of stricture of the œsophagus was resorted to about the close of the last century; and Sir Everard Home, in his 'Practical Observations on the Treatment of Strictures of the Urethra and Œsophagus,' records several instances in which the use of caustic bougies was followed by relief of the severe dysphagia. Simple bougies have been more frequently used, often with benefit, though sometimes, as I have just remarked, to the injury of the patient. A case is mentioned by Mr. Fletcher, in his 'Medical and Surgical Observations,' in which perforation was produced at the termination of the pharynx, and suppuration among the muscles of the neck followed; on the other hand, when carefully employed, food may be introduced into the stomach by œsophageal tubes in cases in which spasmodic stricture prevents the passage even of the blandest fluids.

As an instance of the beneficial use of the bougie, I may refer to the following case:

A patient recently under my care in Guy's Hospital, suffering from severe dysphagia, complained of pain about the level of the sternum. He was forty-three years of age, by trade a letter-carrier, and for twelve months the symptoms of obstruction in the œsophagus had troubled him; but he had not found that the symptoms had generally much increased since the time when he first noticed them. The dysphagia sometimes became greater, but it was always with great difficulty that any portion of solid food could be swallowed. He was a spare man; no enlargement could be felt

in the neck; there was no apparent obstruction in the pharynx, nor was there any evidence of pulmonary, cardiac, or arterial disease. Several attempts were made to pass bougies into the stomach, but without success; they rested about the level of the sternum; even an elastic catheter could not be introduced beyond that point. After a few days I requested the patient to abstain altogether from food, and fed him for one week entirely by nutrient enemata; at the end of that time a large bougie could be easily passed into the stomach; the rest to the canal had allowed the irritation and spasmodic constriction to subside, and, although organic stricture still existed, solids could be more easily swallowed. The bougie met with an obstruction, as before said, about the level of the sternum, and about three inches below the first a second obstruction occurred, indicating probably the upper and lower limit of the diseased surface; and when the bougie reached the constriction the coughing of the patient enabled the instrument to pass onwards. Cod-liver oil and a nourishing fluid diet were given, and the patient left the hospital relieved.

Of the 74 cases the upper part of the tube was affected in 33, though in several it was not confined to that part alone. In 30 the middle, or the part about the root of the lung, was chiefly affected, and the cardiac end only in 10. It is to be borne in mind, however, that the proportions which these numbers represent are not, perhaps, quite correct, for it is by no means infrequent to find disease extending from the cricoid region to the root of the lung, or from the latter to the cardia, so that several inches of the tube are affected, and this renders it difficult to decide upon the precise origin of the disease. Two cases are recorded in which the whole length of the œsophagus was affected.

It is not of much importance, however, to decide as to the precise position in which the disease commences. It is sufficient for clinical purposes to remember that the tube is liable to be affected in three parts—at its commencement, its middle, and its termination. In all these it can be shown that the surface is subject to increased friction, and that the liability of attack is in proportion to the amount of irritation. At the upper part this irritation is greatest, for the tube suddenly contracts from a large pouch into a somewhat narrow tube, and

the food is compressed so as to be moulded to the reduced size of the canal. Subsequently it will pass along smoothly unless interrupted by further obstruction, and this is likely to happen near the root of the lung, at the bifurcation of the trachea, and again at the cardiac end. Again, at the commencement the cartilaginous structures in front of the œsophagus, and the occasional swelling of the bronchial glands, are causes of pressure which do not exist at the lower part.

If the proportions be taken in the different sexes, however, they are found to be somewhat altered, the ratio of affections of the upper to those of the middle parts being as 19 to 20 in males, 14 to 8 in females.

The trachea was perforated in 13 cases, and in the majority of these the disease attacked the part at the root of the lung. It was not always so, and it is to be remembered that cases of simple ulceration occasionally occur which lead to a communication between the two passages.

Case X. *Cancerous Disease of Lower Third of Œsophagus. Division of Canal. Life prolonged by Use of Bougie. Death from Bronchitis.*—A. B—, æt. 63, a farmer, who had led an active life, began to suffer from impairment of his health nine months before his death. His appetite failed, and he soon began to suffer from difficulty in swallowing. The food only appeared to reach the throat, and was quickly rejected. He had an irritable cough, and at the upper part of the right lung the respiration and voice were bronchial, and the resonance on percussion was impaired. He rapidly lost flesh. He expectorated a large quantity of glairy mucus, and it was evident that the saliva filled the œsophagus above the obstruction, and when it reached the throat or epiglottis induced cough. Mr. Durham passed a bougie to the seat of stricture, and found it at the lower third of the œsophagus. By the use of fluid diet and soothing remedies partial relief was afforded, but the obstruction soon became complete, and nothing could be swallowed for about two months before death. Mr. Durham was, however, able to introduce a small œsophageal tube and to feed the patient, gradually increasing the size of the tube; fluid food with vegetable, and when necessary wine, were thus introduced into the stomach night and morning. The patient gained strength, and was able to go out for a drive. Unfortunately in one of these excursions he took cold; the glands at the angle of the jaw and the parotid on the right side became swollen, the skin at the part became erythematous and brawny, suppuration followed, and an incision was made. The œsophageal tube was still introduced night and morning, but with more difficulty on account of the inability to open the mouth freely. The tube had for some days had an offensive smell when withdrawn, as if it had come into contact with

sloughy tissue, and the examination of the mucus showed cells, which were very suspicious as to their cancerous character. Bronchitis then came on, and mucous crepitation was heard at both bases, and on the right side there was some consolidation of the lung. The temperature rose to 101·2°, respiration to 40 per minute, the pulse to 120. There was partial delirium, and in a few days he sank. On inspection, broncho-pneumonia was found, especially in the right lung; the lower third of the œsophagus was affected with a sloughing cancerous growth, which had divided all the coats of the œsophagus, and had formed a sloughy cavity in the posterior mediastinum; a small portion of the œsophagus was left which had served to guide the bougie to the lower opening of the œsophagus. If the life of the patient had been prolonged for a few days the pleura would probably have been perforated. There was scarcely any infiltration of the glands, and no direct extension into the lung.

Although in this case life was cut short by an attack of bronchitis and erysipelatous inflammation of the glands of the neck, there can be no doubt that the exhausted state of the nervous system rendered the patient more susceptible to these attacks. The introduction of the bougie, which was very skilfully effected by Mr. Durham without pain to the patient, greatly relieved the distressing sense of thirst and of exhaustion from which many suffer, and prolonged life for several months.

Case XI. *Cancer of the Œsophagus. Sloughing Pneumonia; the Pneumogastric Nerve involved.*—James R—, æt. 45, was admitted into Guy's Hospital, November 21st, 1854, under Sir Wm. Gull's care, and died November 30th. He was a married man, a labourer, and intemperate in his habits For nine weeks prior to his admission he had been unable to swallow food with comfort, and he had suffered from severe pain at the lower part of the sternum. From that time he lost much flesh; and cough, with pain in his side, came on. He vomited occasionally, and had burning pain at the sternum; and there was a sense of nausea when he began to eat. On admission, he had a cachectic, pale, and wretched appearance; he was troubled with cough, and the expectorated matters were exceedingly offensive. At the apex of the left lung the respiration was coarse, and at the base of the right lung there were signs of consolidation; the patient sank in a few days. The severe pulmonary symptoms in this case completely masked the original disease of the œsophagus; for a short time it was believed that the case was one of pneumonia with old disease of the lung, and that the burning pain at the sternum, and vomiting, were the consequence of his former intemperate habits. At the commencement of the œsophagus extensive ulceration was found on inspection; the ulcer was four or five inches in length, irregularly tubercular on its surface, and several tubercles were

situated in the mucous membrane, both above and below the ulceration. The disease extended as low as the root of the lung, but the lungs themselves and the pleura were free from cancerous disease. The tissue external to the œsophagus was extensively infiltrated, especially on the right side, and some of the bronchial glands were affected; the right pneumogastric nerve extended through the diseased structures. The lower part of the pneumogastric appeared wasted, but it could not be traced satisfactorily throughout, having been divided in the inspection. The right lung, at its lower lobe, was of a greenish colour, and it had a faint gangrenous odour; it was infiltrated with dirty serum, and was imperfectly consolidated. The bronchi were intensely congested. The remaining parts of the lungs and the larynx were healthy. The heart, stomach, liver, and intestines, &c., were also healthy, and no cancerous disease could be detected in any other part.

As to the character of the growth, it had the general and microscopical appearance of epithelial cancer. There was no direct communication between any of the large bronchi and the ulceration of the œsophagus; and it appeared probable that the right pneumogastric, becoming involved in the disease, had predisposed to the pneumonic inflammation on the same side. The case proved fatal at an earlier period than usual, for the patient died ten weeks from the recorded commencement of difficulty in swallowing; and the diagnosis was rendered obscure by the extreme severity of the pulmonary symptoms.

Case XII. *Cancer of the Œsophagus, of the Cervical Glands, and of the Thyroid Body. Gangrene of the Lung.*—George E—, æt. 73, was admitted into Guy's Hospital, November, 1853, in an extremely emaciated state, and died February, 1854. He was a table-cover maker, and in his early life had been intemperate. Eight months before his admission he received a severe fall, from which he never recovered; and two months later he began to suffer great pain in eating solids, and he had occasional attacks of vomiting. These attacks became more and more frequent, and latterly almost incessant. He could not take solid food, and complained of intense pain at the cardiac extremity of the stomach. Mr. Callaway passed an œsophageal bougie, but without meeting any obstruction in its passage. The vomiting diminished soon after admission. The bowels became constipated, and he continued to suffer severe pain. He became gradually weaker, and on February 5th he vomited a considerable quantity of dark-coloured fluid; he died on the 13th. At the central part of the œsophagus, opposite the root of the lung, there was a large, irregular ulcer, two inches in length, which involved the whole of the tube; at the upper part was a raised circular margin, and a partially detached ulcer of similar character, about half an inch in

diameter. At the root of the right lung there was a mass of sloughing tissue, which was infiltrated with sanious fluid, and the adjoining lung was consolidated. At the base of the left lung there was a circumscribed mass of pulmonary apoplexy with pneumonia, and a vomica containing thin purulent fluid. The cervical glands and the thyroid body were infiltrated with carcinomatous product, white, and of a medullary character. The heart had undergone both fatty and fibroid degeneration. In the peritoneum were old adhesions, and a granular condition of the surface of the liver. The kidneys were also granular and contracted.

Although the œsophagus was extensively ulcerated in this case, a bougie could easily be introduced, showing that spasmodic contraction was the principal cause of the obstruction and of the rejection of the food. In this instance also, the bougie might easily have passed through the diseased walls of the œsophagus into the posterior mediastinum, or into the pleura; and, from a diagnostic point of view, it might have led to the supposition that the disease was in the stomach rather than in the œsophagus, on account of the absence of obstruction to the passage. As we have previously stated, great care must be exercised in the use of these instruments.

Case XIII.—*Epithelial Cancer of the Œsophagus, Pancreas, Liver, and Kidneys. The Pneumogastric Nerves involved. Granular Kidneys. Chronic Pleuro-pneumonia, with Cancer. Fibrous Tumour in Uterus. Cancer of Supra-renal Capsules and Semilunar Ganglion.*—Jane B—, æt. 63, was admitted Aug. 23rd, 1855, under Dr. Addison's care. She had suffered for nine months, and the first symptom was pain after swallowing; no tumour could then be felt, but cancerous disease was suspected. After admission, a firm mass, at the scrobiculus cordis, about the size of a hen's egg, could be felt; it was well defined, sensitive on pressure, and tolerably distinct pulsation could be perceived; the food was at once regurgitated. She complained much of flatulence, and at night regurgitated water into the mouth. At first, vomiting several hours after food was the principal symptom. Soon after admission the food was at once returned; sometimes, however, it was retained for several days. She took creosote three times a day, and opium at night, with considerable relief for a short time. On December 8th I examined some of the water ejected from the mouth, but could not discover any cancer cells nor sarcina. She varied much, sometimes the stomach being excessively irritable and rejecting everything, at other times she was able to take food. On December 19th the tumour had not increased in size. She became more and more prostrate, and during the last month of her life suffered severely. She died March 26th. *On inspection* the body was much emaciated. There was extreme atrophy of the brain, notwithstanding the absence of cerebral symptoms. *Chest.*—At the commence-

ment of the œsophagus the mucous membrane began to present an irregular granular appearance, with one or two whitish tubercles about the size of pins' heads; passing downwards, these tubercles became more numerous, till nearly opposite the root of the lung an ulcerated surface was found, with a raised margin and partially sloughing; still lower in the canal than this ulcer the walls of the œsophagus were completely destroyed for about three inches, and the side of the right lung was in a sloughy condition; posteriorly the pericardium bounded this sloughy mass, and there was an opening, about the size of a sixpence, extending through that membrane, opposite the left auricle, which was slightly affected with granular cancerous growth at that part. Nearer to the stomach the walls of the œsophagus were again continuous, but infiltrated with cancerous product, and nearly in a sloughy condition. At the floor of the cancerous ulcer were several branches of the pneumogastric exposed; the right nerve could be traced down to the ulcer, and several branches were completely truncated; another branch of the right nerve passed obliquely across the ulcer to the opposite side, to join the left nerve. On the left side a branch was also observed to be truncated, and another ran for about two inches exposed in the sloughy tissue. The branches to the lungs were entire, and were situated above the cancerous growth. The ulcer in the œsophagus presented the elements of epithelial cancer. Cancerous tubercles of epithelial nature were found in both lungs, with some iron-grey pneumonia at the left apex. *Abdomen.*—In the stomach, near the œsophageal opening, was a raised tubercular growth about half an inch in diameter; it was ulcerated at its apex; its section showed that it principally involved the mucous membrane, but was extending into the muscular coat beneath. Some large nucleated cells were observed in the raised edges of the growth, and degenerated gastric follicles; some of the follicles were much enlarged, containing highly refracting particles, others contained nuclei. The rest of the mucous membrane and the pylorus were healthy. The head of the pancreas formed the hard mass which had been felt at the scrobiculus cordis; it was hard and white, and microscopically epitheliomatous. The adjoining lymphatic glands were infiltrated and adherent; the lesser curvature of the stomach was also adherent; the rest of the pancreas was normal. On the adjoining surface of the liver was an irregular tubercle, evidently produced by contact, and in the substance were several other small tubercles, but consisting of the same epithelial elements. On the right side the cancerous infiltration extended to the right semi-lunar ganglion, which appeared to be infiltrated with cancerous product, cancerous cells being observed among the ganglionic cells. There were cancerous tubercles in both supra-renal capsules, but only involving a small portion of the organ. The kidneys were granular, very small, and only four ounces in weight. The cavity of the uterus was occupied by two soft polypi, and a large dense tumour, about three inches in diameter, was found in its walls; the tumour was dense and fibrous and calcareous, but did not present any trace of cancerous elements. (See Preparation 1799[33]).

In this case the diagnosis was obscure, on account of the food being sometimes retained for several hours; and this symptom appeared to indicate disease of the stomach rather than of the œsophagus. A tumour could also be felt at the scrobiculus cordis; the disease of the œsophagus was, however, too extensive to produce obstruction, the walls of the lower part of the canal being entirely destroyed; the injury of the pneumogastric was very extensive, and the exposure of its branches was probably the cause of the severe pain from which the patient suffered.

Case XIV. *Epithelial Cancerous Tumour in the Pharynx, closing the entrance into the Œsophagus. Effusion of False Membrane in the Larynx and Trachea. Acute Bronchitis.*—Charlotte W—, æt. 32, was admitted under Mr. Cock's care, February, 1856, and died March 6th. She had been out of health for a year, but for three months she had experienced very great difficulty in swallowing, and for several days it had become almost impossible to swallow anything except a small quantity of fluid; and the attempt now led to regurgitation through the nares. The effort of swallowing did not produce urgent dyspnœa. Respiration on admission was easy and normal, but there was slight hoarseness. On examining the chest, the respiration was found to be less free at the right apex. At the left side of the neck, below the angle of the jaw, was a prominent round tumour about one inch in diameter; it could be partially separated from the structures beneath. Mr. Cock attempted to pass a small bougie, but this was found to be quite impossible. The tumour in the throat could neither be seen nor felt. A short time before death very urgent dpspnœa came on, and she died from apnœa. At the lower part of the pharynx, attached to the cricoid and arytenoid cartilages, or rather the mucous membrane opposed to them, were four round tumours closely placed together, or rather one lobulated growth, extending as high as the upper margin of the epiglottis, and quite occluding the opening into the œsophagus. After removal, a probe could only be inserted by slowly passing it round the growth. The soft palate was considerably thickened. The inner surface of the epiglottis, of the larynx, and of the trachea, was covered by a layer of easily separable false membrane; the bronchi, especially the larger ones, were full of tenacious mucus. The tumour in the neck was soft, and of a pale yellow colour. All other parts were normal. On examining the growth from the pharynx, its base was found to consist of large cancer cells, containing a large granular nucleus, and the cells were closely arranged together. The growth in the neck had a similar structure. The surface was not ulcerated, but presented epithelium, which was normal in some parts. The appearance of the papillæ has been previously referred to; some were in a normal condition; in

others, the central capillary was obstructed, and some were still more degenerated, closely resembling brood cells. (Prep. 1785[76].)

The obstruction at the commencement of the œsophagus in this case was mechanical, and the cause of death secondary laryngitis. The diagnosis of tumour was easy, but it was found to be quite impossible to pass any instrument beyond the growth. Many instances of non-cancerous polypi are recorded, and some may be removed by operation; in this case the growth was too low to be reached, and its character was less suited for operative interference.

Case XV. *Carcinoma of the Œsophagus, communicating with the Trachea. Cancer of the Lung and of the Kidney.*—Catherine S—, æt. 38, admitted under Dr. Barlow's care, April 9th, 1856, and died April 17th. She had been a servant in a family for twenty years, and began to suffer from her present illness about six months before her death. On admission she was in a state of great emaciation, and the dysphagia was extreme. The attempt to swallow food was at once followed by the regurgitation of it through the nose and mouth. The circulation was exceedingly feeble, and Dr. Barlow feared lest gangrene might come on. She appeared to die from exhaustion. The body was much emaciated. In the neck, on the left side, was an enlarged cervical gland, about one inch in diameter, firmly adherent to the œsophagus and to the trachea; a smaller gland was situated on the right side; the former tumour could be felt before the division of the skin. The lungs did not collapse freely. On dividing the trachea an opening into the œsophagus, somewhat oval in form, slightly pointed above and below, and about one inch and a half long, was found immediately above the division into the bronchi; the edges of this opening were thickened and slightly irregular. The corresponding part of the œsophagus in its whole circumference presented a nodular surface for three inches in length. The edges were raised and irregular, and the surface ulcerating, and there was slight vascular turgescence of the mucous membrane. Several cervical glands which were adherent to the œsophagus were infiltrated with cancerous deposit; they were of a firm consistency, and were white in colour, but in the centre yellow. Other glands at the root of the lung were not all infiltrated. The bronchi were intensely congested, and contained much dirty grumous fluid. The lower lobes of the lungs were much congested, and the right contained beneath the pleura a small mass, about half an inch long and a quarter of an inch broad, composed of yellowish-white cancerous substance. The left renal vein was filled with adherent clot, and its walls were considerably thickened. In this kidney were several cysts, and a minute tubercle composed of elements resembling the other cancerous structures. On examination of the œsophageal ulcer a small quantity of juice from the section presented numerous nuclei, and in the section some epithelial

plates, cells with large nuclei, and caudate cells. It also presented some elongated nuclei and fibres, some of which had a curved arrangement enclosing nuclei and brood cells. The raised edges of the ulcer were composed of masses of these nuclei and cells, with some intervening elongated nuclei and fibres, and on the addition of acetic acid some elastic coiled fibres were observed. The growth in the lung presented similar aggregations of nuclei. The cervical glands were of a much firmer texture, and much fibrous tissue was observed in them, forming irregular interspaces, in which nuclei were found. The central portions were yellow, and contained highly refracting granules (degenerating cancer). The great number of large nuclei resembled those found in medullary cancer, and this case appeared to be almost intermediate between medullary and epithelial disease.

Case XVI. *Cancer of the Œsophagus. Extension into the Lung. Gangrene.*—James S—, æt. 57, was admitted under my care into Guy's Hospital May 12th, 1858, and died June 4th. For many years he had been a coachman, and temperate in his habits. In 1832 he had been ill for six weeks with pain across the chest, and for many years he had had cough. Eight weeks before admission, on attempting to eat, he felt that he was unable to swallow, and from that time he could take no solid food; the food seemed to pass as far as the scrobiculus cordis, and was then rejected. He was a pale and emaciated man; the thoracic viscera were normal, the abdomen was supple, and no tumour could be detected, but pulsation was very distinct at the scrobiculus cordis. The superficial epigastric veins were slightly enlarged; he complained of weakness and vertigo. On the 21st he had gaseous eructations, which increased the dysphagia. On the 25th food was instantly rejected, and the vomiting produced a "cutting" pain in the epigastrium; at other times the pain was of a dull character. When unmixed with food the rejected matters consisted of tenacious mucus. He died June 4th. On *inspection* the termination of the œsophagus was diseased. For the space of an inch there was cancerous deposit infiltrated into the mucous and submucous tissues, as also into the muscular layer. The canal was much contracted, so that a small probe only could be passed. On the right side the growth was adherent to the lung; the cancerous tissue was at that part ulcerated, and communicated with the lung tissue, which was in a sloughing state. The upper lobe of the right lung contained pneumonic deposit and several small cavities. The other viscera, and the lymphatic glands were in a healthy state. The examination of the growth showed much firm fibrous tissue, and some cells of epithelial cancer.

Case XVII. *Cancer of the Œsophagus. Pneumonia. The Pneumogastric Nerve involved.*—John D—, æt. 71, was admitted into Guy's Hospital, on January 26th, 1859. For two years he had been under observation, and he had also previously been in the hospital. The difficulty in swallowing, and the emaciation, had increased to an extreme degree, but he was able to get some food down until two or

three days before his death, when the symptoms of pneumonia came on On *inspection*, eleven hours after death, the body was found to be much wasted. The œsophagus was contracted one inch above the bifurcation of the trachea, the walls were thickened, and there was adventitious deposit effused in a circumscribed manner in the submucous cellular tissue. Some of the neighbouring glands were slightly infiltrated. There was pleuro-pneumonia of the left lung, the whole being grey and solid, with a dark-coloured grey fluid exuding from it; but there was no sloughing. The left pneumogastric was involved in the diseased structure of the œsophagus. The heart and liver were healthy; so also the gall bladder and the ducts. The kidneys were degenerated, only five ounces in weight, and they contained a few cysts. The diseased œsophageal substance consisted of fibrous and elastic tissue, squamous epithelium, large nuclei and cells in considerable quantity, aggregated in clusters; and some of these clusters of cells were limited by membrane, as if forming part of a glandular structure.

Case XVIII. *Cancer of the Œsophagus. The left Pneumogastric involved. Pneumonia.*—William E—, æt. 50, was admitted July 30th, 1856, under Mr. Callaway's care, and died September 18th. He had suffered from dysphagia for six months, and could not swallow solids. He had cough, and expectorated tenacious mucus. His cough and expectoration became worse, and the lung tissue involved. During the last week of his life he swallowed with more ease. The ulceration in the œsophagus extended from the cricoid cartilage to the bifurcation of the trachea; the edge was well defined, raised, and yellowish; the central part was ulcerated, and the whole circumference of the œsophagus involved; in front, the cartilages of the trachea were exposed, and immediately above the bifurcation was an opening about the size of a sixpenny piece, with irregular serrated margins. The ulceration extended downwards and outwards, and was closely connected with the external surface of the left bronchus; it had involved the pneumogastric nerve on that side, one of the larger branches of which was completely destroyed. Posteriorly, the vertebræ formed the boundary of the ulceration. The greater part of the lower lobe of the left lung was in a state of grey hepatization, and towards the apex there was some iron-grey hepatization, with whitish tubercles. These tubercles appeared to be of a cancerous character. In the right lung was another small mass of condensed lung. There was slight infiltration of the adjoining bronchial glands. On microscopical examination both the ulcer and bronchial glands were found to be epitheliomatous.

The more easy deglutition during the last week of life is possibly explained by the extension of the ulcer having destroyed the whole of the circumference of the œsophagus and also the nerves, and thereby preventing any spasmodic obstruction. The pneumonia of the left lung was no doubt

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accelerated by the injury to the nerve on that side; but it must be borne in mind that the cancerous growth extended to the left bronchus.

Case XIX. *Cancer of the Œsophagus. Communication with the left Bronchus. The Pneumogastric involved. Old Vomica in the Lung. Extension of Disease through the Diaphragm.*—George W—, æt. 53, was admitted, under my care, September 3rd, 1856; he was emaciated and grey; he had been a blacksmith at Chatham, and on the day of admission came from the North Foreland. Until six weeks before, he had enjoyed good health; at that time he experienced pain in swallowing food, especially solids, which were almost at once rejected. He had pain across the sternum. On the 6th, he became more prostrate; the hiccough was distressing; the motions were black; and he brought up brownish-coloured blood; he gradually sank, and died on the 8th, at 2 a.m. *Œsophagus.*—Two or three inches from the commencement of this canal were several small ulcerated surfaces, of a pale yellowish colour, with central depression; an inch further the whole of the walls of the œsophagus were destroyed, and the margin defined; beyond this part was an irregular flocculent grey tissue, floating out when placed in water; it was formed upon a dense fibro-cartilaginous base, firmly adherent to the trachea, aorta, and other tissues; an inch from the left bronchus was a circular opening, about three quarters of an inch in diameter, forming a communication between the œsophagus and the bronchus; the latter tube contained a flocculent grey mass, which almost obstructed it. Some of the bronchial glands were partially infiltrated. The pneumogastric nerve extended into the dense tissue at the base of the ulceration, and some of its branches were exposed at the floor of the ulcer. The destruction of the œsophagus extended to the diaphragm, and the ulceration passed through it, so as to form an irregular sloughing cavity below that muscle, bounded by the stomach, by the cellular tissue, by the large vessels, and partly by the left lobe of the liver. The cardiac opening into the stomach remained in its normal condition, and near it was a second opening from the abscess just mentioned. The ulceration also extended into the liver. The branches of the sympathetic were partially destroyed, but could not be satisfactorily dissected; some of them were very hard, but on microscopical examination, nerve fibre, apparently undegenerated, could be detected. The coronary artery of the stomach was obstructed by clot; some of the glands at the lesser curvature of the stomach were infiltrated. The ulceration almost extended into the thoracic aorta; that vessel was exceedingly diseased, from atheromatous and calcareous deposit, and in two parts had a greenish appearance; there seemed to be a minute communication beneath a bony plate with the ulcer in the œsophagus, but no probe could be passed. On examining the upper margin of the œsophageal ulcer, large cancer cells were detected and some nuclei; the surface of the flocculent growth consisted of pointed

processes filled with granules, sometimes several proceeding from one trunk. The stomach was excedingly contracted and of hour-glass form; the mucous membrane was healthy. The left lobe of the liver, which was somewhat enlarged, almost obscured the stomach; the liver itself appeared healthy, its weight was 3 lbs. At the apex of the left lung was an old vomica, surrounded by iron-grey lung and calcareous deposit; its lining was smooth, and it was capable of containing about ℥ss of fluid. The pleura, on the left side, was universally adherent; on the right side it was partially so at the apex. The right lung also contained a small vomica, but there were no tubercles in it; a small, white, dense tubercle was situated beneath the right pleura. The remaining part of the lungs was œdematous. The pericardium contained an excess of fluid; the heart and its valves were healthy; the weight of the heart was 9½ ounces. The kidneys were atrophied, and contained several cysts.

The pain at the sternum, the difficulty in swallowing solids, the emaciation, the cachexia, the age, all indicated organic disease of the œsophagus. The general bronchial râles pointed to some communication having been set up; and this was believed to be probable. There was no pain at the scrobiculus cordis, nor was there any apparent indication of the abscess which existed. The prostrate condition of the patient had prevented the development of more manifest peritonitis.

The disease had, probably, existed for a longer period than six weeks, if we judge by the destruction of nearly the whole œsophagus, and the firm character of the tissue which bounded it. It was evidently cancerous, although no other parts except those in immediate contact were affected. But the villous and flocculent character of the growth, with evident cancer cells at the margin of the ulceration, appeared to indicate that it somewhat differed from ordinary epithelial cancer. The small vomica at the left apex was not diagnosed; it had remained in a passive condition, but its association with cancerous disease was an exceedingly interesting phenomenon. It is doubtful whether any blood oozed from the aorta, or whether that effused was from the coronary artery of the stomach.

The stimulants and food probably passed into the cavities which had been formed in the mediastinum, and tended rather to irritate than to produce effectual benefit. Nothing more, however, could have been done, except, perhaps, by the

use of nutrient injections; but as the patient could swallow fluids and retain them, these means appeared scarcely to be called for.

Case XX. *Cancer of Œsophagus. Pneumogastric Nerves truncated. Sloughing extending through the Lung and through the Diaphragm.*—John H—, æt. 45, was admitted into Guy's Hospital February 17th, and died March 2nd, 1858. He was a tall, emaciated man, who had been ill for several years. He had no dysphagia, but the food was generally rejected at once; sometimes, however, it was retained. He had no pain between the shoulders, nor on pressure at the region of the stomach. He gradually sank. *Inspection.*—In the right lung the lobules were consolidated very generally, and were infiltrated with offensive serum. At the root of the lung, below the vessels, was a circumscribed slough communicating with the diseased œsophagus. The left lung was affected in a similar manner, but in a less degree. *Œsophagus.*—At the root of the lung the tube was irregularly truncated, and a large sloughing cavity was formed, bounded by the lungs; the cavity was encroached upon anteriorly by the posterior surface of the pericardium. At the lower part the diaphragm had sloughed; and the sloughing cavity was limited below by the pancreas, by the anterior surface of the stomach, and a small portion of the liver. The pneumogastrics were both truncated. In the stomach, at the cardiac orifice, there was an irregular infiltration of the mucous membrane by cancerous product, and two openings extended into the sloughing cavity before mentioned; these openings were bevelled on their inner aspects. The rest of the stomach was healthy. There was no glandular enlargement, nor disease of the spleen, liver, intestines, &c. The pericardium was adherent, the heart small, the valves healthy.

The physician who had the care of this case regarded it as one of pyloric disease, on account of the remarkable absence of pain and difficulty in swallowing, after the patient came under observation in the hospital. This immunity probably arose from the manner in which the œsophagus and its nerves were truncated.

Case XXI. *Medullary Cancer of the Œsophagus. Chronic Pneumonia. Vomica. Acute Pneumonia.*—William G—, æt. 69, had been an attorney, but he had become reduced in circumstances; for twelve months he had had cough and shortness of breath, sometimes palpitation of the heart, but no hæmoptysis; for twelve months also he had pain across the chest, but no expectoration; his health continued tolerable till two months before I saw him, when he first experienced difficulty in swallowing; this gradually increased in severity, so that he was only able to swallow liquids, and that with considerable pain. The pain was situated about the level of the third rib, at the sternum, the sensation being as if a

foreign body was retained at that part; the ability to swallow was occasionally relieved, but never completely so. There was evidence of old disease at the apex of the right lung, and acute bronchitis with it; with these were associated tolerably clear evidence of organic disease of the œsophagus, probably cancerous. In this condition he was admitted into Guy's; he was requested not to attempt to swallow, for this effort produced spasmodic contraction of the œsophagus; several nutrient enemata were given. The following day he swallowed with greater facility, and could take beef tea, eggs, and milk, with a little brandy; his cough, however, was more troublesome; the sputum was purulent, nummulated, and, on microscopical examination, presented no evidence of cancer cells, but some curved elastic fibre, resembling lung structure, and large inflammatory granule cells. After admission no food or milk was vomited. He continued in the same state for some time, but gradually sank in about two months, death being preceded by occasional delirium. *On inspection*, the lung was found to be very firmly adherent to the right apex, and a thick dense layer of fibrous tissue was with great difficulty separated; the whole of the right pleura was destroyed; on making a section of the right lung, a small vomica was found at the apex surrounded with iron-grey lung, the surface was smooth; the lower lobe was in a state of hepatization. The lower lobe of the left lung was also pneumonic; the pleura over it being covered with a thin layer of lymph. Some of the bronchial glands were slightly infiltrated with cancer, but there was no evidence of cancer in the lungs.

In the *œsophagus* was an ovoid mass, about six inches in length and one in thickness, attached at the root of the lung, and reaching nearly to the cricoid cartilage; the canal was dilated; the mass was of a pale yellowish colour, and was softened in the centre; it was attached only to one side of the tube, and no smaller tubercles were observed on the mucous membrane; no communication with the trachea nor bronchi existed; the tumour consisted of nuclei and nucleated cells resembling medullary cancer; none of the brood cells usually found in epithelial cancer were observed. The pneumogastric nerves were free, and the disease appeared to have commenced in the mucous membrane. The heart was healthy; so also the abdominal viscera; the intestinal canal was much contracted, but contained solid fæces. The liver was slightly congested, and the gall bladder was much distended.

The existence of a disease so closely resembling pneumonic phthisis, as that found in this case was very interesting, when we consider it in connexion with the cancerous disease of the œsophagus, and with the age of the patient. It was my opinion, during life, that the disease in the œsophagus had extended into the bronchi, but this was not found on inspection. The only other disease which appeared

to be probable as a cause of the dysphagia was aneurism; but the persistence of the dysphagia in every position, and the absence of other signs of aneurism, led me to believe that the obstruction was of a cancerous character. If the patient had been much younger it might easily have been supposed that the case was one of ordinary phthisis, with severe ulceration about the larynx and epiglottis: we had evidence of chronic disease of the lung, with acute disease; and in phthisis the dysphagia is sometimes exceedingly severe and distressing; but the patient did not lose his voice, the food was never regurgitated through the nose, nor did it produce spasmodic cough; the obstruction was evidently below the epiglottis.

No attempt was made to explore the œsophagus with any bougie or tube; the danger and discomfort which would have arisen from it, did not warrant such an attempt being made. The use of nutrient enemata, even for a single day, removed the very urgent dysphagia which existed on his admission. The patient had previously tried to swallow, till he found himself exhausted.

Case XXII.—*Cancer of the Œsophagus. Artificial Opening made into the Stomach.*—Walter H—, æt. 47, was admitted into Guy's Hospital October 8th, 1857, under my care. He had resided at Tunbridge Wells as a stableman, was of ordinary stature, light complexion, and moderately nourished. He stated that for sixteen years he had had winter cough, but that he had never had dropsy. On admission there was considerable dyspnœa; the lips purplish; the pulse compressible, but regular; the chest was resonant on percussion, and the respiratory murmur indistinct; distant prolonged expiratory murmur was everywhere audible, with some sibilant râle; the voice was also indistinct, and tactile vibration diminished. The heart-sounds were regular and normal; the expectoration frothy and moderately abundant. The abdomen was moderately full and rounded, and there was a small hard gland felt about the anterior margin and upper part of the sterno-mastoid muscle. After he had been in the hospital for a short time, he began to complain of severe pain in the throat during coughing; but, on carefully examining the part, nothing could be perceived. In a few weeks pain was also produced in swallowing, especially when solids were taken, and the cough continued unrelieved. On December 14th, he continued to suffer severely, and became more anæmic; the countenance was expressive of great distress, and the mind irritable; deglutition had become very difficult, so that he could only take fluid forms of food, and some stimulant. The cough also was very troublesome, producing very

severe pain in the throat; it was violent, and small drops of blood were spirted out in the act of coughing; the expectoration was thin and watery. The chest continued resonant; respiration was very feeble; on the left side it was indistinct, and the expiratory murmur was prolonged; the larynx was free in its movements. Nothing could be seen in the throat, except slight œdema and redness towards the right side. The gland at the angle of the jaw remained of the same size; the pulse was compressible; the tongue clean; the bowels confined. Various means were tried, as conium and carbonate of soda, with hydrocyanic acid, steel, &c. The bowels were acted upon by colocynth and henbane, by magnesia mixture, or by injections. Counter-irritation was applied to the throat—hot-water fomentation, or cataplasms, blisters, &c. The inhalation of steam afforded some relief, but still more the smoking of stramonium leaves. Tincture of aconite, applied externally, was also of some benefit. Mr. Cooper Forster examined the throat for me, but could not detect any cause of obstruction. The patient continued during January and February without any improvement, the emaciation increased, and both respiration and deglutition became more difficult, especially the latter. Morphia was occasionally given, and stramonium inhaled, affording partial relief. On again examining the throat, Mr. Forster felt below the epiglottis, towards the right side, a rounded tumour, which was evidently obstructing the commencement of the œsophagus, and he believed that its surface was ulcerated. The respiration, although noisy and accompanied with a loud inspiratory sound, was not hurried, and sufficient air appeared to enter the larynx. The propriety of performing tracheotomy was discussed, but it was decided that no benefit was likely to accrue from it. The examination of the growth in the throat was followed by temporary relief, and the patient was able, for three or four days, to swallow solid food. The stramonium and other remedies were continued, and nourishment was given in any form that could be taken. On March 1st the emaciation was very much increased. During inspiration a loud noise was produced in the throat; and this sound had for some weeks been increasing in intensity, so that he had been unable to sleep for several nights, on account of the "roaring," as he termed it. His voice had become more feeble, but the cough had almost ceased; he could only swallow fluids, and those very slowly; his nourishment latterly had consisted of milk and rum, with eggs. Deglutition was much relieved for two or three days by two small blisters applied on either side of the larynx; but it again became so difficult that nutrient injections were resorted to. These injections, by allowing the throat to rest, had enabled him to swallow with more comfort. The pulse was very compressible and small; the bowels occasionally constipated. March 2nd.—The respiration became more difficult, and by the advice of Mr. Stocker tracheotomy was performed. The incision was made as low as possible, but the trachea appeared flattened from behind, and the patient could not bear the insertion of the tracheal tube; when it was attempted he appeared to be quite incapable of breathing. The operation did not

afford relief, and a deep-toned rhonchus could be heard in the lungs. There was no congestion of the face; the pulse was very compressible; the cough slight; he was able to get down his rum and milk, and some blanc-mange, &c. On the 9th he was breathing more comfortably; the opening in the throat was patent, and thin pus covered the red margins of the wound; there was also less noise on inspiration. 24th.—The emaciation and prostration of strength increased; his bones appeared barely covered with thin skin, and the face expressive of starvation. He said "he was famished." He endeavoured to relieve his distressing thirst by moistening the mouth, but for four days he had not been able to swallow a drop of fluid. The attempt to swallow at my request was preceded by much hesitation and preparation, and was followed by a paroxysm of severe coughing. The expectoration had changed in character, and had become muco-purulent. On examining the chest sibilant râles were everywhere faintly audible. There was no dulness on percussion, but preternatural resonance. The voice was very feeble and scarcely audible; the pulse slow and very compressible; the tongue clean; the larynx was moveable; the gland at the angle of the jaw had not enlarged; the opening in the skin made during tracheotomy remained open, and the skin was undermined, there being evidently no power to repair the wound. The abdomen was exceedingly contracted, the pulsation of the aorta being visible, and the arteries most distinctly traceable. There was no evidence of enlargement of the liver, nor of disease of the abdominal viscera. He complained of pain towards the right side, and tied a handkerchief firmly around him to relieve the sense of hunger. The skin was dry. He passed about a pint and a half of urine during the day. The sleep was tolerable; the mind clear and active. Nutrient injections of beef tea, eggs, and rum, thickened, if possible, with flour, had been given, at first four times and then six times a day. Milk also was ordered, and ℥v of tincture of opium were added to each injection. On the 25th he appeared to be sinking, and the rectum ejected the enemata almost at once. His hands were cold, but he complained of a sense of heat.

It now became a question whether life was to be allowed gradually to die out, or an attempt to be made by any other means for the introduction of food; the patient appeared to have chronic bronchitis, with epithelial cancer at the commencement of the œsophagus, possibly extending into the trachea, and death threatened from inanition. Three modes of relief suggested themselves—1st, the forcible introduction of an œsophageal tube; 2nd, opening the œsophagus in the neck; and 3rd, opening the stomach. In reference to the first, there was evidence of a growth at the commencement of the œsophagus; and the trachea appeared partially compressed, as shown in the operation of tracheotomy. The

disease in the throat was probably of the form of epithelial cancer, and the passage of a bougie must have been constantly repeated. The great irritation and coughing produced by attempting to swallow, showed that the epiglottis was extensively ulcerated; or, that there was a communication between the œsophagus and trachea, which would render the passage of a bougie very dangerous. In some cases of cancer of the œsophagus, a bougie has been passed into the pleura, and led to a speedy death; and probably the passage of a bougie could not have been effected; this decided against the first proceeding. As to the second, namely, opening the œsophagus, since a very frequent seat of cancer in that tube is opposite to the root of the lung, about the third dorsal vertebra, and consequently beneath the position at which the canal could be opened, the operation would have been very formidable, dangerous, and even useless. The third proposition, that of opening the stomach, appeared to be the only operation which could possibly relieve the patient.

Wounds of the stomach, as that of Alexis St. Martin, the cases recorded by Mr. South and by Dr. Murchison, &c., showed that life could be continued after a fistulous communication had been thus made. The operations on the lower animals proved that it could be performed with some probability of success; such an operation would give a chance of prolonged life, where death was otherwise certain; and where the peritoneum was healthy, there was less danger than in abnormal conditions of that membrane. If life were prolonged only for a short time, and food introduced, there would be relief to the distressing thirst and the fearful sense of starvation: and, lastly, it was evident that the patient was dying from inanition rather than from the disease, nutrient enemata being refused. On the other hand, however, I felt that the disease was probably of a cancerous character, and would sooner or later terminate life; that the operation was a hazardous and uncertain one; and that life might possibly be continued for a few days by a small portion of the injection being retained. After carefully weighing these facts, I asked the assistance of my colleague, Mr. Cooper Forster, and if he considered the operation of opening the stomach through

the anterior abdominal parietes, for the purpose of introducing food, a feasible and warrantable one, I decided that it should be attempted. The operation was accordingly performed, and the stomach was opened by an incision commencing at the extremity of the eighth rib, and the edges were stitched to the wound. March 26th.—The operation took place about half-past 2 p.m., and was borne without a movement on the part of the patient. The pulse, which before the operation was 62, and exceedingly compressible, rose to 116. Six drachms of milk with part of an egg were introduced through an elastic tube into the stomach. At twenty minutes past 3, about two ounces more milk and egg were introduced; the patient then complained of feeling a sense of heat, but appeared comfortable. He was now removed to bed. At 4 p.m. the pulse was 120 and still very feeble; it was decided to introduce every half hour, if the patient were awake, two ounces of milk and egg, and every second time two drachms of rum with it. At 9 p.m. he was comfortable; there had been slight pain in the left side; the pulse was fuller, 124; the skin less parched; and he had slept occasionally for a short time. Messrs. Greenwood, Gayleard, Owen, and Tuck, kindly volunteered to remain with him in rotation. During the night he had four hours' sleep; he passed urine, and there were three slight watery evacuations from the bowels. 27th.—About 10 a.m. he coughed violently, and the contents of the stomach were forcibly ejected through the wound. His pulse continued 120. At 1 p.m. he was cheerful, his eyes more bright, his voice stronger, the skin less parched, his tongue moist, thirst and the sense of starvation relieved; he had pain in the left side; the pulse 120, and very compressible; his hands were cold, feet and legs warm; the coldness of the hands had been very marked for several days. The operation had evidently mitigated his suffering. At 1.30 p.m. half an ounce of rum, with sugar, and an ounce and a half of water, and fifteen minims of lemon-juice were given. The stomach received it well, contracting upon the tube. He said that it produced a comfortable sense of warmth throughout the abdomen. At 3.30 the pulse was firmer and fuller than at 1 o'clock, and the hands warmer. Since the operation, during the twenty-

four hours, he had six eggs, beaten up in twelve ounces of milk, given in small divided doses, with four ounces of rum. Milk and egg, or beef tea thickened with flour, were ordered every half hour, and occasionally half an ounce of rum, as just mentioned. At 8.30 p.m. faintness came on, the face became cold and perspiring; pulse 136, and scarcely to be felt. The stomach appeared to have lost its power of contracting on the food introduced.

Stimulants were ordered to be given repeatedly and freely, with nourishment as before; and two or three times, as a stimulant, ɱxx of tincture of sesquichloride of iron. During the night he was evidently sinking, the pulse sometimes became scarcely perceptible, but rallied after stimulants were introduced. On the 28th he slept for a short time about 10 a.m., and expressed himself as comfortable, but gradually became unconscious, and died at 10.45, rather more than forty-four hours after the operation.

The *inspection* was made twenty-eight hours after death. The body was extremely emaciated. The head was not examined. At the lower part of the neck, immediately above the sternum, was the wound made in tracheotomy, gaping and undermined, and on the trachea a few drops of pus. At the left hypochondrium was the opening made by the operation of gastrotomy also enlarged by the plug which had been introduced a few hours before death. The mouth and soft palate were healthy, also the epiglottis. At the posterior surface of the cricoid cartilage there was a growth connected with the mucous membrane, about a quarter of an inch in elevation, and extending from side to side, soft and slightly injected; passing downwards, there was irregular ulceration, and towards the trachea destruction of all the coats of the œsophagus; on either side and below, the ulcer was bounded by a sharp undermined edge. The cellular tissue of the trachea and its muscular fibres were destroyed for about half an inch; the mucous membrane was bare, and perforated by a small opening about one sixteenth of an inch in diameter, so that fluid could pass from the œsophagus into the trachea; below the ulcerated surface in the œsophagus the canal was much contracted by infiltration into the surface of the mucous membrane; the passage was so much diminished at this part

that a probe could only be passed after death, and it was probably quite impervious to fluids during life. The constriction was situated at the level of the first bone of the sternum. The rest of the œsophagus was healthy. One or two glands in the neck were infiltrated and diseased, but none of the mediastinal or other glands. The rima glottidis was free; the vocal cords and aryteno-epiglottidean folds were quite healthy; so also was the trachea. The bronchi contained thick tenacious mucus. The pleura on the left side was healthy; on the right, there were general, but not firm adhesions. The lungs were both much distended with air; they were pale, emphysematous, and covered the heart. At the right apex the lung-tissue was puckered; there were numerous lobules of iron-grey consolidation, with intervening crepitant lung, but no disorganization. The lower lobe of the right lung afforded a beautiful specimen of emphysema, but there were numerous grey tubercles studded in small clusters; they were non-cancerous. The lower lobe of the left lung was much congested, and one or two lobules were softened and breaking down from acute changes, which took place, probably, a very short time before death. There was no enlargement of the bronchial glands. In front of the surface of the heart was a small collection of pus, only a few drops, apparently from the inflammation of a small gland. The pericardium and heart were healthy; the heart was contracted and firm. On opening the abdomen, the intestines were found contracted; *the peritoneum was healthy; no inflammation, as shown by effusion of lymph, serum, or diminution of the normal smoothness, could be detected.* The stomach was partially distended; it was situated lower than usual, and its anterior surface was looped up to the opening in the anterior abdominal parietes made by Mr. Forster at the linea semilunaris. The mucous membrane of the stomach was pale, slightly injected at the opening. On gently drawing aside the stomach at the opening, the opposed serous surfaces were found slightly adhering. The small intestine was healthy throughout, but atrophied; the food introduced had only passed four feet down the intestine; below that point the intestine was exceedingly small. The lower part of the ileum was healthy. In the colon there were several

patches of congested mucous membrane. The gall-bladder was distended, the liver healthy, so also the kidneys; the spleen was very small. There was no evidence of any cancerous disease affecting any part except the œsophagus and one or two adjoining glands.

It is probable that chronic disease of the right apex had existed for a long time, so also the emphysema of the lungs. Other miliary tubercles were perhaps of recent deposition. The lobular consolidation and congestion of some parts of the left lower lobe of the lung were evidently only of very brief duration. As to the cause of the cancerous disease we have no evidence; it was probably of about six months' duration; its existence with chronic disease of the lung is a fact of some pathological interest. The microscopical examination of the growth in the neck presented the form of cells commonly observed in epithelial cancer.

In reference to the diagnosis in this case, it was evident at the time of admission that the patient had chronic disease; he had had cough for fifteen years; there was, however, no evidence of serious obstruction to the heart or to the portal circulation; the dysphagia was then a new symptom. The examination of the chest did not give any indication of phthisis, the respiration was exceedingly feeble at the apices, but there was no dulness on percussion, and the voice was diminished rather than increased in resonance; at the bases the expiratory murmur was prolonged; it appeared probable that there was no marked consolidation of the lung, but rather that the feebleness of the respiratory act was due to emphysema. The question arose, whether there was any pressure on the right bronchus, but of this there was no proof; the respiration at the right base was as strong as at the left, and there was no increase of resonance at the right apex, though the respiration was less distinct. As to the cause of the dysphagia, it was naturally suggested whether it was a case of phthisis, in which the principal disease manifested itself in the throat, by ulceration of the epiglottis. I have several times observed in severe ulceration of the epiglottis very severe dysphagia; and the condition may be mistaken for obstructed œsophagus. Few, however, would have had that idea in this case, for there was wanting

at the early stage the raucedo of phthisis; and the difficulty in swallowing was evidently at a later stage of the process than that produced by ulceration of the epiglottis: there the attempt to swallow is scarcely commenced before the food is ejected, often through the nares; here, it passed beyond, there was no such ejection of food, but rather severe pain, and that extending to the ears. The blood also which was spirted out during coughing was not as we observe it in ulcerated larynx, but was evidently from the pharynx. Subsequently a tumour could be felt at the commencement of the œsophagus. The emaciation was not that of simple phthisis: there we generally have a rounded abdomen, and often more or less diarrhœa; here there was uniform constipation and collapsed abdomen. There was no evidence of syphilis to account for the affection of the throat, nor of aneurism. It was presumed that the affection of the pharynx and œsophagus was of the form of epithelial cancer; the enlarged gland in the neck confirmed this idea, and there was nothing to indicate any such disease of other viscera. As to the prognosis, that was from the first unfavorable, but it was not for several weeks anticipated that such serious disease of the throat would present itself; all idea was then given up of ultimate recovery. In the *treatment*, the object was to relieve the irritation of the bronchi and the engorgement of the portal system; and to strengthen the patient, meat diet was given. The excreting organs and glands were acted on by squill and blue pill, by purgatives, &c. The spasmodic contraction of the bronchi was relieved by conium, alkalies, hydrocyanic acid, and stramonium. The pain produced by swallowing and coughing was most distressing, and sometimes kept the patient awake for several nights. Inhalation of steam afforded relief, so also the smoking of the leaves of stramonium. The application of nitrate of silver aggravated the distress; but small blisters on either side of the throat were productive of the greatest benefit; tincture of aconite also, applied externally was more palliative than chloroform; morphia administered internally produced transient composure; all these means, however, could not check the progress of the disease. When it became necessary to resort to nutrient injections, life was fast ebbing away. It may be

a question as to what is most effective in such cases; beef tea thickened with flour, an egg, and a small quantity of rum were used. Sir W. Gull suggested the propriety of using pepsine mixed with the fluid, and since the rectum is incapable of rendering the aliment in a condition ready for absorption, it may be well deserving of trial. The longest period in which I have known a patient nourished by injections alone, was in a case mentioned by Dr. Barlow, in which for seventy days food was administered only in this manner. In my patient the rectum much more quickly refused injections. All other means of affording relief being taken away, as stated in describing the case, I was brought to the consideration of gastrotomy. I had previously ventured to suggest this operation in impending starvation, in cases of perforation or communication between the œsophagus and trachea, where deglutition is sometimes impossible. Death in these cases sometimes takes place simply from inanition. In this instance, it was well known that there was incurable disease, and that any operation which might be performed would only be palliative. It was submitted to the patient, that such an operation might be quickly fatal, or prolong his life for a few weeks; even with such a slight hope he most readily assented, so terrible was the sense of starvation and of thirst. These symptoms were relieved, and the horrors of such a death partially mitigated. In the treatment of the case after the stomach had been opened, it might have been well to have repeated nutrient injections by the rectum, and to have given food less frequently, although the quantity introduced at each time was only two ounces. There was fear lest the operation might suddenly terminate the flickering flame of life, and lest no rallying should take place; and afterwards, lest the sutures should give way, and thus the contents of the stomach be freely extravasated into the peritoneum. After twenty-four hours, faintness came on; the patient was evidently sinking, and any treatment would have been alike ineffective. Stimulants were given very freely, and at each time were followed by a slight revival in the action of the heart. There appeared to be nothing to call for the use of opium; at last, a small quantity of tincture of iron was administered, as being one of the most

powerful stimulants. The consideration of the complete particulars of this case leads to the conviction, that if the operation had been performed earlier more permanent benefit might have accrued. It was done with a comparatively trifling addition to the sufferings of the patient; it was effected with ease, without collapse or peritonitis; and the thirst and sense of starvation were relieved in a degree which were scarcely anticipated. In cases of equally advanced starvation death has ensued as quickly; and it is probable that had the operation not been performed, life would have terminated even more speedily. The patient would certainly have been deprived of the relief which for twenty-four hours he experienced. Under these circumstances we should strongly urge a repetition of this operation, if a favorable case were presented, but at an earlier period of the disease.

Mr. Forster has a second time performed this operation on a child for occlusion of the œsophagus from the action of caustic alkali; but so feeble had the child become that the stitches between the coats of the stomach and the skin gave way, and extravasation took place into the peritoneal cavity.

Since the publication of my former editions, the operation which was attempted for the first time to relieve obstruction of the œsophagus by opening the stomach has been performed many times, and the following table shows in each instance the nature of the case, the duration of the symptoms, the length of time that life was prolonged after the operation, and the cause of death.

During the time that this work has been in the press, my colleague Mr. Howse, has in two cases successfully performed the operation of opening the stomach; in one case a man suffering from extensive cancerous disease of the œsophagus survived a month; the patient was fed through the parietes, and death was occasioned by the extension of the cancerous disease and by gangrenous pneumonia. The second case is still more recent (July, 1878), but the patient is doing well, and the fistulous opening into the stomach is well established.

Table of Cases of Gastrotomy.

No.	Sex.	Age.	Disease.	Region.	Duration of symptoms.	Duration of life after operation.	Cause of death.	Authority.
1	M.	67	Cancer	Commencement of œsophagus	10 months	40 days	Bronchitis	Sydney Jones.
2	M.	38	„	Root of lung	8 months	4 days	Peritonitis	T. Smith.
3	M.	40	„	Lower œsophagus	12 months	45 hours	Exhaustion	MacCormac.
4	M.	57	„	Root of lung	5 months	4 days	Exhaustion and peritonitis	Le Gros Clark.
5	F.	51	„	Pharynx	2 years	61 hours	Exhaustion	H. Lowe.
6	F.	52	„	Œsophagus	Some time	10 days	Septicæmia	Jacobi.
7	M.	52	„	„	5 months	15 hours	Exhaustion and peritonitis	Sédillot.
8	M.	58	„	Upper œsophagus	9 months	10 days	„	„
9	M.	55	Malignant tumour	Obstructing œsophagus	...	58 hours	Exhaustion	Fenger.
10	M.	47	Cancer	Below cricoid	5 months	44 hours	Mediastinal suppuration after tracheotomy	Forster and Habershon.
11	M.	4½	Stricture from alkalies	...	23 weeks	4 days	Peritonitis	Forster.
12	F.	44	Cancer	...	...	36 hours	Exhaustion	Sydney Jones.
13	M.	57	„	...	...	32 hours	„	T. B. Curling.
14	M.	61	„	Upper border of sternum	5 months	13 days	Broncho-pneumonia	Sydney Jones.
15	M.	70	„	Three inches below cricoid	Some months	16 hours	Exhaustion	Durham.
16	M.	56	Cicatricial stricture	Five inches below cricoid	12 months	56 hours	„	Totherick and Jackson.
17	M.	48	Syphilitic ?	Pharynx	4 months	5½ days	Acute pneumonia	Bryant and Habershon.

* Quoted by Mr. Durham.

* Durham, Gastrotomy, 'Holmes's System of Surgery,' 1870, vol. ii.

Of seventeen cases, then, all proved fatal, the greater proportion of them succumbing within a few hours, and only two surviving the risk of the operation itself. One of Mr. Sydney Jones's cases lived forty days and died of bronchitis. Another, under the care of the same surgeon, lived thirteen days. One patient lived ten days and died of septicæmia. Others only survived three or four days.

It must be noted, however, that 7 died of exhaustion, and these only show that the operation was done too late. They tell very little against the operation itself. In three others exhaustion had probably as much to do with the fatal result as the peritonitis. One patient died of bronchopneumonia.

It is also worthy of note that in Mr. Durham's article on Gastrotomy, seven cases of the operation were performed for the extraction of foreign bodies and these all recovered.

Professor Verneuil* records a successful case of gastrotomy performed upon a young man aged seventeen, in whom the œsophageal obstruction was due to the swallowing of caustic potash. The poison was taken on February 4th, and the stomach was opened on June 26th. In September he was convalescent.

Case XXIII. *Cancer of the Œsophagus. Sloughing. Perforation of the Aorta. Sudden and Fatal Hæmorrhage.*—Margaret H—, æt. 60, was admitted April 17th, 1861, under Dr. Wilks's care, in a prostrate condition; she made no especial complaint, but appeared to be worn out from hard work, rather than to be suffering from any positive disease. About a fortnight after admission, she spat up a little blood; but, on careful examination of the chest, no disease could be detected. Two days before death she again spat up a little blood, and appeared very prostrate. She rapidly sank. On inspection, a circumscribed sloughing cancer was found in the centre of the œsophagus; the disease extended into the mediastinum, and involved the lung on the left side. The sloughing had extended into the aorta; the walls of the vessel were perforated, and the stomach was distended with blood. It could not be ascertained that she had ever suffered from dysphagia.

The diagnosis of this case was very obscure, and even when the first oozing of blood came on it was supposed to have been poured out from the lungs; the hæmorrhage from the aorta led to fatal syncope; the blood, however, passed

* 'Gaz. des Hôp.,' Oct. 28, 1876; 'Med. Times and Gazette,' Nov., 1876.

downwards into the stomach, and was not rejected by the mouth. The absence of the dysphagia increased the obscurity of the symptom.

Among other diseases of the œsophagus we may mention polypus and muscular tumours.

Polypus at the commencement of the Œsophagus. In the 'Medico-Chirurgical Transactions' (vol. xxx), a case of this kind is recorded by Dr. Arrowsmith. A lobulated growth, freely movable and about the size of a walnut, was attached to the mucous membrane of the œsophagus, and produced fatal dysphagia. The tumour was vascular and homogeneous in structure.

Myomata of the œsophagus have been occasionally found, and an interesting case of this kind is minutely described in the 'Trans. Path. Soc.,' 1875, by my colleague Dr. Hilton Fagge. A large tumour, two inches in length, was found about the centre of the œsophagus, in a man aged thirty-eight. He died from bronchitis and emphysema and an injury to the knee, but he did not suffer from any symptom of œsophageal disease.

Obstruction of the Œsophagus from pressure of Aneurismal or other Tumours. Tumours of a cancerous, strumous, or aneurismal character, sometimes exert pressure upon the œsophagus, and cause dysphagia. Cancerous and strumous diseases of the glands occur more frequently in the anterior than in the posterior mediastinum, and in the former situation they do not exert pressure upon the œsophagus; but where the root of the lung or the lower part of the neck is involved there is closer proximity with the œsophagus, and pressure upon, or suppuration communicating with the canal may be the result.

The œsophagus is also in close contact with the aorta, and we frequently find that dysphagia is one of the symptoms of aneurismal disease of that vessel; the dysphagia is, however, less severe and constant than in direct constriction of the œsophagus. It is no uncommon thing to find death suddenly taking place from rupture of the aneurism into the œsophagus; but a considerable time may elapse, as in an instance recorded by Mr. S. Cooper, in which eight weeks elapsed after the first rupture before the fatal hæmorrhage

occurred; in other instances death follows from the condition of the heart, or from pressure on the respiratory and laryngeal nerves, producing fatal syncope or apnœa, even although the pressure on the œsophagus may have been sufficient to produce sloughing. As to other symptoms, they are pain at the sternum, at the side, between the shoulders, and very frequently down the arm; paroxysms of dyspnœa often cause intense distress; and raucedo from pressure on the laryngeal nerves is by no means unfrequent. The sounds of the heart are frequently modified, and if any pressure be exerted on the bronchus, it is manifested by the less free admission of air into the lung on the side of the obstructed bronchus. The pain, dyspnœa and dysphagia, in some of these cases, are much relieved when the patient bends the body forward, so as to remove the pressure from the structures beneath. In an instance mentioned by Mr. Armiger, in the 'Medico-Chirurgical Transactions' (vol. ii), the patient was most easy on his knees and elbows.

The *diagnosis* is often very obscure; the emaciation is not generally so great as we find in cancerous disease, but the paroxysms of dyspnœa and pain are more marked and are exceedingly severe, although the patient is at times able to swallow with ease. The *treatment* is simply palliative; yet much may be done for the comfort of the patient and the prolongation of life, by the regulation of the diet, the avoidance of mental and physical excitement, and the occasional use of sedatives and anti-spasmodics, as of morphia, chloric ether, stramonium, &c., to relieve the paroxysms of dyspnœa. A word of caution must be given in reference to the use of bougies, for I have seen several instances in which the attempt to pass a bougie would have at once broken down the communication with the aneurismal sac, and have led to sudden fatal hæmorrhage.

Case XXIV.—*Aneurism of the Aorta and Sloughing Œsophagus.*—James F—, æt. 34, was admitted, November, 1855, and died in January, 1856; he was a temperate man, married, and a labourer at Dartford. Six months before his admission, after having been engaged a short time previously in carrying very heavy weights, he experienced pain in the left breast; this pain became much more severe, and also extended between his shoulders, but there was no tenderness in the back. December 4th, the pain at the left nipple became more fixed, and there

was a slight systolic bruit. January 1st, it was noticed that the radial pulse was weaker on the right side, and he was found to have difficulty in swallowing solids. This dysphagia increased in severity, and his dyspnœa became more distressing. January 20th, he was unable to swallow food; his face was livid, dyspnœa urgent, and his pain severe. He died on the 25th. On examining the chest, the lungs were emphysematous, pale, but moderately collapsed. There was acute inflammation of the pericardium, and considerable injection of the pleura on both sides. On turning aside the lungs, an aneurismal tumour, about the size of a large orange, was found at the termination of the arch of the aorta; its walls were thin; the posterior part of the vessel was entirely destroyed, and communicated with a cavity in front of the vertebræ, one of which was absorbed. There was scarcely any fibrin in the sac. The aneurismal tumour had pressed upon the œsophagus, and quite obliterated its canal; the whole of its walls were of a greenish colour, very offensive, and in a sloughing condition. Still no perforation had taken place. Both bronchi were compressed. Two other aneurismal tumours were found connected with the ascending and transverse portions of the arch of the aorta. Other viscera were healthy.

Case XXV.—*Aneurism of the Ascending Aorta Rupturing into the Pericardium. Communication of the Œsophagus with the Left Bronchus.*—Frederick K—, æt. 23, was admitted under Sir William Gull's care, January 23rd, and died April 26th, 1856. He was a hawker, and had been living in the Old Kent Road; he had enjoyed good health till five months previously, when he struck his chest against a box hanging from a crane; a fortnight afterwards he experienced pain at the part; this gradually increased till three weeks before admission, when he was obliged to give up work. On admission, he complained of pain in the chest; a distinct pulsation could be felt between the second and third ribs on the right side, and a jar with the second sound of the heart. There was pain at the seat of pulsation, and along the border of the pectoralis major, and down the inner side of the arm. The pain continued severe, and a systolic bruit became audible at the seat of the tumour. He could obtain no rest at night. On April 19th, he had difficulty in swallowing, and this symptom increased in severity. On the 28th, after talking with his friends, he died very suddenly. On removing the sternum, an aneurism of the ascending aorta was opened; it had extended to the sternum on the right side. On opening the pericardium, it was discovered to be full of blood, and a small irregular communication was found at its upper part with the aorta. The heart was of normal size; the left ventricle was not hypertrophied; the valves were healthy. The ascending aorta formed an aneurismal sac, about two inches and a half in diameter, principally on the right side. The lung was adherent, and it was nearly perforated. The aneurism extended as far as the origin of the left carotid; below the left subclavian was another small dilatation. At the centre of the œsophagus

was a slough, and an opening had been formed into the left bronchus; there was no communication, however, with the aorta. The remaining viscera were healthy.

Although it appeared that the greater pressure from the aneurism was on the right rather than on the left side, we can find no other explanation for this sloughing condition of the œsophagus, and its communication with the bronchus, beyond the pressure which all these parts suffered from the distended aneurismal sac.

Case XXVI.—*Aneurism. Pressure on the Œsophagus and on the Left Bronchus. Difficulty in Deglutition. Sudden Death.*—James F—, æt. about 40, was admitted, under Dr. Addison's care, August 24th, 1859, and died September 24th, at 6 p.m. He was a spare man, pale, but strongly built; for nine months he had suffered from pain at the sternum and between the shoulders; he had lost flesh; and for several months had suffered from difficulty in deglutition, so that on admission he was unable to take solid food; but fluids were easily swallowed. A few days after he had been in the hospital, an attack of very urgent dyspnœa came on, but gradually subsided, leaving the respiration easy and of ordinary frequency. In that state he remained till the day of his death. The physical signs were obscure; the resonance on the left side was very slightly diminished; the respiratory sounds on that side were much less distinct than on the right; and were accompanied at the base with slight mucous râles; the voice was not increased in resonance. No abnormal pulsation nor sound in the interscapular or sternal regions could be heard. The heart sounds were normal as to rhythm; but the second sound was "ringing;" the pulse was compressible, more feeble on the left side. He had no vomiting, neither was there any evidence of enlarged glands in the neck, &c., nor had he any pain in the arm. On the 24th, after taking his tea, he washed up the things for the nurse, and immediately afterwards he was seen sitting on the edge of his bed, unable to speak, and scarcely able to breathe. He never spoke afterwards, but died in about a quarter of an hour, the heart continuing to beat after he had ceased to breathe. *On inspection.*—About one inch below the left subclavian artery an oval opening, with rounded edges, led from the aorta, into a large aneurismal cavity about four inches in diameter; this cavity was bounded posteriorly by the vertebræ, which were corroded; the tumour pressed upon the left bronchus, and upon the œsophagus, and probably upon the thoracic duct. The lungs were healthy. The bronchi on the left side were rather more congested than usual. The ascending aorta and the arch were atheromatous; the valves and the muscular fibre of the heart were healthy; the pericardium was normal, and no disease could be found in any other part.

The sudden fatal apnœa was due, probably, either to injury of the laryngeal nerves and spasmodic action of the larynx;

or to sudden distension and increased pressure on the bronchus. The diagnosis was very obscure; the symptoms were slight, and the interference with the entrance of air into the left lung might have been regarded as arising from a tumour in the mediastinum.

Case XXVII.—*Dissecting Aneurism of the Aorta bursting into the Œsophagus.*—James H—, æt. 38, had been losing flesh before admission, but originally had been a very muscular man. He had suffered from symptoms of dysphagia, and there was crepitation at the base of one lung. The aortic arch was found to be in a very diseased state. There were two true aneurisms, one, the size of a hazel nut, would allow the tip of the finger to pass into it, and was situated opposite the orifice of the left subclavian; at the posterior part of the aorta was a second as large as a plum; this opened straight into the œsophagus by a perforation capable of admitting three fingers, and the blood had passed downwards in the coats of the œsophagus, separating the mucous from the submucous coats as far as the stomach. The muscular fibres were hypertrophied; and the stomach and half the intestine were full of blood.

Mediastinal tumours and enlarged glands may cause obstruction. These may be of variable nature. All primary mediastinal tumours may be said to be lymphomata; but other diseases occasionally occur, and of these may be mentioned a fibrous growth of gummatous nature, which has been found twice in our post-mortem series. At other times some extension of cancer from the œsophagus may lead to more complete obstruction, or hydatid tumours may occasionally cause the same symptoms.

In a man æt. 44, admitted with a large cancerous mass in the neck on the left side, the growth evidently extended into the chest, and he soon suffered from difficulty in breathing. The disease had passed down the œsophagus beneath the mucous membrane, and it formed a thick external layer; about the bifurcation of the trachea the whole canal was involved. The bronchial glands, and also the kidneys, were affected. The lungs were in an early stage of pneumonia.

Before concluding the subject of dysphagia, I must refer to its occasional presence in pericarditis and pleuro-pneumonia, as mentioned by Dr. Stokes, in his valuable work on 'Diseases of the Heart.' Although very numerous instances of these diseases have come under my observation, I do not remember ever having witnessed difficulty in swallowing asso-

ciated with the other symptoms of pericarditis; and even when the pericardium was found distended with 36 oz. of pus, and nearly filled the left side of the chest, this symptom was not observed: in a patient recently under my care, extensive pleuritic effusion was found with dysphagia, but careful investigation led me to believe that the latter symptom had its origin in local disease. Transient enlargement of the bronchial glands might, however, induce the dysphagia in these cases, and, to quote the words of Dr. Stokes, it may probably "be less the result of a mechanical condition, such as pressure on the œsophagus, than of some excited irritability either of that tube, or of parts immediately in contact with it."

VII. *Dysphagia from destruction of the mucous membrane by mechanical or chemical agents.*

Every year the lives of many children are destroyed by drinking *boiling water;* vesication of the mouth, fauces, and pharynx, is at once produced; but generally, the instantaneous rejection of the scalding fluid prevents any portion from being swallowed. The margin of the epiglottis and the entrance of the larynx are, however, often injured, and the sudden swelling of the mucous membrane of the glottis by preventing the entrance of air into the lungs, leads to a rapidly fatal result.

The prognosis after accidents of this kind in infants is very unfavorable; for, although the respiration may be apparently unimpeded several hours after the injury, a slight increase of effusion of serum into the swollen mucous membrane of the larynx leads to complete occlusion of the already diminished rima, and causes death from apnœa. The operation of tracheotomy has in not a few instances saved life, but in many the supervention of acute disease of the trachea and bronchi has proved quickly fatal. In several inspections after death, the mucous membrane of the lower part of the œsophagus and stomach have presented considerable congestion, showing that some of the hot water had reached those parts; and in a case of poisoning by corrosive sublimate, lymph was found in the œsophagus.

The action of *corrosive poisons* may be divided into that which is immediate or primary, and that which is remote or

secondary. The mucous membrane of the mouth, fauces, pharynx, and œsophagus, becomes at once discoloured by the chemical action of the poison, and it assumes a yellowish-white or brown colour, according to the strength and character of the agent; if the poison be in a very concentrated state, the membrane is charred and destroyed. The effusion of a sero-albuminous fluid into the mucous membrane, or into the cellular tissue, leads to considerable swelling; but, as with boiling water, the epiglottis rarely escapes injury, and its margin often presents an eroded and serrate appearance. The longitudinal rugæ of the œsophagus, especially near the stomach, are discoloured or destroyed; shreds of œsophageal membrane are sometimes ejected, and in one instance,* after strong sulphuric acid had been taken, a complete cast of the œsophagus was thrown off. The stomach also is sometimes extensively injured, its mucous membrane and coats being charred, or even perforated, and the adjoining viscera similarly acted upon wherever the poison comes in contact with them. If the patient survive the immediate action of the poison, a fibro-plastic product is effused into the submucous tissue; thickening and contraction of the new product takes place, and in this manner an annular constriction may arise.

Symptoms.—The first symptom produced by taking corrosive poison is severe pain of a burning character in the mouth and throat, and along the whole tract of the œsophagus. When any portion has been swallowed it is succeeded by vomiting of dark coloured fluid, containing blood; extreme dysphagia quickly follows, and the act of speaking is exceedingly painful; there is also sometimes urgent dyspnœa. The lips are often injured by the contact of the poison, the tongue is found to be swollen and injected, and the mucous membrane of the whole mouth is discoloured, becoming yellowish-white or brown, or completely charred; and the throat is in a similar condition. Cough and dyspnœa are distressing symptoms if the epiglottis and larynx have been injured. Diarrhœa is occasionally present. The patient has an anxious and dejected countenance; the pulse is compressible and feeble; but the mind retains consciousness till death, which may take place in a few hours. In other cases, it is often

* Mayo's 'Outlines of Pathology.'

remarkable how soon the injured mucous membrane of the mouth and throat recover themselves; the vomiting subsides; the extreme pain in the throat produced by swallowing or coughing disappears; and in a few days the patient appears almost convalescent, and gives hope of recovery. If only the mucous membrane of the stomach be injured, there may be entire immunity from pain; but the freedom from pain is a very deceptive symptom, the patient often unexpectedly dies, from syncope or asthenia, although more generally the subsequent contraction of the inflammatory product in the œsophagus, stomach, or pylorus, leads to obstruction, slow emaciation, the regurgitation or vomiting of food, and a lingering death from inanition.

The first effect of these poisonous agents is best combated by the use of substances capable of neutralizing their chemical properties, combined with oleaginous and demulcent drinks to shield the mucous membrane. Opiates may be given to relieve pain, and as soon as deglutition can be performed, bland and nutritious diet may be allowed.

When secondary contraction of the œsophagus has taken place, the probability of relief is slight; fluid forms of nutriment administered in a concentrated form, and injections of a similar kind may prolong life. Dr. Cumin* succeeded in saving the life of a child by the use of elastic catheters, after potash had been taken; and Mr. Forster,† after the same poison, sought a like result, though less successfully, by the formation of a gastric fistula.

Case XXVIII.—*Poisoning by Sulphuric Acid. Death on the 11th day.*—In an interesting case of poisoning by sulphuric acid, in October, 1855, in which death did not take place until the eleventh day, the mouth and throat were of a whitish colour; at the posterior part of the mouth, there was considerable injection of the mucous membrane, and on each side of the posterior pillar of the fauces there were whitish loose patches of membrane. The edge of the epiglottis was found minutely eroded, and the mucous membrane of the œsophagns was pale and covered with yellow membranous flakes. The prostration and collapse immediately following the reception of the poison were accompanied by vomiting of grumous blood, but in less than twelve hours the patient was able to swallow some milk and arrowroot; and on the fourth day appeared to take her food without difficulty. Death took place from

* 'Transactions of the Medical and Chir. Soc. Edin.'

† 'Guy's Hospital Reports.'

the sloughing condition of the mucous membrane of the stomach, combined with inflammation of the duodenum, and of the whole tract of the intestine. The ability to swallow in this case was restored in a very short time, considering the fearful injuries which resulted to the whole of the mucous membrane. (See more full account of the state of the stomach in our remarks on that viscus.)

Two instances admitted into Guy's Hospital in 1857, illustrate the primary effects of poisons on the pharynx and œsophagus. They are detailed in the Reports for 1859, by Dr. Wilks :

Case XXIX.—"*Poisoning by Soap Lees.*—Charles T. C.—, æt. a year and a half, was admitted under Mr. Hilton, on September 4th, 1857, at six o'clock in the evening. About an hour before, the child had drunk from a cup about a mouthful of soap-lees; some oil and mucilaginous fluids were administered, and he was brought to the hospital. The child was then very ill, and, in the course of an hour or two, some difficulty of breathing came on, but this did not appear sufficiently extreme to warrant tracheotomy. The most marked symptom after this was an intense heat of skin. The child died at five o'clock on the following morning, twelve hours after swallowing the fluid.

"*Post-mortem appearances.*—The mouth and tongue were slightly excoriated, and of a light brown colour. The fauces, tonsils, and mucous membrane of the pharynx had a slightly swollen appearance, and had a yellowish-brown hue. The whole of the œsophagus presented a similar condition, the mucous membrane having a brownish colour, particularly the longitudinal rugæ. The membrane was changed in character by the alkali, but was nowhere destroyed. The most pernicious effect had been produced at the very extremity of the œsophagus, where the interior was of a dark-brown colour; this terminated at a defined line, the mucous membrane of the stomach immediately below being quite unaffected. The stomach was contracted. It was found, on opening it to be quite empty; the rugæ were well marked, and the whole mucous membrane had a slightly pink hue, being more than usually injected. These appearances were, however, so slight that, unless especially looked for, they would probably have been disregarded. As before stated, the termination of the œsophagus was of a dark brown colour, but this terminated abruptly at its margin. Towards the pyloric end of the stomach, near its greater curvature, there were a few rugæ of a very dark colour, produced, no doubt, by the action of the alkali. The mucous membrane, thus altered, was not at all soft, nor could it be stripped off; but, on the contrary, was hard, and had a horny feel. The duodenum was healthy. The larynx, at its top, was almost closed by the greatly swollen epiglottis, the enlargement being due to an effusion of serum within it; the glottis itself was only slightly swollen; and upon raising the epiglottis and looking into the larynx, the passage was seen to be quite free; neither the vocal cords, nor any other part,

having been touched. The lungs showed some lobules in the first stage of inflammation. The heart was healthy, and firmly contracted."

Case XXX.—"*Poisoning by Sulphuric Acid.*—William V—, æt. 56. The patient's mind was not perfectly sound, and, therefore, the account he gave of himself was received with some doubt. When he was admitted, on the evening of October 28th, 1856, he walked up stairs to his bed, and did not appear very ill, although he was dejected, and did not speak much. He stated that he had been to a friend's house; and there, by mistake, drank about a dessert-spoonful of oil of vitriol. His mouth was of a brown colour, but not excoriated. Magnesia and milk were given him. On the following day, and also on the third, he appeared depressed; but he was not otherwise ill, and it was thought, from the mildness of the symptoms, that he would recover. On the fourth day, however, he died rather suddenly, or at least, unexpectedly.

"*Post-mortem examination.*—The body was that of a strong, muscular man. A yellow fluid, of acid reaction, ran from the mouth. The brain was not quite healthy. The mucous membrane of the mouth was of a yellow colour, but when this yellow epithelial layer was removed, the mucous membrane left was healthy. The front part of the tongue was also discoloured, but not the back. The œsophagus throughout was of a yellow colour. The mucous membrane was only affected in the most prominent ridges, but the walls of the organ were swollen to three times times their natural thickness. This was due to a sero-albuminous exudation into the submucous tissue. The top of the larynx was also slightly swollen in the same manner. The stomach appeared natural externally, and was of usual size. Upon opening it, it was found to contain about a pint of a bright yellow fluid. The mucous membrane was especially affected at the pyloric half of the stomach. The fundus, in which the fluid was found lying as usual, had only a yellow tint like the œsophagus, and the mucous membrane was softened; but, towards the middle of the stomach, the whole of the pyloric half of the interior was of a black colour, and raised up in projecting masses or ridges, which were in a sloughing condition, and would soon have been cast off. This black matter consisted of carbonized and decomposed mucous membrane, with blood within it. The whole coats of the stomach were soft, and readily tore. The charring of the stomach ended at the pylorus, but about two inches of the duodenum were of a purplish colour, and the rugæ were blackened; below this, the intestines, both small and large, were unaffected. The small contained a yellow matter, similar to that in the stomach. The contents of the stomach were not acid, nor was any of the poison discoverable. The heart was healthy, and contained a firm, decolorized fibrinous clot on the right side, not acid in its reaction."

The following case illustrates the *secondary* effect of a corrosive poison in the thickening of the whole of the œso-

phagus and obstructed pylorus, which led to a fatal termination, in a man who died three months after having taken an ounce of nitric acid.

Case XXXI.—*Poisoning by Nitric Acid.*—James T—, æt. 24, was admitted under Dr. Barlow's care, in March, 1852, in a state of extreme emaciation; more than two months previously he had taken about an ounce of nitric acid, and had completely swallowed it before he discovered the fatal mistake. The primary effects gradually subsided, but vomiting after food increased, and he steadily lost flesh and strength; he vomited, with some pain, all the food which he swallowed; the abdomen sometimes became extremely distended; the bowels had only been opened twice during the two months preceding his admission; the tongue was injected. He lived eighteen days after admission. On inspection, the epiglottis appeared healthy; the mucous membrane of the whole of the œsophagus was thickened and readily separated; the submucous tissue and all the coats of the œsophagus were also thickened; the stomach was enormously distended, reaching to the anterior superior spinous process of the pubes; the pylorus was obstructed, thickened, and contracted; the lungs and heart were healthy; the liver was small, deep in colour, and the gall-bladder contained about ʒiss of dark-coloured bile; no other viscus was diseased.

Case XXXII.—*Poisoning by Nitric Acid. Recovery from the Primary Effects.*—A young man, æt. about 22, a hawker, whilst at his tea, on March 13th, took by mistake for vinegar, a mouthful of nitric acid, and swallowed it. A severe burning pain in the mouth was at once produced, which extended to the epigastrium. A druggist prescribed an emetic; vomiting then came on, and he brought up about half a cupful of blood. The vomiting continued through the night, and on the following day he was brought to Guy's; the countenance was anxious; the mouth and tongue were stained of a yellow colour, the tongue enlarged and injected; the throat was intensely injected, and presented irregular shreds of whitish membrane upon it. He was unable to swallow, and speaking produced cough and much distress in the throat. He stated, that he suffered pain in the throat and epigastrium when retching came on, but not when quiet. He was a muscular man, and in health at the time of the accident. Milk and eggs were given, and magnesia mixture with tincture of opium ℥v. every four hours. On the 17th, he was sitting up, taking food, and he stated that he felt much more comfortable; he had slight pain in the throat when he swallowed, but had no other discomfort. The throat was still very much injected, and sloughy mucous meubrane was separating. In a few days he left the hospital, and considered himself well.

The immediate effects of the poison were in a few days relieved, and the dysphagia disappeared; but after such severe injury to the œsophagus we must look with great anxiety

to the result, for thickening of the coats and constriction may, and perhaps will, follow; in this case the acid probably reached the stomach, for pain was produced at the scrobiculus cordis; but there was no evidence that serious injury had been done to that viscus.

We have already alluded to the great frequency of organic stricture after corrosive poisons.

Case XXXIII.—*Poisoning by Strong Solution of Ammonia*—The patient was admitted under the care of my colleague Dr. Pye-Smith. On inspection the mucous membrane of the mouth was red, and glazed with shreddy mucus. The œsophagus was intensely red in its whole length, more especially at its lower part, which was of a dark purple, and the colour ceased abruptly at the termination of the œsophagus in the stomach; at the upper part of the œsophagus the mucous membrane was shreddy in longitudinal bands. The stomach was injected over a circular patch, four inches in diameter, in the position where the alkali would first impinge on the membrane; at that part the mucous membrane was thin, elsewhere thick, pale, and coated with thick mucus.

Obstruction by foreign bodies does not generally come under the cognizance of the physician, but he should bear in mind the possibility of dysphagia arising from such a cause, and also that severe and even fatal symptoms may result from the swallowing and lodgment of sharp substances. Recorded cases seem to show that of all things most commonly lodging in the œsophagus, plates of artificial teeth are the most frequent. Such cases as these are to be found in the medical journals.* That they should cause obstruction is by no means to be wondered at. Still more remarkable, however, is the fact that occasionally large substances may become impacted and remain undiscovered for a length of time.† Other cases of dysphagia arise, not unfrequently, from the lodgment of some pointed fragment of food, it may probably be a fish bone. If these foreign bodies remain they are by no means harmless. Cases are scattered throughout medical literature in which the points of such sharp bodies have perforated the œsophagus and aorta, and have led to fatal hæmorrhage. It is well to remember, however, that many persons after swallowing a bone may suppose that it is still in the throat, when they are only

* 'Lancet,' vol. i, 71; vol. ii, 73, &c.

† M. Duplay, 'Lancet,' 1847. Vol. ii, p. 849.

suffering from the effects of its passage, and a mere abrasion on the surface of the mucous membrane will keep up the sensation for many days.

The treatment of such cases may be left to the surgeon without further consideration.

Ecchymosis.—Hæmorrhage from the œsophagus generally arises from the rupture of aneurismal tumours, or from cancerous disease; but in cases of fatal purpura, we sometimes find the whole mucous membrane covered by points of effused blood, and blood is also effused into the surrounding cellular tissue. The œsophagus, however, is affected only in common with the whole mucous surface of the alimentary canal, as well as with other membranes and gland-structures. The œsophageal veins have been found to be varicose in some cases of cirrhosis; and in a case of hæmorrhagic variola the mucous membrane was found coated with blood.

The following case warrants the belief that *rupture* of the coats of the œsophagus sometimes takes place during life; the specimen is in the Museum of Guy's (No. 1799[46]).

Case XXXIV.—*Rupture of the Œsophagus.*—M. C—, æt. 24, a cabinet maker, of intemperate habits, attended a public supper in September, 1842; during supper he felt sick, and left the table; he vomited slightly, and returned home with assistance. He then took a dose of castor oil; at two in the morning he complained of severe pain across the epigastrium, and great difficulty in breathing; the abdominal muscles were rigid, the respiration laborious; the patient was found sitting up in bed, leaning forwards on his hands; his countenance was anxious, the pulse soft, the bowels had not acted; an emetic of antimony and ipecacuanha was administered, but without effect; at 7.30 a.m. there was less pain, but increased dyspnœa, and there was emphysema of the face and throat. The stomach-pump was used, but without effect, and he died at noon. On inspection a large rent was found in the œsophagus at its lower part, filled with ingesta, which were also extravasated into the left pleura; the pleura also contained castor oil. The stomach and intestines were exceedingly distended with flatus; and the stomach partially dissolved by gastric juice. The rent in the œsophagus appears in the preparation to extend into the stomach, but was perhaps increased after death.

It is probable that the œsophagus was much dilated with food, and that its coats were softened either by previous disease, or by digestion from gastric juice regurgitated into it from the stomach, and there remaining sufficiently long to

corrode its walls. There is no evidence that the stomach-pump increased the rent, for the castor oil which was found in the pleura was taken several hours before the stomach-pump was used; still, if it had been known that such a rent had existed, this remedy would not have been applied; the severity of the symptoms suggested the probability that some poisonous substance might have been taken with the food, and that hence the emetic failed to act; under such circumstances the use of the stomach-pump would have tended to relieve rather than aggravate the symptoms.

Mayo quotes a case from Boerhaave of rupture of the œsophagus after an emetic had been taken by a robust, but gouty man; a rent one and a half inches in length was found communicating with the left pleura; and the fatal result took place twelve hours after the emetic had been administered.

In a patient admitted in July, 1874, under the care of my colleague, Mr. Durham, for injury, by which the rib was fractured, the œsophagus was lacerated for more than an inch in extent.*

Gastric Solution.—In studying the diseases of the œsophagus, *gastric solution* of its lower extremity must be borne in mind. This subject has been very clearly brought forward in the communications to the 'Guy's Reports,' by Mr. Wilkinson King, in the years 1842 and 1843. It is exceedingly frequent to find the mucous membrane of the œsophagus abruptly terminating at the cardiac extremity of the stomach, from the solvent action of the gastric juice having extended to that line; but on opening the canal of the œsophagus itself for several inches near its lower extremity, the upper margins of the rugæ are often found deprived of mucous membrane; and long shreds are observed on stretching out the tube, these portions having escaped digestion. This solution extends into the mediastinum, as found in cases mentioned in the communication just referred to, or into the pleura itself, the contents of the stomach thus escaping into the left pleural cavity, which is in closer relation with the œsophagus than the right pleura.

Only two cases of this perforation of the œsophagus have

* For another case of rupture of the œsophagus after vomiting, in a man, aged 49, see 'Lancet,' 1869, vol. ii, p. 337.

occurred at Guy's during the last few years, one in a case of fever, another of hydrocephalus, so that it is a circumstance of unfrequent occurrence. Mr. E. Canton, in the 'Lancet' of 1859, gives an instance of an infant, æt. 2 months, who died comatose, insensibility having come on two hours after the ingestion of breast milk and soaked bread. An oval opening, three fourths of an inch in length, was found on the left side of the œsophagus, the rent commencing a quarter of an inch above the diaphragm. Its edges were thin, floccu-lent, and irregularly fringed; a second aperture also was found separated from the other by a small strip of undissolved texture. The causes of gastric solution are now more clearly understood than formerly. The position of the body, the development of gases in the intestines pressing upon the contents of the stomach, the non-contracted state of the œsophagus itself, are causes which lead to the passage of the gastric juice into the œsophagus. Sometimes, indeed, the pressure thus produced forces the contents of the stomach into the pharynx, and we find them gravitating into the trachea and bronchi.

CHAPTER V.

ORGANIC DISEASES OF THE STOMACH.

Although it is probable that every aberration of function is marked by physical change, still very many of the local alterations of structure are of a character so transient, and so completely beyond the recognition of the senses, that we are compelled to separate them from others in which the structure of a part is more evidently modified.

A division of this kind is especially necessary in the study of diseases of the stomach, for the larger number are of the kind in which no structural lesion can be traced. The chemical, anatomical, and physiological researches of late years have, however, diminished the number of simple functional diseases and have greatly increased our knowledge of those due to organic lesions.

We shall have to treat of the following abnormal conditions of the stomach:

Solution by the action of the gastric juice.
Atrophy and hypertrophy of the mucous and muscular coats.
Dilatation of the stomach.
Inflammatory diseases—
Catarrhal, diphtheritic, and suppurative inflammation.
Ulceration.
Fibroid disease of the pylorus.
Cancer.

Post-mortem solution.—The secretion poured into the stomach from its numerous follicular glands has a very important function to perform in dissolving the nitrogenous portions of food. This secretion, the gastric juice, is a clear, somewhat viscid fluid; it has an acid reaction, from the presence of

hydrochloric or lactic acid, and it contains an organic substance, pepsin, in small proportionate quantity. By the mutual reaction of these agents on the organic animal principles of ordinary food, assisted by the temperature of the body and the churning movements of the stomach, the solution of the protein compounds and of the gelatin and chondrin takes place, and a fluid is formed containing peptone compounds, as they are called, and which is discharged into the intestine through the pyloric valve. The solvent power of the gastric juice is of a simple chemical kind, and it can be exerted external to the living organism when the necessary conditions are carried out; it would act also upon the structures of the viscus itself, even during life, but is prevented by the protective covering of mucus and epithelium, constantly renewed by the living power of the part, and, as shown by my colleague Dr. Pavy, by the circulation of alkaline blood in the minute capillaries of the membrane. After death, however, the chemical action is unchecked, and the walls of the stomach are dissolved; sometimes, indeed, with great rapidity, and in every instance to some extent, so that pathological researches are interfered with, and the appearance of the stomach is necessarily modified.

John Hunter drew attention to post-mortem solution in connection with diseases and injuries of the head, and T. Wilkinson King, of Guy's, added definite facts in reference to the degrees and position of the solution; Dr. Budd, in his treatise on Diseases of the Stomach, has still further and very fully elucidated the subject. The gelatinous softening which has been described by Andral, Cruveilhier, &c., as occurring during life, is now generally believed to be a form of this solution, and in this opinion I concur, although some talented pathologists think differently.

It must be always borne in mind, that after death blood gravitates into the most depending vessels, that exosmosis takes place, and chemical action exerts its influence, unchecked and unmodified by vital action.

The amount of gastric solution depends in part on the quantity of gastric juice actually in the stomach at the time of death. Gastric solution is especially manifest when sudden death occurs during the process of digestion; and it is shown

still more as a sequence of cerebral diseases, especially those of an inflammatory character, in young subjects, the follicles having been stimulated to pour out secretion at irregular times, and in excessive quantity. Time is required for the solution, and the action proceeds more rapidly in summer than during the coldness of winter. The stomach is sometimes found completely perforated, although food may not have been taken for several hours before death.

The simplest condition of this change is thinning and softening of the mucous membrane, so that it is with great readiness detached; if the blood-vessels be empty the membrane is pale, and it has a semi-gelatinous appearance; generally, however, the vessels contain blood, which gravitates into the most depending vessels; the hæmatine exudes into the substance of the stomach itself, and greenish-brown or almost black lines are formed in the course of the vessels, over the whole of the dissolved part, from the action of the gastric juice on the colouring matter of the blood. If the transudation have taken place into the cavity of the stomach, a greenish-brown fluid is produced by a similar action. This solution may be so slight that it is only detected when we examine a section of the membrane with the microscope, or the mucous membrane is exceedingly thinned, or entirely destroyed; the submucous and the muscular coats are then dissolved, and at last the peritoneum is reached. The serous membrane occasionally gives way, so that a ragged perforation is formed, and the contents of the stomach transude into the peritoneal cavity. The adjoining viscera then become acted upon, unless adhesions exist which have obliterated the cavity, as we find in strumous peritonitis.

The extent of the dissolved part is marked by a defined line, showing the level to which the solvent fluid has attained. This is generally along the greater curvature; but sometimes, from the position of the body, we find that the solution is greatest in the region of the lesser curvature, or even that the duodenum is especially acted upon; and this part of the intestine may be perforated while the stomach is intact. Or from the evolution of gases, position of the body, &c., the fluid is pressed into the œsophagus; the mucous membrane of that canal is dissolved, and sometimes all its coats per-

forated, so that the contents of the stomach are found in the pleural cavity.

John Hunter attributed these effects to the fact that chemical action is unchecked by the vital state of the parts; but Dr. Bernard and Dr. Pavy* have demonstrated that the gastric juice will act upon living tissues, as shown by introducing a rabbit's ear and the leg of a frog into a gastric fistula, thus proving the protective influence of the gastric epithelium and mucus. These experiments, however, are not conclusive, for the circulation could not be carried on in the usual free manner, and the condition of the nervous system is not sufficiently regarded.

When the anterior part is acted upon, Dr. Budd† explains the fact by the small quantity of gastric juice, which was in the greater curvature, being neutralized either by ammonia being evolved, or by the exudation of alkaline serum from the blood, or from dropsical effusion; whilst the small quantity on the anterior part has not been thus neutralized. The action of the gastric juice, Dr. Budd states, may be checked by alcoholic liquors, or by medicines administered before death. We are not acquainted fully with the causes of the greater gastric solution in some cases than in others, for, whilst agreeing with the author just cited, that it is occasionally very manifest in cases of phthisis, renal disease, typhoid fever, and cancer of the uterus, or disease of organs in which the stomach is functionally disturbed, we shall find an almost equal percentage of cases of solution when such causes do not exist. It is certainly more manifest in children and in inflammatory disease of the brain, and is generally more marked in acute than in chronic disease.

Atrophy of the Mucous Membrane.—Wasting of the mucous membrane of the stomach takes place in common with that of other organs and glands, and the subject has been elucidated by Dr. Handfield Jones, whose microscopical investigations have directed particular attention to the subject.

The mucous membrane of the stomach consists principally of small glands or follicles, which open into minute pits on the surface, and secrete the gastric juice, the most important

* 'Guy's Reports,' vol. ii, third series, and 'Phil. Trans.'

† Budd on the Stomach.

solvent of food. Between the terminal extremities of the follicles clusters of lymph cells are observed. The follicles rest on a stratum of connective tissue of varying thickness, beneath which is a layer of non-striated muscular fibre. The delicate capillary branches of the blood-vessels, derived from the coronary, hepatic, and splenic arteries, extend between these gastric follicles in nearly a straight course, and they form a beautiful plexus of vessels around the minute crypts, and also beneath the follicles themselves. These structures are easily observed under a low magnifying power of the microscope, and in a portion of congested membrane present a beautiful appearance. The sympathetic nerve filaments are also seen at the base of the mucous membrane, sometimes upon the capillary vessels, and at other times apparently leaving them, forming a close plexus interspersed with numerous ganglia in the submucous tissue; filaments extend both to the peritoneal surface and to the mucous membrane.

The surface presents columnar epithelium and mucus, and the follicles contain spheroidal epithelium and nuclei. As in every other gland, these minute and simple ones appear to have varying degrees of functional activity, and undergo degenerative changes. Thus in many cases of fatal disease, with gradually increasing exhaustion, only a small quantity of food is taken for many days before death, whilst in other instances the appetite is maintained to the last; we consequently often observe, that in the one case, the follicles are full of secreting cells and nuclei; whilst in the other, they are comparatively empty.

Microscopical investigation has done much to increase the knowledge of pathology; but with increase of microscopical power we must add equal caution in removing all the causes liable to mislead us. The mode which I have adopted in preparing sections, and which will generally be found a successful one, is to stretch the membrane over or between the fingers, and then, by means of Valentin's knife, make a section of the required depth and thickness. This is afterwards removed by scissors, and spread out in water by needle points. I have examined with great care a considerable number of stomachs from the post-mortem table of Guy's Hospital; but it is not necessary to mention the cases in

which the membrane appeared in a healthy condition. In many of these examinations I have observed appearances precisely corresponding to the descriptions and drawings of Dr. Handfield Jones; but I think we must carefully consider that many of these appearances may be produced, by the mode of making the preparation, or by changes after death. I refer to wasting of the follicles, nuclear deposit around them, and the development of cysts. The gastric follicles change very rapidly after death, and in a short space of time nothing can be observed but the termination of the follicle itself upon the submucous areolar tissue, and above this an irregular aggregation of granules and nuclei. The basement membrane also rapidly becomes dissolved, and this condition will be found, on microscopical examination, before the ordinary appearances of gastric solution are observable in the stomach. The greater curvature of the stomach is in this way generally too much changed to allow us to place much dependence upon its microscopical examination; and for this reason, it is evident that we have to avail ourselves of portions of membrane above the line of solution. That from the lesser curvature, however, and from the pyloric region, is less generally dissolved by the gastric juice, and is also the part most subject to morbid changes; but the cardiac portion should also be examined when possible. Not only does the membrane become dissolved, but, in some cases, by decomposition, it becomes emphysematous, and presents minute vesicles and blebs, which occupy the substance of the tissue; or the appearance of the very minute emphysematous vesicles in the mucous tissue may resemble the appearance of well-defined cysts, surrounded by nuclei. This is one source of fallacy, and another will be found in the fact, that nuclei are readily separated from the follicles in the preparation of the section, and become diffused between the structures. The contents of the follicles are easily detached, and, by the action of acetic acid, of cold water, or by mere pressure, a perfect cast of the follicles will be often extruded, and project from the surface of the membrane. A third fallacy, which may considerably mislead us, is the appearance of the mucous coat, altered by the state of contraction of the submucous and muscular coats beneath.

The mucous coat will expand to the largest amount of distension that the muscular coat allows. When the muscular coat is contracted, the usual appearance of rugæ is presented; but a further contraction produces a mammillated appearance of the membrane. This may be sometimes observed, if we remove a portion of healthy mucous membrane a short time after death and immerse it in cold water for a few hours, this state of mammillation is then produced. A thickened, chronically-inflamed membrane will, I believe, present *true* mammillation of the stomach; but in that artificially produced, the manner in which the fissures extend nearly to the submucous cellular tissue, might lead us to attribute this appearance to a morbid contraction of the membrane itself. Dr. Handfield Jones gives, in his observations on the stomach, an original and interesting account of the production of mammillation; and he attributes these depressions to wasting of the membrane, the breaking up of nuclear masses, and to the contraction of the tissue beneath. This opinion requires confirmation, for, as far as my observations have gone, it would appear that mammillation is more common than the existence or evidence of solitary glands or separate nuclear deposits in the membrane; and that this appearance of simple mammillation may be easily produced artificially in a healthy mucous membrane. A fourth fallacy may arise from the direction of the section. The surface of the stomach being not that of a plane membrane, and its follicles opening into crypts, an oblique section may readily give the appearance of fibrous tissue abnormally developed, where such does not really exist.

The whole of the coats of the stomach are sometimes exceedingly wasted, but in fatty degeneration or atrophy of the mucous membrane this is not generally the case. There are several degrees of this wasting or fatty change. Thus, sometimes the cells of the follicles, instead of presenting a simple nucleus, contain a great number of minute highly refracting particles, and almost resemble an inflammatory granule cell, while the appearance of the stomach itself is otherwise in a perfectly healthy condition; although these cells are also found in other states, as in extreme congestion with superficial ulceration, &c., they appear to indicate a diminution of vital

activity rather than an excess of it. At other times, the stomach is found to be pale, and here and there studded with white points, somewhat resembling solitary glands, but not at all elevated above the surface. A horizontal section, in such a case, shows around the crypts, at the whitened portion, minute highly refracting granules and fatty particles; and a vertical section presents a dark border on the surface, consisting of the same elements; these are also sometimes observed, more or less distinctly beneath the follicles.

A more advanced condition of atrophy shows the follicles to be entirely destitute of secreting cells, and only containing granules of fat, or perhaps wholly destroyed, with irregular patches of pale mucous membrane. The mucous membrane of the stomach also undergoes lardaceous degeneration, in which the minute capillary arterioles are infiltrated by amyloid material; this is an uncommon condition, and only present with extensive lardaceous disease in other organs.

Besides these forms and degrees of atrophy, which may be called secondary, there are others which arise from chronic inflammation of the membrane, in which the structure appears thickened, dense, and the mere rudiments of gastric follicles remain. These may arise from fibroid degeneration or cancerous disease slowly encroaching upon the membrane adjoining it, and thus leading to atrophy and degeneration.

The symptoms observed in some of the cases in which this fatty change in the mucous membrane of the stomach existed, were a sense of great prostration and exhaustion, with complete loss of appetite. The tongue was clean, there was no pain, neither was there thirst, nor vomiting, but an inability to take food; in cases where vomiting has sometimes taken place, it has possibly been from other causes. This form of atrophy has been observed in phthisis, in struma, in exhausting suppuration, and is often associated with a fatty condition of the liver.* Wasting of the mucous membrane may be the result of the action of corrosive poisons.

In a patient, æt. 50, who died from extensive strumous disease, the *stomach* was found to be flaccid; its mucous membrane was covered with a thick layer of mucus, and it presented, especially towards the pyloric extremity, several

* Handfield Jones.

opaque white patches, about a quarter of an inch in circumference. These parts were found to consist of degenerated mucous follicles. The follicles had their usual outline, but were filled with minute fat-particles, and were destitute of secreting cells.

In a case of poisoning by chloride of zinc, much wasting of the mucous membrane of the stomach was observed, there was distension, with grey lines of discoloration, and at the greater curvature an emphysematous condition.

On the examination of the mucous membrane, above the emphysematous line, the ends of gastric follicles were observed, but they were not covered with the usual thickness of membrane. At the pylorus the mucous membrane regained its usual thickness, but it had a pitted margin, as at the circumference of an ulcer ; near to it the membrane appeared thin, and presented numerous very minute, transparent vesicles, which projected upon the surface of the membrane, and appeared to consist of a cyst wall, containing fluid and nuclei. The cysts, when ruptured, presented a halo of fluid and granules around it. Other more minute cysts were found in the substance of the membrane, particularly towards the greater curvature. They were about 1-30th to 1-10th of an inch in diameter.

At first, it appeared that the development of cysts in this case had taken place before death ; but the greater curvature presented large blebs of air, and the smaller vesicles were, no doubt, of a similar character. The separation of the elements of the membrane by the development of gas had given rise to this deceptive cystic appearance. I have observed a similar emphysematous condition of the mucous membrane in some other cases, and it probably arises from rapid decomposition taking place in connection with partial gastric solution, modified, perhaps, by a diseased condition of the membrane.

It occasionally happens that we find structures resembling solitary glands of the intestine in the mucous membrane of the stomach. Thus, a short time ago, in examining the stomach of a child who had died from chorea, I found the whole membrane presenting numerous whitish specks, which consisted of these structures imbedded in the substance of

the membrane. These are probably identical in structure with lymphoid tissue.

Hypertrophy.—An apparent thinning of the mucous membrane of the stomach is consequent on great dilatation of the viscus; and conversely the lining membrane seems to be preternaturally thickened when the stomach is contracted, and large rugæ are formed by the inversion of the mucous membrane; and, as we have before remarked, simple contraction of the submucous tissues causes a mammillated appearance, resembling that produced by chronic change. Still there are instances arising from chronic irritation and inflammation, and from prolonged congestion, to which we shall have to refer when speaking of catarrh, in which the mucous membrane is both thickened and hypertrophied. In other cases, indeed, polypoid masses are formed by the mucous membrane, and I have observed large folds of this kind surrounding the pyloric orifice, without evincing symptoms of disease during the life of the patient. Rindfleisch* considers that the mammillated state of the stomach is due to the mucous membrane becoming, by the hypertrophy of its glandular layer, too large for the muscular coat. Polypi became developed from this overgrowth, and "in their interior, besides the dilated tubuli, true cysts are found scattered here and there; these are filled with watery fluid or with mucus. The interlobular connective tissue, together with the walls of the tubes themselves, forms septa." Beside these polypoid elevations of the mucous membrane pedunculated polypi are occasionally met with.

Mammillation of the stomach may thus be due to varied pathological conditions.

1. It may be artificially produced by simple contraction of the muscular coat.

2. It may be due to hypertrophy of the glandular structure of the mucous membrane.

3. To wasting and contraction of intertubular tissue (Handfield Jones).

4. Possibly to cystiform distension of the follicles.

The more marked hypertrophic changes which take place are those connected with the muscular coat, when there is

* Rindfleisch, 'Pathological Histology,' vol. i, p. 419. New Syd. Soc.

obstruction at the pylorus; the muscular tissue then becomes stronger and thicker, at first in the proximity of the obstruction; the hypertrophy gradually extends its area, reaching two or three inches, and even over the whole stomach. This change is a preservative one, and it tends, though with less and less efficiency, to force the dissolved aliment through the diseased part; but at length the wasting consequent on the system not receiving its proper supply of nutriment becomes extreme, and the patient succumbs.

Dilatation of the Stomach.—The distension of the stomach is due to a relaxed condition of the muscular coat. The stomach in a healthy state contracts upon its contents, and by its vermicular action facilitates the movement and churning of the contents, by which their thorough mixture with the gastric juice is promoted, their solution accomplished, and the resulting fluid propelled onwards through the pyloric valve. It is at the pylorus that the muscular fibre, especially the circular coat, has its fullest development. When there is any obstruction at this part, particularly if it be gradual in its origin, the muscular coat becomes proportionately increased, so that the chymous fluid may be pushed through the narrowed orifice. We have already adverted to this hypertrophy of muscular fibre, but when the muscle is unable to overcome the hindrance, then the ensuing dilatation becomes the more prominent feature, and gradual distension ensues, till an enormous size is attained, as we find in pyloric disease.* The muscular coat is, moreover, closely connected with the nervous filaments of the pneumogastric nerve, and also with the vaso-motor nerve. When, from irritation of the nervous supply, irregular contraction takes place we have spasmodic pain and, it may be, hour-glass contraction; but, when the nervous supply is weakened, the muscular coat is less able to contract, and less competent to execute its usual movements; and under such circumstances sudden great distension may so increase that the muscular coat is unable to contract, the propelling power is unequal to the work, the muscle is paralysed from over-distension, as is that of the urinary bladder also when over-stretched.

* Bamberger quotes a case in which an inconceivable quantity of fluid (90 lbs.) filled the stomach. Virchow's 'Handb. der Speciellen Path. und Ther.'

Dilatation arises, therefore, from several causes. 1st. *From obstruction.*—The distension may be from obstruction at the pylorus, and this impediment at the outlet produces hypertrophy of the muscular coat of the stomach. We shall have to refer again to this condition when describing organic disease at the pylorus, whether fibroid or cancerous, or simple ulceration; it is in this form of obstruction that the peristaltic movements in the stomach, as pointed out by Sir William Gull, are especially recognised. They are seen to pass from the left to the right, and when the walls of the abdomen are wasted, are easily observed. A small quantity of food or water taken by the patient may serve to induce them. Spasmodic contraction at the pylorus or pressure from abdominal diseases of various kinds may also produce over-distension.

2nd. *From paralysis.*—Distension of the stomach may arise from an exhausted state of the nervous supply of the pneumogastric, as mentioned by Traube,* and also of the vaso-motor nerve. In these instances no peristalsis is observed, for the muscle is weakened. This form of distension is found in states of exhaustion, as from long fasting, and in hysteria; great distension takes place, with distress, breathlessness from pressure upon the diaphragm, and sometimes severe pain at the stomach, passing through to the spine. It would seem that long-continued vomiting may induce this form of nervous exhaustion; and a similar condition has been found in diseases of the brain and the spinal cord, in typhus, cholera, and puerperal fever. Again, the fulness of the stomach in phthisis, and the flaccid condition in which it is often found in this disease after death, may be due to the paralysis or exhaustion of the pneumogastric; and in heart disease, in which chronic gastric catarrh is induced, the flatulent distension of the stomach is promoted by a similar state of nerve exhaustion.

The remarkable case recorded by Dr. Fagge † was perhaps due to nervous exhaustion, for there was perforation of the duodenum and an abscess behind the colon; local suppuration in the neighbourhood of the stomach, such as empyema

* 'Gesammelte Beiträge,' ii, 988.

† 'Guy's Hospital Rep.,' ser. iii, vol. xviii, p. 1.

and purulent pericarditis, may also affect the nervous supply, and thus favour distension.

3rd. *From the paralysis of simple over-distension.*—Distension of the stomach may, however, suddenly take place and increase to such an extent that the very distension itself is the cause of the paralysis. Although not dependent upon any obstruction at the pylorus, the result is the same in this case as in the first form; but, since the muscle is paralysed, there is no visible peristaltic action.

This distension may be due to the formation of gas from indigestible food, as mentioned by Dr. Hodgkin in his 'Anatomy of the Mucous and Serous Membranes,' and severe dyspepsia may also precede it. The following table indicates the class of cases in which distension occurs. It has been compiled from the post-mortem records of Guy's Hospital during the last ten years, with the addition of several other cases.

Table of Cases of Dilatation of the Stomach.

No.	Sex.	Age.	Disease causing death.	Size of stomach, &c.	Symptoms.	Remarks.
1	F.	...	Obstruction of pylorus	Contained three pints of black blood; it reached the pelvis and filled up the right iliac fossa	...	The peristalsis of the stomach had been noticed during life and mistaken for sigmoid flexure.
2	M.	16	Pyæmia	Reaching below umbilicus; contents only gas, 56 cubic inches	None.	
3	M.	27	Morbus cordis, ascites	...	Of flatulent distension	Paracentesis of stomach without good effect.
4	M.	28	Injury to knee and exhaustion	Distended to the size of a lung	None mentioned	
5	M.	43	Aortic aneurism, purulent pericarditis	Much distended; contents 1¼ pint	"	
6	M.	36	Cirrhosis, ascites	Held two quarts	"	
7	F.	44	Phthisis and disease of knee	Formed an immense bag, so that it and the liver were the only organs seen on opening the abdomen; contents, a quantity of clear mucus; pylorus quite unobstructed	Much vomiting	Other hollow viscera normal.
8	M.	14	Suppuration of knee, pyæmia	Widely dilated	None mentioned	
9	...	...	Cancer of bladder	Great distension by gas	...	
10	M.	30	Pyæmia, idiopathic	Contained two pints	...	
11	...	...	Left pleurisy and effusion	Stomach "dilated"	...	
12	M.	30	Simple dilatation	Nothing seen but the stomach on opening the abdomen; no obstruction whatever	Much vomiting for four days	Mentioned in Dr. Fagge's paper, 'Guy's Hosp. Rep.,' vol. xviii.
13	M.	17	Lithotomy, pyæmia, suppurative pericarditis	Much distended by brown liquid	"Suffered much the latter days of life from distension of the stomach"	
14	M.	32	Amputation of thigh	Enormously distended; filled whole abdomen	No obstruction	
15	F.	48	Simple dilatation	Contained 10½ pints; many of the muscular fibres had given way	Sudden vomiting	Path. Soc., iv, 137. Dr. Humby.
16	M.	18	Simple dilatation; retro-peritoneal abscess	...	Vomiting, pain, collapse	Recorded by Dr Fagge.
17	M.	26	Empyema	Enormous dilatation	Pain, vomiting, &c.	Recorded by Dr Hughes Bennett.
18	F.	23	Simple dilatation	Reached to pubes	Vomiting	Andral, Clin. Med., Spillan's Trans., p. 852.

Attention was drawn to distension of the stomach many years ago by Sir William Gull in a case under his care, and of which the drawing is in the Museum at Guy's Hospital, in which the stomach filled the whole abdomen, and this distension appeared to be the cause of death; it has been well described by my colleague, Dr. Hilton Fagge, in the communication previously alluded to.

The form of the abdomen is peculiar in this kind of distension, being full in the left hypochondrium, but hollow in the epigastric space, the curve of the upper portion of the stomach is dragged obliquely downwards, and the pylorus is situated low down on the right side, or even near the pubes. The greater curvature of the stomach is seen to describe an arc from the left hypochondrium in the direction of the pubes, following the curve of the abdomen. If the pylorus be retained in its usual position the stomach may be acutely bent, as in one of the cases described by Dr. Fagge.

If the distension be simply gaseous the peculiar form just described is less marked, the epigastrium is more uniformly distended, and the diaphragm is pressed upon. Fluid necessarily gravitates, and thus the stomach gradually assumes a lower position.

The peculiar bulging of the stomach at the lower part of the abdomen may lead to the supposition that it consists of a distended urinary bladder, or it may be mistaken for ascites, or hydatid tumour,* or distended colon; and whilst partially resonant on percussion it may produce a splashing sound from the presence of fluid with air. The symptoms produced by this state of distension are vomiting of large quantities of fluid, of a grumous brown character, or watery acid mucus, or coffee-ground substance. The relief thus obtained is often only partial, and in those instances where there is pyloric obstruction, the ejected fluids are often in a fermenting condition, with a frothy, yeast-like surface, and the sarcina ventriculi of Goodsir may be recognised; in these cases also the peristaltic movement of the stomach is a sign of value. The peculiar form of the stomach, the hollowness at the epigastrium, and the splashing sound

* Bamberger, loc. cit.

produced on percussion, are significant diagnostic signs. As to other general symptoms there is distress, the eyes appear sunken, there is sense of exhaustion, the pulse is compressible, and the bowels are generally confined. When the disease comes on acutely prostration is rapid, and in a short time the disease may prove fatal. In other cases, however, the disease may persist for many months.

The case described by Sir William Gull was a remarkable one, for the distension of the stomach was the only morbid condition, and was quickly fatal.

In a patient lately under my care, a lady, æt. 60, the disease commenced after nervous shock. Stimulants were given to relieve this state and produced subacute gastritis. Violent vomiting came on, and with this some pain at the region of the duodenum or pylorus, as if there was spasmodic contraction or ulceration. The sickness soon subsided, but the bowels were confined, and the patient did not gain strength. Gradually the fulness in the epigastric region passed into the umbilical, and then into the hypogastric region, the epigastric space becoming deeply hollowed. The distension had the form of a large stomach, extending nearly to the pubes; an attack of vomiting occasionally took place, but became less frequent, recurring every three or four days, then once a week, and afterwards at intervals of a fortnight or longer; no pain was produced, but weakness and constipation. No peristaltic movement could be recognised in this case.

The symptoms continued for more than a year, and were greatly relieved by treatment. The bowels were acted on by enemata, by castor oil, by magnesia, &c.; internally, remedies were employed to check fermentative action, more especially hyposulphite of soda with morphia, and they afforded great relief for a time. Steel, nux vomica, &c., were also used. The plan recommended by Kussmaul was tried, namely, washing the stomach out with the stomach-pump; but it distressed the patient, and as there was no pain it was not repeated. This plan, however, in some cases has afforded great relief. Friction, and gentle manipulation of the stomach, is sometimes beneficial, and the application of an electric current may induce more vigorous contraction of the mus-

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cular fibre.* Nutrient injections repeated several times during the day were beneficial in the case just mentioned.

Mayer† and Pibram have stated that, from experiments on animals, sudden distension of the stomach produces slowness of the pulse and increase of arterial tension by contracting the vessels; this statement, if correct, may have an important bearing on the severity of the abdominal symptoms, but it does not seem to be borne out by the clinical symptoms of patients suffering from flatulent distension, where the pulse is feeble and compressible.

In the treatment of these cases, the plan advocated by Kussmaul is worthy of trial, for it certainly speedily relieves gaseous distension, and the removal of fluid from the stomach enables the viscus to contract more readily. It is important to allow the stomach to rest, and for a time nutrient injections only should be used. When food is administered it is well to avoid those substances which are likely to ferment, such as saccharine and farinaceous food; milk and light soups may be taken. As to medicines, opium or morphia and alkalies may be given; and, to check fermentation, carbolic acid or the hyposulphites; afterwards steel, quinine, and strychnia, may be used to strengthen the muscular action. The local application of electricity is also beneficial.

Hour-glass Contraction.—The form of the stomach is sometimes remarkably changed by the state of its muscular coat, not only by its uniform contraction, when it resembles a piece of intestine, or by its distension, forming an enormous sac, but by irregular contraction, when it assumes the shape of an hour-glass. This narrowing of the stomach generally takes place about the centre, across the part that is the subject of ulcerative action; in many instances the cicatrix of an ulcer is found at the contracted part, but this is not always the case. In an instance of cancerous disease of the sigmoid flexure of the colon and duodenum, in which the liver also was involved, there was a fibrous band between the lesser curvature of the stomach and the liver, and the cicatrix of an

* Fürstner has recently published some remarks on the use of the induced current in dilatation of the stomach; in three cases where the dilatation occurred in hysterical females all were relieved. 'Berliner, Klin. Wochenschrift,' March 13th, 1876.

† 'Centralblatt,' 13, 1873.

ulcer. The stomach may also be drawn down by an adherent state of the omentum. It is probable that pain of a severe kind is sometimes due to this cause; and when recognised, narcotic remedies, with careful regulation of the diet, are the only treatment likely to be of service.

Lardaceous Disease of the Stomach.—The malnutrition which has been called amyloid or lardaceous disease sometimes affects the coats of the stomach; the stomach, however, is less subject to this change than the intestine, and it is only affected in those instances in which other viscera, as the liver, kidneys, spleen, &c., are extensively involved. The mucous membrane appears thickened, and when iodine is applied a brownish-red discoloration is produced. If a section of the mucous membrane be made, the minute capillary arteries are found to be thickened, and the nutrition of the mucous membrane is changed. The diseases in which lardaceous disease is especially observed are cases of chronic phthisis, and also old syphilis. In an instance of elephantiasis Græcorum with tubercular lung, the viscera, and amongst them the stomach, were affected with lardaceous disease. In conditions of disease producing general exhaustion, it is impossible to recognise this gastric change by any especial symptoms, nor does it call for treatment.

Inflammation of the Stomach.—The instances of *acute inflammation* of the stomach, which have come under my own observation, have arisen from poisons, as alcohol, arsenic, oxalic acid, chloride of zinc, sulphuric and nitric acids; in these there are two symptoms which demand particular attention—the absence of pain at the stomach, in most instances, unless perforation have taken place, and the marked prostration of strength, with depression of the pulse.

After irritant and corrosive poisons have been taken, burning pain in the mouth and throat, charring of the mucous membrane, vomiting, irritability of the stomach, purging of blood or of loose fæcal evacuations, are produced; and according to the strength of the fluid and its action on the pharynx, œsophagus, and epiglottis, there is dysphagia or dyspnœa. The vomiting is generally excessive from the primary irritation of the poison, and the vomited matters vary according to the character of the agent and the extent

of its chemical action. Subsequently, if the mucous membrane of the stomach or œsophagus have been destroyed, and fibro-plastic exudation have taken place, contraction is the result, and narrowing of the canal follows. The period during which food is retained is according to the situation of the occlusion, whether in the œsophagus or at the pylorus; in the former case, the food is at once regurgitated; in the latter, it may be retained for several hours. If the absorption of nutriment be thus prevented, emaciation takes place, the whole frame becomes wasted to an extreme degree, and a fatal issue follows in several weeks or months after the poison has been swallowed. I must refer my readers to Dr. Taylor's valuable work on 'Poisons' for an account of the distinctive symptoms produced by the various corrosive and irritant poisons.

In a case of poisoning by alcohol, the appearance of the stomach resulted from the irritant action of the poison; but the morbid change was of such a character, that unless especial attention had been drawn to the part, it might very easily have been overlooked. The stomach was minutely injected with arborescent vessels, and the congestion was apparently the remains of an acute erythematous inflammation.

In another case, in which sulphuric acid had been taken, the patient survived for eleven days, the mucous membrane was left as a detached slough. No pain was complained of, and death appeared to result from syncope.

Absence of pain was also shown in a marked degree in a case of poisoning by chloride of zinc, from Burnett's disinfecting fluid.

In another case, in which a woman had taken some oxalic acid, the quantity of which, however, was not known, vomiting and prostration were the only symptoms, and the patient gradually recovered; and in an instance of a case of poisoning by corrosive sublimate, there was no pain at the stomach, except the tenderness resulting from the violence of the vomiting, but only extreme irritability; afterwards, as the enteric inflammation increased in severity, with tenesmus, &c., pain came on about the umbilicus, and generally in the abdomen, but especially over the colon. The intensity of the disease in the ascending colon and in the rectum was very mani-

fest; and it is remarkable how comparatively the small intestine escaped. Depression of power, as shown by a very compressible pulse, was a marked symptom throughout; but after the fourth day on which salivation was developed it became more evident, and the patient quickly succumbed. The œsophagus was acutely diseased, and the whole intestinal tract more or less congested. The suppression of urine, and the coarse as well as the congested state of the kidneys, were indicative of extreme irritation of those glands, but the whole character of the blood seemed to be changed; it was fluid in its character, the heart contained only a loose coagulum, and this condition of the blood had probably an important influence in determining the intense congestion and the pneumonic state of the lower lobes of the lungs. The patient died on the sixth day.

The *prognosis* in cases of acute inflammation of the stomach from poisons is generally unfavorable, and care must be taken lest the absence of pain and the clearness of the intellect mislead us as to the injury done to the stomach. The action of the heart is often exceedingly feeble, the pulse being perhaps scarcely perceptible; and this circumstance is the cause of the fatal syncope, which often unexpectedly supervenes.

The *treatment* in acute inflammation of the stomach from poisons consists—1st, in the removal of the poison; 2nd, in counteracting the first effect by antidotes, and by protecting the mucous membrane by means of oleaginous and demulcent substances; 3dly, in diminishing the pain by the use of opiate and anodyne agents; 4thly, in sustaining the patient under the effect of the nervous shock and extreme depression by means of bland nutriment, and sometimes by nutrient and stimulating enemata; 5thly, the secondary effects of contraction of the œsophagus and pylorus may be mitigated by the use of fluid food in a concentrated form, and several cases are recorded in which the constriction of the œsophagus was relieved by bougies. Great injury may be done by the too-active interference of the attendant; depletion and mercurials, as well as powerful stimulants, generally aggravate the mischief.

Acute Catarrhal Gastritis; Inflammatory Dyspepsia; Sub-

acute Inflammation.—Catarrh of the stomach takes place, probably, in an acute form, and is the cause of some of the varieties of dyspepsia; but we are not cognizant of the conditions observed after death indicative of this state, except that we sometimes observe intense congestion with excess of mucous secretion. It very rarely happens that any one can have the opportunities possessed by Dr. Beaumont, of observing the appearance of the gastric mucous membrane during life; he found sometimes an erythematous condition, with deficient gastric secretion, arising from irritating food or stimulants. These cases of dyspepsia are no more functional in their character than coryza or slight conjunctivitis. In ordinary catarrh, after exposure to cold, we find there is generally partial, often complete, loss of appetite, and occasionally diarrhœa, the mucous membrane of the stomach joining in the general condition.

In the dyspepsia just mentioned the *symptoms* are nausea or vomiting increased by food, craving for cold drinks, injection of the tongue, and enlargement of the papillæ, with sometimes an abundant yellowish-white fur, tenderness and uneasiness at the scrobiculus cordis, pain extending to the back between the shoulder-blades, loss of appetite, languor, headache, and an incapacity or unwillingness for mental or physical exertion, an anxious care-worn countenance, with a sunken condition of the eyes. Oftentimes there is slight febrile disturbance, with a burning sensation at the palms of the hands and soles of the feet; the bowels become irritable or constipated; the urine is high-coloured, and, with nitric acid, assumes a deep-red colour, or it deposits lithates abundantly. When vomiting is severe, bright-green fluid and mucus are often ejected. This state, in not a few instances, passes into a more chronic form of the disease, which is often called *chronic gastritis*, a condition which is indicated by soreness at the scrobiculus cordis; by pain, which extends to the spine; by sallowness of the complexion, and an anxious, distressed countenance; by injection of the tongue, which is sometimes like raw beef, or has red patches upon it, as if deprived of epithelium; by a compressible pulse, and by emaciation. The pain at the stomach is increased by food in every form. This disease

is often very obstinate, and persists month after month; and although we have no evidence of actual ulceration and destruction of the surface of the mucous membrane, still there is probably chronic inflammatory change. The gums sometimes become spongy, and the mouth and pharynx aphthous and painful; vomiting also is occasionally a troublesome symptom, and diarrhœa may be present. Vomiting, tenderness at the scrobiculus cordis, and the desire for cold drinks, are the prominent symptoms of this inflammation of the mucous membrane.

There is a predisposition to this form of disease in strumous subjects; but we must distinguish this affection from a sympathetic irritation of the stomach, produced in the early stage of disease of the lungs and of the brain, and to which we shall have subsequently to refer. And, we find towards the close of phthisis, of cirrhosis, of strumous peritonitis, &c., a state arises, which although associated with a general condition of exhaustion, closely simulates what we have described as chronic gastritis; in these instances, however, the small and large intestines are often implicated, and we find a flush on one cheek, profuse perspirations at night, preceded by dry burning heat; the bowels are at one time confined, at another relaxed, and the motions are very offensive in character. These symptoms are often associated with great irritability of temper, fretfulness, and sometimes with delirium. (See Gastro-enteritis.)

In the disease to which my late colleague, Dr. Addison, gave especial attention towards the close of his life, "melasma supra renale," irritability of the stomach and great prostration of strength are the two most prominent symptoms; and so closely do the symptoms resemble those produced by poisons, and so frequent are the traces of gastric irritation found after death, that it has often been questioned how far these gastric symptoms, with bronzed discoloration of the skin, are due to sympathetic disturbance, and how far to disease of an inflammatory character. In instances of this kind which have come under our notice superficial ulceration of the stomach has been observed, in others arborescent injection of the capillaries, with ecchymosis and an excess of tenacious mucus.

As to *remedial* measures, stimulants aggravate the malady; but leeches may sometimes be applied in severe instances to the scrobiculus cordis; whilst generally, cool drinks, soda-water, or ice mitigate the symptoms, and may be used with solution of potash and demulcents, or with magnesia and opium. The carbonate or nitrate of bismuth, with carbonate of soda and spirit of chloroform in almond emulsion, is of great service in these conditions. If the bowels are confined, saline aperients should be given, as the carbonate of magnesia and soda, with lemon-juice or citric acid. Mercurial purgatives are sometimes used, and have the advantage of thoroughly unloading the bowels and of diminishing capillary and portal engorgement, without increasing the irritability of the stomach; thus, calomel may be given in doses of three to five grains, in combination with colocynth, aloes, rhubarb, henbane, &c.; or blue pill or grey powder may be administered in similar combination; or, again, the calomel may be decomposed by alkaline carbonates, as in the preparation of soda with mercury in the Guy's Pharmacopœia. It is well also to follow these mercurial purgatives with a warm aperient draught, so as to produce a full and copious evacuation. To give mercurial preparations, so as to affect the system generally, we think to be positively injurious, and it is better when they can be altogether dispensed with; saline aperients, followed by vegetable tonics, and a bland, unstimulating diet, are generally sufficient. Local applications to the pit of the stomach are also useful in lessening the vomiting and the pain, as mustard or linseed poultices, chloroform liniment, with belladonna liniment, &c. Subsequently, if the appetite fail, and the mucous membrane be relaxed, benefit accrues from the internal administration of the dilute nitric or nitro-hydrochloric acids, with vegetable infusions, as calumba, cascarilla, cusparia, or gentian.

In the more chronic forms the means best calculated to afford relief are the giving of nourishment in small quantities, of a character which is easily digestible, and well masticated. Alkalies and salines relieve the irritability and congested state of the mucous membrane; for instance, solution of potash, the bicarbonate of potash or soda, calcined or carbonate of magnesia, administered with almond emulsion, with cam-

phor mixture, or with any demulcent. If there be neuralgic pain, it is well to add a few drops of dilute hydrocyanic acid, tincture of henbane or conium, the solution of morphia or a preparation of opium; or to give the trisnitrate of bismuth, with chloric ether.

In some cases I have seen very great benefit from the administration of lemon-juice; the pain has subsided, and the toleration of food and ability to digest it have considerably increased. It must be borne in mind, in these cases, that whilst vegetable food appears to be less easy of digestion, and often has to be prohibited, if months are allowed to pass without its use the health fails on that account alone, and increased cachexia is produced; the administration of fruit, oranges, grapes, &c., is advisable; the juice of a lemon may be taken daily with relief to the pain and distress at the scrobiculus cordis.

The application of leeches or blisters is often of service, and in some cases I have known benefit derived from the introduction of a seton at the pit of the stomach.

The action of the skin should be promoted; and although sudden and violent exercise is injurious and could not be borne, still, exercise in the open air, and even horse exercise, is often very beneficial. A change of air should, if possible, be made, especially from a damp and relaxing situation to one of a more dry and bracing character.

Chronic Gastritis or *Chronic Catarrh* of the stomach and of the intestines, although it may arise from inflammation affecting the gastro-intestinal tract in common with the pulmonary mucous membrane, is more frequently observed as a consequence of congestive disease of the portal system. The mucous membrane and submucous tissue become congested, often intensely so, or even ecchymosed; the membrane has a swollen, œdematous or granular appearance, and is covered with a thick and tenacious layer of mucus. This is sometimes found to be alkaline in its reaction, is with difficulty washed off by water, and consists of mucous corpuscles, nuclei, and epithelium.

Thickening of the mucous and sub-mucous membranes, and grey discoloration from the deposition of pigmental granules from the long-continued congestion of the capil-

laries, are the result of chronic catarrh. The follicles of the stomach are found very distinct, and filled with nuclei and cells, and there may be increase of the interlobular lymphatic elements or nuclear overgrowth in the sheath of the vessels.

The cause of this condition appears to be persistent congestion, but it may also arise from long-continued excesses, and it has been observed especially in tuberculosis, as well as in phthisis. Dr. Wilson Fox gives a total of 14 cases out of 36. Of 100 stomachs examined, 21 had acute catarrh, 19 chronic catarrh and in 17 the two states were combined. Other diseases which appear to predispose to it are fevers, Bright's disease, peritonitis, and pneumonia. In chronic bronchitis and emphysema, in valvular or obstructive disease of the heart, in cirrhosis of the liver, and in other conditions, the vena portæ, and its tributary branches, become overfilled with blood, and consequently the capillary vessels from the mucous membranes of the viscera also become surcharged; altered secretion, and the condition we have just described, is the consequence; thus, the congestion is not limited to the stomach, but extends through the whole of the tract of the alimentary canal, in both the small and large intestines.

These conditions, then, are not in themselves primary, but are the result of cardiac, pulmonary, or hepatic disease. Sooner or later, in most cases, the signs indicative of gastric catarrh come on, pain at the scrobiculus cordis increased by food, pain between the shoulders, occasional vomiting, flatulence, oppression at the stomach, malaise, constipation; the flatulent distension after food becomes exceedingly distressing, so that scarcely any can be taken with comfort, and solid food is almost discarded. In some cases the pain takes the form of a severe paroxysmal colic, returning day by day at a definite time.

An attack of hæmatemesis, or of bleeding from hæmorrhoids, may remove the congestion, and afford comfort to the patient, but the symptoms are very quickly reproduced. The dyspnœa and palpitation of heart disease, the cough and gasping for breath of chronic bronchitis, engage the attention of the patient, and obscure the less urgent symptoms of disease of the alimentary canal; it is when the

former have been relieved that attention is directed to the abdomen. This state of catarrh is often relieved by the same means which mitigate the original disease. Emptying the portal system not only diminishes the distension of the right side of the heart and of the pulmonary vessels, but also the congestion, which is the direct cause of the catarrh of the intestines. Purgatives, saline, hydragogue, or mercurial, are generally used, and sometimes the more direct means of relieving the vessels by the application of leeches to the anus. The administration of mineral acids, with demulcents, expectorants, or tonics, according to the condition of the patient, affords great relief; the preparations of steel may also be given with advantage.

Diphtheritic Inflammation of the Stomach.—Acute inflammation of the mucous membranes manifests itself by alteration in the secretion and condition of all the parts composing them. The capillaries and the blood within them, the formation of epithelium or mucus or of other secretions, are modified, and the whole vital condition of the part deviates from the healthy state. "The more the conditions of nutrition deviate from what is normal, the more will the material effused from the vessels deviate from the normal type."* This is exemplified in ordinary catarrh and bronchitis, as compared with the effusion of false membrane in croup and laryngitis, and with the sloughing which is occasionally seen in some severe cases of angina. In these diseases the membrane becomes intensely red from congestion of its capillaries, swollen from effusion of serum into its tissue, hot and more highly sensitive, and its secretion is changed. If the disease be slight, the mucus is altered in quantity rather than in quality, or its cells are found to be exceedingly abundant and imperfect in their formation, or mere nuclei are produced. In croupous inflammation, the secretion consists of a blastema, with greater or less tendency to fibrillate, containing granules, nuclei, or variously formed cells. It is more or less adherent to the membrane beneath, though not incorporated with it. The larynx and trachea are most frequently the subject of the disease, or

* Paget, 'Surgical Path.'

perhaps still more, the mucous membrane of the mouth, pharynx, and nasal passages.

The real nature of the croupous inflammatory membrane, notwithstanding all that has been written respecting it, still remains in some obscurity. In common with other morbid products it is thought by many to be of vegetable origin. We shall only state that wherever it occurs it is from a membrane formed by epithelial and lymph or pus cells welded together by a coagulated fibrinous material. This opinion is considerably strengthened by the study of allied disease in the alimentary canal. The mucous membrane of the bowel discharges casts of coagulated mucus. The reason of the coagulability of the effused material is probably not the same with all persons; in some it may be, that the intensity of the inflammation leads to the effusion of an ordinary coagulable fibrin, in others that the character of the surface and the secretions with which the effusion comes in contact may lead to coagulation which would not otherwise take place.

The term diphtheritic inflammation was applied by Bretonneau to a form of acute inflammation of the mouth and pharynx, accompanied with the effusion of a greyish false membrane in small lenticular or diffused patches, and followed by superficial or deeper ulceration, the disease extending to the nasal mucous membrane; the same term is applied to similar disease affecting other organs.

Of late years, however, the term diphtheritic, as applied to inflammatory products, has come to have somewhat different significations in English and German literature. The croupous inflammation of German authors, though a term of much wider extension includes our diphtheritic inflammation; and, any sloughing disease of a mucous surface, where the whole thickness of the membrane sloughs, would be the diphtheria of the German pathologists. We make this distinction, though it is not adhered to by English writers, because there are two forms of disease both in the throat and stomach which correspond to the two varieties. Both in the throat and in the stomach we occasionally find a sloughing form of disease, and we also observe a membranous inflammation.

The stomach is less prone to acute inflammatory disease than either the small or large intestine, and we rarely have an opportunity of observing acute gastritis except as the result of irritant poisons. Croupous or diphtheritic inflammation is still more rare, and the following case, although in many respects imperfect, is of considerable interest; the symptoms of disease of the stomach were not clearly marked, but the patient was exhausted, and suffering from advanced syphilitic necrosis of the bones of the nose, and was also the subject of disease of the kidneys.

CASE XXXV.—*Syphilis. Diphtheritic Inflammation of the Stomach. Diseased Kidneys. Necrosis of the Bones of the Nose.*—Ann O—, æt. 47, was admitted, under Mr. Poland's care, Nov. 22nd, 1854, and died March 30th. She had had syphilis many years previously, for which she had taken mercury, and was admitted in a state of general cachexia, with necrosis of the bones of the nose. In this condition she continued till a short time before death, when she appeared more exhausted, and puffiness of the hands and face came on. She appeared to die from exhaustion.

Inspection fourteen hours after death.—The whole of the soft parts and the bones of the nose as well as of the palate were destroyed. In the brain there was serous effusion. The lungs and heart were healthy. The liver was fatty and nodulated, and it contained small lardaceous masses. The spleen was firm and waxy, and it also contained lardaceous matter; its weight was six ounces. The kidneys were much degenerated, presenting white deposit in the secreting structure, and the tubes contained highly refracting granules (fat).

The stomach presented a very remarkable appearance; it was of normal size. The mucous membrane was intensely congested; in numerous parts were small patches of thin, yellowish, lymph-like substance, which were very adherent, and were composed of mucous cells, granules, granule cells, and some secreting cells. Other parts of the mucous membrane were covered with tenacious mucus. There was intense congestion of the capillaries of the mucous membrane, the follicles of which were distended with granules and with secreting cells. A dissolute life, and the impairment of general health by syphilis and mercury, were the predisposing causes of this disease of the stomach.

Of croupous inflammation of the stomach Bamberger states, "That it is found in children with croupous exuda-

tion on other membranes, and in adults it is secondary to typhus, pyæmia, puerperal fever, cholera, dysentery, or any acute exanthem." It is sometimes found in children, too, after the administration of tartrate of antimony.*

In a case of diphtheria, which was under the care of my colleague, Dr. Pye Smith, in a child, æt. 4½, the palate, larynx, and trachea, were affected, and pneumonia was also produced. The œsophagus was healthy, but in the stomach, within the radius of two and a half inches from the cardiac orifice, were numerous small ulcers like hæmorrhagic erosions, and some of them were covered with a pellicle.

Dr. Fenwick has described acute inflammatory disease coming on in the stomach after scarlet fever, and in a case of hæmorrhagic smallpox, which terminated fatally in Guy's Hospital, under the care of my colleague, Dr. Pavy, the mischief had extended into the stomach, for not only the œsophagus, but the stomach and a great part of the intestine, were lined with black pulpy fluid, which evidently consisted of blood.

Of the other form, which is perhaps better termed phlegmonous gastritis, the following case may be taken as a typical instance.† A patient who died from gout, with granular kidneys, hypertrophy of the heart, and phlegmonous colitis, had also acute disease of the stomach. The stomach was thickened, and was rigid from inflammatory infiltration; the surface of the mucous membrane gave an alkaline reaction to test paper; the mucous membrane presented patches of yellowish colour, like fibrin; these were adherent, and on removal brought away some of the mucous membrane. He had suffered from diarrhœa, and the intestine presented a curious state of its submucous tissue; there were projections like boils due to collections of pus beneath the mucous membrane; the mucous surface was covered with lymph; in other parts ulcers appeared with ragged bases, some were nearly healed; the whole membrane was puckered, and the morbid process had apparently gone on for some time.

Suppuration in the Coats of the Stomach.—Local suppuration in the walls of the stomach is of exceedingly rare

* Bamberger, loc. cit., p. 272.

† 'Path. Trans.,' 1875, Dr. Fagge.

occurrence. The history of the following case is imperfect in its details, but is sufficient to show the general character and symptoms of such disease. It is probable that the case was one of pyæmia.

Case XXXVI.—Elizabeth T—, æt. 40, was admitted, May 2nd, 1847, into Guy's Hospital. She was a married woman, and a nurse. For a fortnight she had suffered from pain in the limbs and back, and for a few days in the stomach and chest. The abdominal tenderness subsequently increased. She had anorexia and constant vomiting of a dark-coloured, bitter fluid, with intense thirst. Her death was preceded by restlessness and stupor.

Inspection twenty-four hours after death.—The body was tolerably nourished. The peritoneal cavity contained yellow, opaque, puriform secretion, of uniform consistence, but of very offensive odour. At the pyloric third of the greater curvature of the stomach was a firm mass, measuring four and a half by three and a half inches. On opening the stomach, a small quantity of greenish fluid escaped. The mucous membrane was dotted over its surface with points of ecchymosis, and an irregular, dark-brown patch, about the size of a shilling, was found near the pylorus, at the centre of the thickened mass. When the peritoneal and muscular coats were divided, there was found to be a collection of pus in the submucous cellular tissue. The pus was semi-fluid. The intestines were distended with gas; but no disease could be found in the mucous membrane, except a small polypus in the rectum. The liver was dark, congested, and lacerable. The spleen and kidneys were congested. The uterus was full of menstrual blood. (Preparation 1802[65].)

In a case of pyæmia, under the care of my colleague, Dr. Moxon, with fistula of the rectum, two or three abscesses, as large as hazel nuts, were found in the stomach between the muscular and mucous coats. The serous and mucous coats were healthy, and no trace of ulceration could be detected.

In addition to this form of local suppuration a diffuse form has also been found in very rare cases, perhaps the best recorded instance being that of my colleague, Dr. Hilton Fagge, in the 'Pathological Society's Transactions' for 1875, p. 81. The case, as there detailed, is that a gentleman, æt. 51, was taken with vomiting and retching at 8 a.m. He had always a weak digestion, and for that reason, during a late visit to Brighton, had taken but very sparingly of soup, tea, and other light food. The pain was paroxysmal and very severe, shooting up to the right shoulder. He became a little delirious, and had frequent calls to evacuate his

bowels without any feculent matter passing, and he died quite suddenly at midnight. Bamberger,* in his description of phlegmonous gastritis or inflammation of the submucous cellular tissue of the stomach, after describing it as commonly secondary to pyæmic affections, and noting that Oppolzer had seen it twice in puerperal fever, gives a somewhat similar case in a young healthy soldier. The patient died after a few days of vomiting, with violent pain of the stomach and high fever with delirium. The stomach was infiltrated through its whole extent with pus, which streamed out on every section. He remarks that a diagnosis in such cases is hardly possible, by reason of the want of further recorded cases. Dr. Moxon says of it,† "That though it is rare, Ackerman has collected thirty cases, and that it is apt to set up pyæmic abscesses in the liver." This, however, would hardly apply to the diffused form so much as to the localised, for it would appear that the former is too rapid in its course to have much time for the development of secondary abscesses.

Ulceration of the Stomach.—There are several forms of simple ulceration observed in the stomach:—1st. Superficial ulceration, affecting only the mucous membrane, which, although confined to the surface, is associated with marked gastric symptoms. 2ndly. Follicular ulceration. And 3rdly. Perforating ulcer, acute and chronic.

Long-continued congestion of the mucous membrane of the stomach not only produces the state which we have described as chronic catarrh, but is also followed by superficial ulceration, or as it is termed *hæmorrhagic erosion;* but this destruction of the mucous membrane is also the result of subacute inflammation. The membrane is generally found to be congested, especially at the rugæ, and the ulcers are situated at the lesser curvature, or in the neighbourhood of the pylorus. The ordinary size of these ulcers is about a quarter of an inch in diameter; they have irregular and sometimes rounded edges; as to colour, they are minutely injected or pale, and in depth they often reach to the submucous cellular tissue; a single point of

* Loc. cit., 266.

† 'Path. Anat.,' Wilks and Moxon, p. 381.

ulceration may alone be observed, or several parts of the membrane may be thus superficially destroyed. It has even been suggested that several of these ulcers by uniting may lead to the larger perforating ulcer. The intervening tissue may either have a normal appearance, or present arborescent and even general congestion, whilst the submucous and muscular coats of the stomach remain free from hypertrophic change, unless chronic irritation has existed. On further and microscopical examination, the ulcerative process is found to have irregularly destroyed the gastric follicles laterally; and the surface presents mucus-cells, nuclei, and epithelium.

The *symptoms* of superficial ulceration are sometimes of an acute character; vomiting, pain at the scrobiculus cordis, and between the shoulders, tenderness at the epigastrium, pyrosis, injection of the tongue at the tip and edges, loss of strength, and even great prostration, are the symptoms which have been observed in this disease; but in superficial ulceration other coincident diseases may exist; as disease of the supra-renal capsule, with long-continued indigestion, phthisis, as in a case where there was great intemperance, and we have also observed it with chorea. Great prostration of strength is often a marked symptom, and a most interesting one, when it is viewed in connection with the intimate union of the stomach with the large plexuses and ganglia of the sympathetic nerve. The association of some of these cases of superficial ulceration with pyæmia, appears to show that a general diseased condition of the blood predisposes to or excites this change.

In the class of cases associated with portal congestion, vomiting of coffee-ground substance sometimes takes place before death, and fluid of a similar kind is found in the stomach on post-mortem examination; chronic congestion followed by ulceration leads to effusion of blood, which gives rise to this red-coloured vomited fluid. Obstructive disease of the heart and lungs, and any condition which interferes with the free circulation of blood through the liver, predisposes to this form of disease. This state of stomach is often associated with chronic catarrh, and the symptoms before mentioned are generally present, an attack of hæmatemesis

may afford great relief, but the symptoms may be so masked by the primary disease that this gastric ulceration is only recognised on the post-mortem table.

The following cases, tabulated from the 'Guy's Post-mortem Records,' indicate the frequent association of hæmorrhagic erosion with disease of the heart and lungs.

1. Cancer of rectum and liver; œdema and gangrene of lungs.
2. Aortic disease; dropsy; pulmonary apoplexy.
3. Large white kidney with severe catarrh of stomach.
4. Ulcerative endocarditis; adherent pericardium.
5. Disease of aortic and mitral valves.
6. Lardaceous viscera; dropsy; old syphilis.
7. Albuminuria; hypertrophied heart.
8. Dilated heart; imperfect ventricular septum; dropsy.
9. Subacute aortitis; retroverted valve and dilatation of the heart.
10. Dilated heart.
11. Aortitis; hypertrophy and dilatation of heart.
12. Bruised side; polypi in the right side of the heart.
13. Purpura hæmorrhagica.
14. Chronic bronchitis.

In the *treatment* of superficial ulceration the application of leeches, or of a small blister to the scrobiculus cordis affords considerable relief; nitrate of bismuth with conium, or with morphia, and hydrocyanic acid, soothes the irritated membrane, and diminishes pain. Solution of potash, the bicarbonate of potash, or of soda, with anodynes and demulcents, render the mucus less irritating, and thereby diminish the congestion of the mucous membrane. Nitrate or oxide of silver in small doses relieves the pain, and renders the stomach more tolerant of food. Chloric ether also, with carbonate of soda, and mucilage mixture or almond emulsion is often of great service.

Ice and cold water are exceedingly grateful to the patient, but stimulants are not well borne, although on account of the prostration we are often tempted to give them; if they be absolutely called for, they should be diluted and mixed with food, as wine with arrow-root or jelly, or a small quantity of brandy with soda water. A farinaceous diet is more suited to these cases than animal food, which taxes in a greater degree the energies of the diseased membrane; it is well

to allow three to four hours to intervene between each meal, unless the stomach be very irritable, or the patient prostrate, when small and often repeated quantities are to be preferred.

In some cases of anæmia, and chlorosis with leucorrhœa, steel may be taken with advantage; it should be administered in the milder forms, as the ammonio-citrate and tartrate, or in pills, as the compound steel pill with henbane and rhubarb, and always after a meal.

In the congestive forms of ulceration, purgatives relieve portal congestion, and thus remove much distress; but their action is followed by prostration, so that at last we are obliged to suspend them altogether. Diuretics and diaphoretics also tend to a similar result; small depletions afford temporary relief, but are not called for unless the respiration and the impeded action of the heart absolutely require them.

Case XXXVII.—*Superficial Ulceration of Stomach. Diseased Supra-renal Capsules.*—John J—, æt. 22, was admitted March 20th, and died on the following day. He was a stonemason by trade, residing at Lambeth, and during the winter had had pain in his stomach and vomiting. The vomited matters consisted of watery fluid. On admission the extremities were cold and he was almost pulseless, he had not diarrhœa but he had slight pain in the hypogastric region. He rallied a little after admission, but vomiting of bilious matter came on, and he appeared to die from syncope.

The *inspection* was made seventeen hours after death. The body was tolerably nourished, but the face was of a dingy hue, "Melasma Addisonii." The brain and its membranes were normal. At the apices of the lungs were lobules of iron-grey consolidated lung, with some calcareous deposit. The right side of the heart was moderately distended; the left was firmly contracted. On carefully examining the *stomach*, the cardiac extremity presented post-mortem solution, but towards the lesser curvature the mucous membrane was granular, and in several parts was destroyed by small patches of ulceration. These were quite superficial and irregular. In other parts above the line of solution there was arborescent injection. On microscopical examination, mucous and granule cells were observed. In the small intestine, Brunner's glands in the duodenum, and Peyer's and the solitary glands in the ileum, were very distinct. The liver and spleen were healthy; the kidneys coarse. The supra-renal capsules were atrophied, being only forty-nine grains in weight, and each was adherent to the surrounding parts by dense fibrous tissue; the left appeared irregular from contraction. The section was pale, and presented fibrous tissue, fat, and cells.

There were evident symptoms of disease of the stomach in the pyrosis, pain, and vomiting from which this man suffered.

Discoloration of the skin and the prostration of strength, which was very remarkable, were typical signs of a condition which is now well recognised as Addison's disease of the supra-renal capsules.

The connexion of all these symptoms may be accounted for by the fact that the pneumogastric nerve not only supplies the stomach, and joins the large sympathetic ganglia of the solar plexus, but sends a large branch to join the sympathetic nerve of the kidney and supra-renal capsule, and this nerve is of considerable size. The exhaustion, collapse, fluttering pulse, present in many diseases of the abdomen, and sometimes produced by blows on the epigastrium, as well as the neuralgic pain in the side, with gastric irritation or ulceration, arise, no doubt, from this cause, namely, the connexion of the sympathetic with the pneumogastric and spinal nerves.

Case XXXVIII.—*Chorea. Endocarditis of the Mitral. Ulceration of the Stomach.*—Elizabeth C—, æt. 18, was admitted March 28th, into Guy's Hospital. For two weeks before death she had very severe chorea, with constant jactitation, and sleeplessness; gradual exhaustion supervened. The mucous membrane of the stomach was softened and partially dissolved at the greater curvature. Near the lesser curvature were several small congested patches, in the centre of which the mucous membrane was destroyed. One of these had the appearance of a cicatrix.

On microscopical examination, the follicles were found to be full of granules, and cells containing highly refracting particles, somewhat resembling inflammatory cells. Similar cells, with mucus, were present on the surface, and the capillaries of the mucous membrane were much congested. The mucous membrane of the small intestine was similarly congested. The condition of the stomach appeared thus to indicate considerable irritation; but the severe nervous symptoms completely masked every other morbid state.

Case XXXIX.—*Catarrh, and Superficial Ulceration of the Stomach. Cystic Disease of the Ovary.*—Ann A—, æt. 23, was admitted October, 1854. She was a married woman, and with the exception of ague several years previously, she had enjoyed good health. Nine months before admission, after vomiting, which had latterly become habitual, she experienced pain in the side, and the abdomen became swollen. The enlargement increased and subsequently proved to be ovarian. After

paracentesis the fluid re-collected, and she was admitted in a very enfeebled condition. Vomiting came on, and she gradually sank.

Inspection fifty-eight hours after death.—The peritoneum contained three to four quarts of reddish fluid, and also a large cystiform tumour formed by the right ovary. The stomach was large; its rugæ were reddened, and covered with a thick layer of mucus. The mucous membrane was thin, and presented, especially at the lesser curvature, numerous minute ulcers, which were found to extend to the submucous cellular tissue, and on their surface numerous spherical cells, containing highly refracting particles, were observed. The other parts of the intestine were much congested. The liver was fatty.

In this case the power of the patient was much reduced, and the abdominal tumour had exerted considerable pressure on the vessels. It appeared, however, that for some time before death, the mucous membrane of the stomach had been in an irritated, if not inflamed condition, as indicated by the repeated attacks of vomiting, before any mechanical pressure was exerted upon the viscus. The earlier attacks of vomiting were perhaps due to sympathy with the diseased ovary.

Follicular Ulceration of the Stomach.—Minute points of ulceration, varying in size from one sixteenth to one fourth of an inch in diameter, are sometimes found studding the whole surface of the stomach. They do not extend deeper than the mucous membrane, and are situated, not only at the lesser curvature, but over the greater part of the stomach; and they appear sufficiently distinct from the more common superficial ulcer to warrant separate mention. They may be associated with a similar condition throughout the intestinal tract. Dr. Brinton thinks that there is no proof of their origin in the gastric follicles, or in the lenticular glands if present; and suggests the term punctate ulceration as being more correct.

This form of ulceration has been observed in children with severe gastric symptoms; but it has been generally found after death when no indication of disease of the stomach had previously existed, excepting, perhaps, the vomiting of coffee-ground substance. A drawing, in the Museum of Guy's,* from an infant under the care of Dr. Lever, shows the mucous membrane of the stomach intensely congested, and covered with minute points of ulceration. The microscopical appearance of these minute ulcers presents irregular edges extend-

ing into the gastric follicles; the base consists of the submucous tissue, and on the surface are numerous cells, either altered secreting cells, or inflammatory granule cells. There is no proof that the disease originates in the solitary glands, but rather that it is follicular in its character. These ulcers, in some cases, are probably formed a short time before death; and are due in part to irritating secretions, and to the depressed state of the nervous system. The disease is closely allied to the gastritis folliculosa of Cruveilhier, or to what is called hæmorrhagic erosion; but the latter term is more applicable to some of the forms of superficial ulceration with great congestion.

In connection with the subject of follicular inflammation we may refer to an interesting case which occurred under the care of my colleague Dr. F. Taylor. In the stomach of an illegitimate child aged 8 months, and who had died from syphilis, numerous whitish round spots, about the size of "spangles," were observed. These were at first believed to be ulcers, but on careful examination the mucous membrane was found to be entire, but it could be easily removed on the slightest pressure—these spots extended to the subserous tissue. There was also ulceration of the rectum.

In some fatal cases of hæmorrhage from the stomach, a minute ulcer, scarcely larger than those just described, has been found; at the base of which the branch of an artery has been observed containing a small clot.† Sometimes there are seen numerous minute specks, each containing a small clot.

Two cases of this kind are recorded by Dr. Murchison in the 'Path. Soc. Trans.,' vol. xxi, p. 162. The ulcers were such as might be called hæmorrhagic erosions, and occurred in spirit drinkers, and both were fatal from hæmorrhage.

Case XL.—*Follicular Ulceration of the Mucous Membrane of the Stomach, with Renal Anasarca and Diseased Heart.*—Susan K—, æt. 67, was admitted into Guy's in June, 1854. She had general anasarca, with albuminous urine; the pulse was irregular; and there was dyspnœa, with palpitation of the heart. A short time before death, vomiting of a dark-coloured fluid took place.

On *inspection*, coarse congested kidneys were found, with a heart

* Drawing No. 286[75].

† Drawing No. 1801[30].

weighing fifteen ounces, dilated and flaccid, and with some atheromatous deposit on the mitral and aortic valves. There were several small fibrous tumours beneath the peritoneum covering the uterus. In the stomach, above the line of gastric solution, were numerous minute ulcerations, about the size of a pin's head, studding over the whole of the membrane, and without any thickening of the submucous or muscular tissue. See Preparation, Museum, No. 1802[75].

Case XLI.—*Follicular Inflammation of the Stomach. Burn on the Leg. Amputation. Abscess in the Lung and Spleen.*—George H—, æt. 15, was admitted into Guy's Hospital April 20th, and died June 23rd. He had scalded the arm and leg with hot tar. The left leg was principally injured, but was never disposed to heal, and the nerves became exposed; the leg was amputated on account of his prostrate condition and the severity of the pain from which he suffered.

Inspection eight hours after death. The stump was sloughing, and the dry bone projected. The left arm was œdematous. There was pyæmic pneumonia and minute abscesses in the heart and spleen. The diaphragm on both sides was covered with purulent lymph.

The *stomach* contained coffee-ground fluid. Near the cardiac extremity were numerous minute follicular ulcers; but the gastric follicles for the most part were found to be in a normal state.

Perforating Ulcer of the Stomach.—The form of ulceration which we have next to consider has been designated emphatically ulcer of the stomach, by some also the chronic, and by others the perforating ulcer. Some cases of the latter description are not of a chronic character, and ought perhaps on that account to be considered apart; many of those, however, which have extended over considerable periods, terminate in perforation, so that we can scarcely separate the one from the other; the term perforating is however meant to imply a *tendency* to extend through the mucous, and also through the muscular and peritoneal coats, although adhesions may prevent sudden fatal peritonitis.

The perforating ulcer has probably in all cases been preceded by some of the conditions previously described. The ulcers are situated at the lesser curvature of the stomach, sometimes towards the anterior, but more frequently towards the posterior aspect, and near the pylorus; they vary in size from a quarter of an inch to three inches, or even more, in diameter, and are round, oval, or reniform, the latter perhaps from the union of two ulcers. In the 'Dublin Hospital Gazette,' Dr. Law mentions an instance in which an ulcer

was six inches in length in its long axis. Dr. Brinton,* in his investigations on 'Ulcer of the Stomach,' states that in 43 per cent. the ulcer was situated at the posterior surface, in 27 at the lesser curvature, in 16 at the pyloric extremity, in 6 on both the anterior and posterior surfaces, often in opposite positions, in 5 on the anterior surface, in 2 at the greater curvature, and in 2 in the cardiac pouch; those on the anterior surface being the most liable to lead to perforation and peritonitis.

The edges of the chronic ulcer are rounded and elevated; but in those which are more emphatically termed the perforating ulcer the edges are frequently neither raised nor injected, but merely present a small punch-hole opening, perforating the peritoneal membrane. The opening is rather larger on the mucous surface, but there is no evidence of inflammatory action, and sometimes no adhesion whatever with adjoining viscera. More frequently, however, the edges of an ulcer in the stomach are considerably thickened by the infiltration of fibrous tissue in the mucous and submucous coat; the centre is therefore depressed, and a hollowed cavity is produced; and in many of these cases, also, the disease extends through the muscular and even through the peritoneal coat. The opening in the mucous membrane is larger than that of the muscular, and the muscular than the peritoneal coat, so that the ulcer has a bevelled appearance on its inner aspect. This fact has been adduced in support of a theory as to the causation of the perforating ulcer, as we shall see in discussing the pathology of the affection. If the peritoneum ulcerate or slough before adhesions have formed, a round opening, as if a punch-hole had been made, is observed to extend into the serous sac, and leads to rapidly fatal peritonitis. If, however, adhesions take place around the ulcer, its base is formed by the adjoining viscera, such as the pancreas, or the left lobe of the liver, or the spleen. In these cases the base of the ulcer, or cicatrix, is of a whitish colour, and consists of fibrinous effusion, and is smooth, or it has a minutely granular appearance; the edges become exceedingly firm, and are formed of dense fibrinous effusion into the mucous and submucous tissues. Glandular mucous mem-

* Brinton on 'Diseases of the Stomach.'

brane is not reformed in these cicatrices. It is of some importance in explaining the frequency of hæmorrhage to remember, that the ulcer is most commonly found on the posterior wall of the stomach, and therefore that the floor of the ulcer is usually formed by the *pancreas*, and that pancreatic gland structure appears to have very little granulating power. The lobules of the gland are frequently to be seen unobscured by any new tissue at the base of the ulcer. The perforation into the peritoneum is sometimes found at the edge of a large ulcer which has been closed by adhesion, but which has given way at the side. Adhesions also take place between the anterior surface of the stomach and the abdominal parietes, so also with the parts in the lesser omentum, with the glands, &c. When the liver is invaded, we find that the adjoining hepatic tissue contains a considerable infiltration of white fibrous tissue, and it is not very uncommon for suppuration to extend round the base of the ulcer, and to invade some branch of the portal vein, either by direct ulceration into it or by secondary phlebitis, and this leads to secondary abscess in the liver. Ulceration occasionally leads to perforation of the coats of the adjoining vessels, either at an early stage, or when an ulcer has existed for some time. Hæmorrhages thus produced are sometimes rapidly fatal, or they become checked for a time, and they often recur. Dr. Brinton describes three varieties of this hæmorrhage:—1st. From the extension of ulceration into the minute vessels of the mucous membrane and submucous tissue, leading to a gradual discharge of blood, which becomes mixed with the secretions; 2nd. Greater hæmorrhage from sudden congestion of the ulcerated surface; and 3rdly. Very profuse bleeding from a large artery of the stomach. The hæmorrhage from the first two is never of any great severity, and we believe in fatal hæmorrhage from ulceration an open vessel can always be found by careful search. The perforated vessel is often seen closed by a small clot, or a drop of blood may be pressed from it, and in large ulcers may be sometimes seen like a small papillary eminence. This hæmorrhage, however, is not limited to the gastric arteries, but takes place from the arteries situated at the base of the ulcer, and belonging to adjoining viscera; thus, in one instance both the

splenic artery and the pancreatic were perforated; and recently, we had an instance in which the splenic artery alone was divided. (Preparation in the Museum of Guy's Hospital.) Dr. Lee, quoting Cruveilhier, states that ulceration into arteries and perforation take place more frequently in secondary ulceration of a cicatrix than with primary ulceration. Hæmorrhage, however, often occurs at an early period of the disease.

The form of the stomach may be greatly changed either by adhesions external to the viscus, or by contraction of the walls of the ulcer. When the ulcer is situated in the centre, the cavity may appear almost double, a form of hour-glass contraction. It is exceedingly rare in simple ulceration, even when situated at the pyloric extremity, for the whole circumference of the part to be occupied by the ulcer or its cicatrix; the side is irregularly puckered rather than uniformly contracted. In some cases the ulcer is so large, and the thickening so great, that the whole stomach becomes involved in the inflammatory changes, and is greatly thickened, and consequently very much contracted. The disease is then associated with more than the usual emaciation, and the case will probably be mistaken for one of cancer at one or other orifice; though in cancerous disease it is more common to find one or other orifice surrounded. In another instance the part which, on opening the stomach, was supposed to be the pylorus, was found to be a circular contraction and a large ulcer, about an inch and a half from the pylorus, and healthy mucous membrane intervened; but this was not simple ulceration; there was cancerous product in the contracted omentum at the part; it was doubtful whether the cicatrix of an ulcer had been followed by cancerous effusion in its neighbourhood, and it is probable that this is really the case in some instances.* The

* With regard to cancer occurring after ulcer; it would appear that it does so in two ways:—1, by a transformation of the simple sore into a cancerous one. It is by no means uncommon to find evidence of a chronic ulcer and some part of it cancerous. This corresponds to what is observed in other parts, and in the skin more especially, where a chronic ulcer becomes epitheliomatous. But there is another method, viz., where, as in the text, the sore still remains simple, but there is cancer in the neighbourhood. These cases, too, have their parallel in other parts, and we may mention the breast, where chronic eczema and other

thickening of the margins of the ulcer also encroaches upon the branches of the pneumogastric, and leads to intense pain, violent vomiting, and death from exhaustion. This implication of the nerve structure may possibly tend to the production of the anæmic state of so many of these patients; the anæmia being thus a consequence, and not a cause of ulcer. The second case related is of this character. The ulcer sometimes, also, extends into the sac of the lesser omentum, and may cause acute peritonitis, or form an abscess bounded by the spleen, diaphragm, pancreas, and liver; or it communicates with the colon, or even with the parietes; these latter cases, however, are generally of a cancerous character ;* or the diaphragm itself is perforated, and pleurisy and empyema are produced.

A remarkable instance occurred in Guy's, in 1845, under Dr. Barlow's care, the full report of which, by Dr. Wilks, is found in the 'Medical Gazette' for May, 1845, but I have given a brief abstract of it. A secondary cavity, partially filled with air, had given rise to the symptoms of pneumothorax. In another case which I have recorded, a sinuous ulcerated opening extended through the diaphragm into a sloughing cavity of the lung. A communication sometimes takes place from the colon, but this appears generally to extend from the intestine to the stomach, rather than from the latter to the former; and the ulceration in these cases is found more generally at the greater curvature. In a patient who died in 1847, there was an ulcer opening from the colon into the greater curvature, and two others from the greater curvature into the sac of the lesser omentum, forming a large fæcal abscess, which extended through into the lung. Dr. H. Davies narrates a case in the 'Pathological Transactions,' of simple chronic ulcer extending into the colon. There had been dyspepsia and fæcal vomiting, whenever the bowels were constipated. The patient gradually sank.

states about the nipple are occasionally followed, not by cancer of the breast, but by cancer of the axillary glands. Such cases have been dwelt upon particularly by Sir James Paget.

* See Dr. Murchison in 'Path. Trans.,' vol. viii, and Dr. W. T. Gairdner, in 'Edin. Med. Journal,' 1855.

The following Cases of gastric ulcer have occurred in the post-mortem room of Guy's Hospital during the last twenty years.

No.	Sex.	Age.	Seat of ulceration.	Hæmorrhage.	Cause of death.	Appearances of ulcer, remarks, &c.
1	M.	60	Anterior surface near centre	Four years ago and at death	Hæmorrhage from a large vessel	Four ulcers formed in an old cicatrix.
2	M.	...	Near lesser curvature	None	Perforation	Oval, thick-edged; connected with a portal abscess.
3	F.	40	Lesser curvature, anterior and posterior surfaces	„	„	Large ulcer; edge an inch thick; anterior wall perforated and two arteries open.
4	M.	43	Pylorus	Yes	Hæmorrhage	Thick-edged ulcer, extending into the duodenum; a large artery open.
5	F.	72	Posterior wall, cardiac end	„	„	Flat superficial ulcer; no opening in vessel found.
6	F.	21	Lesser curvature, anterior and posterior	None	Perforation	Circular, thin, sharp-edged; one on each side of the lesser curvature.
7	M.	23	One ulcer in anterior wall, two others near the pylorus	„	Abscess of lung	That on anterior surface adherent to the liver.
8	M.	62	Close to pylorus, anterior and posterior	„	Perforation	Floor formed by pancreas; several vessels open.
9	F.	39	Pylorus	„	Pulmonary embolism	A burn case; the ulcer looked like a slough of mucous membrane.
10	M.	35	Posterior aspect of lesser curvature	„	Cæcitis	
11	F.	51	Close to pylorus, lesser curvature	„	Granular kidneys	Edges thickened; an old ulcer.
12	F.	63	Larger posteriorly, extending to the anterior wall	„	Perforation	Edges thick; pylorus contracted.
13	F.	50	Lesser curvature	Hæmorrhage	Hæmorrhage	Oval ulcer; floor formed by pancreas.
14	F.	59	„ „	None	Not stated	Edge much thickened.
15	F.	56	Greater curvature	„	Uterine cancer	Two small scars of old ulcers.

16	M.	59	Pylorus	None	Perforation	
17	F.	35	„	„	Amyloid viscera	Stomach-wall thick.
18	F.	49	General	„	Cancer of liver, &c.	Ulcers pea-sized and smaller.
19	M.	42	Middle region	„	Abscess of lung, &c.	Many erosions; two ulcers, each the size of a shilling at lesser curvature.
20	F.	30	Lesser curvature	„	Peritoneal cancer	Stomach small, very thick, hard as gristle, but not cancerous.
21	M.	50	„ „	„	Aortitis, hepatic capsulitis	Deep, callous, extraordinary mammillation.
22	M.	34	Anterior pyloric region	„	Renal disease, hypertrophied heart	Two large ulcers on the anterior face of pylorus.
23	M.	42	Lesser curvature, two inches from pylorus	„	Perforation	Branches of pneumogastric nerve on the floor.
24	M.	34	Anterior surface	„	„	Edge ⅛ of an inch thick.
25	M.	30	General, except pylorus	„	Aortic aneurism	Resembling strumous lupus of face.
26	M.	47	Posterior surface of pylorus	„	Carbuncle, osteo-myelitis	Pylorus thickened.
27	M.	38	Lesser curvature	„	Perforation	Five ulcers, all near together; one repairing, one produced by a slough of the mucous membrane.
28	M.	59	Posterior wall near pylorus	„	Extensive scald	Several ulcers; edges vascular.
29	M.	31	One third from cardia, one inch from the lesser curvature	„	Perforation	Peritonitis and subsequent hæmorrhage (see case).
30	F.	39	Pyloric third	„	Inanition	Extreme thickening of muscular coat.
31	M.	63	Near cardia, lesser curvature	Hæmorrhage	Hæmorrhage	Primary division of gastric artery opened.
32	M.	53	Œsophageal end	„	„	Two ulcers; splenic artery opened.
33	M.	58	Not stated	„	Granular kidneys	(see case).
34	M.	63	Lesser curvature, posterior wall	„	Hæmorrhage	Splenic artery opened.
35	M.	54	Pyloric end, lesser curvature	None	Pneumonia	Ulcer edge hard.
36	M.	54	Pylorus	„	Peritonitis	The ulcer the size of an open hand.
37	M.	8 mos.	General	„	Infantile syphilis	No evidence of peritonitis.
38	M.	28	Lesser curvature	„	Hernia, operation, peritonitis	The ulcer the size of a crown piece.
39	M.	66	„ „	„	Bronchitis, hypertrophied heart	
40	M.	38	?	„	Cancer of duodenum	A punched ulcer the size of a sixpence. Prep. 1845[10].
41	F.	25	Pyloric end	„	Abdominal fistula and chronic peritonitis	See case.

No.	Sex.	Age.	Seat of ulceration.	Hæmorrhage.	Cause of death.	Appearances of ulcer, remarks, &c
42	F.	76	Lesser curvature, posterior wall	Yes		
43	M.	38	Whole surface	,,		
44	F.	37	Lesser curvature, anterior surface	...	Perforation	
45	F.	50	Very minute	Hæmorrhage		
46	M.	28	,, ,,	,,		
47	F.	20	Middle of lesser curvature	,,		
48	F.	21	Posterior surface	...	Exhaustion	Nerves involved.
49	F.	32	,, ,,	...	,,	,, ,,
50	M.	28	Anterior and posterior	...	Perforation	
51	F.	22	,, ,,	...	,,	
52	M.	52	Posterior	...	,,	
53	M.	37	,,	...	,,	
54	F.	21	Anterior and posterior	...	,,	
55	F.	27	Anterior	...	,,	
56	M.	29	Lesser curvature	...	,,	Reniform shape.
57	F.	38	Anterior part of lesser curvature	..	Local suppuration	Pneumonia.
58	F.	39	Posterior curvature	...	,, ,,	
59	F.	25	,, ,,	...	Fæcal abscess	Colic fistula.
60	F.	36	Posterior part, lesser curvature, two ulcers	...	Empyema	Fistula into pleura.
61	M.	64	Posterior part, lesser curvature	...	Empyema, abscess	
62	F.	55	,, ,, ,,	Hæmorrhage		
63	M.	53	Lesser curvature	,,		
64	M.	60	,, ,,	,,	Chronic bronchitis	
65	M.	34	...	...	Fibrous growth	

For other cases of gastro-cutaneous fistulæ, see "Memoir," by Dr. Murchison, 'Med. Chir. Trans.,' vol. xli, p. 38. It is there shown that this oftener results from simple ulceration than from cancer. Six cases are, however, given where it was associated with cancer, mostly at the pylorus.

Of these 65 cases, 37 occurred in males, 27 in Females.

Causes of Death.

	Males.	Females.
Hæmorrhage . . .	8	5
Perforation . . .	12	14
Peritonitis (without perforation) .	1	—
Various	16	8
	Not stated	1
	37	28

Many facts of great interest have been brought forward in the valuable papers of Dr. Brinton. As to sex, that ulceration of the stomach is twice as frequent in females as in males; the reverse being the case in cancer. In 654 cases he found 440 were females, and 214 males; and that in one out of every five cases more than one ulcer was present; whilst in one out of every seven or eight cases perforation took place.

In the consideration of the age of those who are the subjects of this affection, the cases of cancer which have come under my own immediate notice have been more advanced in life than those who were the subjects of ulceration of the stomach. Dr. Brinton has collected a large number of cases, and he shows that the ulcer generally "affects the periods of middle and advancing life with a frequency which gradually increases up to the extreme age allotted to man." But the cases of ulcer in which *perforation* causing peritonitis happens "seem not only to select another period of life, but to exhibit a marked contrast of age in the different sexes, the period of life in which it is most liable to occur being quite a different epoch in the male and in the female," —in the female being between the ages of 14 and 30, in the male from 50 to 60; the diminished risk of the female at the latter periods of life rendering the total risk in the same number of cases nearly equal.

The same author states that in the female one half the instances of perforation takes place between the ages of 14 and 20, whilst in the male there is a constant proportion in each decade up to 50, which diminishes but little up to 70. The complete average age in the former, however, being 27

years, in the latter 42. Dr. Lees* mentions that he has seen perforation of the stomach from ulcer "in a girl of 8, and a boy of 9 years of age."

As to the situation of perforating ulcer of the stomach, Dr. Brinton gives the following as the relative situation in every 100 cases, but the term perforation here must be remembered as being applicable especially to those instances in which fatal peritonitis follows, not to those in which adhesion renders extravasation impossible, as we so often find in perforation on the posterior aspect.

In 100 ulcers on the posterior surface perforation occurred in				2
„	pyloric sac	„	„	10
„	middle	„	„	13
„	lesser curvature	„	„	18
„	anterior and posterior surface	„		28
„	cardiac extremity	„	„	40
„	anterior surface	„	„	85

Dr. Brinton has collected from varied sources 654 cases, but there are several differences in our smaller number which are opposed to some of his deductions. In reference to sex there are males 37, and females 28. The total as previously given is 65, but in one the age is not stated; it was a case of multiple ulcer in an infant, and the disease was of a different character, it has, therefore, been excluded.

Of the males :—the mean age was 45, youngest 21, oldest 66.
„ females „ 40 „ 20 „ 76.

In the various decades the ages were as follows, bearing in mind that the males are to the females as 35 to 28—

	20—30		30—40		40—50		50—60		60—70		70—80	
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Males . .	6	17	9	26	4	11	9	26	7	20		
Females .	8	23	9	26	2	6	6	17	1	3	2	6

Of the males :—10 died from perforation—the average age being 38 years.
„ females 7 „ „ „ 23 „

That is to say taking males and females together 27 per cent. died of perforation; 28 per cent of the males, 25 per cent. of the females.

On the whole these facts corroborate those deducible from Dr. Brinton's larger numbers, but in less striking pro-

* Dr. Lees on "Diseases of the Stomach and Indigestion."

portions. In regard to sex, however, this is not so, Dr. Brinton puts the proportion of males to females as 1 to 2, and all who have written on the subject agree with him. Bamberger gives a still larger preponderance to the women, viz. 91 to 22.* In the numbers we give, the males are in excess, viz. 35 males to 28.

There is, however, reason for supposing that these discrepancies are to a large extent explained by the different sources whence the figures are obtained. Some calculate the proportions from cases as diagnosed during life; others only from those which reach the post-mortem room. This is seen from a perusal of the latest contribution to the etiology of gastric ulcer by Lebert.† Taking the several statistics of this author we get 69 males to 183 females, while the fatal cases are 57 males to 41 females. Nor do we think this is altogether accidental. It is sufficiently obvious that in hospital or private practice women suffer more often than men from some of the symptoms of gastric ulcer; but it is probable, that if the actual state of facts could be proved many of these would have to be re-grouped as cases of gastralgia, subacute gastritis, or gastric catarrh.

The following table gives the percentage of deaths in the several decades as given by Lebert on 198 post-mortems taken from various sources, and that obtained by the analysis of our own cases.

Age in years.		Lebert.			Guy's Hosp.	
10 to 20	...	10				
20 „ 30	...	24	Gastric ulcer Period.	...	22	Gastric ulcer Period.
30 „ 40	...	14		...	28·5	
40 „ 50	...	22		...	9·5	
50 „ 60	...	15		...	24	
60 „ 70	...	10		...	13	
70 „ 80	...	5		...	3	

The pathology of ulcer of the stomach is still involved in much doubt and obscurity. Many theories have been suggested, and each one has its supporters.

1st. Perforating ulcers are said to be of an inflammatory origin; the sequel in fact of chronic gastritis or the result, the coalescence of several small ulcers to form a large one.

* Loc. cit., p. 280.

† 'Die Krankheiten des Magens,' by H. Lebert. Tübingen, 1878.

2nd. They have been attributed by Rokitansky to congestion, extravasation, and subsequent necrosis of tissue.

3rd. Virchow has supported an embolic theory.

4th. Some cases have been thought to prove that they are occasionally due, and perhaps frequently so, to some deterioration of nerve influence, or to some persistent local nervous irritation.

In considering the pathology of gastric ulcer, however, it is important to distinguish between the acute and chronic forms. The determining cause is different; the acute ulcer is rapid in its formation, and, therefore, it leads to perforation before adhesion has taken place, and to peritonitis; it has a peculiar appearance, and it occurs at a definite period of life, especially in the female sex. The chronic form is very insidious, it creeps on for years. Perforation into the peritoneal cavity is more rare, because adhesions have formed, and death from hæmorrhage is more frequent.

It will be well to consider separately the causes which we have enumerated. Of those mentioned the first can scarcely apply to the acute perforating ulcer, for there are objections to that form being considered as having essentially an inflammatory origin. The course is too rapid to indicate an ordinary form of inflammation, and the stomach in such cases does not show any evidence of it after death. The ulcer is sharply defined and without a trace of thickening, and the surrounding mucous membrane is more or less healthy. Neither is a simple congestive origin satisfactorily substantiated. A local congestion followed by infiltration of the coats of the stomach by blood and subsequent necrosis of the tissues as a consequence, must be due, either to a local intensification of a general gastritis, of which there is no evidence in the majority of cases, or else to some local venous stasis or arterial plugging. This, indeed, is Virchow's hypothesis,* and it satisfactorily explains the occurrence of rapid ulceration. The experiments of Dr. Pavy,† which have been latterly confirmed by Panum, show that the arrest of the circulation through any part of the stomach leads to digestion of that part by the gastric juice in contact with it.

* 'Virchow's Archiv,' xxv, p. 491. † 'Proceedings of the Royal Society.'

From the pathological changes in other structures we know that embolism of the terminal vessels of any part leads to hyperæmia, to extravasation of blood, and subsequent disintegration of the damaged tissue. A venous stasis, would, of course, tend in the same direction. The shape of the ulcer has been strongly dwelt upon as favoring the embolic theory, and it has been pointed out by Virchow and others that the so-called wedge or cone shape corresponds with the infarctions of embolic origin. Still direct proof is wanting that embolism or sufficient venous stasis is present in any number of cases to account for the frequency of ulcer; and, moreover, it is not easy to explain why embolism should take place in the gastric arteries and not elsewhere, and why it should occur so frequently at a particular age and in the female sex. An atheromatous state of the kidneys has been suggested as the cause of the disturbance of the circulation by Müller,* but the examination of the coronary vessels does not support this theory. We are led, therefore to look to the 4th cause, viz. some deteriorated state of nervous supply, or some prolonged local nervous irritation as the true origin of the acute perforating ulcer. It is true that for this, again, there is no direct proof, not perhaps so much as there may be for the embolic theory; but the sex, the age, the habit, the condition of the patients in whom it occurs, all point towards the probability of a nervous origin, and pathological processes in other organs and tissues, as the sloughing of the cornea in paralysis of the fifth pair, are sufficient warranty for entertaining the idea.

With regard to the chronic gastric ulcer, its appearance and the changes around it favour the belief that it originates in chronic inflammatory disease. It may be set up in one or other of the various ways that have been mentioned in connection with the acute form, but we believe that while other causes may conduce towards its occurrence, and while gastric solution may tend to its further excavation, an inflammatory state is the best explanation of the appearance of the ulcer.

The stomach is more fixed at the lesser curvature, in fact, this part is almost stationary, for the stomach in its general expansion and consequent movement turns upon this part as

* 'Wurzburg, Verhandlung,' vi, p. 474.

a centre, and it is at the lesser curvature that ulceration generally takes place; the nerves also are more freely distributed there. The normal distension of the stomach takes place especially at the greater curvature. but when the stomach is distended after removal, rupture always occurs at the lesser curvature; and this fixity of position and the altered nervous and vascular supply which result from distension may be the determining cause of the position of the gastric ulcer.

The *symptoms* of chronic ulceration are, at first, those of ordinary dyspepsia, and are often very obscure and imperfectly marked; thus slight uneasiness after food, and constipation, may be the only evidence of disease; afterwards the pain, with tenderness in the region of the stomach, especially at the scrobiculus cordis, attracts more attention from the patient; the pain is sometimes slight, at other times intense, and of a peculiar gnawing character; it is generally increased by food, and relieved by the ejection of it; vomiting is, therefore, generally present, and pyrosis or water-brash. Other symptoms are pain between the shoulders, more or less of abdominal uneasiness, constipation, emaciation, and a peculiar pallor and cachexia. Hæmorrhage and the ejection of blood by vomiting, hæmatemesis, or its discharge by the bowels, as black stools, melæna, are present in most cases at one or other stage of the disease.

The *pain* is not always of the same character, but may be considered as a symptom present in almost every case; it may be almost constant, but generally undergoes degrees of exacerbation, being increased by food; the patient often states that pain comes on as soon as the aliment reaches the stomach, and continues as long as it is retained; sometimes it is so intense that the patient is completely exhausted, as I have several times found when branches of the pneumogastric nerve have been involved in the dense edges of a chronic ulcer; at other times it is so slight, that it only amounts to tenderness on pressure at the scrobiculus cordis. In a case recently under my care, in which other signs of ulcer were present, the patient stated that the pain was sometimes relieved by firm pressure against the back of a chair. Position has, in not a few instances, a marked effect on the

severity of pain, and I have several times seen the observa- of Dr. Osborne* confirmed, that the influence of the position of the patient on the pain serves as a guide to the seat of the ulcer, according as the contents of the stomach gravitate towards or away from the injured part; thus in an ulcer at the posterior part of the lesser curvature the patient has been most easy when leaning forward and towards the left side; and yet I have seen the pain continue whatever position has been assumed. In young women suffering from well-marked ulceration of the stomach, with chlorosis, neuralgic pain in the side may be present at the same time as tenderness and pain at the scrobiculus cordis, and, in these cases, we have increase of pain during or prior to the menstrual periods. The pain in the back is rarely absent in chronic ulcer of the stomach; it is generally less severe, and comes on later than the gastric pain, but is sometimes complained of more urgently than that at the stomach itself, the patient often stating that "the pain goes through to the back." In speaking of the diagnostic value of pain, Dr. Lees states, "the occurrence of pain will often be of great assistance in the diagnosis between simple ulcer and cancer; for it is an important and curious fact, that there is seldom pain in cancer of the stomach, unless great obstruction of the pyloric orifice prevents the passage of food out of this viscus." And again:—"The mere fact of severe pain constantly occurring after food, should lead you to diagnose simple ulcer of the stomach rather than cancer. The pain, moreover, in simple ulcer, is often of a gnawing character, causing a sense of sickening depression; it is variable and remittent, sometimes being very severe and then ceasing for days or even weeks; but, in malignant disease, the pain, though not often severe or lancinating, yet is almost always constant after it has once commenced." Although all observers will bear testimony to the general variability and the gnawing character of the pain in ulcer of the stomach, still, in some instances, as when branches of the pneumogastric nerve have been involved in the edges of the ulcer, or laid bare on its floor, the pain is terribly constant. Again, in cancer of the pylorus, as in a Case to be presently mentioned, there was no pain acknowledged on

* 'Dublin Journal of Medical Science,' 1st ser., vol. xxiv, p. 301.

repeated questioning of the patient as to present symptoms or previous history; and in other instances of cancer, when suffering is very severe, the relief from pain is often very great on the avoidance of solid and indigestible food, and during the use of anodyne remedies. The dragging pain in the epigastric region, produced by adherent omental hernia, and the pain often present at the scrobiculus cordis in chronic disease of the lungs and heart, must be remembered as liable to simulate gastric ulcer, and to obscure the diagnosis.

The period at which vomiting takes place in ulceration of the stomach is equally varied; sometimes the food is at once rejected, in other instances it is retained for many hours or days. In the case previously alluded to, in which the thickened edge of the ulcer contained a large branch of the pneumogastric nerve, the stomach almost instantaneously rejected food, and the patient died exhausted, but if the nerve be divided by ulceration or by sloughing the vomiting may entirely cease. Fermentation and the development of the sarcina ventriculi of Goodsir* take place in some cases of chronic ulcer, as well as in cancer and diseased pylorus. The sarcina can scarcely be considered as a proof of obstruction, for its development occurs without any impediment.

Vomiting however, as a sign of gastric ulcer, must be regarded with great care, since in so many instances it is purely sympathetic in its origin. Pyrosis also is often present in disease of a less serious character, and is among the signs of functional disturbance.

Chronic disease of the abdominal viscera is often marked by an anxious and dejected countenance, with emaciation; in gastric ulcer this appearance is present, and is associated with pallor, arising from the impairment of general nutrition.

In cancerous disease, a care-worn expression is found, with cachectic *sallowness;* and, in the anæmia of chlorosis and amenorrhœa, there is, in extreme cases, a waxen appearance, which is very peculiar; so also in the anæmia after considerable loss of blood. Again, in many instances of struma and of glandular disease, pallor is present; but in ulcer of the stomach the anxious countenance of abdominal disease,

* Merismopödia ventriculi (Robin).

conjoined with the emaciation and pallor of imperfect nutrition, afford a very characteristic morbid expression, and as a symptom is rarely absent.

As we have before said, hæmorrhage takes place in most cases of gastric ulcer; vomiting of several pints or even quarts of blood may be amongst the earliest symptoms of disease; in other instances the bleeding is slight, or entirely absent. It proved fatal in sixteen cases of those which we have tabulated, or one in every four cases. The *first* hæmorrhage from the stomach is occasionally fatal; in ordinary cases the discharge of blood is preceded by a sense of weight and coldness, followed by faintness or actual syncope, and then rejection of dark-coloured blood takes place. The action of the gastric juice confers this deepened colour; but if the effusion be very rapid, the colour is more bright; a portion of blood passes onwards into the duodenum and intestines, and if life is prolonged, so that it may be discharged per rectum, a black, tarry evacuation is the result. Sometimes, however, the whole of the blood is thus discharged, and there is melæna without hæmatemesis; but these symptoms are generally combined. Instances have been recorded where sudden hæmorrhage into the stomach was followed by fatal syncope, without the discharge of blood either by vomiting or purging; more frequently the hæmorrhage is oftentimes repeated. Some of the most severe cases of hæmorrhage are those in which the dense fibroid tissue of a chronic ulcer prevents the retraction of a perforated vessel.

Unless hæmorrhage, however, take place, we cannot with any certainty diagnose ulceration of the stomach; cachexia, emaciation, pallor, pain, and vomiting, all arise without ulceration, in cases of gastrodynia and irritability of the stomach, sympathetic or otherwise. But hæmorrhage is not in itself pathognomonic of ulceration; it often arises from over-distended capillaries in a gorged state of the portal circulation, and in cancerous disease; and although less frequent in cancer than in simple ulceration, it does occasionally arise. Disease of the œsophagus and aneurism sometimes produce the same symptom.

The form of ulceration, however, which leads to the most disastrous termination, is that which tends to fatal perfora-

tion into the peritoneal cavity. These instances often occur in young women affected with chlorosis and amenorrhœa, or with painful menstruation; the previous gastric symptoms are very slight, or altogether unnoticed, although there is generally impaired health, with leucorrhœa or chlorosis, neuralgic pain in the side, and symptoms of hysteria. The onset of the fatal attack is unexpected, and is generally after slight muscular exertion, or after a full meal; intense pain comes on, followed by rapid prostration and collapse. The skin becomes cold and clammy; the pulse fails; the pain in the abdomen becomes general; tympanitis follows, and occasionally vomiting supervenes; death ensues in from five to twenty-four hours, although life is sometimes prolonged for several days; but, in rare cases, the patient recovers. The difference in the sexes with regard to the age at which perforation is liable to occur is seen in the table. The average age of males dying from perforation is thirty-eight, that of females only twenty-three.

Abercrombie distinguishes three modes of fatal termination of ulcer of the stomach. 1, Gradual exhaustion; 2, hæmorrhage; and 3, perforation into the peritoneal cavity; others may be mentioned, as the extension of inflammation to adjoining viscera, as in the case related in which mischief passed through the diaphragm into the lung, and acute pleurisy was set up; secondary suppuration in the branches of the portal vein and pyæmia; and the occurrence of pneumonia or bronchitis from nervous exhaustion. The disease, however, sometimes remains in a passive condition, and the patient dies of some other complaint. It is not very rare to find cicatrices in the stomach; and in those cases where there has been extensive destruction of surface, and of the muscular and peritoneal tissue, the adjoining viscera are found covered with a smooth fibrous tissue.

The duration of life after the development of symptoms of ulcer of the stomach, as compared with cancer, is generally very different. Setting aside those cases in which perforation into the peritoneal sac takes place, the ulcer is more curable and extends over a longer period; it may be several years, and some have mentioned cases continuing for even twenty, and in one under my own observation the symptoms

were said to extend over forty years. I have several times observed patients, men of middle life, suffering from severe gastric symptoms, with sallow complexion, pain at the scrobiculus cordis, vomiting of food, occasional hæmatemesis, loss of flesh, &c., who have lost their symptoms under treatment and care, have regained flesh and comfortable health, and had no return of symptoms for several years. In cancer, after the well-marked symptoms have occurred, we rarely find that a year passes, and frequently only three or four months, before a fatal termination takes place; and it is probable that many cases of supposed cancer of the stomach, in which the patient survived for many years, were really chronic ulceration.

Chronic Ulceration implicating branches of the Pneumogastric.

Case XLII.—*Chronic Ulcer of the Stomach. Phthisis. Branches of the Pneumogastric Nerves involved.*—Eliza B—, æt. 21, was admitted into Guy's Hospital October 13th, 1858. She had enjoyed good health till she was fifteen years of age, when her health failed. She was then obliged to leave her situation as nursery-maid, on account of weakness, and pain in the chest. At sixteen, menstruation commenced, and continued regularly till eighteen months before admission, but from that time there had been amenorrhœa. She was anæmic, emaciated, and had a dark areola around the eyes. The respiratory murmur was feeble at the apices; the heart sounds were normal. She complained of pain frequently recurring in the hypochondriac and lumbar regions; of a feeling of distension and pain after taking food, and of a sensation as of a weight rolling when she turned on her right side, the left being the side on which she could recline most easily. The appetite was bad the bowels were regularly open; she slept but little; the urine was normal. Various remedies besides steel and cod-liver oil were given, and she left the hospital for a short time, but was readmitted on March 16th, 1859. She was then extremely blanched, much emaciated, and had a dejected countenance. She generally sat up in bed, inclining towards the left side, for it produced pain to turn on the right side. There was no evidence of disease in the chest found after careful examination; the respiration was 30; the chest was resonant; and the respiratory sounds were feeble, but otherwise healthy. She had vague pain in all parts of the body, especially in the shoulder; the spine was tender everywhere, and unusually prominent from the wasting of the muscles. The abdomen was rather distended, apparently from flatus. In the epigastric region there was a hard swelling, tender on pressure, and tympanitic. When in great pain at this distended part, if com-

pression was made, the swelling disappeared, and the pain was relieved. On deeper pressure in the epigastric region, a hard, resisting sensation was communicated. The superficial abdominal veins were distinct. Opium, chloroform, chlorodyne, cod-liver oil, &c., were administered, with partial relief.

On May 5th she was transferred to my care, and was then greatly emaciated; she suffered constant severe pain in the epigastrium, and in the left shoulder, and the pain was worse after taking food, which also produced slight nausea. She had much flatulence, but no vomiting; the bowels were never acted upon without medicine or an enema. The heart's action was rapid; the rhythm regular; the pulse, 120, was compressible. The abdomen was firm and somewhat enlarged. The pain increased in severity, and sometimes became of an agonising character; it was somewhat relieved by medicines, as by opium, morphia, henbane, aconite, creasote, &c. The symptoms continued with varing severity till the end of July, but in August symptoms of phthisis began to develop themselves; the right side became dull, and indubitable signs of disorganization at the apex were present. The patient began to cough and expectorate, and became extremely emaciated. Scarcely any nourishment was taken, but she lingered till October 10th.

On inspection, the right pleura was universally adherent; the left partially so. The right lung was extensively disorganized, and contained a large cavity in the upper lobe, and much tubercular deposit in the lower. The cavity was very large and ragged, and had apparently extended rapidly. The left lung was nearly healthy, so also the heart. On opening the abdomen, the *stomach* was seen to be closely adherent to the left lobe of the liver at its under part. The stomach appeared to be thus hooked up in the central part, and presented an hour-glass contraction. This adhesion of the smaller curvature of the stomach and of the posterior surface of the liver was so firm that it was impossible to separate the two organs. The liver also contained much fibrous tissue. On attempting the removal of these viscera, it was found that the pancreas also was closely involved in the adhesions. By opening the stomach along its greater curvature, a large chronic ulcer was found to be situated at the middle of the lesser curvature. It was $2\frac{1}{2}$ inches in length, and 2 in breadth, and had completely healed, there being no sign of recent action about it. It had a raised, firm edge, and its floor was formed by tough, fibrous tissue upon the liver and pancreas the coats of the stomach having been entirely destroyed at that part by the ulceration. The pneumogastric nerves on both sides terminated in the fibrous tissue which bounded the ulcer. The mucous membrane was elsewhere healthy.

The symptoms in this case advanced very slowly to a fatal termination, and nearly six years elapsed between the onset of the disease and the death of the patient. There was no hæmatemesis at any period, and the most prominent symptoms

were anæmia, gradually increasing emaciation, and pain in the left side, which became exceedingly severe. The pain was at times agonizing, and was unrelieved by any form of anodyne medicine; the manner in which the branches of the pneumogastric nerve were involved in the dense fibrous tissue at the edges of the ulcer afforded an explanation of the suffering. The position of greatest ease, however, was that in which fluids gravitated from the ulcer, namely, the position assumed in leaning forwards and towards the left side, thus far confirming the statement of Dr. Osborne. Vomiting was not a prominent sign of disease. For some months the general symptoms were those of phthisis; and, in fact, towards the close, symptoms of affection of the lungs were rapidly developed. In reference to the etiology of the phthisis, it is an interesting question whether irritation of the gastric branches of the pneumogastric nerve had anything to do with the production of disease at the termination of the pulmonary branches, or whether the phthisical mischief was produced by the general impairment of nutrition.

Case XLIII.—*Chronic Ulceration of the Stomach, involving the Pneumogastric Nerve. Atrophy of the Left Lobe of the Liver. Death from Exhaustion.*—E. S—, æt. 32, had been a widow for nine years. Four years before admission into Guy's Hospital she had an attack of hæmatemesis, but her health improved, and she continued in her situation as housemaid. Two years later she had a similar attack, and, six months later severe pain at the region of the stomach came on. The pain continued for a few days, and was much relieved by vomiting of blood. A similar attack came on after admission. Great weakness, with severe pain in the stomach, were the principal symptoms; the pain extended to the back, and was of a paroxysmal character; and food was very quickly rejected. At the epigastrium, fulness was at first felt, but afterwards a distinct tumour. The vomiting was uncontrollable, but sometimes subsided for several days. Vomiting of grumous fluid then came on, and the pain at last became very severe; she gradually sank.

Inspection.—The body was much emaciated; there was no marked disease about the thoracic viscera; the stomach was distended, and reached nearly to the umbilicus. At the scrobiculus cordis the left lobe of the liver was contracted, and adherent to the lesser curvature of the stomach, and it constituted the tumour which had been felt during life. The stomach contained a considerable quantity of grumous fluid, and at the lesser curvature, about half an inch from the pylorus, was an ulcer two inches and a half in diameter, with raised everted edges of mucuous membrane and dense fibrous tissue; the base of the

ulcer was smooth, composed of an albuminous layer, and formed by the pancreas and by the inferior surface of the left lobe of the liver. The pylorus was not hypertrophied. The remaining part of the stomach appeared healthy. On carefully dissecting the pneumogastric nerve along the lesser curvature, it was found to pass to the margin of the ulcer, and its fibres were incorporated with the dense fibrous tissue of which the raised edges of the ulcer were composed. Plate I.

The continued suffering, and the daily rejection of food, at length completely exhausted the strength of the patient, and were the cause of her death; and although the pylorus was free from obstruction, and no hypertrophic change was evident in the muscular coat of the stomach after death, the symptoms were explained by the manner in which the branches of the pneumogastric nerve were involved in the dense edges of the ulcer.

The attack of hæmatemesis four years before admission into the hospital, showed the chronic character of the disease; and, as the ulceration slowly extended into the surrounding vessels, the effusions of blood were repeated; but intervals of reparative action probably took place, for we find that there were periods during which the more severe symptoms were relieved, and the character of the ulcer, as shown by its general and microscopical appearances, warranted such a conclusion.

The left lobe of the liver was small and atrophied, and its section presented several large vessels surrounded by contractile tissue, without any intervening gland-structure. Chronic change had extended into this part of the gland, and the obliteration of the vessels had led to the atrophy of the whole left lobe.

Ulceration with Perforation.

Case XLIV.—*Chronic Ulceration of the Stomach, with Painter's Colic. Perforation.*—George O—, æt. 28, was admitted into Guy's Hospital February 22nd, and died April 16th. He was a married man, of anæmic appearance, but with dark hair. For ten years he had been a painter, but previously he had employed himself as a publican, and he had then drank freely. Except an attack of fever several years before, he had been in good health till nine months before admission, when he was seized with colic, which came on with vomiting, obstinate constipation, and severe griping pain at the umbilicus; from that time he lost flesh, and had constant pain in various parts of the abdomen; the bowels became

constipated, and he suffered from pain between the shoulders. A fortnight before admission he had hæmatemesis, and he became very anæmic; this condition persisted till his application at Guy's, when the tongue was pale and the respiration easy; there was griping pain also, in the abdomen, and constipation; but the abdomen was supple, and no disease could be detected on palpation. Compound Soap pill, gr. v., was given every six hours.

On Feb. 29th—Vomiting of grumous matter came on; an enema was administered, and an electro-galvanic current applied to the spine and abdomen; the galvanism produced some uneasiness.

On March 3rd—There was great pain in the abdomen, vomiting of grumous, coffee-ground substance; rapid prostration came on, and death took place in a few hours.

Inspection, twenty-nine hours after death.—On opening the peritoneal cavity it was found to contain a considerable quantity of gas; and grumous matter was extravasated from the stomach. Upon raising the left lobe of the liver an opening, about the size of a pea, was observed in the lesser curvature of the stomach; the mucous membrane was generally thickened, and about half an inch from the pylorus, near the lesser curvature, was an oval ulcer, about three inches by two in size, with raised and everted edges; the floor of the ulcer was formed by the pancreas, covered by white fibrous tissue; the opening before mentioned was at the anterior part of this ulcer. The colon contained a large quantity of scybala.

There was considerable difficulty in the diagnosis of this case; the evident indication of colic, in a painter of intemperate habits, rendered the symptoms of ulceration of the stomach more than usually obscure. The attack of hæmatemesis might have been attributed either to ulceration or congested portal circulation; but the vomiting of coffee-grounds substance indicated the slow effusion of blood; and it afforded a very characteristic symptom of chronic organic disease. The immediate cause of the perforation was not apparent; but, although we could not affirm that the muscular contraction produced by the galvanism was in any manner the cause of the suddenly fatal issue, still, if the chronic ulcer of the stomach had been as prominently before the mind as the lead colic, it is probable that the use of galvanism would not have been directed.

Case XLV.—*Perforating Ulcer of the Stomach, with a second small Chronic Ulcer in the same organ.*—Harriet B—, æt. 22, a single woman, a milliner, who worked in the city, but resided at Bethnal Green, was stated to have enjoyed good health, with the exception of occasional

pain and other uneasy sensations in the gastric region, but she had not any sickness, and she continued at work. The bowels were generally regular. On Friday, Oct. 20th, after eating at about 3 p.m. a full meal of anchovies and bread, she was seized with violent vomiting, followed by most intense pain, which commenced in the left hypochondriac region, and gradually extended over the abdomen. She said that the pain commenced by something giving way in her side. When seen, about 9 p.m., she was in a state of great prostration, and she died at 11 a.m. on the 21st, twenty hours from the commencement of the attack.

The body was well nourished. On opening the abdomen, the viscera were found distended and covered with a coat of recent lymph, and with some castor oil, which had been administered by the friends shortly after the attack. In the stomach there were two ulcers, one with raised and rounded edges, about half an inch in diameter, extending to the muscular coat; the other about the same size, but with a smaller opening in the muscular, and a round, smooth, small punch-hole opening perforating the peritoneal sac. Both were situated at the lesser curvature, and the latter, in which was the peritoneal perforation, was towards the posterior part. The remaining viscera appeared healthy.

This case was peculiarly interesting: 1st, in presenting two ulcers in the stomach, but in different stages, the one resembling ordinary chronic ulcer with thickened edges, the other having the appearance of but slight action around it; 2nd, in the early age of the patient, twenty-two, and the slight character of the symptoms, namely pain but no sickness; although an ulcer existed in the stomach, dyspepsia was the only precursor of the fatal perforation, and she considered herself in good health, and continued at work; 3rd, in the sedentary employment, constrained position, irregular meals, uncertain hours, and probably only scanty fare, all tending to impair nutrition, and act as causes of this fatal malady; 4th, in the occurrence of the perforation, as is usually the case, after a meal; 5th, in the pain commencing at the hypochondriac region, for this is not always the case, and we cannot thereby ascertain at all times the seat of perforation; sometimes, even, the position of the pain suggests cæcal instead of gastric disease; and 6thly, in showing the folly of at once giving a purgative draught, for the castor oil was here found floating in the peritoneal cavity.

Case XLVI.—*Chronic Ulceration. Death from Perforation.*—A man, æt. 37, had been subject to dyspepsia, constipation, and general abdo-

minal uneasiness, but he had had no vomiting; intense pain came on suddenly, and he died in a few hours.

In the *stomach* a circular ulcer was found about the size of a five-shilling piece, the edges were rounded, and the mucous membrane was more extensively destroyed than the muscular; the base of the ulcer was formed by the pancreas and by condensed cellular tissue; and quite at its upper margin, below the left lobe of the liver, there was a small perforation, which had led to general peritonitis. The microscopic examination of the ulcer showed it to be of a simple inflammatory character.

The absence of hæmatemesis, of vomiting, and of other symptoms of gastric ulcer, except dyspepsia, was remarkable in this case, for the ulcer was of large size, and was not of recent formation.

Case XLVII.—*Chronic Ulcer of the Stomach. Perforation.*—Mary C—, æt. 21, was admitted August 28th, 1858, about noon, and died in ten minutes. She had been in a situation near the hospital, and had suffered from vomiting occasionally for five years, but had never had hæmatemesis.

Inspection was made about three hours after death. There was general peritonitis. In the stomach there were two ulcers, each about three eighths of an inch in diameter; both were situated at the lesser curvature, the one at the anterior, the other at the posterior part of the stomach. Their edges toward the stomach were thickened and bevelled; the anterior one presented a small punch-hole opening extending into the peritoneum, which had led to the fatal peritonitis. The posterior one had also perforated all the coats, but extravasation had been prevented by the adhesions. The other portions of the mucous membrane of the stomach were healthy, presenting only slight injection; the remaining viscera were healthy.

In this case there had been evidence of disorder of stomach for several years; and the appearance of the ulcer also indicated chronic action in its thickened edges, but there had been no vomiting of blood. The ulcers on opposed surfaces of the stomach probably arose from the two surfaces coming into contact.

Case XLVIII.—*Perforating Ulcer of the Stomach.*—A servant girl, æt. 27, residing in the Borough, was suddenly seized with severe pain in the abdomen; collapse came on, and death followed in twenty-four hours. On *inspection* a round ulcer was found on the anterior surface of the stomach; on the mucous surface it was half an inch in diameter, but on the peritoneal only a quarter of an inch, and there was very little thickening. Its perforation into the peritoneum had set up fatal peri-

tonitis. Other portions of the mucous membrane of the stomach were partially dissolved. Remaining viscera were healthy.

This was one of the instances in which there was very little indication of disease prior to the fatal attack, and the appearance of the stomach after death showed an absence of thickening, and of chronic action.

Case XLIX.—A remarkable case, in which an ulcer of the stomach existed, and in which perforation was apparently produced by the straining consequent on violent vomiting, occurred under the care of Sir William Gull in a hospital patient in 1866. A young man, æt. 21, was seized three week before his death with griping pain in the abdomen, followed by intense pain and obstinate constipation. There was severe vomiting. Two bands were found in the peritoneum passing upwards from the cæcum, one to the transverse colon, strangulating the intestines which had slipped beneath it, the other passed to the pelvis.

In the stomach, about one third from the œsophagus towards the pylorus and an inch from the lesser curvature, was an ulcer, which had perforated the peritoneum and had set up intense peritonitis. The opening through the serous membrane was smaller than that in the mucous membrane. There was no thickening of the edges of the ulcer.

Case L.—*Chronic Ulcer of the Stomach. Perforation of all the coats except the Peritoneal. Fatal Peritonitis.*—(Reported by Mr. A. W. A. Evans.)—William M—, æt. 29, a policeman, was admitted into Guy's Hospital, October 28th, 1859, under Dr. Addison's care. He had been in the police force for six weeks, when he was seized with pain about the scrobiculus cordis, with vomiting, which came on about an hour after food had been taken. There was pain also at the right shoulder, and a little blood was found in the vomited matter, but no sarcinæ. He had suffered habitually from constipation. Three years previously he had had a similar attack, from which, however, he recovered in three months. He afterwards enjoyed good health, although he had vague and intermittent pains in the epigastrium. He was a tall, sallow and anæmic man, and on admission suffered from rather severe pain at the epigastric region, but nothing could be felt on tactile examination. He stated that he had passed dark-coloured stools; the tongue was large and white; the pulse 88. Magnesia mixture, with hydrocyanic acid, was prescribed three times a day. A castor-oil injection was administered at night, and beef tea and arrowroot allowed. A small blister was afterwards applied to the scrobiculus cordis, and ʒij of sherry wine, with two eggs, &c., were ordered. On November 2nd nitrate of bismuth was given, with mucilage mixture. The bowels then became constipated, and the magnesia mixture was repeated with dilute hydrocyanic acid, tincture of opium, and of lavender. On the 4th he passed a black evacuation, but the constipation continued. On the 14th gr. xv of colocynth and

calomel were given, and a castor-oil injection administered, which acted very freely on the bowels. On the 16th, severe pain came on in the abdomen; he became collapsed, and had vomiting, with excessive tenderness of the abdomen; a grain of opium was then given every six hours; but on the 17th he was evidently sinking, and died at nine p.m. On *inspection* the peritoneum was found to be universally inflamed, and the intestines were glued together by recent lymph; older adhesions were found between the stomach and the parietes at the superior part of the abdomen. The stomach was slightly hour-glass in form; and about one and a half inches from the pylorus on its posterior aspect was a chronic ulcer; all the coats were destroyed, and the pancreas formed the base of the ulcer, which was two inches in diameter. The mucous coat was more extensively destroyed than the muscular. A smaller ulcer, directed anteriorly, united with the posterior and larger one, its base was formed by delicate fibro-cellular tissue and peritoneum; this thinned, *almost perforated* portion, was a quarter of an inch in diameter, and at its centre was a transparent spot, only one eighth of an inch across; water, however, did not exude. The perforation was not complete, but there was no doubt that sufficient transudation had taken place to produce the fatal peritonitis. The thoracic and other viscera were healthy.

The condition of the ulcers in the stomach was peculiar; two ulcers had become united, but the posterior portion was of older formation, and had a firm base of pancreatic tissue; not so, however, the anterior one; its base consisted of fibro-cellular tissue and peritoneum, but the serous membrane was still entire. In typhoid ulceration of the intestines we have several times observed peritonitis produced when the peritoneum remained entire, transudation having taken place without complete perforation, and it is probable that a similar occurrence ensued in this instance. The case illustrates, also, the caution that should be used in the administration of purgative medicines.

Chronic Ulceration leading to Abscess.

Case LI.—*Perforation of the Stomach. Local Suppuration in the Peritoneum. Pleuro-pneumonia.*—M. A. B—, æt. 33, was admitted into Guy's Hospital, under my care, September 20th, 1860. She was tall and stout, and stated that till the 18th she had enjoyed good health; at 2 a.m. of that day she had been seized with severe pain in the left side, which continued till admission.

On the 21st she was in less pain, and the countenance was less distressed; the tongue had white fur on it, and was rather dry; deep inspiration produced severe pain in the left side, but no friction sound

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could be heard; air entered the lower lobe of the left lung very imperfectly; and, in fact, respiration was scarcely audible either in front or behind on the left side. There was no abnormal sound with the heart; the pulse was compressible, and the skin hot. The resident medical officer had ordered gr. xv of colocynth and calomel, and pills twice a day, containing calomel, antimony, and opium.

On the 22nd she still complained of severe pain in the side; there was dulness at the base of the left lung, and scarcely any air entered that lung; the skin was hot; the tongue was dry and furred; the pulse was compressible; the bowels were opened freely. She was ordered to be cupped on the left side to ℥vj; to take soap and opium gr. v every night; and acetate of ammonia three times a day.

On the 24th the pain in the side was much less severe, but she was still very ill, complaining of tenderness of the abdomen; the tongue had a whitish fur. The abdomen was supple, not tympanitic, but there was tenderness at the lower part. She stated that in the previous week, immediately after menstruation, she had been exposed to cold, and that then the pain came on. Carbonate of ammonia was given three times a day, and the opium pill continued.

On the 25th she complained of an offensive taste in the mouth, and of increased pain in the left hypochondriac region, but she bore considerable pressure without aggravation of her suffering; the tongue was furred; the mouth was clammy; the pulse compressible, and slightly excited. She very much desired to have soda water, and was ordered effervescing mixture, with carbonate of magnesia, gr. x, every four hours, and wine ℥vj.

On the 29th she was still distressed with an offensive taste in the mouth; the tongue was furred; there was no tenderness of the abdomen, nor distress in breathing. Opium was given night and morning, and soda water occasionally.

On the 30th she was seized with eructation, and vomiting of thin offensive pus, to use the words of the sister of the ward, as if an abscess had broken; she became exceedingly prostrate, and died on the 2nd October at 9.50 a.m.

Inspection on the same day at 2.30 p.m. The pleura was adherent at the lower lobes of both lungs, which were in a state of lobular inflammation. The heart was healthy. The liver was pale, and it extended nearly to the crest of the ilium; it was very fatty, and weighed 6 lbs. On the left side there was a large abscess in the peritoneum bounded by the spleen, the left lobe of the liver, and the stomach. The walls of the abscess were covered with a layer of greenish-yellow lymph, and the abscess contained about two pints of grey offensive pus. The abscess communicated with the stomach by a small punch-hole perforation, situated about the middle of the lesser curvature of the stomach on the anterior aspect. The edges of the ulcer were bevelled internally, but they were not thickened. The mucous membrane of the stomach was thickened and ecchymosed in patches; there was some contraction of the mucous membrane of the stomach opposite the ulcer over the

pancreas, as if from the cicatrix of a former ulcer. The kidneys were pale; the intestines and ovaries were healthy.

The diagnosis of this case was obscure: on admission, there appeared to be diaphragmatic pleurisy, but afterwards it was evident that the disease was below, not above, the diaphragm. There was an absence of the ordinary signs of peritonitis, namely tenderness and distension of the abdomen; still, there was pain of moderate degree in the lower part of the abdomen, especially on the left side. There cannot indeed be a greater proof of the absence of the ordinary signs of peritonitis than that a gentleman of great experience ordered, in my absence, free purgatives of colocynth and calomel. The patient was very restless, but her principal complaint was of the offensive taste in the mouth, and she incessantly begged to have soda water. The adhesions had localised the inflammation, and there was none of the collapse which marks perforation into the general cavity of the peritoneum. For several days the suppuration increased in the abscess, but it evidently communicated with the stomach, and the decomposition of its contents led to the offensive character of the breath which distressed the patient so much. It is probable that the pneumonia arose from pyæmia; and it did not come on till a short time before death. The sudden discharge of pus only a few hours before death indicated the rupture of an abscess; but it was even then very doubtful whether it proceeded from a thoracic or abdominal source.

Case LII. *Chronic Ulceration of the Stomach, extending to the Diaphragm, and simulating Pneumothorax.*—Barbara —, æt. 39, was a married woman, who for eighteen months had suffered from symptoms of dyspepsia or chronic gastritis, from pain between the shoulders and at the epigastrium, and from vomiting. Two days before admission she was seized with intense pain in the left side and shoulder, and she had urgent dyspnœa. On examination at the base of the left lung there was resonance, amphoric breathing, metallic tinkling, and ægophony. She died twenty days after the attack of dyspnœa.

Dr. Barlow's diagnosis was confirmed; there was pleurisy on the left side, and a large peritoneal abscess, which communicated by two openings with the lesser curvature of the stomach—one near the œsophagus, capable of admitting the middle finger, and another, smaller, near the anterior wall.

The abscess was bounded by the ribs, spleen, liver, and diaphragm, and by inflammatory adhesions in a partially sloughing condition. The pleura in this case was not perforated, so that the symptoms of pneumothorax were produced by the air in the peritoneal abscess.

The post-mortem examination in the following remarkable case is here introduced as an illustration of perforation of the stomach, associated with perforation of the colon, as well as of the diaphragm. The disease, however, in the colon appeared to be of the longest duration, and to have led to the formation of the fæcal abscess, whilst the perforation of the stomach was, perhaps, secondary, and from the external to the internal surface.

Case LIII. *Fæcal Abscess, connected with the Stomach, the Lung, the Spleen, and the Transverse Colon.*—Ellen R—, æt. 25, was admitted in July, and died August 5th, 1847. History not known, except that she had fæcal vomiting.

On inspection the left lung was found adherent by old adhesions; a vomica was found in the upper lobe, and grey hepatization existed at its lower part. *Abdomen.*—The intestines were matted together by old adhesions; the liver also was adherent to the stomach. On the left side was an abscess of some extent, bounded in front and to the outer side by the ribs, to the inner side by the stomach and by the spleen, below by the transverse arch of the colon, above by the diaphragm and right lung. This abscess communicated with the chest by an opening through the diaphragm, and was there bounded by the lower surface of the right lung and thickened pleura. It communicated also by two separate openings with the greater curvature of the stomach, and by one opening with the transverse colon; it was filled with partially coagulated blood; the upper portion of the spleen was found sloughing in the cavity of the abscess. The stomach also, and the transverse colon contained each of them a considerable quantity of blood. The openings in the stomach were round holes, having tolerably smooth edges, and the mucous coat was not thickened; the peritoneal coat appeared as if it had been ruptured. There were several ulcers in the transverse colon which communicated with the abscess, and the bowel was thickened around them. The liver was large and fatty. Some of the mesenteric glands were calcareous. The contents of the pelvis were all bound together by old adhesions, and there was a considerable quantity of recent lymph at this part. Between the rectum and the bladder was an abscess communicating with the rectum; there were several other ulcers in the rectum, and the whole mucous membrane was intensely injected and of a deep purple colour. There was strumous ulceration of the mucous membrane of the uterus.

CASE LIV. *Chronic Ulcer of the Stomach. Peritoneal abscess. Perforation of the Diaphragm. Empyema.*—J. F. L—, æt. 64, a basket maker by trade, was admitted into Guy's Hospital, under Sir William Gull's care, May 14th, 1860. He had inflammation of the lungs when thirty years of age, and a year afterwards he had rheumatic fever. Seven years before admission he had a blow by a capstan, which threw him into the hold of the vessel, and from that time he had always suffered pain on taking cold. Seventeen or eighteen months previous to admission he had also noticed a swelling at the epigastric and umbilical regions, and he had nausea and vomiting after taking food, but no blood was vomited. Severe tearing pain at the stomach was produced by retching, and he also experienced at those times a burning sensation, which lasted for twenty-four hours. The swelling had not increased, but had extended more generally over the abdomen; and for a few days the pain had reached the loins. For two weeks he had felt severe pain above the crest of the ilium on each side; it came on after attempting to work, and it passed up each side behind the clavicle. The painful part began to swell, and continued swollen for two days, but the swelling afterwards disappeared. From the commencement of his illness he stated that he had had a sense of tearing whenever he lifted his left arm; and he had frequently felt severe pain below the last rib on the left side; the pain was also felt in the lumbar region. He had suffered much from flatulence, but not from sickness; the bowels were generally constipated. He was a spare man, with an anxious expression. The chest on admission was normal. The liver could be felt in the epigastric region; the spleen was also enlarged. The abdomen was increased in size; it was tender and tympanitic; but no fluctuation could be felt. The urine was not albuminous, its sp. gr. was 1020. He was ordered iodide of potassium with the bicarbonate of potash. On the 19th the pain in the abdomen was aggravated so that he could scarcely bear the pressure of the bedclothes; the bowels were confined. Half a grain of opium was given twice a day, and a simple injection was administered. During the afternoon of the same day intense pain came on, and extended from the crest of the ilium to the side of the thorax. On the 20th he seemed to be in severe pain, and he suffered from great dyspnœa; the face was pallid; there was an anxious expression of countenance; and he had slight cough and scanty expectoration; the abdominal muscles did not move; the base of the left lung was dull, both anteriorly and posteriorly, and there was an absence of any respiratory sound; but there were tactile vibration and vocal resonance. The abdomen was tense; the skin was hot, but the extremities cold; and he complained of great thirst. On the 21st there was still great pain on the left side of the chest; the left side was dull on percussion except at the apex posteriorly; there was an entire absence of respiratory murmur and vocal resonance at the base of the left lung, but passing upwards the breathing became bronchial, and higher still it became amphoric, with almost an ægophonic voice and great resonance on coughing. The heart sounds were distinct on the

right side of the sternum, and the dulness extended as far as that part. On the right side generally the respiration was puerile, and accompanied with bronchial râles; the pulse was 104; the tongue moist and furred; the bowels were open; there was no appetite, but there was great thirst, and the breath was sweet. A blister was applied; acetate of potash with nitric ether and compound tincture of camphor were prescribed, and four ounces of gin, afterwards increased to eight, were ordered. The patient, however, rapidly sank, and died the following day at half-past four. *On inspection* the abdomen was enlarged. The left pleura was full of pus, and was lined with a flocculent membrane; the heart was pushed over beyond the median line, and the left lung was compressed. The right pleura and lung were healthy, so also the pericardium and the heart. On opening the abdomen the left lobe of the liver was found to be adherent at the scrobiculus cordis by firm tissue, and it had formed the hard mass felt during life; the peritoneum generally was healthy. On drawing down the stomach, and removing the left lobe of the liver, a large abscess was found between the stomach and the diaphragm, and it contained nearly a pint of pus. The abscess was bounded by the liver in front and on the right, by the spleen on the left, and by the pancreas posteriorly. In the diaphragm was a small opening about the size of a crow-quill, and thus a communication has been formed between the abscess in the abdomen and the pleura. At the lesser curvature of the stomach, and on its posterior aspect, was a chronic ulcer two and a half inches long, bounded behind by dense cicatrized tissue on the pancreas, but no perforation could be detected. The liver was fatty, the other viscera were healthy.

Sir W. Gull correctly diagnosed this case as one of chronic disease of the stomach, leading to perforation of the diaphragm, and causing the fatal attack of pleurisy. The swelling at the epigastric region, accompanied with nausea, vomiting, and "tearing pain," were strongly indicative of gastric disease; but it was very doubtful whether the malady was of a cancerous character. It was doubtful, also, whether the blow he received from a capstan had anything to do with his subsequent disease. Chronic ulceration took place, perforation of the walls of the stomach followed; but the mischief was localised by adhesions; suppuration then took place, beneath the diaphragm; this muscle at last itself became perforated, and intense pleurisy was at once set up by the extravasation of pus into the pleural cavity.

Case LV.—*Chronic Ulceration of the Stomach. Perforation. A Sinus extending into the Left Lung. Gangrene. Empyema. Second Chronic Ulcer.*—Eliz. F—, æt. 36, had been treated as an out-patient for

dyspepsia, and it was supposed that ulceration of the stomach existed; the prominent symptom was vomiting of coffee-ground matter. After admission into the hospital she became extremely low and emaciated, and gradually sank. It was then believed that she had cancerous disease. She died October 13th, and was examined twenty-six hours after death.

Chest.—The left pleura contained purulent effusion. The lower lobe of the left lung was pneumonic and adherent to the diaphragm; a vertical section of this lobe exhibited an excavation, filled with dark-grey and tenacious matter, which exhaled a gangrenous odour. The cavity was traversed by pulmonary vessels, which, when placed under water, had a curious flocculent appearance; a sinus passed from this cavity, through several fistulous openings in the diaphragm, into the stomach. The heart and pericardium were normal, except that the foramen ovale was open. In the abdomen there were chronic and vascular adhesions between the viscera and parietes, more particularly about the right hepatic lobe; the liver was situated unusually low in the abdomen. The small intestine appeared perfectly healthy; the kidneys were coarse, and their tunics adherent. The liver and gall-bladder were healthy.

On opening the stomach, along the greater curvature, an aperture of a circular figure was discovered in its walls, the circumference of which, with the exception of a small aperture at its upper border, was very firmly adherent to the under surface of the left lobe of the liver. This appearance, the remains of old ulceration, was situated in the region of the lesser curvature of the stomach. From the perforation in the ulcerated walls of the stomach a sinus passed upwards, bounded upon the left by the spleen, on the right by the left lobe of the liver, and behind by the pancreas and small omentum; above, it extended to the diaphragm, which was perforated by several foramina, and the sinus communicated with a cavity in the inferior lobe of the left lung; the surfaces of the organs bounding this sinus were tinged with a dark-grey hue. The opening from the ulcer in the stomach was valvular, and was situated under its superior border. The stomach contained dark, almost black, thick, viscid fluid; there was also a second chronic ulcer near the pyloric extremity of the stomach.

The diagnosis of this case was obscure; the earlier symptoms indicated ulceration of the stomach, but the unusual prostration led to the idea that the disease was of a cancerous character. The disease commenced in the stomach, and the ulcer at the lesser curvature led to perforation; the aperture, however, was at the posterior aspect, and it was also surrounded by adhesions, so that it passed into the structures between the diaphragm and the stomach without leading to general peritonitis. Circumscribed suppuration then took place, and ulceration extended through the diaphragm. Here,

also, adhesions between the pleural surface of the lower lobe of the left lung and that of the diaphragm, prevented acute pleurisy being at once produced; the lung tissue was perforated, and a sloughy cavity was formed. The pleura subsequently became acutely diseased, and effusion of pus took place in the non-adherent part of the serous membrane. The gangrene of the lung and the empyema led to the excessive prostration in this case. A second ulcer was found in the stomach.

Chronic Ulceration with Hæmorrhage.

Case LVI.—*Chronic Ulceration of the Stomach. Fatal Hæmorrhage. Perforation of the Splenic and of the Pancreatic Arteries.*—Charlotte T—, æt. 55, was admitted into Guy's Hospital, March 4th, 1857, and died March 5th, at 9.40 p.m.

She had previously been admitted under Dr. Oldham's care, in a very blanched condition, complaining of severe pain in the left side; she had had no vomiting nor spitting of blood, and her appetite had failed; whilst in the hospital, however, she took food well. She was in a week's time transferred to Dr. Wilks's care, and was then evidently suffering from internal hæmorrhage; she had great pain and uneasiness in the left side, with nausea, but did not vomit. During the night she vomited a cupful of blood, and shortly afterwards died. She had been a charwoman and of intemperate habits, and six years before death she had vomited blood.

On inspection, the pleura was found adherent, and the lungs healthy. The left ventricle was contracted and empty, as in death from loss of blood.

In the abdomen the peritoneum was healthy, except adhesion at the upper part, where the anterior wall was firmly united to the stomach and liver. These structures could be separated with care, except at the left hypochondriac region, where the adhesions were exceedingly firm. The whole of the liver, stomach and spleen, were removed together; the stomach was found to be contracted at its centre by a large oval ulcer placed transversely; two pouches were formed, the pyloric being the smaller of the two, and the cardiac one formed a large cavity, capable of holding at least a quart of fluid; each part contained a large quantity of coagulated blood, partly digested. At the posterior part of the stomach, near the lesser curvature, was a large chronic ulcer, with raised dense rounded edges, and with a depressed slightly granular centre; the ulcer was oval or rather reniform in shape, and appeared to be formed by two ulcers which had coalesced; it was at least three inches in length, and one and a half to three in breadth. Its floor was formed partly by the left lobe of the liver, to which it was firmly adherent, and by the pancreas. Two small papilliform eminences

were found on careful examination, and a bristle could easily be passed into open vessels; one opening was found to communicate directly with the splenic artery, on the upper margin of the pancreas, and a second with the artery in the centre of the pancreas. Each of the perforations in these vessels had a small quantity of blood at their orifices, but did not contain any clot or blood. The pylorus and the rest of the stomach were healthy. The intestines contained a considerable quantity of blood, but were otherwise healthy. The portion of the left lobe of the liver in connection with the stomach was atrophied, and it presented fibroid degeneration; the other part of the liver was fatty. The kidneys were granular.

This case presents us with an unusual mode of termination of gastric ulcer. The ulceration had been slow in its progress, and it had apparently extended over at least six years or more; there had been some hæmorrhage, which had probably come from some of the branches of the gastric arteries; as the ulceration extended, the walls of the stomach were perforated, but adhesions prevented peritonitis. In this state the health had become impaired by disease of the kidneys, which were found after death in a state of advanced degeneration; slow ulceration had reached the vessels at the base of the ulcer, and the perforation of two large vessels led to the fatal hæmorrhage. These vessels were healthy, but the ulceration had destroyed the surrounding structures more extensively than the arteries, and the contraction of the vessels was also prevented by fibro-elastic tissue, so that minute papillary eminences were formed; the disease of the kidneys and the condition of the blood also tended to increase the hæmorrhage. It is remarkable that so little blood was vomited, although the stomach was full, and the intestines contained a considerable quantity. The absence of this symptom arose partly, perhaps, from the adhesions of the stomach to the parietes, as well as from the prostrate condition of the patient.

As to the cause of the complaint, we are led to suppose that the intemperate habits of the patient produced the disease of the stomach, as well as that of the kidneys; the one tended to increase the other, and at last hastened the fatal termination.

Case LVII.—*Ulceration of the Stomach. Fatal hæmorrhage.*—Joseph G—, æt. 53, was admitted into Guy's February 28th, and died March 6th.

This patient was admitted after hæmatemesis had taken place; it came on suddenly, and there were no premonitory symptoms; he died on the sixth day, completely blanched.

On inspection, forty hours after death, a small ulcer about the size of a fourpenny-piece was found at the lesser curvature of the stomach; it was round, depressed in the centre, and the edges of the mucous membrane were raised; in its centre was an opening from which exuded a drop of blood, and a probe could be passed into a large vessel beneath, apparently the gastric. The stomach was of normal size, and free from blood, but the large intestines contained blood, as shown by their dark colour. A partial inspection only was allowed.

Numerous instances of hæmorrhage into the stomach recover, even after extreme loss; the hæmorrhage is checked by the formation of clots in the divided vessel. This obstruction of vessel was well shown in a case of gastric ulcer, which terminated fatally from bronchitis. Large hæmorrhage from the bowels had taken place several months previously, and on inspection two chronic ulcers were observed towards the anterior surface at the lesser curvature, and on one of them the truncated extremity of a small vessel was filled by a clot.

A most interesting and rare case of recovery after apparent perforation is recorded by Dr. Hughes and Mr. Hilton, in the Guy's 'Reports.' The young woman left the hospital, and appeared convalescent; subsequent indiscretion in diet produced a return of the symptoms, and a fatal result. A cicatrix of previous ulcer and adhesions were found, but with new perforation. The opiate plan of treatment of Drs. Stokes and Graves was adopted with unusual success.

Case LVIII.—*Chronic Ulceration, with Villous Growth. Stomach exceedingly contracted, simulating cancer.*—Thomas F—, æt. 34 years, a married man, who resided at Dover, and followed the occupation of a fruiterer, was admitted into Guy's June 30th, 1854, under my care, in the Clinical Ward, in a pale and exceedingly emaciated condition. With the exception of an attack of rheumatism fifteen years before, his health had been good till eight months prior to admission. He stated that eight months previously he took cold, and experienced pain in the chest, at the lower part of the sternum, accompanied with difficulty of deglutition. He obtained no relief, but the pain gradually increased in severity, and was accompanied with vomiting after food; his food was brought up directly after being swallowed, his own description being that it never seemed to reach the stomach, but was brought up unchanged; the vomiting sometimes subsided for several days, and he was thus able occasionally to retain fluid food; when this occurred he experienced relief from the sense of painful exhaustion. Emaciation

had slowly increased. On admission, his exhaustion appeared extreme, but still he experienced no pain; the abdomen was collapsed; no tumour could be felt; the distress on swallowing was localised at the lower part of the sternum. At the base of the right lung there was dulness on percussion, and some tubular breathing, but no cough nor dyspnœa. He sank on the fourth day.

Inspection.—The lower lobe of the right lung was consolidated, granular, and very readily broke down. The heart was healthy. The peritoneum also was healthy. The stomach was so small and concealed that it was not at first perceived; it was exceedingly contracted and lobulated externally, resembling a portion of large intestine; it was about six inches in length and two in breadth. On laying it open, from the œsophageal to the pyloric orifice, it presented a very unusual appearance. At the pylorus, and extending along the greater curvature, was a deep excavation or ulcer, bounded by a sharp, slightly ulcerated border, the surface of which was smooth, and of a greyish colour. This ulcerated surface extended about half an inch beyond the pylorus; passing towards the cardiac extremity and along the lesser curvature, the mucous membrane appeared smooth, shining, and glazed; and towards the cardiac extremity presented several raised, circular patches; the largest of these, very near to the ulcer, was about one eighth of an inch in elevation, and about one inch in diameter, and was composed of villous folds, which appeared to radiate from the centre; floated under water, this growth from the mucous membrane had a very beautiful appearance; nearer to the œsophagus was another circular patch of a similar description; and on either side there were slight folds, but less elevated, and having a longitudinal arrangement. On taking a small portion of this villous growth it was found to consist of very delicate plicated folds; scarcely any epithelium was found on the surface, but numerous crystals, resembling triple phosphates, were observed upon it; the growth was composed of cells of large size, from $\frac{1}{2000}$th to $\frac{1}{1500}$th of an inch in size, many oval, some angular; they contained granules, and large nuclei from the $\frac{1}{4000}$th to $\frac{1}{2000}$th of an inch. These cells were very similar to those found on the mucous membrane of a healthy stomach, or in connection with the gastric follicles. A section of the growth rendered this more probable; immediately beneath the surface of the mucous membrane was a thick layer of these secreting cells, reaching to the distended gastric follicles, which were lobulated and much distended by similar cells; beyond these enormously enlarged gastric follicles was a stratum of white fibrous tissue, from one sixteenth to one eighth of an inch in thickness; and similar tissue extended between the follicles themselves. All the growths from the membrane had a like structure. On the surface of the apparently smooth portion were several small isolated dendritic or imperfect villi, containing cells, as before described. Beneath the mucous membrane was a dense fibrous layer, and then hypertrophied muscular fibre. The hypertrophy of the muscular fibre was more marked towards the pylorus, but even there did not exist in an extreme

degree. The examination of the ulcerated surface did not show any structure which indicated the disease to be of a carcinomatous character. The liver, pancreas, and the remaining abdominal viscera and glands, were healthy. One kidney was large and healthy; the other appeared atrophied. See Plate II.

The pathology of the case just detailed is of great interest; it could not be ascertained, from minute inquiries from the patient, that he had taken any poisonous or corrosive substance. There had apparently been inflammation of the mucous and submucous tissues, leading to very slow ulceration in one part; in another, to the development of contractile tissue in the substance of the membrane, and producing contraction of the whole organ. The villous growths at first gave the idea of epithelial cancer; but the presence of gland follicles in their normal arrangement, though much hypertrophied, and the absence of every other indication of cancer, led me to the belief that these parts were merely portions of changed or hypertrophied mucous membrane. There was no glandular enlargement nor disease resembling carcinoma in any part of the body. The disease during life was believed to be carcinomatous, and located at the cardiac extremity of the stomach; the manner in which the food was at once regurgitated or rejected from the stomach, the unrelieved pain, and steady emaciation, seemed to warrant such a supposition. The acute disease at the base of the right lung was interesting, as illustrating the manner in which such disease in an exhausted subject may take place without general symptoms. There was neither cough, dyspnœa, nor febrile symptoms; the pulse was quiet, and the tongue clean; still, there were dulness and tubular breathing at that part, and the lung was found, on inspection, in the second stage of pneumonia.

Case LIX.—The thickening produced by hypertrophied tissues in chronic ulcer may be so great as to resemble cancerous growths, as in a case under the care of Sir W. Gull, in Guy's, in 1866. Caroline D—, æt. 39. Four months before her death she had rigors after dinner, and two months later she began to vomit; for six weeks she had a burning sensation in the throat and œsophagus, and for five weeks vomited everything. The urine contained albumen, the conjunctiva was yellowish in colour, and a movable tumour could be felt. The peritoneum was studded with small, round, wart-like patches, with black spots as after minute hæmorrhage. The stomach contained about a

pint of dark-coloured fluid, the cardiac end was distended and its walls rather thinner than usual. At the pyloric third of the stomach was a tumour about two and a half inches in transverse, two inches in vertical, and one and a half inches in antero-posterior measurement; on section two fifths of it were hypertrophied muscle; the fatty tissues were much thickened and indurated. The thickened tissues constituted the bulk of the tumour. There were no enlarged glands, but an ulcer was situated two inches from the opening of the œsophagus. The rest of the stomach was healthy.

Cancerous disease may, however, exist *with* ulcer. In a woman, æt. 30, who died from cancerous disease of the peritoneum, which led to complete obstruction, there was an old callous ulcer which had destroyed all the coats of the stomach; the stomach was small and as hard as gristle; its walls in the pyloric three fourths were three quarters of an inch in thickness, at the cardiac position one fourth to one sixth. The lesser curvature was the thickest part, at the ulcer the coats were more than an inch in thickness. There was no milky juice. The gastric follicles were much wasted.

Causes.—There is much obscurity as to the predisposing cause of ulceration of the stomach. Some cases are preceded by a state of chronic inflammation of the whole mucous membrane, produced by intemperance or irregularity in diet. In others it appears probable that the general state of nutrition and of the nervous system act as predisposing causes. Mental depression or anxiety, scanty food, late hours at night, and insufficient exercise, pressure upon the scrobiculus cordis, either by direct girthing of the abdomen, or by constant and constrained position, as in milliners and shoemakers, or the striking of the epigastrium by the shuttle of the weaver, are also causes of gastric ulcer.

Treatment.—There are several objects to be sought for in the treatment of ulceration of the stomach:

1. The promotion of reparative action by sustaining and increasing general nutritive power.

2. The relief of distressing symptoms, pain, vomiting, hæmorrhage, pyrosis, constipation, &c.

3. The prevention of the extension of the disease.

4. The removal of its complications.

1. Almost the first consideration, and certainly one of the most important, is the administration of proper food. If absolute rest could be afforded to the stomach, the ulceration affecting its surface would probably in many cases rapidly

heal; but, since this is almost impossible, it must be our object to give such forms of nutriment as will spare the stomach; and in seeking to accomplish this purpose, it must be borne in mind that the especial office of the stomach, and its peculiar secretion, is the solution of nitrogenous compounds. These elements are found in the flesh of animals, in beef and mutton, &c.; hence we generally find that solid animal food produces pain and vomiting, and must in most cases be avoided.* If, however, these elements of food be given, they must be in an unirritating form, as the less oleaginous kinds of fish, the sole, whiting, cod, &c., or poultry; or in a fluid state, as veal and mutton broth, clear soups, &c.; beef-tea often creates nausea and vomiting. Still more must hard and indigestible meats, preserved meats, and cheese be avoided. Oysters, sweetbread, can often be taken when more irritating diet would be rejected.

Starchy food is converted into sugar by the saliva and by the secretions in the intestine, and in that state is readily absorbed; but, at the same time, it readily undergoes fermentative change and produces flatulence, so that in pyloric obstruction it is well to abstain from it. So also, oleaginous substances are converted into an emulsion by the alkalies in the secretions of the mouth and intestine, and in the bile; so that these forms of diet, whilst they are demulcent and soothing to the diseased gastric surface, do not require the stomach in order to place them in a state ready for absorption. Good stale bread, biscuits, milk, starchy substances—as arrow-root, tapioca, maize, or Indian corn, flour, rice, &c., may thus be given to the patient; eggs often disagree, but may be taken in the form of light puddings; milk, also, when refused in its simple character, may be better tolerated by combination with isinglass, as in blanc-mange, or with soda water or lime water; and even cream and bacon are occasionally well borne.

Rich soups, highly seasoned dishes, peppers, mustard, &c., are better abstained from; so also pastries, and food containing much insoluble material, as salads, unripe raw fruit, green vegetables, &c. It is, however, undesirable altogether

* Corvisart has shown, that the pancreatic fluid promotes the solution of nitrogenous substances.

to abstain from vegetables, for we may thus defeat our object, by inducing cachexia; oranges, lemons, &c., may be often taken with benefit.

Again, it is most important that food should be partaken of slowly, and thoroughly masticated; and it is better to take small quantities at a time, and to repeat the allowance more frequently, than to distend the stomach by a large and bulky meal; about three to four hours should intervene in ordinary cases, but when there is great exhaustion, with irritability of the stomach, food may be required more frequently, and in very small quantities. Exertion, both mental and physical, should be avoided directly after meals; in fact, everything should be done to facilitate the process of digestion. It is well to abstain from alcoholic liquors if possible; they tend to aggravate the disease, and should not, I think, be given unless the circulation be failing, and there be tendency to syncope; but, when required, brandy in small quantity and well diluted, or the forms of sherry which contain the least quantity of sugar are best. New wines, port, and imperfectly fermented malt liquors, generally disturb and distress the patient.

It is desirable to use every means in our power to improve the health, as exercise in the open air; but over-fatigue, or constrained positions, should be avoided. Moderate horse exercise, and bracing air, will sometimes afford more relief than medicinal agents, even when long continued; but violent shaking is injurious. When a chlorotic or anæmic state has been produced, the preparations of steel, by restoring a more healthy condition of the blood, greatly facilitate reparative changes. We prefer the milder preparations, as the ammonio-tartrate or citrate; the compound steel pill, with aloes and myrrh, or quinine with iron, as the sulphate or citrate conjoined, may also be beneficially prescribed.

It is obviously most desirable to administer that form of aliment which will nourish the body, so that healing may be favoured, but without irritating and disturbing the process which is going on towards recovery. The difficulty is still more increased by the occasional irritability of the stomach itself; and this leads us to the consideration of the means we possess for the mitigation of distressing symptoms—pain,

vomiting, hæmorrhage, pyrosis, constipation. For the relief of *pain*, opium or its alkaloid morphia is often the best remedy, in doses of ¼ to 1 grain of the former two or three times a day, or a few minims of the solution of the latter. Chloric ether, in doses of 10, 15, to 20 minims, will be found very efficacious, especially when combined with nitrate of bismuth in 10 to 20 grain doses. Chlorodyne is stated as being a valuable substitute, but I have no experience in its use. Dilute hydrocyanic acid, in doses of 3 to 5♏, is also a useful adjunct in some cases, especially when given with alkalies. Both potash, soda, lime, and magnesia, have been used; they neutralize acid secretion, and oftentimes increase the anodyne power of the remedies previously mentioned—opium, morphia, chloric ether, &c. If, however, there be constipation, dryness of the tongue, and opium is not well borne, conium or henbane may be used as substitutes. The nitrate and oxide of silver, in doses of ¼ to 1 grain, in some instances diminish the pain and irritability of the stomach, especially when the gastric symptoms are associated with pyrosis. Creasote or carbolic acid in 1♏ doses we have found very effectual in relieving pain, when accompanied with irritability of the stomach, or with vomiting and fermentative changes in the food. Charcoal is also a remedy which in some cases acts very speedily and efficaciously in relieving pain and flatulent distension. Again, carbonic acid, as in ordinary soda water, is effective in relieving pain as well as vomiting. So also the use of cold water and ice, which are often very grateful to the patient.

Vomiting is a very distressing symptom in many cases of ulcer of the stomach. It is best combated by only partaking of fluid diet, and of that in moderate quantities. The remedies we have already mentioned are of service, but especially bismuth, hydrocyanic acid, creasote, ice and the alkalies.

Sir Wm. Jenner has pointed out the value of the sulphite of soda in checking the fermentative action, and the development of sarcinæ in obstruction from chronic ulcer, as well as in cancerous and pyloric disease. It may be given in ℈j doses, alone or conjoined with other agents; the hyposulphite is also given in similar cases.

Counter-irritants are often of service for the relief of pain

and vomiting in these cases. A small blister may be applied to the scrobiculus cordis, or croton oil rubbed in so as to produce a pustular eruption. Some even use a seton; but I think, that we may attain the same beneficial result by milder remedies with less suffering and distress to the patient.

If there be *excessive secretion or hæmorrhage*, astringents may be given; thus, mineral acids, as the sulphuric alone, or with Epsom salts; acetate of lead, tannin, and alum, are also available; and when we have hæmorrhage without great irritability, small doses of turpentine with mucilage or yolk of egg may be prescribed. Tincture of iron is sometimes very effective in checking the hæmorrhage.

When hæmorrhage has recently taken place, it is well to avoid the use of anything likely to distend or mechanically to disturb the stomach, as carbonic acid. Ice, however, should be allowed to the patient, as it tends to produce contraction of bleeding vessels.

Pyrosis may be checked by the astringents just mentioned; but we have found the greatest benefit from nitrate or oxide of silver with opium, from creasote or carbolic acid, from the compound kino powder, and when other symptoms would permit it, from the astringent preparations of iron.

The bowels should be acted upon by agents which are neither retained in the stomach, nor irritating to it, as the aloes or colocynth pill, with henbane; the effervescing citrate, the carbonate or Dinneford's fluid magnesia; in other instances enemata are useful, consisting of simple water or castor oil, or of turpentine; and occasionally a mercurial purgative will be found beneficial in thoroughly emptying the canal without increasing gastric irritability, as a few grains of grey powder, one or two of calomel, or of blue pill, with henbane, &c.; but to continue this form of medicine is, we think, injurious and prejudicial to the patient. In many cases of constipation with gastric disease, minute doses of strychnia, or of the extract of nux vomica with aloes, act very beneficially.

In order to carry out the *third* indication of treatment, namely, in preventing the extension of the disease, sudden and violent exertion should be guarded against; and also the distension of the stomach by large meals, or by food which

leads to the formation of gaseous products, as the result of fermentative changes.

4th. In the treatment of the complications of gastric ulcer, arising from its extension to neighbouring parts, as when perforation has taken place, and the symptoms of peritonitis have been suddenly produced, there is still a slight chance that life may be prolonged, if the patient is not moved, nor anything introduced into the stomach, except a teaspoonful of water or milk to assuage thirst. Opium must be given freely, as recommended by Dr. Stokes and Dr. Graves, so that the patient may be entirely under its influence—a grain every three or four hours—by this means peristaltic action is checked, nervous shock diminished, extravasation prevented, adhesions promoted, and life may be thus preserved. For many days aperient remedies should be avoided, and food only taken in the most cautious manner.

If local suppuration have taken place, opium is still the best remedy, in order to diminish irritative fever, to relieve pain, and to place the patient in the most favorable condition for reparative action. If the disease have extended into the chest, the prospects of recovery are still less; for sudden acute pleurisy and empyema, or asthenic pneumonia are almost certain to follow. Life may be prolonged by sustaining the patient, and the severity of the symptoms of acute disease of the chest may be partially relieved by ammonia and opium.

The two following cases illustrate the relief that may be afforded by the treatment just recommended.

Case LX.—*Chronic Ulcer of the Stomach. Relieved.*—Jane H—, æt. 34, was admitted under my care into Guy's Hospital, May 1st, 1861. She was a married woman, but had had no family. For eleven years she had had pain at the stomach, with frequent attacks of vomiting of clear fluid. In 1858 she vomited a large quantity of blood, and eighteen months later had a second attack of hæmatemesis. During three months prior to admission, she had continued pain at the scrobiculus cordis, extending to the spine, and increased by food; there was tenderness at the scrobiculus cordis; and she became so weak as to be obliged to keep her bed. For two months she had had vomiting, sometimes *directly* after food, at other times an hour afterwards; the bowels were constipated. On admission she was emaciated, and rather sallow; there was tenderness and increased pulsation at the scrobiculus cordis. She was most free from pain when lying partly on the back

and towards the left side. The pulse was very compressible, 74; the tongue was very red in the centre; the respiration was coarse at the apices of both lungs; menstruation was scanty and irregular, and had disappeared for two months. She was ordered colocynth pill, with henbane at night; and nitrate of bismuth with chloric ether three times a day, and food in a fluid form.

8th.—Symptoms relieved; no vomiting, and less pain. She continued to improve greatly, and left the hospital convalescent on May 27th.

There appeared to be little doubt, in this instance, as to the presence of an ulcer in the stomach; and we have very rarely observed a greater measure of relief than she experienced.

Case LXI.—*Ulceration (cancerous?) of the Stomach. Relieved.*—David H—, æt. 36, was admitted into Guy's Hospital under my care, April 8th, 1861. He was a married man, a printer, who had resided at St. Luke's. Fifteen months previously he had drunk gin immoderately, and violent vomiting was produced; no blood, however, was ejected. After that time he had suffered from pain across the abdomen and in the back. The pain was greatly increased by food, and vomiting came on directly after it had been taken; but for six weeks the pain had been less severe. His diet had consisted of beef tea, eggs, milk, &c. He was greatly emaciated, sallow, and had an anxious expression of countenance. A hard tumour, about two inches across, could be felt at the scrobiculus cordis. The action of the heart was feeble, and the pulse was very compressible. Extract of nux vomica, with disulphate of quinine and aloes, and myrrh, were given three times a day.

April 18th.—He complained of intense pain at the scrobiculus cordis, unrelieved by position, and increased by food. There were spots of purpura on the legs. He craved for meat, but refused vegetables. Soap and opium pill were prescribed night and morning; and lemon juice, with infusion of calumba, three times a day.

20th.—Athough he had no vomiting, the pain was very severe at the stomach; he was more prostrate and distressed, the bowels were constipated, and he was unable to take solid food. The opium was continued, and he was directed to take chloric ether with bismuth.

22nd.—He was very much relieved.

30th.—Again suffered severe pain. He was in the habit of taking a small quantity of food, and after a short time, because the pain became very severe, he endeavoured to excite vomiting, as affording the only means of relief. He was very much emaciated and prostate; but he said that he was rather easier when sittting up. Opium was added to his medicine.

May 28th.—Very prostrate, and emaciated to an extreme degree; but he said that he was well, because the pain and vomiting had subsided. The tumour at the scrobiculus cordis was less distinct.

June 8th.—The gastric symptoms continued in abeyance, and he left the hospital in improved health.

The pain produced by the reception of food into the stomach, and increasing till vomiting had taken place, was very characteristic of organic gastric disease. The prostration was excessive; but when almost pulseless, and when the pain and vomiting had subsided, the patient stated that he was well, and he insisted on endeavouring to walk about. It was a good illustration of the benefit of avoiding fresh causes of irritation, and opium with chloric ether afforded great relief; but, although he left the hospital free from pain, we fear the disease was advancing, and would lead to a fatal result.

Sloughing of the Mucous Membrane of the Stomach.—The action of caustic poisons is the ordinary cause of sloughing of the mucous membrane of the stomach; but in the two following cases the appearance was peculiar, and very different from that produced by a clot of blood covering an ulcer. At the lesser curvature of the stomach there were several black patches, the largest being about an inch in length; and other smaller patches were placed in the same direction along the lesser curvature. The black central portion could not be removed from the tissue beneath; but, on section, it was found that a cup had been formed of fibrous tissue surrounding the base and on either side of the slough, showing either that an inflammatory condition had preceded the loss of vitality in this isolated portion of membrane, or that having sloughed, this new action had been set up around it. The appearance presented was very similar to an ordinary bed-sore on the sacrum. A slight, unusual irritation, with depressed vital power, appeared sufficient to cause total loss of vitality. Effusion of blood into the substance of the mucous membrane probably preceded this change, and it closely corresponded with a condition sometimes found in the lung, namely, that observed when hæmorrhage into the substance of the lung is followed by loss of vitality in the part; and one or more lobules of the lung are found detached by an attempt at reparative action.

The cases here recorded, confirm the opinion expressed by Dr. Copland, and are in accordance with the experiments of others, that the condition of the nervous system has an important influence on the mucous membrane of the stomach. In both cases there was acute pneumonia; in the one, with

renal anasarca, in the other, with paraplegia. The effect of division of, or disease implicating the pneumogastric nerve, on the nutrition of the lung, is shown by great congestion, and often by acute pneumonia, as we have remarked in the consideration of diseases of the œsophagus; instances also are very frequent of functional disease of the stomach arising from irritation of the pulmonary branches, and cerebral centre of the pneumogastric nerve; but the production of organic change in the stomach by division or disease of the nerve has not been established.

Case LXII.—*Ulceration of the Stomach. Sloughing. Paraplegia. Softening of the Spinal Cord. Disease of the Vertebræ.*—Elizabeth G—, æt. 33, was admitted February 23rd, 1855. She had been ill for six weeks with paraplegia. Sloughing of the hips, &c., followed, and she gradually sank.

Inspection thirty-six hours after death.—Opposite the eleventh dorsal vertebra the cord was quite diffluent; and this softening extended, though in rather less degree, to the upper part of the dorsal region. It was more marked in the posterior column. *Chest.*—The bronchi were congested, and were full of tenacious mucus; the lower lobes of the lungs were in a state of red hepatization, being red, fleshy, and very soft. The mitral valve was thickened. *Abdomen.*—Omentum attached to the bladder; the stomach was placed vertically, and was distended; it was pulled down to the pelvis, and occupied half the abdomen. *Stomach.*—Much enlarged, containing grumous fluid; its greater curvature presented post-mortem solution, and the mucous membrane was partially destroyed. Above the line of solution there were several ulcers about the size of a shilling piece. The mucous membrane at the margin of the ulcers was pale and slightly raised, and the floor of the ulcers was covered by a black slough. The intestines were much congested. The liver was very fatty. The spleen was healthy. The bladder was sloughing, as also were the vagina and os uteri, so that there was free communication between them. The uterus contained a decomposing fœtus of about two months.

Case LXIII.—*Mottled Kidney. Anasarca. Pneumonia. Sloughing Mucous Membrane of the Stomach.*—Stephen F—, æt. 51, was admitted April 10th, and died April 20th, 1855, from chest disease. Nine years before he had had scarlet fever, and for the last eighteen months he had not been well. On admission the urine was very albuminous.

Inspection fourteen hours after death.—The body was generally anasarcous. The lower lobe of the left lung was red, consolidated, and almost breaking down. The rest of the lung was very œdematous. The bronchi were full of frothy mucus. The left ventricle was much hypertrophied. The weight of the heart was 17 oz. At the lesser curvature of the stomach were several sloughs; the largest two inches

in length, and about one in breadth, black, and slightly raised; a section showed that the slough was situated in a cup of slightly thickened tissue. Two smaller sloughs were situated near to it. On microscopical examination of the adjoining portions of mucous membrane, the gland follicles were not distinct; and on the surface were columnar epithelium and crystals, &c. The small intestines were healthy. The spleen was small, firm, and lardaceous. The kidneys were mottled, and the Malpighian bodies were degenerated and lardaceous.

An instance recently occurred in Guy's of acute tuberculosis in a young man, in whom the lungs were filled with miliary tubercle; in the stomach, at the lesser curvature, on both the anterior and posterior walls, were several ulcers about a quarter of an inch in diameter, with red well defined margins, and containing at their bases a dark slough. Excepting at the edges of the ulcers the mucous membrane appeared healthy, and there was no evidence of chronic disease. There was no obstruction about the coronary arteries or veins. The liver contained three small hydatid cysts, and there was the remains of one, a calcareous cyst, at the apex of the left ventricle. There was strumous disease of the left kidney and prostate gland.

Fibroid Degeneration of the Pylorus.—The condition of the pyloric valve in which degeneration of a fibroid character is found to exist, has been and still is by many pathologists considered as a form of cancerous disease, by others as hypertrophy of the normal constituents of the affected part. If, however, the diseased structure be carefully examined, no evidence of cancer will be found in it, or in the adjoining parts. The disease apparently commences in the submucous cellular tissue, which undergoes fibrous thickening, whilst the mucous coat is in many cases unacted upon. This fibroid deposit leads to obstruction at the valve; the muscular coat then becomes hypertrophied, and the amount of the hypertrophy is an indication of the degree of obstruction; the disease may be essentially hypertrophic in character and due to excessive action of the valve.

The growth beneath the mucous membrane is whitish in colour, firm, and without any juice, as in cancer, sometimes cartilaginous in hardness; it consists of elongated or wavy fibres, resembling a fibroid tumour, which with acetic acid present numerous elongated nuclei; bands of similar tissue

pass between portions of involuntary muscular fibre; and externally the omentum may be contracted, and adhesions may have been formed with adjoining structures.

The *symptoms* closely resemble those of cancerous obstruction; and they consist in chronic dyspepsia, followed by emaciation, vomiting occurring several hours after food, pain, distension of the stomach, with eructations, fermentation, and the development of sarcina ventriculi, constipation and gradual exhaustion, till at last the patient sinks from inanition. The abdominal walls are wasted and collapsed, and a tumour is often felt at the epigastric region, consisting of the thickened tissues at the pylorus. If, however, the stomach be free from adhesions, the thickened pylorus is often pushed downwards, so as to be felt near the umbilicus, or even near to the pubes. It must not, however, be supposed that the pylorus can *always* be felt by tactile examination; sometimes the most careful manipulation fails to detect it, although it may be in a thickened condition. Pain is not generally a *marked* symptom of this form of pyloric disease; but tenderness on pressure is sometimes present, and this, perhaps, arises from peritoneal adhesions.

The distension of the stomach often becomes extreme, and the movements of the hypertrophied muscular fibre may be seen through the wasted parietes. This peristaltic movement may be induced by swallowing a little water or food; but both the distension and peristalsis are less distinct when pyloric disease is acute, and may be altogether absent.

After death, in some cases, we find evidence of chronic change, and a gray and thickened appearance of the mucous membrane of the stomach, and a chronic ulcer or cicatrix are occasionally present. At the pylorus the mucous membrane may be quite healthy, having distinct, or even hypertrophied gastric follicles; but the irritation at the part may have excited secondary disease and ulceration. The glands near the pancreas are not usually affected.

The *diagnosis* is sometimes obscure, and the presence of other more acute disease may entirely mask the complaint. The duration of life after fibroid degeneration has taken place is greater than in the ordinary forms of cancer, especially medullary and epithelial cancer; and in simple fibroid disease

the cachexia has not the expression peculiar to cancerous affections; but it will be found extremely difficult to distinguish these diseases during life, especially when only observed at their earlier stages.

We are not acquainted with the predisposing, nor with the *exciting causes* of this fibroid disease; but it is probable that long-continued irritation, as indicated by dyspepsia, generally precedes it. The intemperate do not appear to be more liable, and one sex is equally the subject of it as the other; it occurs, also, in early and middle, as well as in advanced life.

As to treatment, we can afford relief, but cannot remove the obstruction. The change from solid and irritating food to fluid and unirritating nutriment is often followed by much benefit; and we may use with advantage those agents and means which have been recommended in chronic ulceration of the stomach. It is very important to administer fluid diet of a kind that does not easily undergo fermentative change, as milk, meat, soup, &c., but if vegetable food cannot be taken, lemon juice should be substituted for it.

Case LXIV. *Thickened Pylorus. Cicatrix of the Mucous Membrane, with Hypertrophy. Ulceration of the Cæcum and Colon. Fatty Degeneration of the Heart.*—G— G—, a silk weaver, æt. 62, was admitted in a prostrate and anæmic condition. He had had hæmorrhoids for twenty years; and he had occasionally lost a considerable quantity of blood. Four months before admission, he had violent pain from the hip to the foot, and his legs swelled. Violent pain also came on in the region of the stomach. Diarrhœa followed, and continued till death.

On inspection, the heart was found to be fatty, the colon and cæcum ulcerated. The stomach was somewhat enlarged, and its mucous membrane pale; at the greater curvature, for a space of about two inches in circumference, the mucous membrane was thickened, and was a little puckered; and at the upper border of this patch was a small growth, consisting of thickened and prominent mucous membrane, about one eighth of an inch above the remaining part. On examining the raised portion, it was found to consist on the surface of columnar epithelium, and beneath of cell-structure. The nuclei of the cells were very distinct; and gave the idea of cancer, but they were identical with the secreting cells ordinarily observed in a healthy organ. The pylorus was much thickened, and consisted of dense fibrous tissue, passing between bundles of involuntary muscular fibre. There were no true cancerous structures, and the diseased condition of the pylorus arose from fibroid degeneration of the submucous and submuscular tissues, which had been followed by hypertrophy of the muscular coat. See Drawing, in Museum, No. 298[50], Prep. 1806[75].

This fibroid degeneration, with hypertrophy, contrasted remarkably with true scirrhous disease. It had not led to the ordinary symptoms of obstructed pylorus, and was not diagnosed during life; the cause of death was exhaustion from diarrhœa in an anæmic subject.

Case LXV. *Diseased Pylorus. Phthisis.*—Mary W—, æt. 22, admitted into Guy's Hospital December, 1856. She stated that she had worked at the fur trade, and was nearly always in a stooping posture; three years previously vomiting had come on, preceded by pain across the chest; the symptoms, however, were much relieved, and she married; in a short time she became pregnant, and the symptoms returned; they were, however, regarded as sympathetic from the uterine condition. After her confinement she nursed for seven months; and for four months prior to admission she had constant vomiting, which came on several hours after taking food; she suffered from constipation, and gradually emaciated.

On admission into Guy's she was exceedingly wasted, and had a strumous appearance; her complexion was dark, and she was anæmic; she suffered from flatulent distension, which was easily dispersed, and complained of burning pain at the stomach; the vomiting often came on about six o'clock in the evening; on examination of the abdomen, a prominent tumour could be felt at the region of the pylorus. The vomiting after food and emaciation continued, and medicine afforded very temporary relief; a few weeks before death cough came on and expectoration; she died March 10th; her death had been expected week after week, but still she lingered on, and at last the emaciation became extreme. A short time before admission she had slight hæmoptysis, but there was no evidence of disease of the chest at that time.

Inspection was made on March 12th. On opening the abdomen scarcely anything but the enormously distended stomach could be seen; the pylorus was somewhat depressed, and the greater curvature reached nearly to the pubes. The tumour consisted of the diseased pylorus. The interior of the stomach presented a growth at the pylorus which completely surrounded the valve, so that the little finger could not pass; the growth extended nearly two inches into the stomach; the disease was of the character which has been described as hypertrophy, and was manifested in a very marked degree. The semi-transparent muscular layer was more than a quarter of an inch in thickness, and was traversed by delicate lines; upon it was placed a very dense, whitish substance, nearly half an inch in thickness, firm and tough in texture, which could be cut with difficulty; on pressure no juice exuded; upon this, again, was thickened mucous membrane; the surface was not ulcerated, but was whitish in colour, and irregularly tuberculated. The disease did not terminate so abruptly in the duodenum as we often find, but gradually subsided to the natural thickness of the intestine. The

duodenum was otherwise healthy; so also the mucous membrane of the rest of the stomach. The intestines, liver, kidney, and glands were healthy.

On microscopical examination, the non-malignant character of the growth was well shown. The mucous membrane at the pylorus covering it was thickened, but presented normal structure; the gastric follicles were beautifully distinct, elongated, and filled with nuclei, apparently quite healthy. The white submucous substance was composed of dense fibre, and with acetic acid presented elongated nuclei, arranged as in fibrous tissue; there was no evidence of cancerous deposit. The muscular tissue had the usual involuntary fibre, but firmer bands intersected it. There was no cancerous disease in any part of the body.

At both apices of the lungs there was disorganization; there were several small vomicæ filled with pus, and surrounded with iron-gray pneumonia, and with some white, granular deposit, resembling tubercles; but no cancerous disease could be found on microscopical examination.

The disease apparently commenced in the submucous cellular tissue, and consisted of abnormal development of the ordinary fibrous tissue, and closely resembled the fibrous growths of other parts. This hypertrophy of the muscular and mucous coats was probably secondary, and the result of the obstruction. The history of the case, the disappearance of the symptoms, and their recurrence after an interval of more than two years, are more allied to fibrous degeneration than to cancer.

The occurrence of phthisis with the diseased pylorus is rare; the patient was a strumous subject, and during the exhaustion consequent on the disease of the stomach pneumonia was set up, and a low organized product effused. The age of the patient was less than that in which we generally find this disease, only twenty-two; and it is doubtful how far her employment induced the complaint.

In another instance fibroid disease of the pylorus was found in a young man æt. 29, the vomiting had come on about six months before death; and the peristaltic movements of the stomach were visible. The stomach contained a large quantity of fluid, but its surface was healthy. The pylorus would only admit a probe a quarter of an inch in diameter. The section showed fibrous material in the submucous tissue, but no milky juice was present, and there was no ulceration.

The pylorus is sometimes found to be remarkably thick-

ened, although no symptoms of disease have been detected during life. On the post-mortem table fibrous nodules are also occasionally observed in the submucous coat; in an instance of this kind the growth was supposed to be of syphilitic origin, but this opinion was not borne out by other appearances; the patient, aged 61, had an atheromatous state of the aorta, and embolism of the cerebral arteries; he had pneumonia also, and granular kidneys. In another case a woman, aged 64, who had pneumonia on the right side, presented a growth beneath the peritoneum of the stomach on its anterior surface and near the pylorus. The growth was about the size of a hazel nut; it was easily enucleated, and did not involve any of the muscular fibres. It was fibrous under the microscope; several more were in the neigbourhood over the stomach, and one or two appeared to be in the course of the minute subperitoneal vessels.

Polypoid Growths in the Stomach.—The mucous membrane of the stomach not unfrequently presents polypi attached to its surface; several of those which I have examined have presented the appearance of healthy mucous membrane, and they had not produced any symptoms; sometimes smaller growths of this character appear incorporated together, and closely resemble the appearance of commencing carcinoma; it would seem that a cicatrix or some irritating cause has in some cases induced them. They are especially found towards the cardiac extremity of the stomach. We have already referred to the views of Rindfleisch, who considers them to be extreme conditions of mammillation, and traces them from a rugose state to pedunculated masses of hypertrophied mucous membrane. Mammillation is however almost invariably found, not at the cardiac, but at the pyloric end of the stomach. It is rare to find mammillation at the cardia, and therefore most unlikely that it should advance to such an extreme stage as that indicated by a polypoid growth; and, on the other hand, the instances which have come under our own notice have given no evidence of such an origin, and we regard them as independent growths which occasionally occur in the stomach, similar to those which are found more commonly in other parts of the intestinal tract, more particularly in the rectum and sigmoid flexure.

Cancer of the Stomach.—The stomach is one of the organs most frequently affected with cancer, and in this frequency a remarkable contrast is presented when compared with the rarity of strumous disease of the same organ. Every form of cancer is found to occur in the stomach, but instances of medullary and scirrhous cancer are the most numerous, whilst epithelial, villous, colloid, and melanoid are more rarely found. It is seen, however, that these varieties frequently pass the one into the other, and thus, while one part has almost the firmness and structure of scirrhus, another has the characteristics of medullary growth; and again, the surface also of a medullary cancer may have the appearance of a villous structure. The disease originates in the mucous membrane of the stomach, or its submucous tissue, or it is propagated to the stomach by the affection of the glands in the neighbourhood of the pancreas; and the pylorus, lesser curvature, and cardiac extremity are the parts generally affected. It is not necessary for me to describe the ordinary characters of the several forms of cancer; the cases I have briefly given show the general appearance of the structures found in them. Bamberger, following Rokitansky, describes the three chief forms of cancer of the stomach, as fibrous, medullary, and areolar or colloid. The melanotic and villous are to be looked upon as varieties of the medullary. Bidder has noticed epithelial cancer.

All these forms of disease have a tendency, unlike ulcers, to attack the orifices of the viscus, and the medullary and more particularly the colloid varieties are prone to spread in the submucous tissue. Blended, as they often are, the one with the other, it becomes scarcely necessary to distinguish between them clinically, but it might perhaps be said in relation to diagnosis, that the symptoms vary according to the form of disease. Thus in scirrhus there is local obstruction and dilatation, and some vomiting; there may also be contraction, so that the calibre of the stomach is narrowed, like a portion of intestine. Alveolar cancer, on the other hand, leads to enormous thickening, sometimes of the whole stomach, and the vomiting may be the chief and the only symptom. Medullary cancer forms large fungoid masses, which may slough away and thus no obstruction is produced;

in these cases emaciation is the only symptom present. Other forms of tumours, spindle-cell sarcoma, and fibroid tumours have been noticed.

We are not acquainted with the determining cause of the forms of cancer, or whether the opinion which is maintained by some pathologists can be established, that scirrhus is connected in its origin with the fibrous tissues of the part; medullary with the mucous surface or gland-structure, and colloid especially with the latter; or whether they are rather indications of the intensity of the morbid action. The part affected has a modifying influence on the character of the disease, the epithelial cancer of a surface covered by squamous epithelium is different from the same disease, where the epithelium is columnar; an instance of differentiation as applied to morbid changes. It would seem that scirrhous disease is less removed from normal nutritive change than medullary cancer; in the one there is a greater disposition to form fibroid tissue, in the other the growth is cellular or even nucleolar. The vascularity of these growths is very different, sometimes the whole structure is reddened and it is full of blood, and the size of the vessel may be so great as to cause active pulsation, and in this way may simulate aneurismal disease. The stomach may be affected secondarily from the liver or peritoneum, or cancerous disease of the stomach may be associated with chronic abscess extending to the diaphragm or between the liver and pylorus; in one instance this secondary suppuration extended up the œsophagus as high as the division of the trachea; in another case under my care in which cancerous disease of the stomach was well marked, adhesion of the lesser curvature to the abdominal walls had taken place, and at this part a small abscess had perforated the stomach.

The *symptoms* of cancerous disease of the stomach, when a tumour cannot be detected on manipulative examination of the abdomen, are often exceedingly obscure, especially in the earlier stages of the disease. It may be convenient to divide the symptoms into three classes, as they are manifested in different stages of the complaint. First, before the formation of any perceptible tumour; secondly, during the development of a growth; and thirdly, the last stage, that of

disintegration, by ulceration or sloughing. The first symptoms are those of dyspepsia; and with these there is often a peculiarly sallow and anxious expression of the countenance; pain at the stomach may be entirely absent, or there may be severe gastrodynia; pyrosis is frequently present.

In the second stage of the disease vomiting is generally the most prominent symptom, especially when the disease is situated at the pylorus or cardia, and the rejection of food takes place according to the seat of obstruction or irritation of the gastric surface, either a short time or several hours after a meal. In some instances the vomiting so quickly follows deglutition as to lead to the supposition of œsophageal disease. The pain also becomes more severe, and is generally of a more lancinating character than that experienced in chronic ulcer of the stomach. The vomited matters are often frothy and fermenting, and present us with abundant sarcina ventriculi. Hæmatemesis is occasionally present. Flatulence distresses the patient, and eructations are frequent; the bowels become constipated; emaciation steadily advances, and the countenance becomes haggard and cachectic. On careful examination, a tumour may generally be felt at the region of the stomach, or of the pylorus; it often increases rapidly, and on account of the wasted condition of the parietes, becomes very apparent.

In the third stage of the disease the symptoms are more severe and the emaciation extreme, and the vomiting of coffee-ground substance often precedes a fatal termination. The earlier stages are sometimes so slight that the sudden onset of the last stage appears to be the commencement of the disease: thus a patient may fall down after some exertion and attribute the malady to an accident; this obscurity of the earlier symptoms has been observed in several cases of villous cancer, especially when the orifices are free. The vomiting sometimes ceases on account of the sloughing of the growth; the obstruction thereby being removed, or the branches of the pneumogastric nerve being destroyed, there may be cessation of consequent irritation; the pain also, sometimes diminishes from similar causes, and as the exhaustion becomes typhoid in its character, the pain may entirely cease, or it may be almost absent throughout the

course of the disease. Again, as has been shown by Dr. Kennedy,* the size of the tumour may actually lessen from the sloughing process.

The immediate cause of death in cancer of the stomach differs exceedingly; the fatal termination may result from exhaustion consequent on the interference with the absorption of nutriment and the completion of the digestive function; the exhaustion may cause comatose symptoms, and what has been designated serous apoplexy; or after sloughing has taken place, the patient may rapidly become prostrate; the breath is then very offensive, he is seized with hiccough, and in many instances, the absorption of septic matter takes place, typhoid prostration ensues, and lobular pneumonia is the result; or the ulcerative process may produce, in rare cases, fatal hæmorrhage, as in an instance in which the splenic artery was divided. Again, the extension of disease to adjoining parts may materially modify the later symptoms of disease, by extension to the liver, by pressure of enlarged glands on the bile-ducts, thus producing jaundice, or ascites may follow the implication of the peritoneum. The cancerous ulceration sometimes extends to the actual destruction of adjoining tissues, and may pass into the liver; in an instance of this kind a secondary opening made its way into the duodenum, and death resulted from hæmorrhage. Communication sometimes takes place with the transverse colon by a valvular or sloughy opening; and if the opening is large, fæces also pass into the stomach. In some cases there is no evidence of the passage of fæces into the stomach, but merely gas, which greatly distresses the patient by the fæcal odour of the eructation. Dr. Gairdner† states that fæcal vomiting is more likely to take place when the pylorus is free; but Dr. Murchison, on the contrary, and we think correctly, remarks, that fæcal vomiting is regulated by the size of the communication between the stomach and colon. The adhesions and sloughing occasionally reach the external parietes; and if a communication also exist with the colon, an artificial anus is the result. We have, however, more frequently found this perforation of the skin in instances of cancerous disease

* 'Dublin Quarterly,' 1851.

† 'Edinburgh Medical Journal,' July, 1855.

affecting primarily the transverse colon, and sometimes coming on after blows, &c. (See Disease of Colon.)

The coffee-ground substance to which we have referred consists of blood which has oozed from the diseased surface, and has become darkened by the action of the gastric juice; in some instances the hæmorrhage is great, and leads to a fatal termination.

Cancerous disease is generally found to have involved the glands in the small omentum at the lesser curvature. Next in frequency we find the liver also attacked, sometimes to a very great extent; the bile ducts may be so implicated as to form a mass, as it were, imbedding the duct; and, in an instance of this kind under my care in which jaundice existed for ten days or a week before death, it was difficult to state in which structure the disease commenced; next the glands in the anterior or posterior mediastinum are infiltrated, and tubercles may be found on the pleura or in the lungs. And lastly, other abdominal viscera, the peritoneum, kidneys, or spleen, may contain cancerous growths. In cancerous disease, also, we observe that the coats of the stomach themselves become infiltrated, and in this respect contrast with the condition which we find in fibroid degeneration of the pylorus. In any form of obstructive disease at the pylorus the muscular walls become hypertrophied; but if there have been ulceration at the pylorus, and the obstruction has subsequently been removed, the hypertrophy may be exceedingly slight; so also when the central portions of the stomach or the cardia are affected.

Diagnosis.—It will be found that the symptoms of cancer closely resemble those of chronic ulcer of the stomach; both are preceded by a period of dyspeptic suffering, during which the diagnosis is exceedingly obscure. The expression of the countenance in both is indicative of distress, but in chronic ulcer there is pallor, in cancer cachectic sallowness. Vomiting of blood is more frequently observed in ulceration than in cancer; but in the closing stages of cancerous disease the rejection of coffee-ground substance is of very frequent occurrence. The pain of chronic ulceration is often very intense, even more so sometimes than in cancer; but it is of a gnawing character in the former, more acute and lancinating in the latter; again, the vomiting is often more severe

in ulceration than in cancer. The tumour of cancer is generally much larger and more perceptible than the thickening around an ulcer. The emaciation in both may be gradual, progressive, and extreme; but the termination in ulcer is more frequently by hæmorrhage or perforation, whilst in cancer it generally arises from the typhoid exhaustion consequent on the degeneration or sloughing of the growth, the absorption of decomposing material into the blood, or the extension of disease to adjoining structures. Both diseases may occur at the same age, but it is more common to find chronic ulceration at an earlier period than cancer. This is shown by contrasting the ages of the cases we record of chronic ulcer of the stomach with those of cancerous disease of the same organ; the average of the former being male and female 45 and 40, and of the latter 52 in men, and in women 49. From 40 to 60 years is the age at which we are most likely to have cancerous disease of other organs, and this law holds good with the stomach. The age will in some measure assist us in the diagnosis even at the later stages, but still more in the earlier; for the varied forms of dyspepsia, gastrodynia, pyrosis, &c., are very frequent at a period long antecedent to the age at which cancer generally manifests itself; dyspepsia being exceedingly common among young females, whilst cancer is almost unknown. Cancerous disease sometimes supervenes upon a chronic ulcer, so that in these cases the symptoms may occur at an earlier period and be of longer duration than in simple cancerous disease.

Taking our actual numbers, the comparative ages at each decade are as follows:

Age	10—20	20—30	30—40	40—50	50—60	60—70	70—80	
Cancer	1	2	10	17	24	18	2	=74
Ulcer	0	14	18	6	15	8	2	=63

This comparison indicates that cancerous disease occurs especially in the later period of life, whilst ulcer occurs more frequently at an earlier period. If, however, we remove instances of acute perforating ulcer, the proportion of ulcers at the earlier periods would be greatly diminished, and would approximate more closely to the age in which cancerous disease prevails.

The investigations of Dr. Brinton* on this subject are very interesting and important; he has collected from varied sources a considerable number of cases of cancerous disease of the stomach; and he shows that males are more subject to the disease than females in the proportion of 2 to 1; out of 223 cases, 151 were males, and 72 were females; in our cases out of 74, 52 were males, and 22 females; as to the age of those affected, the period given by Dr. Brinton does not coincide with the age of those which have come under my own observation as compared with ulceration of the stomach. The following table, taken from the work of the author just mentioned, shows the liability to cancer and ulceration of the stomach at various ages:

Age	10—20	20—30	30—40	40—50	50—60	60—70	70—80	80—90
Cancer	¼	11⅔	31⅔	63	88	100	52⅙	60
Ulcer	20	51	49	47	56	80	75	100

The average age of those affected with cancer he mentions to be 51 in the male, and 40½ in the female; and in reference to the position, he confirms the well-known fact, that whilst the pyloric portion is the most frequent seat of cancer, the lesser curvature and posterior surface are the positions of ulcer, by the following tabular statement:

Position.—In 360 cases.

Cancer.—219 Pylorus. 38 Lesser Curv. 36 Cardia. 13 Stomach generally. 11 Greater Curv. 11 Posterior Surface. 11 Anterior Surface. 4 Middle.

Ulcer.—52 Pylorus. 98 Lesser Curv. 5 Cardia. 0 Stomach generally. 8 Greater Curv. 177 Posterior Surface. 18 Anterior Surface. 0 Middle.

As to the duration of chronic ulcer compared with cancer, the former disease extends over a longer period of time; in cancer the disease may be very rapid; in a case under my care the patient was only ill seven weeks, and had no pain, although there was vomiting for three weeks; the duration may be from three to six or twelve months, or even two years; in ulceration, the disease will be found continuing three, four, or even seven years, with varied accessions of severe symptoms; and instances have occurred in which twenty or more years have intervened between the commencement of the symptoms and their removal by restoration to health or their fatal termination. Moreover, ulceration is more amenable to treatment.

* 'Med.-Chir. Review.'

Beside ulceration of the stomach, there are other maladies to be borne in mind in the diagnosis of gastric ulcer. In *aneurismal* disease of the aorta, or of the cœliac axis, the pain is of a different kind; it is less, if at all affected by food; it is most severe at night, and the constitutional symptoms are less decided. A systolic or diastolic bruit may be absent in aneurism, and pulsation is a very deceptive symptom; for it is often very marked in functional disease of the stomach, and the aneurism may be so near to the diaphragm that pulsation cannot be felt. In aneurism the sac dilates uniformly, and is not affected by position, as we may find to be the case in diseased glands at the lesser curvature, or in an enlarged left lobe of the liver reaching the aorta and so receiving pulsation. In some forms of medullary cancer the growth is so vascular that it pulsates uniformly, and resembles aneurismal disease; in these cases, however, the gastric symptoms are very decided. In disease of the *glands at the lesser curvature,* there is less functional disturbance of the stomach than in primary disease of that organ. So also in *disease of the liver* there is an absence of gastric symptoms, but the pulsation of the left lobe of the liver is often deceptive, as just mentioned. *In disease of the pancreas,* the mischief is more deeply seated, the stomach symptoms are less decided, and we not unfrequently find that jaundice is produced by obstruction of the bile duct where it approximates to the pancreatic duct. *Disease of the omentum.*—The omentum is sometimes thickened by chronic inflammatory deposit, and forms a hard mass immediately below the stomach, and may simulate disease of the stomach; when, however, there is deposit in the omentum, the mass is movable, and the diagnosis is more easy. Where there is cancerous disease in the *transverse colon* there is exhaustion and cachexia, but the pain after food comes on at a later period; vomiting is absent, unless there be fistulous communication with the stomach, and there is frequently discharge of blood from the bowel. *Local peritonitis* and suppuration are productive of great tenderness in the region of the stomach, but true gastric symptoms are absent. In *simple fibroid disease* at the pylorus, the duration is longer, the tumour is less distinct, and the symptoms are more amenable to treatment.

The evidence of cancer is most marked when the pylorus is affected, and obstructive disease set up. Where this is not the case, cancer is sometimes, however, found after death, without having led to any special symptom, the patient having died from another disease; the regurgitation of glairy, gelatinous fluid, and gradual emaciation, may constitute the most prominent symptoms. It sometimes happens that cancerous disease of the liver is followed by infiltration of the glands at the head of the pancreas, which become united to the pylorus; and, without having infiltrated the mucous membrane, these glands lead to obstruction at this part, causing hypertrophy of the muscular coat, and, by this obstruction, they simulate primary cancer of the stomach itself. The stomach is sometimes secondarily involved in cancerous disease of the œsophagus, as in an instance in which two malignant ulcers were found in the stomach, and a third in the duodenum. The disease in the œsophagus had led to the prominent symptom of dysphagia, and produced sloughing in the adjoining lung. When the cardiac extremity is diseased, the vomiting frequently occurs so immediately after taking food that the symptoms resemble cancerous disease, or some other form of obstruction of the œsophagus. In some instances the pneumogastric nerves may be traced through the medullary tumours of the stomach; and either the nerve-fibres may be found to present their ordinary microscopical appearance or be entirely destroyed. It is this destruction of the nerve-fibres which sometimes leads to a cessation of the pain and extreme irritability of the stomach.

The following table of cases, which have occurred for the most part in Guy's Hospital during the last twenty years, shows the sex of the patient, the form of the disease, the cause of death, the condition of the stomach as to dilatation or contraction, and the complications or secondary affections. Out of 79 cases the cancer occurred at the

Pylorus in	41	Centre in	4
Lesser curvature in	11	Multiple in	1
Cardia in	10	Greater curvature in	1
Anterior wall in	5	Cardia and pylorus in	1
General in	4	Not stated in	1

Table of Cases of Cancer of the Stomach.

Sex.	Age.	Seat.	Form.	Cause of death.	Condition of stomach.	Complications.
M.	62	Cardia	Fungating	Double pneumonia	Contracted	None.
M.	56	Pylorus	,,	Exhaustion	Muscle thick	,,
M.	63	,,	,,	Pleuro-pneumonia	... ...	Liver secondarily affected.
M.	67	Multiple growths in the mucous membrane	... ...	Peritoneal cancer	Matted up in the omentum	Supra-renal capsules affected.
F.	38	Pyloric half	... ...	Exhaustion	Normal size	Lung, liver, peritoneum.
F.	58	Lesser curvature	... ...	,,	... ...	Humerus and vertebræ.
F.	63	Cardia	Encephaloid	,,	... ...	Liver, kidneys, pleura.
M.	60	Greater curvature	... ...	Pneumonia	... ...	,, omentum.
M.	45	Pylorus	... ...	Exhaustion	Enlarged	,, pancreas.
M.	58	,,	Encephaloid	,,	Muscle thick	Lung, spleen, liver, kidney.
M.	50	,,	Scirrhus	Chronic pneumonia	Extreme hypertrophy	
M.	55	?	... ...	...	... ...	Inspection imperfect.
M.	47	Pylorus	Scirrhus	...	... ...	
M.	50	,,	... ...	Exhaustion	... ...	Liver
F.	32	Anterior wall	Colloid	,,	... ...	,,
M.	45	Pylorus	... ...	Pleurisy, peritonitis	Muscle thick	None.
M.	38	Cardia and pylorus	... ...	Exhaustion	Normal	Omentum.
M.	45	Lesser curvature	Soft, spongy	,,	... ...	Lung.
M.	56	Pylorus	Encephaloid	,,	Normal	Glands, liver, S. R. capsules.
M.	71	General	... ...	,,	... ...	Peritoneal.
M.	70	Pylorus	... ...	,,	... ...	
M.	46	,,	... ...	,,	... ...	Liver.
M.	45	Lesser curvature	... ...	Hæmorrhage from splenic artery	Normal	Pancreas, liver, spleen.
M.	49	Pylorus	Encephaloid	Exhaustion	... ...	Liver, glands.
F.	64	,,	,,	,,	... ...	,,
M.	54	Cardia	,,	Hæmorrhage from splenic artery		

Sex.	Age.	Seat.	Form.	Cause of death.	Condition of stomach.	Complications.
M.	62	Pylorus	Epithelial	Acute pleurisy	... ...	None.
M.	57	Lesser curvature	... ...	Exhaustion	Pylorus contracted, cardia dilated	„
F.	36	Pylorus	Scirrhus	„	... ...	Ovaries and liver.
F.	50	Lesser curvature	... ...	„	... ...	Liver.
M.	52	Pylorus	Submucous	„	Small	Axillary glands.
F.	40	„	„	„	Much thickened	None; heart weighed only 3½ oz.
M.	61	Centre	... ...	Granular kidneys		
F.	37	General	Epithelial	Pleuritic effusion, &c.	Much hypertrophied; the walls ½ to ⅓ inch thick	Peritoneum, pleura, pericardium.
M.	58	Cardia	Adenoid	Pleurisy and pneumonia	Small	Liver, lung.
M.	52	„	Epithelial	Cirrhosis of liver, pneumonia	Distended	
F.	30	Pylorus	... ...	Exhaustion	... ...	Liver, glands, &c.
F.	48	Middle	Fibrous	Wasting, vomiting, pain	Much shrunken	
M.	45	Pylorus	... ...	Vomiting, wasting, jaundice	Much distended	
M.	55	„	... ...	„ exhaustion	Large, thick muscle	Colon, liver, testes.
M.	29	„	Scirrhus	„	Distended, no hypertrophy	
M.	44	„	... ...	Suppurative nephritis		
M.	32	Cardia	... ...	Scrofulous kidney, peritonitis		
M.	53	Middle third	Epithelial	Vomiting	Muscle 1 inch thick	Retro-peritoneal.
F.	47	Pyloric half	Spindle-sarcoma	„	Very large	
F.	56	Lesser curvature	Villous	„	Large	Liver.
F.	62	Pylorus	... ...	...	Large, very thick	Ovaries, peritoneum, liver.
M.	64	Cardia	... ...	Exhaustion		
M.	53	Pylorus	... ...	„	Large, thick	
F.	64	„	Fibrous	Pneumonia	Thick, no dilatation	Liver, glands.
M.	51	General	... ...	Exhaustion	... ...	None.
M.	44	Pylorus	... ...	„		

M.	66	Pylorus	Round-cell sarcoma	Exhaustion	Large	None.
M.	51	Lesser curvature	... ...	„	... ...	„
M.	?	„ „	Epithelial	Hæmorrhage	... ...	„
F.	45	Anterior wall	... ...	Pleurisy	... ...	„
M.	26	Pylorus	... ...	Phthisis	Much dilated	„
M.	?	„	... ...	Hæmorrhage, exhaustion	Dilated	Peritoneum.
F.	62	Middle	... ...	Pneumonia	Very contracted	None.
M.	34	Pylorus	... ...	Suppurative peritonitis	... ...	Liver.
F.	51	„	... ...	Exhaustion	Much contracted	Ovaries.
M.	63	„	Epithelial	„ granular kidneys	Much dilated	Liver.
F.	52	„	... ...	Hæmatemesis	Small	Lumbar glands.
F.	58	„	Medullary	Exhaustion	Contracted	Liver.
M.	30	Cardia	... ...	Hæmatemesis	Much contracted	Liver, omentum.
F.	?	Lesser curvature	... ...	Exhaustion	... ...	Liver.
M.	69	Cardia and œsophagus. Two separate growths	... ...	„	... ...	Liver, lung.
F.	36	Lesser curvature	... ...	Perforation, peritonitis	Cardia and pylorus exempt	None.
M.	61	Pylorus	... ...	Exhaustion	... ...	Intestine.
M.	45	Anterior middle	... ...	Hæmorrhage, peritonitis		
M.	50	Pylorus	... ...	...	Gastric fistula	
M.	57	General, cardia and pylorus exempt	Sarcoma	...	Dilated	Ovaries.
F.	17	Pyloric half	... ...	Exhaustion	Much enlarged and coats thick.	
M.	63	Anterior wall	... ...	Pylephlebitis	... ...	Liver.
M.	49	Posterior and upper part	... ...	Exhaustion	... ...	Lungs.
M.	64	Cardiac end	... ...	„ coma	... ...	Pleura.
F.	56	Lesser curvature	... ...	Hæmorrhage	... ...	Liver.
M.	48	Pylorus	Epithelial	Exhaustion, &c.	... ...	None.
M.	57	„	... ...	„	Normal	Liver.

In the *treatment* of cancer of the stomach the same remedies which have been mentioned in chronic ulceration may afford great comfort to the patient, although they are ineffectual as a means of cure.

It is of the greatest importance carefully to regulate the diet of the patient; but it is of no use, and indeed the exhaustion is increased, by the continued administration of food that cannot be digested or pass the pylorus. If there be pain, and especially if there be obstruction at the orifices, fluid diet only should be taken, and of a kind that does not easily undergo fermentative change; milk and simple soup, as mutton broth, chicken broth, egg, &c., are the best, and some fresh lemon juice with water to supply the place of vegetables; farinaceous food, although unirritating, is often followed by flatulent distension; sugar should be avoided, and these patients are, as a rule, better without ardent spirits. A small quantity of wine, such as good Marsala, may sometimes be taken with advantage, and although ardent spirits, as brandy or whiskey, do not ferment, they are more irritating to the mucous membrane and to the liver.

Medicines which soothe the mucous membrane and which check fermentative action are often of great service. Carbonate or nitrate of bismuth, with carbonate of soda and chloric ether, may be given with almond emulsion or with tragacanth powder and water; if there be pain very small doses of morphia may be added. The disadvantage of the use of bismuth is the constipating effect that it has upon the bowels, for although the quantity of food taken may be small, there are abundant alvine excretions, and if the transverse colon be loaded and distended the gastric symptoms are increased. Magnesia medicines may be given to obviate this effect, or simple injections used. Castor oil is often easily taken when mixed with tragacanth powder and an aromatic water. Pills are better avoided in pyloric disease and in malignant ulceration; they do not dissolve in the stomach, and sometimes irritate the diseased part. In one instance, after several pills had been administered and retained for four or five days, they were vomited up almost unchanged. Morphia in small doses alone or with alkalies is often a great relief to the patient, or

it may be combined with belladonna. If there be much fermentative action and distension, the sulphite or hypo-sulphite of soda is very useful in ℈j doses, alone or with the narcotics just mentioned. Mineral acids often distress the patient and increase irritability of the stomach, and the mildest tonics, as calumba, cascarilla, increase vomiting and do no good, so also the stronger tonics, as quinine; sometimes very minute doses of steel, as the ammonio-citrate, are tolerated, and if there be hæmorrhage, astringents, as the tincture of iron, alum, or tannic acid, may be given. If the stomach refuse these remedies, in cases of great irritability, opiates may be used as suppositories. External remedies afford some relief, and the chloroform liniment alone, or with belladonna liniment, well shaken together, may be used on linen or spongio-piline. Nutrient injections often prolong life and relieve the patient from much gastric distress; flatulence, distension, and the vomiting of food, are thus avoided, and the sufferer is nourished by this imperfect means more than by ineffectual attempts to induce normal digestion.

Case LXVI.—*Scirrhous Pylorus. Carcinomatous Tubercles in the Liver, Spleen, and Kidney, and on the Diaphragm.*—Edgar C—, æt. 40, was a cooper, and till the attack, for which he applied to the hospital, he had enjoyed good health. Four months previously sickness had come on, and it took place generally a few hours after taking food, but sometimes he was able to retain three or four meals in succession. A tumour could be felt at the region of the pylorus; there was great emaciation, and he slowly sank.

Inspection twenty-six hours after death.—The thoracic viscera were quite free from disease. There were several white, firm tubercles in the abdomen, on the under surface of the diaphragm, opposed to the liver; similar tubercles were found in the sheath of the right kidney, and a rather larger one on the surface of the spleen. In the liver, on its under surface, were several tubera, about half an inch in diameter, with raised and well-defined edges; the remaining portion of the viscus was healthy. The stomach was very much distended with air and dark, reddish-coloured fluid; at its lesser curvature a small tubercle was observed on the peritoneal surface; several of the nerves at the lesser curvature were involved in this growth. On opening the stomach it was found to contain fluid, as before mentioned, smelling very strongly of lactic acid. At the pylorus was found a hard mass, composed principally of glands, and on the inferior surface the pylorus itself was infiltrated with dense cancerous deposit. The valve was contracted so as only to admit a large-sized catheter, and its mucous membrane was destroyed by ulceration; the ulcer extended into the stomach; its

edges were raised, and in some parts were vascular. The muscular coat could be traced nearly to the pylorus, somewhat thickened, but in a healthy condition; it then became involved in the cancerous infiltration, and was of a whitish colour; at the pylorus both muscular and mucous coats were destroyed, and semi-cartilaginous tissue only remained for about three quarters of an inch. The mucous membrane and the infiltrated tissue presented well-marked cancer-cells, with very large nuclei, and aggregated cells, as in epithelial cancer; the dense tissue beneath was gland-tissue, infiltrated with scirrhous product. The duodenum contained bilious matter and a considerable number of white grains, which were at first supposed to be Brunner's glands, but they were found to consist of solitary glands. The pancreas and the remaining portion of the intestine were healthy; there were some infiltrated glands at the commencement of the rectum, but the mucous membrane was sound.

The symptoms in this case were well marked, and it was evident that there was obstructive disease at the pylorus. The examination of the growth at that part showed great resemblance to epithelial cancer; the glands, however, in the neighbourhood of the pancreas, which were infiltrated, and the cancerous tubera found in the liver and on the peritoneum, presented the character of ordinary scirrhus.

It was an interesting fact to find at the rectum, a frequent seat of cancer, the glands infiltrated; but the lumbar and mesenteric glands were free from disease.

Case LXVII.—*Medullary Cancer of the Stomach, having a villous character.*—Thomas G—, æt. 62, had been a shepherd at Shoreham, and eight months before admission experienced flatulence, loss of appetite, and dyspepsia. For six weeks he had been very ill, and he had suffered occasionally from vomiting. He had no pain or uneasiness at the stomach; but he was emaciated, and there was a tumour, about the size of an orange, situated just above the umbilicus, but separable from the liver, and slightly movable on respiration. Slight œdema of the ancles came on before death, which took place six weeks after admission.

On *inspection* the thoracic viscera were healthy. On opening the abdomen a tumour, about the size of an orange, was found to be situated at the pyloric end of the stomach; the gall-bladder above was adherent to it, accounting for the movements of the tumour with the liver; and below, the transverse colon and omentum were inseparably united with it. The pylorus appeared embraced by the growth extending from above and below, and on opening the stomach the whole of its circumference was found affected. The intestines were collapsed; the liver was healthy, but its peritoneal coat was thickened at its lower margin. The gall-bladder was empty; the pancreas was not at all

affected, though in close contact with the tumour; the kidneys were small, atrophied, and contained cysts. There were several gastric glands in the neighbourhood of the lesser omentum, which were infiltrated with cancer, but the lumbar and bronchial glands were not affected. On opening the stomach it presented a large medullary growth, extending about two inches from the pylorus into the stomach, involving the whole of the valve, and forming a projecting, soft, tubercular ring, vascular, and extending into the duodenum. The pylorus itself would admit the tip of the little finger. This growth was soft, of a yellowish-white colour, and about one inch in thickness. At the margin the muscular coat could be traced into it, forming a semi-transparent layer, about a quarter of an inch in thickness, but evidently infiltrated with cancer; at the edge of the cancer the muscular coat suddenly became of its usual thickness, showing that there had not been great obstruction, so as to lead to much hypertrophy of that layer. Near to the lesser curvature was another growth, projecting from the mucous membrane, soft, irregular on its surface, and covering about a square inch in extent; it was about half an inch in thickness, and at its edges presented small, soft, tubercular growths, projecting from the membrane. The mucous coat, involved in carcinomatous disease, could be dissected away from the muscular, till near the centre of the growth, where all the tissues were firmly united together, and large vessels could be seen passing into the cancerous mass. Near this part, vessels full of blood extended to its circumference, giving it, in some parts, a red and vascular appearance.

Microscopic examination showed that the mass consisted of cells and nuclei, varying in size; some cells were about the size of healthy epithelium. The nuclei were large, very distinct, and some had double nucleoli. On taking a portion of the surface of the tumour, and floating it in water, numerous rod-like processes were observed, extending for a considerable distance from it, having the character of villi; and they gave to the margin of the growth a flocculent appearance. These villi were found to contain numerous nuclei.

At the margin of the growth the gastric follicles were much degenerated, and they were in some parts distended, but without cells; in other parts, only the termination of the follicles could be seen; again, some of the follicles had an irregular outline, and presented crystals on the surface of the membrane. Around the former portion of atrophied follicles there was fibrous tissue, arranged in meshes, and with acetic acid the fibres appeared minutely granular.

The whole appearance of this structure was that of medullary cancer; it was composed principally of nuclei, and had affected the pyloric extremity, leading to symptoms of obstruction. There was some infiltration of the adjoining glands; but the remaining viscera were healthy. The growth appeared to have commenced in the mucous membrane. It was on the examination of the surface, however, that the resemblance to villous cancer was manifested; the surface had a flocculent appearance, and microscopical examination showed that this arose from villous processes extending from the surface.

This case appeared to stand in an intermediate position between medullary and villous cancer; and it confirms the opinion expressed by Sir James Paget, that the latter may be merely a variety of the more common form.

As to the symptoms, several months of dyspepsia were passed; the health then rapidly failed, and prostration of strength, emaciation, and occasional vomiting, were the principal indications of disease. It was remarkable to observe the absence of pain or even uneasiness of the stomach.

Case LXVIII.—*Cancerous Disease of the Stomach. Exhaustion. Epileptic Fit. Coma. Serous Sub-arachnoid Effusion. Some thickening of the Arachnoid.*—William G—, aged 64, was admitted into Guy's Hospital, under my care, November 23rd, 1870. He was a married man, a mason, his habits of life had been temperate, and he had never contracted syphilis. Five years previously he had been in the hospital for rheumatism, but had otherwise enjoyed good health. About the commencement of October he began to suffer from aching pain in the chest and pains in the limbs. He then lost his appetite, and the sight of food produced nausea; although he had been troubled with retching, he had never vomited. The symptoms became more severe, till the period of admission. He was pale and emaciated, his mind not very active; his complaint was of constant burning pain at the pit of the stomach, and he suffered from great thirst and from nausea. No tumour could be felt at the region of the stomach; there was some tenderness, and the recti muscles were rigid. The thoracic viscera were normal, but the heart was feeble; pulse 72; temperature 99°. The bowels were regular; the urine normal. There was no enlargement of the liver, but he complained of pain when percussion was made. The spleen was normal. He was ordered the sedative mixture of bismuth (Guy's), and for diet, arrowroot, beef tea, &c., with brandy ℥ij. The pain in the stomach was soon relieved, and he had inclination for food. December 7th.—The recti muscles of the abdomen still remained stiff and hard, but

there was increased pulsation at the scrobiculus cordis. He was allowed mutton chops, at first pounded, and afterwards, at his request, solid. 21st.—The countenance had a wasted, haggard expression; he was able to retain the solid meat diet; the abdomen was less contracted and a small round growth could be felt just beneath the cartilage of the seventh rib, near the cardiac end of the stomach. It could be moved, and on pressure communicated pulsation. Castor oil was given, and Dr. Moxon afterwards gave croton oil to unload the bowels, but the swelling remained the same. The moral and intellectual perceptions of the patient were found to be blunted; he walked out of the ward at night, and supposed that he had been walking for an hour or two; afterwards tried to get into the next patient's bed; placed his mutton chops under the bed, as he said, to feed the mice. The liquor bismuthi, with citrate of ammonia and iodide of potassium, were ordered. On the 21st January his mind became more clear; he complained of pain in the abdomen, and said that he was very hungry. The abdomen became fuller, more tense, and fluctuation could be felt. The growth in the neighbourhood of the stomach became obscured by the effusion.

In February I again took charge of the ward; the patient was then in a conscious state, and complained of pain in the abdomen, especially in the gastric region; there was diarrhœa, which was checked by logwood mixture. His sense of hearing became blunted, and he had a humming noise in both ears. 25th.—The abdomen was more full and tense; there was a slight fit in the morning, the patient lost consciousness for a short time, and on recovering retched a good deal. There was pain over the whole abdomen. The left side of the face was slightly paralysed; grasp of the hand feeble; the patient seemed very drowsy. On March 3rd he got out of bed in the night and fell down in the ward. He complained afterwards of severe pain over the lower ribs on the right side. No broken rib could be detected, but a flannel bandage was placed around the chest. On March 6th he had rigors; he scarcely understood anything that was said to him. On the 10th the urine was found to be albuminous; the pulse was 96, and very feeble; he remained in a state of stupor, from which he could sometimes be partially roused, but he almost at once relapsed into a semi-comatose state. He frequently muttered incoherently. Milk with egg and brandy were given. He swallowed food well, and there was no vomiting. He died at half-past seven in the morning of the 20th.

An inspection was made in the afternoon of the same day. The *brain* was small and soft, there was serous effusion between the convolutions, and the fluid in the lateral ventricles was in excess. There was some thickening of the membranes on the surface. The left pleura was adherent. The lung was œdematous, and a patch of recent pneumonia was found. Numerous hard, fibrous nodules were observed on the surface of the pleura, especially at the upper part. The œsophagus was ulcerated. At the cardiac end of the stomach there was a large mass of encephaloid cancer, two inches in depth, very soft, and partially ulcerated. The peritoneum contained six pints of greenish serum, and there were small

lymph-granulations. The spleen was soft; the kidneys were healthy; there was no deposit in the liver.

The termination of this case was peculiar; as the exhaustion increased an epileptiform attack came on, probably from the atrophy of the brain, with some arachnoid irritation, the faculties became blunted, and the patient slowly sank; at this time the gastric symptoms were necessarily obscured, and if the patient had been seen for the first time after the occurrence of the cerebral symptoms, the nature of the malady might have been quite overlooked. The presence of albumen in considerable quantity led us to suppose that the kidneys were diseased, and had some connection with the epileptiform attack and subsequent persistent drowsiness; the post-mortem examination showed that the albuminous urine was an effect of the fit rather than its cause, for the kidneys were pronounced to be healthy. It is unusual to find such extensive disease at the cardia without vomiting or, at least, regurgitation of food; but the patient only experienced dry retching. The food having passed into the stomach no further impediment was met with, as the pylorus was free. On admission the growth could not be felt, partly from the rigidity of the parietes, and in part from its small size, but as the muscles became relaxed and the growth increased in size, a hard pulsating nodule could be felt; the pulsation was communicated by contact with the aorta beneath; after a few weeks the tumour was again lost to the touch by the serous effusion into the peritoneum. The treatment throughout was purely palliative. The movable character of the tumour when first discovered whilst Dr. Moxon had charge of the ward, led to the free use of purgative medicine to remove any possible source of fallacy in the local retention of a fæcal mass in the larger bowel; the true character of the disease, however, being fully recognised.

Case LXIX.—*Villous Cancer of the Stomach. Perforation. Extension into the Left Lobe of the Liver. Secondary opening into the Duodenum. Death from sudden Hæmorrhage into the Stomach.*—Elizabeth C—, æt. 56, admitted into Clinical ward, October 12th, 1870. She had resided near Plumstead, had worked hard, and had suffered privation. She dated her illness thirteen months back, when on lifting a large tub of water she "felt something snap in her left side, which gave her great pain, and made her feel very faint." For a week she was unable to do

any work on account of the severity of the pain; hot fomentations afforded partial relief. About a week after the accident she vomited about "half a washhand basinful" of dark fluid like coffee grounds mixed with clots of blood, and she continued to vomit similar dark fluid every fortnight till the time of admission. She experienced pain in the side even when lying quiet, but it was rendered much more severe when she moved about or coughed. The appetite was bad, and directly after she took any food great pain in the region of the stomach came on, and in about half an hour it was rejected with black fluid. She lost flesh, and became much paler. The bowels had been regular, the motions sometimes quite black, at other times of a clay colour. She was a thin and cachectic woman, with an anxious expression of countenance. She complained of great pain in the left hypochondriac region, extending to the epigastric and right hypochondriac spaces; the pain was increased by pressure, and was greatest three inches below the left nipple and four inches from the median line. There was dulness at the ensiform cartilage. Pain was described as of a stabbing character, and as commencing on the left side and extending to the right. She had a slight cough, but respiration was normal. There was no bruit with the heart. The urine was free from both albumen and sugar.

On inquiry it was found that for several months before the hæmorrhage from the stomach took place she had suffered from pain, which was relieved by brandy or gin, but that she had been a temperate woman.

Leeches were applied to the stomach, and conium and blue pill and the sedative solution of bismuth were ordered. She had spare diet. On the 24th meat diet was allowed, the pain having subsided, but it produced at once a return of suffering. The cough was rather troublesome. On November 1st she again had vomiting, and opium was given at night. On the 7th diarrhœa came on, but was checked by logwood and opium, &c., and she continued to lose flesh. On the 1st December I took charge of the ward. She was then emaciated and cachectic; there was defined hardness and tenderness at the scrobiculus cordis, as if the left lobe of the liver was implicated. Opium three times a day gave considerable relief for a time, but she had repeated attacks of diarrhœa and pain across the abdomen, and she steadily lost strength. Bismuth, krameria, &c., afforded partial relief, but she became very desponding. For some days the pain would cease altogether. On the 20th January she was free from pain, the pulse compressible, the abdomen contracted, but during the night vomiting and diarrhœa supervened, and she gradually sank.

Inspection was made on the following day. The chest was healthy; the heart wasted. *Abdomen.*—The peritoneum was healthy, but there were firm old adhesions between the stomach and the left lobe of the liver (the part felt during life), but the parietes were free; the stomach was half filled with blood clot and serum; the intestines were also filled with blood. On opening the stomach a large villous cancerous growth, five to six inches in length, was found at the lesser curvature on the

posterior aspect of the stomach. It had a villous flocculent appearance, its edges were raised, and an inch in thickness. Some of the villi floated loose in the clot; it was of a pale yellow colour, softened, and in the centre was a slough; at the central sloughing portion the walls of the stomach had become perforated and the sac of the lesser omentum opened; a secondary and also sloughy opening had been formed into the duodenum immediately beyond the pylorus. The valve itself was unaffected. The opposed surface of the liver from the cavity behind the stomach had become affected by direct continuity, and the disease had destroyed a considerable portion of the left lobe of the liver; about half an inch in thickness of liver-structure only remained. The centre of this liver disease was sloughing; it was bounded by sprouting, soft, cancerous growth, which extended into the gland, and was itself surrounded by a more dense whitish zone of firmer tissue. The rest of the liver was fatty and congested; the ducts were free. There was no secondary affection of the glands. The spleen was normal. "When floated in water the villosities were very long and beautiful, and were full of large vessels injected with blood; the ramifications of these could easily be seen by the naked eye; they were soft and easily detached."

Under the microscope the growth was found to consist of an immense aggregate of cancer cells and nuclei, with very little fibroid or elongated cell-development.

This case was one possessing many points of great interest. The onset was peculiar; a short period of dyspepsia was followed by sudden hæmorrhage from the stomach. It is probable that a growth had already formed in the stomach, and that the sudden strain upon the vessels during the muscular effort led to rupture of their coats and effusion of blood; hæmorrhage may also have occurred into the submucous cellular tissue.

After a short time perforation took place, but it was at the posterior part of the stomach, and extravasation was localized by adhesions. It is, however, possible that the perforation occurred at the period when great muscular exertion was made, and this rupture was the cause of the severe pain. The local mischief extended to the liver; the cancerous disease had involved the gland, and the sloughing arose from the loss of vitality in the new deposit rather than from destruction of the liver structure itself. This was shown by the margin of cancer growth in the liver. As disease advanced the opening into the stomach not being perfectly free, burrowing took place behind the pylorus, in the direction

of the duodenum, and an opening had formed, as before described, into the first part of that portion of small intestine. The perforation of some fresh vessels and the consequent hæmorrhage were the immediate causes of death.

This instance furnishes another example of the insidious commencement of cancerous disease of the stomach, but the whole course was obscure, and the more so, as vomiting was greatly lessened by the removal of all obstruction at the pyloric valve by the secondary opening just described. Distension of the stomach from gaseous evolution tends greatly to increase the severity of the vomiting in organic disease at the pylorus. In this instance a free discharge of gas could take place into the duodenum by means of the secondary opening beyond the pylorus. The comparative freedom from pain was also remarkable; in fact, the patient was so destitute of pain that one of my clinical clerks suggested whether there was not a great deal of hysterical exaggeration in her state.

Case LXX.—*Villous Growth of the Stomach. Cirrhosis. Ascites.*—Isabella D—, æt. 65, was a married woman, who had been accustomed to take spirits, but she stated that she had been in good health till six months previously, when she caught cold, which was succeeded by cough, by shortness of breath, and by burning pain at the scrobiculus cordis. Seven weeks before admission, her legs, and afterwards the abdomen, began to swell; diarrhœa, great prostration, and syncope came on, and before death she became partially comatose.

On inspection there were adhesions between the liver, colon, and stomach, and the peritoneum contained about a gallon of serum. The liver was in a state of advanced cirrhosis. The stomach was moderate in size, flaccid, and on the inner aspect of its anterior wall presented a large villous growth, about three inches in diameter, the edges of which were raised, and the centre ulcerated. On floating in water, it presented beautiful villous processes; these, under the microscope, were found to consist of long, delicate growths, some terminating in points, and filled with granules. The base of the growth presented nuclei. There was no hypertrophy of the pylorus, nor of any portion of the muscular coat. The other portions of the mucous membrane presented gastric follicles, containing fat and nuclei. The kidneys were atrophied.

In this case, with the exception of burning at the stomach two months before death, which is a not an unfrequent symptom of dyspepsia, there was no sign observed of disease of the

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stomach. This is partly explained by the disease affecting the anterior surface of the organ, leaving the pylorus perfectly free. This absence of obstruction was further shown by the atrophic rather than hypertrophic condition of the muscular coat. The advanced disease of the liver, producing dropsy, appeared sufficient to explain all the symptoms, and the distension of the stomach entirely prevented any tumour being felt at that region. The appearance of the growth, under the microscope, gave less positive proof of a cancerous origin than in the preceding case; some granules at the base of the villi, but none of the ordinary cancer-cells or nuclei, were present.

Case LXXI.—*Colloid Cancer of the Stomach and of the Colon.*—Elizabeth T—, æt. 37, hadbeen a servant, and had been out of health for four months, but twelve months previous to admission she had had jaundice. She was somewhat emaciated, and had a sallow, aged, and very haggard expression of countenance. She complained much of flatulent distension of the abdomen, with a sensation of sinking at the scrobiculus cordis; after eating she suffered much pain at the stomach, but the pain was most severe after taking fluids. There was occasional vomiting, or rather regurgitation of thin, glairy, and gelatinous fluid; this fluid came up into the throat, especially at night. The bowels were constipated, and she was troubled with hæmorrhoids. The abdomen was moderately distended, but no tumour could be felt on manipulation. The pulse was feeble. She was in a semi-jaundiced and drowsy condition, complained of a sense of fulness in the head, and of muscæ volitantes; she became more and more exhausted, and gradually sank in about a month.

Inspection.—The body was not extremely emaciated. The intestines were much distended with flatus, and the peritoneal sac contained several pints of fluid. The stomach was very much contracted, and its walls were three fourths of an inch in thickness. The outer or muscular layer was a quarter of an inch in thickness, semi-tranparent, and it was divided by white bands which were continuous with the submucous tissue. The mucous membrane had a pulpy, honeycomb appearance, and it was replaced by minute colloid cysts, containing clear, gelatinous fluid; these cysts were most distinctly observed on the internal surface of the stomach; there were also some ulceration and congestion of the vessels. The pylorus was not thicker than the rest of the stomach; but the hypertrophy of the muscular coat extended the whole length of the œsophagus. Some of the glands of the curvature of the stomach were hard and thickened. The fluid from the colloid cysts contained large cells filled with several nuclei, and were surrounded by very delicate stroma. The vessels of the stomach were rendered quite patulous by the tissue placed around them. The small intestines were

free, but the large intestine was much thickened; immediately above the cæcum there was a portion of colon affected with colloid growth, and from the hypertrophy of the muscular coat it had the appearance of a pyloric valve; the submucous coat also was much thickened. Some of the solitary glands in the colon were enlarged. The liver, kidneys, and spleen were healthy; so also the thoracic viscera. The heart was contracted.

In this case the symptoms at first were not at all more severe than those often observed in pyrosis, with flatulent distension of the abdomen; nor was the serious nature of the disease for some time anticipated.

The stomach is preserved in the Museum, No. 1813[29], and shows in a very beautiful manner the structure of colloid cancer. The hypertrophy of the muscular coat was remarkably extensive, reaching into and passing along the whole length of the œsophagus. The small intestine was free; but the mucous membrane of the colon was affected with similar disease to that of the stomach. Of this there was no evidence during life, although the constipation of the bowels was, perhaps, rather more obstinate than in cases of ordinary cancer of the stomach, but not more than is observed in many cases of dyspepsia. The most marked symptom was the regurgitation, and the filling of the mouth during sleep with watery, gelatinous fluid; this, unfortunately, was not examined microscopically during life; it might have afforded clear evidence of the nature of the disease. The semi-jaundiced condition arose from slight pressure by diseased glands on the common bile-duct, and the colloid growth gradually extended through the whole of the mucous membrane of the stomach by continuity of structure.

Case LXXII.—*Colloid Cancer of the Stomach, the Omentum, the Peritoneum, and of the Rectum.*—John C—, æt. 47, was a pensioner, and one month before his admission began to experience pain at the scrobiculus cordis. Vomiting came on, with costiveness and gradual emaciation. A tumour could be felt extending across the abdomen, and it was doubtful whether this was the margin of the liver, or a tumour involving the pylorus, or merely thickened omentum.

The parietes of the abdomen were very thin. The peritoneal cavity contained several gallons of fluid, of very deep colour, almost sanguineous; the serum presented shreds of lymph, and other delicate bands of lymph passed between the coils of the intestine. The omentum was found to be contracted into a thick, yellowish mass, about half an

inch in breadth, which projected towards the abdominal parietes. The margin was irregularly notched, and situated immediately above the transverse colon. The surface of the liver was roughened by small gelatinous tubercles, and a thick layer covered the whole opposed surface of the diaphragm, which at this part was much thickened, and the pleural surface was also encroached upon. The lesser omentum was also much thickened, and a white, hard mass, about the size of a hen's egg, was situated at the lesser curvature of the stomach, near the pylorus. The small intestines were contracted, the large were distended; the peritoneal surface was everywhere studded with small tubercles, from the size of a millet-seed to that of a bean; these were soft, gelatinous, and of a red colour. The sac of the lesser omentum contained tubercles similar to those in the general cavity of the peritoneum, and it was distended with fluid. The cavity of the stomach was small, its parietes were thickened, and at the lesser curvature from the œsophagus to the pylorus the mucous membrane was irregularly raised, and presented an appearance of cells distended with clear, gelatinous fluid. The larger curvature was healthy; the liver was small, and of a deep bilious colour; the hepatic cells contained very little fat. The pancreas and the small and large intestines were healthy, but at the commencement of the rectum was a small nodule of cancerous growth; this had led to thickening of the mucous and muscular coat, and the intestine at that part would scarcely admit the index finger. Preparation No. 1813[30].

The microscopical examination showed the well-marked characters of colloid cancer. The growths on the peritoneum consisted of large, poly-nucleated cells, with delicate intervening stroma. In the omentum there was a greater quantity of fibrous tissue between the cells; and some of the cells contained four or five large nuclei, which were rendered very distinct by acetic acid. The mucous membrane of the stomach presented similar structural elements. The affection of the rectum in this case was an interesting association of disease.

Case LXXIII.—*Chronic Ulceration of the Stomach. Cancer.*—James T—, æt. 46, a weaver, who had been living at Spitalfields, was a regular and sober man, but he had been a great smoker. His father and mother both died of phthisis; for thirty-four years he had been employed at the loom, and he had suffered much from the shuttle striking the scrobiculus cordis; these blows at first produced nausea and faintness, which continued for several hours. Five years before admission the same unpleasant symptoms returned, obliging him to discontinue his work; they were accompanied with vomiting, although at first only his breakfast was rejected; these symptoms continued for four years, and then left him for three months,

during which time he rapidly gained flesh, and continued his employment.

Six months prior to his appearance at Guy's he was again attacked with pain and vomiting, and he began to lose flesh; he suffered great pain if he fasted, but on taking food the pain very soon returned, and it was only relieved by vomiting; the vomiting sometimes came on immediately after a meal, or it was delayed for about six hours; he had never vomited blood; the bowels were constipated, and the urine scanty.

He was a small man, of light complexion, and had a diabetic appearance. The chest was healthy; the tongue was moist and clean; the abdomen soft, flattened, and contracted; the integuments dry. Fluid magnesia ℥ss, and dilute hydrocyanic acid ♏iij, were ordered three times a day; and a soap enema.

The vomiting continued very severe, and he became increasingly prostrate; hiccough came on, coffee-ground vomiting, and he gradually sank.

On inspection, the body was extremely emaciated; the lungs were collapsed; much black pigment was found upon them, but they were otherwise healthy. The heart was healthy. *Abdomen.*—The intestines were collapsed. At the duodenum there was much contraction from puckering of the omentum and stomach. *Stomach.*—The walls were exceedingly thin and atrophied; about two inches from the pylorus was a contraction, which at first was mistaken for the pylorus; there was considerable contraction also of the omentum at that part, and firm semi-cartilaginous hardness of the structure. On opening the stomach, an oval ulcer, about two and a half inches in length, and one in breadth, was observed surrounding the constriction; its edges were rounded and elevated; its base quite smooth. On section, the mucous membrane appeared to be continuous with the upper layer of the ulcer; its deeper layers were very firm, white, and fibrous. Beyond the ulcer and its contraction was a portion of healthy mucous membrane, then the pylorus, which was also perfectly healthy. The first part of the duodenum was congested, and there was pigment in the mucous membrane. In the omentum were several hard tumours, and the omentum itself formed a firm, contracted mass, about the size of the middle finger. On section these structures were firm, and contained whitish juice, and under the microscope showed large cells containing large, very distinct nuclei, evidently cancerous. In the stomach no follicles could be detected on the smooth surface of the ulcer; and in the structures beneath, none of the cancerous cells found in the omentum and glands were present, but abundant fibrous tissue; there was also much fibrous tissue in the omentum, &c. The rest of the intestine was healthy; the colon was contracted, and contained some scybala. The liver was healthy; the spleen was enlarged and firm; the kidneys also were healthy.

The history and appearances after death in this case war-

ranted the belief that ulceration of the stomach had existed for a considerable time; and although we found evidence of cancerous tubercles in the omentum, I think it probable that the development of cancerous growth only took place during the latter stage of the disease; the growth closely resembled chronic ulcer in its general and microscopical appearance, except that it nearly surrounded the pyloric extremity. In some instances, cancerous deposit takes place at the edges of a chronic ulcer; such, however, was not the case here. This case corresponds with those previously referred to, in which a cancerous action took place in the glands and structures adjoining the chronic irritation.

Case LXXIV.—*Cancer of the Stomach. Communication with the Colon. Ulceration of the Cæcum and Ileum. Chronic Phthisis.*—John T—, æt. 67, was admitted August 15th, 1855; he was a married man, who had resided at Greenwich. He had been out of health for twelve months, complaining of dyspepsia, and pain at the scrobiculus cordis; the food appeared to remain at the end of the œsophagus, and not to reach the stomach. There had been no vomiting either before or after admission, but a hard defined growth could be felt at the scrobiculus cordis, which left no doubt as to the nature of the complaint; the abdomen was collapsed. On September 15th he was greatly emaciated and able to take but very little food; his mind wandered much; the feet and hands were œdematous; and numerous spots of purpura were found on the hands and forearms. He gradually sank.

Inspection.—The body was much emaciated. *Chest.*—Very strong pleuritic adhesions were found, especially at the right apex; the right lung was puckered, exceedingly dense, and on section presented iron-grey consolidation, occupying nearly the whole upper lobe; in the centre it was firm and calcareous; the lower portion of the upper lobe contained numerous miliary tubercles, some surrounded by dense, others with crepitant lung; in the lower lobe were scattered isolated miliary tubercles, semi-transparent in colour. On the surface of the lobe were several lobules, which were broken down in the centre into thin pus, and surrounded by a tolerably defined margin; the extreme edge of the lung was emphysematous; the left lung was in a similar condition, but the bronchial glands were healthy. The tubercles in the lungs consisted of molecular matter, of small irregular cells and nuclei; some of the cells were the size of the ordinary ones in the pulmonary structure, but none were like those in the stomach.

The abdomen was collapsed; the stomach was firmly adherent to the transverse colon. On opening the former, along the lesser curvature, a large growth, nearly four inches in circumference, was found at the pyloric extremity, involving the whole of the pylorus, and surrounding the stomach at that part; the edge was thick, rounded, and raised an

inch above the surrounding mucous membrane, so that the growth formed a sort of cup; the margin was of a deep purplish hue; the centre presented an irregular ragged slough of a brown colour; it was deeply excavated, and had a feculent odour. At the pylorus the muscular coat was about four lines in thickness, of a whitish colour, with small intersecting semi-transparent bands. Nearer to the cardiac extremity were two small raised growths, one about half an inch in diameter, red and prominent; the other about a quarter of an inch in diameter. The rest of the mucous membrane was pale. The stomach near the pylorus was firmly adherent to the transverse colon, and from the centre of the slough a probe could be passed into the colon; the opening in the colon was valvular, grey, and about a line in diameter. The pancreas and omentum were healthy; several mesenteric glands in the neighbourhood were infiltrated with soft cancerous product. The duodenum was grey, but its mucous membrane healthy; at the ilio-cæcal valve were the remains of an ulcer occupying nearly the whole of the last Peyer's gland, and extending to the cæcum; its margin was raised, and presented several congested nodules. Externally the cellular coat was firm, hard, and contracted. The remaining part of the intestines was healthy.

On examining the surface with the microscope, the growth presented on the surface columnar epithelium, and consisted of nucleated cells, with very large and distinct single or double nuclei, and of delicate intervening fibrous tissue; there was no doubt of their cancerous character. The adjoining mucous membrane presented numerous fat particles in the follicles; the glands contained similar cancerous nuclei. The ulcer in the ileum and cæcum appeared partially cicatrized; it did not present any cancerous product, but only fibrous tissue. At the pylorus, bands of involuntary muscular fibre were found to extend between the cancerous elements.

As far as could be decided by microscopical examination, the disease in the lung was of a non-cancerous character; it appeared to consist in a chronic and almost quiescent state of phthisis; but besides this chronic disease, there was evidence of acute lobular pneumonia, which had probably come on a short time before death. The condition of the ileum was that of a healing ulcer. It was difficult to obtain a full history from the patient, and the evident cancer of the stomach obscured the signs of pulmonary disease. The existence of a communication with the colon was not known during life.

Case LXXV.—*Struma. Cancer of the Stomach.*—Hannah W—, æt. 33, was admitted October, 1857. She was a thin, emaciated young woman, pale, with a dejected and somewhat melancholic expression; she had always been delicate, and had been subject for a long time to

vomiting. For twelve months she had suffered constantly from this symptom, which generally came on in the evening; menstruation had also ceased during that period; but there was no evidence of disease of the ovary. January, 1858.—The abdomen was moderately rounded, and there was considerable tenderness at the scrobiculus cordis; and at the region of the greater curvature towards the pylorus, a large tumour or induration could be felt. At the angle of the jaw, on the left side, there was enlargement of the glands of the neck; no disease could be detected in the chest, but the respiration was very coarse at the apices. The heart was normal. Various remedies had been tried to relieve the irritability of the stomach, and magnesia mixture, creasote, calomel, &c., had been given. Steel pill and some lemon-juice were occasionally taken, but afforded only slight and temporary relief. Bismuth, and afterwards the injection of nutrient enemata, were then tried, but without relief; solid food produced excessive pain, and fluids had the same effect, although in less degree. February 1st.—She was unable to bear the injections, and complained much of pain. The tumour was more distinct, oblong, hard, and tender; the pulse compressible, the face flushed. One drachm of fluid pepsine with mucilage was tried, with a small quantity of chop, and milk diet night and morning. 4th.—She was rather more comfortable. 6th.—She complained of nausea after the medicine. Opium, 1 grain, was given every night. April 8th.—Continued in the same anæmic condition, but the emaciation became greater; the abdomen was collapsed; the tumour in the lower part of the epigastric region was distinct, but not enlarged; and there was greater prostration. The pain and vomiting remained as before. She gradually sank, and died July 9th, 1858.

Inspection nine hours after death.—There was consolidation of the lower lobe of the left lung. The bronchial glands were enlarged and filled with firm and cheesy deposit. The glands on the left side of the neck were enlarged from strumous deposit. The heart and pericardium were healthy. The peritoneum was healthy. The *stomach* was reduced in size; the walls were infiltrated with cancer, extending from the pylorus to the œsophagus, along the lesser curvature, and, in some parts, were three quarters of an inch in thickness, whitish, firm, and consisting of cancerous cellular deposit. The muscular coat was much hypertrophied. The lesser curvature was adherent to the pancreas, and the neighbouring glands were infiltrated. The mesenteric glands contained white softened deposit. The liver presented vascular nodules of cancerous deposit, their central parts being depressed; some nodules were firmer, and white in colour. The right ovary was enlarged.

In this case the association of strumous disease of the glands of the neck and of the chest, with cancerous disease of the stomach, was unusual. The patient was younger than those usually affected with cancer, and the duration of the disease, which lasted two years, was greater than in ordinary

cases. The pain was severe throughout the disease, and this suffering was, perhaps, due to the infiltration of the glands about the ganglia, or to the implication of branches of the pneumogastric nerve in the diseased walls of the stomach.

Case LXXVI.—*Cancer of the Stomach. Disease of the Supra-renal Capsule.*—John S—, æt. 43, a sailor, was admitted into Guy's Hospital, under Dr. Barlow's care, December 21st, 1859. Six years before he had had dysentery in the Black Sea. In November, 1859, he was taken ill somewhat suddenly at Malta, he fell down on deck, and suffered from severe pain at the scrobiculus cordis. He remained in hospital at Malta for a month; vomiting then came on, and afterwards continued; but he had occasional intervals of cessation of several days' duration. On admission he was emaciated, and had a haggard, distressed appearance; he had severe pain across the abdomen. In January, 1860, severe vomiting returned, generally after every meal, or at night; the bowels were much constipated; he was prostrate, and on placing the hand on the abdomen a hard growth could be felt in the region of the pylorus and gall-bladder. The forehead was discoloured, as in Melasma Addisonii. He slowly sank, and died February, 1860. There was an inspection on the 20th, and a cancerous ulcer, about three inches in diameter, was found at the pylorus; its edges were slightly raised, and its surface sloughy; near to the liver was some infiltration of medullary matter. The supra-renal capsules were enlarged and infiltrated. No other part was diseased.

The symptoms in this case were marked, but the sudden onset of the disease, causing him to fall whilst walking and carrying a tray on deck, was unusual, and might have led to an incorrect diagnosis. The patient rapidly became very prostate, and it is probable that the affection of the supra-renal capsules tended to increase the exhaustion, and hastened the fatal termination.

Case LXXVII.—*Cancer at the Pylorus, simulating Disease of the Œsophagus. Communication with the Colon.*—James E—, æt. 61, was under my care in Guy's Hospital in 1859. He was a hawker, who had resided at Kensington; his habits of life had been intemperate. He had been in St. George's Hospital with fractured ribs; hæmoptysis followed, and from 1852 he had suffered from bronchitis. In 1857 he was in the Consumption Hospital for bronchitis; but at the same time he had dyspepsia, with occasional nausea. In October, 1858, he first noticed a small hard swelling in the left hypochondriac region; it was movable, and did not cause any pain. After that time he gradually emaciated, and had daily increase of pain at the affected part; and vomiting, previously occasional, became almost constant, although it sometimes ceased for several days. On admission, on March 19th, he

had a sallow, slightly jaundiced, appearance; he was of dark complexion; his skin was of normal temperature; the tongue was furred, and brown in the centre, but whitish at the edges. The chest presented the signs of old bronchitis; the heart-sounds were normal, but the pulse was feeble, 75. The abdomen was tense and resisting, and was resonant, excepting at the epigastric and left hypochondriac regions, where a defined tumour was present; the tumour was painful on pressure, and had slight pulsation, and on taking solids they were *instantly rejected*, as if there were obstruction at the extremity of the œsophagus; but fluids were retained for three or four hours, and were then rejected as a chyme-like mass. There was interscapular pain. The bowels were much confined; the urine was high coloured, of sp. gr. 1020, and free from albumen and sugar. On April 14th he vomited dark offensive matter, of almost fæcal odour. Local erysipelas of the forehead and right eyelid came on, and slight abscess followed. This, however, subsided; but he gradually sank, and died June 19th. The abdomen only could be examined. There was a tumour at the pylorus, about the size of a closed fist, firmly adherent to the anterior abdominal parietes and to the edge of the liver. On removing it from the parietes a small abscess was found to have been produced anteriorly from the extension of the cancer to the surface, and the consequent local peritoneal inflammation. On opening the stomach, the pyloric end was found to be occupied by a large cancerous growth, which extended about three inches into the stomach and surrounded the orifice, and it reached nearly to the œsophageal opening at the lesser curvature. The growth was sprouting and fungating; it had a green, sloughy appearance, and was situated in the mucous and submucous tissues. Posteriorly the muscular coat was hypertrophied, but anteriorly this coat was invaded by the cancerous disease, and there was adhesion to the anterior abdominal parietes. There was adhesion also with the colon, and a communication existed, through which a probe could be passed. The pancreatic glands were involved, but the other abdominal viscera were healthy. The growth was soft, vascular, and of an encephaloid character.

The vomiting, in this instance, during the early stage of the disease, took place so quickly after deglutition, that the disease was at first referred to the œsophagus, and, till nearly the close of life, the cardiac extremity rather than the pylorus was supposed to be the seat of organic mischief. The communication with the colon gave a fæcal odour to the ejected matters, and the extension of disease to the skin would, in a few days, if life had been prolonged, have led to the formation of an artificial anus.

Case LXXVIII.—*Cancer of the Pylorus. Hydatid Disease of the Cellular Tissue of the Bladder.*—W. A—, æt. 52, a clerk, who had resided at Woolwich, was admitted into Guy's Hospital under my care,

March 28th, 1860. He had enjoyed good health till eight months previously, when loss of appetite and vomiting after food came on; the rejection of food took place either at once or after long intervals. The bowels were constipated. Emaciation had gradually become extreme, and when brought to the hospital it was thought that he would scarcely reach the ward. He, however, rallied, and survived for three weeks. Vomiting did not recur till two days before death. There were no signs of disease of the chest. The abdomen was much contracted; an ill-defined tumour could be felt in the region of the pylorus; and there appeared to be no doubt that he suffered from chronic disease of the stomach. He had not suffered from hæmatemesis, neither did he complain of any pain at the stomach. The diagnosis of cancerous disease was confirmed at the inspection. In the hypogastric region was a tumour reaching as high as the umbilicus, precisely resembling in form a distended urinary bladder; it was dull on percussion, rounded in form, and fluctuation was distinct; it was also readily felt in the rectum. The patient stated that he never experienced any difficulty in passing water, nor had he any pain at the part. A catheter was passed without difficulty, and a few ounces of healthy urine were drawn off. On *inspection* the thoracic viscera were found to be in a healthy state; the peritoneum also was healthy. The stomach was slightly distended, and on drawing it aside, a marked constriction was observed at the pylorus; and several of the glands at the lesser omentum and near the pancreas were enlarged and infiltrated with cancerous product. A firm growth was found to exist at the pylorus, extending into the stomach for about one inch and a half, where it terminated by a rounded, raised, and vascular edge; the valve was quite surrounded by the growth, and the surface was partially ulcerated. The growth had a similar vascular and raised edge on the duodenal aspect, but was there less prominent. The little finger could be passed through the pylorus. The growth was of a yellowish-grey colour, moderately firm, containing succulent fluid; it was composed of cells with large nuclei, free nuclei, elongated cells, &c., and was evidently cancerous. The liver, kidneys, and spleen, were healthy, so also the intestine. The ureters were not distended, the right one was spread out on the cyst, which occupied the usual position of the bladder; whilst the bladder was itself flaccid and situated on the left side of the hypogastric tumour. The peritoneum was smooth and healthy. The mucous membrane of the bladder, the prostate and urethra, the vesiculæ seminales, and vasa deferentia, were all normal. To the right of the bladder, in the median line, and apparently developed in the loose cellular tissue of the bladder, was a large hydatid cyst, holding nearly three pints of small cysts, varying in size from a line to an inch in diameter, and full of clear fluid. At the base of the cyst was a firm, yellowish-grey substance, containing plates of cholesterine. The cysts beautifully showed their lineated structure, and numerous hooklets of the echinococcus were observed. The cyst had apparently commenced in the neighbourhood of the prostate.

The diagnosis of cancerous disease at the pylorus in this case was made out without difficulty; but there was much obscurity as to the character of the hypogastric cyst. There was no difficulty in micturition, and the patient was scarcely aware of the presence of the tumour. In some instances the ureters are compressed. This is shown in one of the instances recorded by Dr. Bright; the pelves of the kidneys became distended, and suppuration took place in them; in that case some of the hydatids were discharged with the urine. Occasionally the pressure is upon the urethra, when the cyst may still more easily be confounded with a distended urinary bladder. The vomiting in this case subsided to an unusual extent, ceasing for a fortnight.

The preceding cases indicate several important facts in relation to the symptoms and course of cancer of the stomach: —1st. That the symptoms may be exceedingly slight, and the disease easily overlooked. 2nd. That the indications are more marked when the orifices are affected. 3rd. That the cachexia, the pain, the vomiting, &c., vary in almost every case, being sometimes slight, or altogether absent; in other cases intensely severe. 4th. That the onset of the severer symptoms may be very sudden, but it is generally preceded by a period of dyspeptic symptoms. 5th. That the disease is not limited to persons in advanced life. 6th. That it is sometimes associated with struma. 7th. That the occurrence of cancer with chronic ulcer of the stomach tends to explain some cases in which the disease extends over many years. 8th. That cancerous disease generally terminates within a year after a tumour has formed. 9th. That the mode of termination is greatly modified by the extension of disease to adjoining structures. 10th. That in most cases death takes place from exhaustion or asthenia, and that fatal hæmorrhage and peritoneal perforation are more rare than in ulceration of the stomach. 11th. That the absorption of degenerating cancer-structure sometimes leads to symptoms resembling pyæmia. 12th. That some of the distressing symptoms may be alleviated, but that over-active treatment appears to hasten the fatal termination.

Although in several instances which we have recorded strumous disease was coincident with cancer, the former

appeared to be in a quiescent state, and the two morbid processes were not, therefore, in active operation together. Still there may be some unrevealed connection between these morbid states; for phthisical parents have children who die from cancer, and some who are apparently strumous in early life are affected at a later period with cancerous disease. We must hesitate, however, to consider as causative and connected, conditions which *may* merely have a coincident relationship.

Reference has been made to the presence of foreign bodies in the stomach, and perhaps one of the most remarkable specimens is that which is preserved in the Museum of Guy's taken from an English sailor, who had repeatedly swallowed clasp knives; after several years emaciation ensued and death took place. The stomach was found after death to contain several knives and parts of others, which had been partially dissolved.

Stones are sometimes swallowed and afterwards discharged by the rectum, and it is surprising how foreign bodies may thus harmlessly pass through the stomach and intestine without producing pain or any distressing symptom. Coins, nails, in one instance a drawing pin, passed without pain. Accumulations of hair and string have been found in the stomach, as in a case recorded in the fourth volume of the 'Clinical Society's Transactions.'

CHAPTER VI.

FUNCTIONAL DISEASES OF THE STOMACH.

The imperfect performance of the digestive process constitutes dyspepsia; but, this general term is the expression of an effect which arises from numerous causes, and it associates maladies which differ in their origin, in their course, and in their termination. Thus, at the commencement and throughout the course of organic disease of the stomach the food is imperfectly assimilated; but in the greater number of instances of gastric disease the dyspepsia is a transient symptom, and it entirely ceases after a longer or shorter period; and where other diseases are the immediate cause of death, we are often unable to find any structural change in the stomach, either in its secretions or component parts, although dyspepsia may have existed for some time; these cases, then, constitute what are ordinarily regarded as *functional* diseases of the organ, the conditions being either transient or of such a character as to be beyond our sphere of observation.

In the consideration of functional diseases of the stomach there are some points which are essential to bear in mind, in order that we may rightly understand the symptoms, and adopt means for their relief.

Its *anatomical relations*. The *diaphragm* is situated immediately above the stomach, and is connected to it at the œsophageal opening; its movements affect the stomach, and are concerned with the abdominal muscles in the act of vomiting. Contraction of the diaphragm favours the opening of the cardiac orifice of the œsophagus, and is also the cause of hiccough. The *liver* partly overlaps the stomach by its left lobe, and disease of the one part may be referred to the other. The relationship of the *transverse colon* is

equally important, for not only does its distension press upon the stomach and interfere with its functional activity, but the omentum, which is attached both to the stomach and the colon, may drag the former viscus considerably downwards. Again, the *aorta* is situated behind the stomach upon the spine, and its pulsations are easily transmitted, especially when there is any thickening or tumour in the viscera in front. The situation of the stomach corresponds with the scrobiculus cordis, or the depression marked out by the division of the ribs, and reaches downwards in an ordinary state of distension to midway between that part and the umbilicus. In great distension it may occupy the greater part of the abdominal cavity ; it reaches to the spleen in the left hypochondrium beneath the ribs, and on the right side terminates in the duodenum at the pyloric orifice, at a line corresponding to about one inch to two inches nearer to the median line than the end of the ninth rib. Flatulent distension of the stomach greatly alters the form of the abdomen, especially towards the left side and in the central portion.

We need not dwell upon the physiology of the stomach, further than to remark that the especial function of the stomach is the solution of nitrogenous food, and that saccharine and farinaceous food, as also oleaginous food, undergo changes and become absorbed independently of the action of the stomach itself. The conversion of cane sugar into grape sugar, and of farinaceous food into similar principles, produces substances which easily undergo fermentation, and we have to bear this circumstance in mind in our endeavours to relieve flatulent distension of the stomach and vomiting. The oleaginous food becomes emulsified by the action of the bile and pancreatic secretion, prior to its absorption by the villous processes in the small intestine. Absorption takes place in a very limited degree from the mucous membrane of the stomach, but we have numerous glands—gastric follicles—which secrete an acid digestive fluid. This fluid or gastric juice is strongly acid in its reaction from the presence of lactic and hydrochloric acids, and it contains an organic principle—pepsin—which causes the solution of the nitrogenous food in the diluted acid fluid. Pepsin is closely

allied to albumen and to fibrin. It is soluble in water, but insoluble in alcohol. The dissolved products pass on, in more or less complete solution, through the pylorus, to be still further acted upon by the biliary and pancreatic secretions, and thereby fitted for absorption by the minute villous processes of the small intestine.

Schmidt gives the analysis of the gastric juice as consisting of—

Water	954·13
Pepsin	·78
Sugar, albuminates, lactic acid, butyric acid, ammonia	38·43
Chloride of potassium	·70
Chloride of sodium	4·26
Potash	·17
Phosphate of lime	1·03
Phosphate of magnesia	·47
Phosphate of iron	·01

Dyspepsia or *Indigestion* is due to several causes, and it may be well to remark upon these before passing to the consideration of the different forms of the disease, Indigestion may be due to an improper kind of diet; the food may be unsuitable, it may be administered in such a manner, or at such periods, that it does not undergo normal changes, and fermentation instead of solution is the result; or the apparatus for digestion may, in one or other of its parts, be impaired, either :—1st. Its mucous membrane and its secretion may be disordered. 2nd. The vascular supply may be in an abnormal state. 3rd. The nervous system may be affected. 4th. The muscular layer may be so changed that the movements of the stomach are impeded. Several of these causes of dyspepsia may be combined; thus, a deficient secretion of the gastric juice may be due both to the state of the nervous system, and also to the state of the capillary vessels, whether they are in active or passive congestion; some of these functional diseases are very transient maladies, others pass into or are the commencement of irremediable disease.

It would lead us beyond our purpose were we to describe the whole system of dietary which is suitable in health and disease, neither is it necessary, in referring to each malady as it comes before us, we allude to the most suitable form of

diet in each case; but, we may remark upon the importance of considering the age of the patient, and the requirements of the system; at a very early period of life, although digestion is active, a solid meat diet is unsuitable and would produce serious results, for the blandest nourishment, such as milk, can only be borne; so also in advanced years, the full diet which is an advantage and necessary during the vigour of middle life, and when active exercise can be taken, becomes injurious to health when this activity has ceased. The period at which food is taken is scarcely of less importance; in early life it must be repeated every hour or every second or third hour; in middle life three, four, or five hours may elapse between each meal, whilst, again, in declining years the quantity partaken of is generally less; a smaller interval of time should intervene between the meals, and it is often necessary to relieve the weakness of the system by a supply of nourishment during the night.

In describing the forms of dyspepsia we may consider them as follows:

1. Those depending on an altered condition of the *mucous membrane and of the gastric juice.*

(*a*) Deficiency of gastric juice, atonic dyspepsia, as in the dyspepsia from weakness, whether from diseased vessels and impaired nutrition, from an exhausted state of the cerebro-spinal system of nerves, from exhaustion of the vaso-motor nerve.

(*b*) Excess of gastric-juice.

(*c*) Irregular secretion.

(*d*) Abnormal composition, as in pyrosis, gout, rheumatism, hepatic disease, albuminuria; in all these the nervous and vascular systems are also involved.

2. Dyspepsia from an altered *vascular supply*, active and passive congestion.

3. Dyspepsia from disturbance of the *nervous system*, whether the sympathetic or the cerebro-spinal system of nerves and especially of the pneumogastric.

Gastralagia.

Excessive irritability.

Anorexia.

Perverted appetite.

4. Dyspepsia from *impeded muscular* movements; and
5. From *fermentation* of the contents of the stomach.

1. Dyspepsia arising from deficiency of the gastric juice is often connected with general weakness and may be designated "atonic dyspepsia." Some of these forms of disease present marked and distinctive symptoms, and for convenience of description we may divide them (1) into those connected with diseased vessels and a general failure of power, as in advanced life; (2) exhaustion of the cerebro-spinal system of nerves; and (3) exhaustion of the sympathetic or vaso-motor nerve. In advanced life the glands are less active to secrete gastric juice; the vessels are less elastic, and in their degenerated state the circulation becomes feeble, and the mucous membrane receives a diminished supply of blood, the nerves are less sensitive to excite normal movements. In age the destruction of tissue takes place without proportionate repair of tissue, and emaciation is the result; but this emaciation may be so great and the circulation so enfeebled that the patient suffers from anæsthesia and disturbed sensation in varied parts. It may be merely numbness in the hands and feet, or pain, cramp, sensation as of "pins and needles." The special senses may be also disturbed, and both sight and hearing affected, or the brain may be unable to carry on its functions and syncope and vertigo may follow. Distressing symptoms may ensue upon the introduction of food into the stomach; the food remains undigested, it produces pain and a sense of weight, headache, flatulence, and sometimes the symptoms just referred to, vertigo, disturbed vision, and even syncope. These effects of indigestion are more severe if associated with another frequent trouble of advanced life, namely, an inactive state of the colon, for if the transverse colon be distended the gastric affection is rendered more severe. It is surprising how gradual is the failure of power of the stomach; and we frequently remark how greatly the functional activity is reduced without the loss of life. For months life may be sustained with only a very small supply of food, when there are no great demands upon the strength; in extreme age, a cup of milk or of arrowroot may be almost the only

sustaining food partaken of week after week. In the treatment of this condition we must bear in mind that we have to cope not so much with actual disease as to retard a degenerative process; the diet should be carefully regulated, it should be of a nourishing kind, and as large meals cannot be taken, a shorter interval between them should be allowed than in ordinary health; and if there be wakefulness at night or restlessness, some fluid nourishment should be taken, especially between two and four in the morning.

Alcoholic stimulants are often taken at this age with advantage, and other stimulants as ammonia combined with vegetable bitters; stimulating condiments may be useful, as mustard and the various peppers, &c. As to other tonics, nux vomica or its alkaloid strychnia, nitro-hydrochloric acid, and the milder preparations of steel, may be given. If the bowels are inactive, an aloetic dinner pill with nux vomica and soap, or with guaiacum is often very useful. Large meals should be avoided, so also the immoderate use of tobacco and of tea.

Another form of atonic dyspepsia is that connected with *exhaustion of the cerebro-spinal system of nerves;* here also there appears to be a deficiency of gastric juice, probably from an anæmic state of the mucous membrane, and it may be produced by sedentary occupation, want of exercise, mental distress, over-excitement, and anxiety. The nervous energy of, and the vascular supply to the digestive organs, appear to be inadequate to their requirements, and digestion becomes oftentimes a painful process, from which the patient shrinks. This state is marked by pallor, and by an anxious expression of the countenance; the appetite is lost, or it is a fastidious one; the pulse is sharp, irritable, but compressible; palpitation of the heart, throbbing sensations, and often pain in the head, are produced; the tongue is slightly injected in its papillæ, and has a whitish fur upon it, though in many cases the tongue is clean, large, and indented; there is sometimes nausea, or actual vomiting; the bowels are constipated or irregular; a sense of oppression or weight comes on after eating, sometimes followed by a throbbing sensation in the abdomen, and almost over the whole body, with languor or drowsiness; at other times

there is faintness; and when undigested food passes into the pylorus and duodenum, violent cramp or spasmodic pain is produced.

The ingesta may be retained in the stomach for many hours, and in some cases even days in a crude state; the secretion is not sufficient to dissolve what is placed in the viscus; the irritation produced by the retained food aggravates the ailment, and fermentation or decomposition is set up, with flatulence, pain, heartburn, or severe gastralgia. These symptoms, however, may arise from excess of food rather than from diminished solvent power, as we have previously noticed. When the nervous power is thus weakened the process of digestion is sometimes watched with the most scrutinising care; one kind of food after another is said to produce pain and is left off; digestion is said to be so slow that a long interval must elapse before further supplies are taken, life is rendered miserable, and the patient complains of inability to attend to ordinary duties; some of these instances of indigestion from exhaustion pass into the condition of great nervous irritability, marked by severe neuralgic pain, or by great irritability of the stomach.

Recovery takes place, but it is often greatly protracted. In the treatment it is unwise to underrate the sufferings and distress of the patient. Stimulants afford relief, but must be used with great caution, otherwise they will be taken at irregular times without corresponding nourishment; the mucous membrane of the stomach will then become irritated and congested, subacute gastritis and all the symptoms of congestive dyspepsia will be produced, and the second disease will be tenfold worse than the first, for a craving for alcoholic stimulants may be induced. Patients should be encouraged to take suitable nourishment, to masticate it properly, and exercise in the open air should, if possible, be taken daily. Constipation should be relieved by aloes and myrrh, or by colocynth and henbane, with or without extract of nux vomica; a dose of blue pill or of oxide of mercury is sometimes of advantage; and to rectify the condition of the stomach, capsicum with small quantities of ipecacuanha may be given to increase the secretion; dilute hydrochloric acid to add to its solvent power, or carbonate of ammonia with bitter infusions to stimulate the vascular and nervous systems

of the abdominal organs. Or the dilute phosphoric acid with tincture of nux vomica, or with three to five minims of the solution of strychnia, may be given.

Some years ago Dr. Ballard* introduced into English practice, according to the suggestion of M. Corvisart, an artificial digestive compound, in the form of pepsin, prepared from the stomach of ruminants. This constitutes the basis of the various kinds of "Poudre Nutrimentive" (Boudault). I have not met with the success expected from this remedy; but when properly prepared as by Mr. Squire, and given in doses of two to five grains combined with dilute hydrochloric acid, pepsin promotes digestion, and has in some cases proved of great service. In all cases, however, it is desirable to remove the causes of the imperfect secretion, if possible, rather than to supply a very imperfect artificial substitute.

The stimulant effects of coffee, ammonia, &c., are not so effective as those of alcohol in these cases, and brandy or wine is often better than malt liquor. In saying this we are very far from recommending the habitual use of such stimulants.

The habit of smoking, or snuff-taking, produces a relaxed and enfeebled condition of the mucous membrane, the secretions of which become insufficient to ensure solution of the food; stimulants are often resorted to, to counteract this effect, and many suffer severe dyspepsia from this cause.

In a third form of atonic dyspepsia the defective condition of the gastric secretion and of the power of digestion is connected with the state of the nerve of nutrition, as it has been termed, the *vaso-motor or sympathetic nerve.*

During *chronic disease,* as phthisis, the power to digest food seems to fail entirely in some cases; the symptoms of chest disease may be relieved, but the patient cannot take food, and if constrained to swallow it, it does not digest; this may be quite independent of the state so often found at the close of chronic disease in which the mouth becomes aphthous, the tongue red and clean, almost like raw meat, the gums spongy, the throat sensitive, and the gullet irritable.

In *extreme poverty and want*—in starvation—we do not

* Ballard, 'On Artificial Digestion.'

find the craving for food that some would imagine, but the appetite may be almost destroyed from exhaustion. There is sallowness of countenance, the eye is sunken, the tongue clean or irregularly furred, injected at the tip and edges, there is irritable cough, the pulse is irritable but compressible, there is pain at the scrobiculus cordis, the stomach is very sensitive and the bowels easily disturbed. It would be very unwise to place food of a kind difficult of digestion in a stomach so enfeebled; the gentlest measures must be used; stimulants cautiously used, and by degrees, more sustaining nourishment allowed.

Another cause of this nervous exhaustion is that observed in young persons during *rapid growth*, and during *climacteric changes*, as at the commencement of menstruation; there is gradually increasing weakness and loss of strength, the countenance becoming pale, the lips blanched, there is inactivity of both mind and body, and frequently severe headache, sometimes intense in character, on one temple, or in one eye, or it may be at the vertex; the pupils are dilated, the tongue pale, the bowels generally confined, the pulse compressible, the blood is generally deficient in red corpuscles, and in young women this state passes into what is designated chlorosis; the menstruation becomes scanty or it ceases altogether, there is venous murmur in the neck, systolic bruit over the aortic valves, the nervous system is disturbed, and pain is easily induced; it is generally complained of in the left side below the left breast, in a small circumscribed space. In this state of general weakness digestion is impaired, and it is on this account especially that we refer to the state at all; the appetite is perverted or lost, patients will take scarcely any food of a nourishing kind, a little tea and bread, or sweets, and the like. Sometimes the stomach is irritable, and there is pain at the scrobiculus cordis, food is rejected at once, and although scarcely anything is retained there may be a plumpness of the system, which shows that some portion of nourishment is absorbed. The vomiting appears to take place as soon as the food reaches the stomach; it has been well designated "hysterical stomach" and "regurgitative disease of the stomach." Sometimes, however, the emaciation is extreme. So, again, when

there is complete anorexia, and determination not to take food, the wasting necessarily becomes very great. Intense neuralgic pain is another of the indications of exhausted nervous power. This form of indigestion may be greatly relieved by the judicious use of chalybeate medicines, and it is well to begin with the milder preparations, as the ammonio-citrate of iron, which may be conveniently given in an effervescent form; the bowels should be relieved by aloetic aperients, but it is most important to insist on a nourishing diet, as milk, cocoa, meat, vegetables; and malt liquors, as good draught stout, are of great service. If the imperfect nutrition goes on there is fear of tubercular formation and its attendant subsequent changes.

Another condition of indigestion is that associated with the exhaustion consequent upon *child-bearing, over-lactation repeated hæmorrhages,* &c., the face becomes sallow, blanched, the forehead often irregularly bronzed, there is headache, neuralgia, pain at the top of the head, ringing noise in the ears, the eyes are intolerant of light, the pulse is compressible, the mind often becomes disturbed, delusions may distress the patient, and the appetite is gone. The stomach in this state often becomes irritable, and there is a sensation of emptiness or faintness. This condition is one requiring careful treatment, for stimulants are of great value, but require extreme care, for the relief afforded prompts to the continuance of the remedy when the disease has passed away. In these patients the heart becomes feeble, there is faintness, and strong stimulants are at once resorted to to relieve the distress.

Carbonate of ammonia, with aromatics and bitter infusions, may be used, and steel at first in small doses and in the milder preparations; afterwards mineral acids, as previously mentioned, and quinine, strychnia, &c., should be given.

In *very stout* persons, or in those in whom the appetite has previously been pampered, we find feebleness of digestion, with a sense of weight or exhaustion; spasmodic pain also, and irregular action of the heart are easily induced. These symptoms arise in part from the feeble condition of the heart and circulation, and are increased by an inactive state of the liver. The appetite is often small in stout

persons; and the hydrocarbons are stored up, instead of being removed in the ordinary changes of respiration; but the mischief is still further increased when the heart is irregular from an excess of fat about it, or when the feeble circulation of the brain manifests itself in vertigo and disordered sensations. Much relief is afforded by occasional alteratives, by aloes, rhubarb, and taraxacum, or by nitro-hydrochloric acid with bitter infusions; stimulants should be avoided if possible, and out-door exercise gradually increased.

Dyspepsia is also occasioned by an *excessive secretion* of gastric juice, which is apparently, in some cases, poured out in unusual quantity from a slight stimulant. A burning sensation at the stomach two or three hours after a meal, heart-burn, pain in the back, are the usual symptoms of this state. It may be associated with hepatic or with cerebral disease, and it is then best combated by remedial agents calculated to relieve the exciting cause of the disease; imperfect secondary assimilation, such as exists in gout and in rheumatism, produces symptoms similar to those just mentioned, and they are probably due to a changed character of the secretion rather than to mere excess.

In the treatment of this form of dyspepsia the diet should not contain an excess of nitrogenous substances; and food should be slowly and thoroughly masticated; it is also important not to limit the patient to fluid forms of food, which are rapidly absorbed, and often leave an undigested sedimentary deposit; the evil of this form of dietary we have often seen in chronic disease, in which dyspepsia has apparently been produced, or, at least, aggravated by this cause. Stimulants are better avoided, or they should be taken in great moderation; whilst ardent spirits, and the stronger wines are better abstained from altogether, for a temporary relief does not compensate for the injury they perpetuate. Exercise, and the maintenance of good action from the skin are very important, especially when this gastric disturbance is combined with hepatic derangement.

As to other remedies, the carbonate or caustic alkalies with bitter infusions often afford almost immediate relief; but they do not remove the cause of the malady, and are

ineffective unless the diet be regulated, and right exercise maintained. Creasote or carbolic acid, combined with sedatives and aperients, greatly mitigate the distressing symptoms ; and in all these cases it is well carefully to watch that the bowels are not confined, and that the liver performs its functions. It is not necessary, however, to resort continually to blue pill or calomel to rectify any deviations from healthy action in the hepatic secretion.

Dyspepsia from an *irregular* secretion of the gastric juice is closely allied to the state just described. Such irregularity Dr. Budd has mentioned as one cause of the varied degrees of gastric solution observed after death, where other conditions have previously been the same. He states, very truly, that whilst in health the stimulus of food leads to the effusion of gastric juice, in disease it may be poured out without this stimulus. In organic cerebral disease, and also in gastric disease connected with disturbance of the nervous system of a functional kind, a perverted and craving appetite, and desire for food at unusual periods, may be due to this irregular secretion ; and, it is not uncommon to find those who suffer at irregular periods from burning pain at the stomach, which is at once relieved by partaking of a mouthful of biscuit or dry bread. When the complaint arises from gastric causes, the directions we have briefly given for the relief of the excessive secretion of gastric juice, may be found of service ; but where it arises from the former, namely, from cerebral disease, other symptoms will be generally present, such as pain in the head, a slow and labouring pulse, disturbed special or general sensibility. In this case, a spare and unstimulating diet is called for ; the free action of the bowels is desirable, and the avoidance of all causes of mental excitement is most important. Too frequently in children a ravenous appetite is found to be the precursor of organic disease of the brain ; and in mania the sufferer is oftentimes prompted to swallow the most extraordinary substances, as large quantities of gravel, possibly from a sense of gastric distress, and of unsatisfied morbid appetite.

Dyspepsia produced by *morbid changes* in the gastric secretion leads us to other symptoms of disease ; and the first that we have to notice is *Pyrosis or water-brash.* This is a

symptom of frequent occurrence, and it receives its appellation from the fact of its consisting in the rejection of a thin watery mucus. Half a pint of thin watery fluid, sometimes resembling the white of an egg, is occasionally vomited or regurgitated at once; it is generally neutral in its chemical reaction, and often tasteless, but sometimes it is found to be slightly alkaline, and the patient complains of its saltness. The period at which the discharge of fluid takes place varies both as to the hour of the day, and the frequency of the occurrence of the attack. The vomiting, however, generally occurs when the stomach is empty; and it is accompanied with a sense of contraction and of pain at the epigastric region and at the spine; with some patients the attack comes on in the forenoon, with others during the night, as at one or two in the morning, that is to say, several hours after retiring to rest. As to the other symptoms, the tongue may be clean, the pulse normal, the patient tolerably nourished, or anæmic and enfeebled; headache is often present, and in some instances the water-brash alternates with more severe gastralgia, and often with mental languor and depression.

It is the opinion of Dr. Handfield Jones* that pyrosis is a chronic catarrh of the mucous membrane of the stomach, similar to blennorrhœa from the bronchi; there is much to warrant this supposition. Dr. Chambers,† however, favours the idea that the œsophagus is the source of the discharge, and it may be, that pancreatic secretion is regurgitated into the stomach and then rejected. The disease comes on after the continued use of oatmeal, and hence it is more common in the north; it may follow symptoms of chronic gastritis; and it is produced by great anxiety of mind, by exhaustive disease, by over-fatigue, or by an overworked frame; it also occurs during pregnancy, and it is met with amongst the symptoms of commencing cancerous disease of the stomach. With such causes, it is not surprising that numerous instances of this disease are found among the out-patients of dispensaries and large hospitals.

The remedies which relieve pyrosis are astringents and tonics, as the sulphate of iron with the extract of logwood;

* Handfield Jones, 'On the Mucous Membrane of the Stomach.'

† 'Chambers, 'On Digestion.'

quinine with aloes and myrrh; nitrate of bismuth alone or with conium and nux vomica; an alterative of blue pill, with rhubarb, is sometimes beneficial. Solution of potash, with hydrocyanic acid or with henbane and bitter infusions, is of great service when there is much pain. Other astringents may be advantageously employed with sedatives, anodynes, and tonics, as the compound Kino powder, catechu with morphia or opium, oxide of silver, sulphate of copper, strychnia, or the infusion, tincture or extract of nux vomica.

A form of pyrosis is found to arise in connection with colloid cancer, watery fluid being regurgitated into the mouth; and it is important to bear this fact in mind in the diagnosis of colloid disease; and in ordinary pyrosis the symptoms are sometimes so severe and persistent as to cause hesitancy in our prognosis, and to suggest the presence of carcinomatous disease.

Beside the abnormal conditions of the gastric juice already mentioned, there are two others which must be considered, namely, the dyspepsia occurring in what has been termed the lithic acid diathesis, and the dyspepsia found in albuminuria. The former is especially observed in those who are the subjects of *rheumatism* and of *gout*, and the following symptoms mark its presence:—A fastidious appetite, heartburn, flushes of heat, pain at the scrobiculus cordis and in the left hypochondriac region, a constipated or irregular condition of the bowels, a furred tongue, pain in the head, mental depression or unusual excitement, and sometimes severe vomiting and intense pain at the stomach.

The disease appears to be produced by imperfect secondary assimilation, as explained by Dr. Prout. The functions of other viscera are disordered, particularly of the liver and kidneys; the motions become pale, the urine high-coloured, and it deposits lithates, or it contains an excess of uric acid. The heart and sympathetic nerve are affected; there is often irregularity of the pulse, and there may also be vertigo or transient anæsthesia. The blood contains lithic acid, as shown by Dr. Garrod, or other elements from the decomposition of tissue; and in this state the gastric juice has an abnormal character; it becomes preternaturally acid from lactic or

hydrochloric acids, or is excessive in quantity, and may be otherwise changed.

This form of dyspepsia is easily produced when hereditary tendency exists; but, even where this is not the case, it may arise from over-stimulating diet, from excess, and from other irregularities.

In few dyspeptic conditions is the regulation of the diet more important, both as to its quality and its quantity; and it should consist of well-cooked, plain, animal food, with vegetables, the latter being in excess. Stimulants should be avoided, or the lighter wines taken; for although the immediate distress is relieved by ardent spirits, the disease is subsequently aggravated.

As to medical treatment, the first object is to mitigate present distress and pain; if the suffering be severe, chloric ether, chlorodyne, opium, or morphia may be resorted to; the salts of potash, soda, and magnesia afford relief to the heartburn and distress, and may be combined with carminative or antispasmodic remedies. Charcoal will often relieve the flatulent distension, and may be taken in the form of capsules, or merely mixed with some fluid, as milk or gruel. It is, however, most desirable to remove, if possible, the cause of the disease, namely, the secondary mal-assimilation; and to correct an inactive condition of the liver, if such a state exists, small doses of blue pill may be combined with colchicum, rhubarb, aloes, and sometimes, also, with quinine. Taraxacum with bitter infusions, and with the alkaline bicarbonates, acts sometimes as a useful laxative. If, however, there be exhaustion and general feebleness of power, ammoniacal stimulants must be given in combination, and wine allowed. The saline mineral waters are in some of these instances justly recommended; those of Bath, Bristol, Buxton, and of Cheltenham are most likely to be of service amongst British springs; and on the Continent, the springs at Homburg, Wiesbaden, Ems, Karlsbad, and Vichy may be resorted to. Kissingen also and many other places.

Nothing will avail effectually, however, unless strict dietetic rules be observed, accompanied by exercise in the open air. If the meals be daily hurried, the mind constantly on the stretch from business occupations, the hours of rest

shortened, and the consequent exhaustion removed by stimulating potions, the physician has no chance of affording relief.

In *albuminuria*, the vomiting and nausea, which are amongst its most common symptoms, are generally considered as sympathetic; and the renal plexus of nerves, in its connection with the semilunar ganglion, with the pneumogastric nerves, and with the gastric plexus, is regarded as the exciting cause of the vomiting and nausea. This is probably in great measure the case; but another cause exists, namely, the altered condition of the blood, and the excess of urea which it contains; the urea is poured out with the normal gastric juice, and acts as an irritant to the stomach, and tends to neutralize the gastric juice. Urea has been demonstrated in the secretion from the bronchi, and it is probable that, in these cases, it exists in all the secretions; but, perhaps, in none, to a greater degree than in that from the stomach.* It is in vain to expect much relief from remedies directly applied to the stomach; attention must rather be given to the disease of the kidney, and means employed calculated to restore the blood to its normal state, or to free it from poisonous excreta.

Diaphoretics, as antimony with acetate of ammonia, and salines; purgatives, as jalap or elaterium; warm baths or vapour baths will afford more relief than hydrocyanic acid or creasote; and cupping from the loins will sometimes remove, or, at least, greatly mitigate the nausea and vomiting; counter-irritation may be applied to the loins or to the scrobiculus cordis; and in some instances of extreme general anasarca, the gastric symptoms and the distress of the patient are greatly diminished by puncturing the thighs and thus allowing the serum gradually to exude.

There are other forms of mal-assimilation which occasion dyspepsia, and we find indications of this in some of the varieties of cutaneous disease. No organ sympathises more closely with the stomach than the skin; in every period of life this fact is noticed; in infants we have strophulus, and eczema from gastric irritation; in adults some of the forms of urticaria and roseola, eczema and lepra; in advanced life, eczema and prurigo, &c.

* Bernard, also Goodfellow, 'On Disease of the Kidney.'

It not unfrequently happens that flatulence is produced by the formation of gas in the stomach, irrespective of the decomposition of food, to which reference will subsequently be made; and in cases of hysteria, or in prolonged abstinence from food, &c., the stomach sometimes becomes painfully distended, eructations take place, and the power of digestion is diminished. It has been supposed that gas is effused from the capillaries, but of this we have no proof; and equally hypothetical is the opinion that it arises from mucus becoming decomposed by gastric juice, and thus evolving gaseous products; the flatulence is generally preceded by slight pain, or by a gnawing sensation at the scrobiculus cordis; a full meal in this condition will probably not be digested, but the flatulence will be prolonged, and colic be produced. The better method is to take a small quantity of nourishment, with some stimulant—a cup of coffee, or a glass of wine—and afterwards a more substantial repast, giving time for thorough mastication. Charcoal may in some cases speedily relieve this symptom, but it is more advisable to try and remove the cause.

We have next to consider those conditions of functional disease of the stomach in which the *vascular supply is disturbed*, whether in acute or chronic congestion.

The experiments and observations of Dr. Beaumont on Alexis St. Martin have pointed out the state of the mucous membrane which sometimes exists after improper food or stimulants have been taken; the surface of the stomach was found in such cases much injected, or erythematous. The secretion was diminished, and during this period more or less discomfort was generally produced; this condition entirely ceased in a short time, and the surface presented its usual appearance; but if death had taken place from some other cause during that condition of dyspepsia, the abnormal state would also have disappeared, and no structural lesion would have been discovered on careful or even microscopical inspection. This form of dyspepsia is, perhaps, one of the simplest degrees of acute catarrh or erythema, of which mention has been made in the last chapter.

After intemperance, either in eating or drinking, the gastric mucous membrane becomes over-stimulated, the portal system is at the same time engorged, and the liver is

congested and disordered; in this state natural secretion does not take place in the stomach, and dyspepsia is produced.

In this hyperæmia or erythema of the gastric mucous membrane the complexion becomes slightly sallow, and the patient complains of mental depression, lassitude, or headache; the tongue is furred, the appetite is impaired, and the condition of the bowels is disordered, as shown by a confined state, or by irregular action, with more or less pain. In some cases pain comes on at the scrobiculus cordis and between the shoulders, with thirst, nausea, and vomiting, and often with the rejection of green bilious fluid.

When excess is habitual the same symptoms are produced in a modified degree; the patient is hypochondriacal; he often believes himself to be the subject of serious disease of the liver; the bowels are constipated or irregular; flatulence, spasmodic pain or cramp in the abdomen, pain across the chest, tenderness at the scrobiculus cordis are produced; the tongue is furred, or its papillæ are distinct and injected, the appetite is lost, especially in the morning, stimulants are longed for, and at the same time a bitter or nauseous taste in the mouth distresses the patient; the pulse is compressible, and a sense of exhaustion and of physical fatigue are attributed to actual loss of power. Sometimes also there are severe headaches, vomiting, disturbed special sensibility, as indicated by double vision, muscæ volitantes, noises in the ears, disturbed general sensibility, as manifested by numbness, formication, loss of sleep, or sleep disquieted by frightful dreams. In this condition, food taken into the stomach remains undigested, and there is a sense of weight or "load at the chest;" the thick mucus covering the congested membrane prevents the action of the gastric juice on the alimentary mass, as in the instances of chronic catarrh previously described.

In the treatment of dyspepsia following excess an emetic may be advisable, but not unfrequently this natural mode of relief takes place spontaneously, and the vomiting is preceded by pallor and faintness. If the irritability of the stomach continue, soda water or effervescent salines, as the carbonate of potash, soda, or magnesia with citric acid, may be administered with or without the addition of hydrocyanic acid. The

carbonic acid acts as an anodyne and sedative to the mucous membrane, and the sedative compound which is produced relieves the portal congestion. Bismuth is often of great value, and may be given with carbonate of soda and chloric ether with almond emulsion, or with water and in effervescence by means of citric acid.

In this condition of great irritability of the stomach, in which the nausea and vomiting are sometimes excessive, and the disrelish for food well marked, even the sight or smell of it being distressing to the patient, the administration of alkalies is more beneficial than that of mineral acids; the former act as sedatives, rendering the abnormal as well as scanty secretion less irritating, and enable the diseased membrane more quickly to recover itself, and to put forth its proper secretion; the latter act as astringents and tonics to a relaxed mucous membrane. Cold drinks and ice are often craved for, and when given in moderation tend to relieve the congested state of the gastric membrane.

If more chronic effects have been produced, small doses of blue pill with rhubarb, and with magnesian purgatives, may be useful; for, by these means the portal system becomes freed from engorgement, and proper secretion takes place; should a sense of exhaustion then continue, it is well to give hydrochloric or nitro-hydrochloric acids with infusion of gentian or calumba.

The diet should be plain and easy of digestion, not rich or highly seasoned, and without stimulants, for medicines are of no avail, if stimulants be continued; three to four hours should be allowed to intervene between each meal. The character of the diet, and the quantity of the food taken are most important considerations; for meals taken too frequently or in excess, may, equally with the administration of improper and indigestible substances, be the cause of the malady. Before the stomach can empty itself it is often again irritated by a fresh supply; numerous dishes may prompt to intemperance, and excess is especially injurious when associated with late hours and deficient exercise. The function of the stomach is connected with the solution and preparation for absorption of the nitrogenous articles of diet, as they are present in our ordinary animal food; and in the

conditions of active congestion and great irritability, bland demulcent and starchy substances, as milk, arrow-root, &c., are to be preferred.

Again, imperfect mastication increases the difficulty of digestion; for the secretions of the stomach are then unaided by the division of the food, and the action of the saliva in changing the starchy portions into saccharine matter is not duly performed. This defective division of food may arise not only from the hurry of business and the force of habit; but also, because the agents of mastication are destroyed; and the dentist, by restoring the teeth, may afford the most effectual means of removing this form of dyspepsia.

The more severe forms of subacute gastritis produced by excess, and the chronic congestion in the gastric catarrh connected with pulmonary and cardiac diseases, have been already noticed.

III. The state of the *nervous system* is an important consideration in the study of disease of the stomach, as the diseases of other organs lead to disturbance of this viscus by their nervous and sympathetic relations with it. The stomach receives its nervous supply from the pneumogastric nerve, as well as from the vaso-motor nerve of the abdomen. The pneumogastric has its origin in the brain, at the floor of the fourth ventricle, and is brought into intimate relation with other nerves arising at the same part; it then passes to the base of the skull, and is united with other nerves, with the spinal accessory, the facial and the fifth in the neck; it is distributed to the larynx and to the œsophagus; in the chest to the lungs and to the heart, and in the abdomen it is brought into intimate relationship with the nerves of the liver and pancreas and of the kidney, and it unites with the large sympathetic ganglia at the upper part of the abdominal aorta. Hence the intimate relation of the parts supplied by this nerve. In structural diseases of the stomach the nervous supply is concerned in many of the symptoms produced, as the irritability and the severe pain, in ulceration of the stomach, and in malignant disease, but it is with functional diseases that we have especially to do in the present chapter. *Pain*, or gastralgia, as it has been technically called, *irritability of the stomach* leading to nausea and vomiting, *loss of*

appetite or anorexia, and perverted appetite, are the symptoms that are produced in these affections; and it is to the pneumogastric nerve, in its extensive connections, that these symptoms are due. The symptoms just referred to may be caused by irritation, either at the origin or at the peripheral extremity of any of the branches of this important nerve. On examination it is found that the stomach itself is not at fault, but that the source of its disturbance is elsewhere. We will take these symptoms *seriatim*, and first in reference to *pain*. Gastralgia is sometimes very intense; although partly neuralgic, it is the nerve at its origin and the state of the whole nervous system that are at fault. The pain is irregular in its onset; it is not necessarily connected with food; in fact, it is sometimes relieved by food; there is not the same association with vomiting that we find in gastric ulcer; the expressions of pain by the patient are made in the strongest language; it is "an agony," the pain is "intense," but the other conditions do not correspond, and it is found that when the attention of the patient is diverted the pain ceases. This form of disease is observed where the nervous system has been overwrought, in patients with hypochondriasis, in young persons with disturbed menstruation, with leucorrhœa and dysmenorrhœa. The appetite is impaired, the bowels irregular, vomiting is not usually present, the tenderness at the stomach is not such as we find in organic disease, neither do we find that the remedies which relieve organic disease are of service. Those remedies which strengthen the nervous system, as fresh air, strengthening diet, cheerful occupation, horse exercise, are of value, although sometimes opium, morphia or belladonna are required to quiet the pain and procure sleep. It is often found that this state is associated with disturbance of the uterine functions; and sometimes it suddenly ceases, but gives place to irritation in some other branches of the pneumogastric nerve.

Vomiting and irritability of the stomach are also common symptoms of disturbance of the nerves of the stomach, both of a primary and reflex character; in disease of the brain these are most important symptoms; in tumours of the brain the vomiting comes on nearly every day, at irregular times, but

with a clean tongue and without connection with food, so also in tubercular meningitis and in hydrocephalus; at the commencement of ingravescent apoplexy we find that vomiting takes place, so also after severe concussion of the brain; again, in some cases of anæmia of the brain vomiting is induced.* In diseases of the larynx and of the pharynx we find that the irritation of the peripheral nerves in these parts causes vomiting, but still more important are those gastric symptoms produced by disturbance of the pulmonary branches of the pneumogastric nerve. In early phthisis the irritation from tubercular deposit at the apices of the lungs causes violent vomiting, sometimes so severe that the thoracic mischief may be entirely overlooked. Another circumstance often observed in connection with these forms of reflex irritation is, that when the thoracic disease has advanced or has become suddenly increased by the onset of acute inflammation, then the gastric symptoms cease. In cardiac disease and pericardial effusion we also find that the stomach becomes sympathetically irritated. The sympathy of the stomach with disturbance of the abdominal viscera is still more manifest; we find vomiting a very common symptom of pregnancy and of ovarian disease; the vomiting may be especially marked at the earlier period of pregnancy; but in other cases it continues throughout the whole course; so also in ovarian disease, the irritability of the stomach is often so decided that the fear is entertained of organic disease of the stomach, when the sudden enlargement of the ovary by the distension of an ovarian cyst takes place, and all the gastric symptoms cease. During the passage of gall-stone vomiting is an almost constant symptom, as well as in diseases of the liver; it is seen in renal calculus, as well as in many forms of renal disease; in intestinal obstruction, in disease of the suprarenal capsules it is usually present, and lastly as an expression of sympathy of the stomach with a morbid state of the whole system at the onset of acute disease, as exanthems, &c. Each of these conditions produces peculiar and characteristic symptoms, but all of them may be accompanied by violent

* "Gastric Crises in Locomotor Ataxia," by Dr. Grainger Stewart, 'Medical Times and Gazette,' Oct. 7, 1876; Charcot, 'Leçons sur les Maladies du Système Nerveux.' Tome ii, 2e édition, p. 32.

and most distressing vomiting, and unless care be taken in the investigation it may obscure the primary malady.

But not only does the stomach itself become functionally affected by peripheral irritation, but we find that true disease of the stomach leads to sympathetic disturbance of other viscera, as of the head, causing pain, disturbed vision, muscæ volitantes, throbbing in the head and ears, tinnitus aurium; the hepatic and renal secretions may be similarly affected; and, as it has been justly observed by Dr. Philip, these secondary conditions may become so severe as to be more persistent and trying than the disease of the stomach itself; thus intense neuralgic pain in the face and head may have its source primarily in the stomach, and in functional disease connected with an irritable state of the pneumogastric nerve we find that first one then another set of branches may be involved. Acute asthma gives place to irritation of the stomach, and *vice versâ;* excessive irritation of the heart may also follow, or laryngeal spasm.

An equally marked association of disease, arising from the state of the nervous system, is the irritation of the lungs from disturbance of the stomach equally with that of the stomach in consequence of mischief in the lung; thus dyspepsia gives rise to dyspnœa, and to cough, from the irritation of the gastric branches of the pneumogastric, producing reflex irritation; so also with the heart, by means of the cardiac branches of the same nerve; for palpitation or irregular pulsation may be due to gastric disturbance, and may simulate severe organic disease of the heart.

In phthisis, it has been long noticed, that indigestion may precede the physical signs of disease in the lungs; nausea, loss of appetite, impaired digestion, furred tongue, pain at the scrobiculus cordis, as well as severe vomiting to which we have referred, and, after a time, hæmoptysis and the general signs of tubercular disease become developed.

The observations of Dr. Theophilus Thompson, in reference to the state of the gums in phthisis—a red injected line being produced along the margin of the teeth—is a further confirmation of the irritated condition of the mucous membrane. This early state of phthisis is that in which the greatest benefit is derived from prophylactic treatment; by

change to salubrious or sea air, by attention to warmth and clothing, the avoidance of night exposure, by taking cod-liver oil, and sometimes vegetable tonics, the further progress of the disease may in many cases be warded off.

The irritability of the stomach induced by functional disturbance of the uterus is sometimes excessive, so that any substance is instantly rejected; leucorrhœa and dysmenorrhœa may be the cause of this excitable condition; and these symptoms may exist without producing any emaciation in the patient. It is to this condition that Sir Henry Marsh has given the name of "regurgitative disease," in which the food or the greater part of it is regurgitated rather than vomited; and this takes place without previous nausea, or progressive emaciation; and pain may be entirely absent.

In the treatment of these forms of irritation much relief is afforded by hydrocyanic acid, by creasote, by calcined magnesia with opium, by chloroform or chloric ether, or by nitrate of bismuth with conium. Morphia may be used hypodermically and in uterine irritation, opiate enemata or suppositories are often of great value. The oxalate of cerium is another remedy which is sometimes of great service in this reflex irritability of the stomach. Small blisters applied to the scrobiculus cordis or to the spine, sometimes alleviate the symptoms.

When the symptoms result from pregnancy, the mineral acids will often afford relief, or the oxalate of cerium just mentioned. In this condition of excessive irritability it is often advisable to omit all medicine, and allow the stomach to rest, employing nutrient enemata, and giving only a teaspoonful of water occasionally to relieve thirst. Another plan may be followed, of giving a small quantity of milk and water every ten minutes or half hour.

In some instances a determined effort of the will will overcome the gastric irritation; the viscus has become so irritable that the least distension, or it may be voluntary pressure at the scrobiculus cordis, suffices to cause instant rejection of the contents of the stomach; but the presence of a stranger or the absence of any vessel into which the patient may vomit may check the action; as in a young patient in Guy's

Hospital, who was cured because the nurse did not give her any vessel into which she might vomit.

Calomel is used by some as a sedative to the mucous membrane of the stomach; but since this condition of irritability is so frequently found associated with an anæmic and chlorotic or hysterical state, the administration of mercurials, except as occasional aperients, is better avoided.

A form of dyspepsia, which primarily arises from the condition of the nervous system, has been already noticed in reference to deficient secretion of gastric juice; namely, the dyspepsia in hypochondriasis, and in an overworked or imperfectly developed brain; this condition is exceedingly distressing to the patient, and equally trying to the physician; it is sometimes the precursor of epilepsy or of mania. In these instances of dyspepsia the whole attention is occupied by the diet, the mind is depressed, and its energies enfeebled; one change after another is tried, but pain and discomfort equally follow; the stomach is sometimes exceedingly irritable; the bowels are watched with undue anxiety, the sleep is unrefreshing, and life rendered miserable. To tell the patient nothing is the matter, would be to drive him to some one who would give an opinion more in unison with his feelings. By carefully regulating the diet and the bowels, by cold sponging, by taking frequent exercise, either walking or on horseback, or a pedestrian tour when it is possible, by keeping the mind free from anxiety, and by cheerful society and occupation, all the symptoms may be greatly relieved.

In some men we observe a state closely resembling hysteria; as shown by flatulence, loss of appetite, sensibility of the surface of the abdomen, sensations almost amounting to globus hystericus, disturbed cerebral function, depression, anæsthesia, incapacity for exertion, &c.; in this condition, which is often combined with distension of the colon, I have found marked benefit result from the use of aloes combined with steel and with assafœtida; fresh air and vigorous exercise are important remedial agents when they can be attained.

In other cases much resembling those just mentioned, the head is badly formed, and the forehead is narrow; the body is well nourished, but the patient complains of pain at the

scrobiculus cordis and in the back, or in various parts of the body; the mind is depressed, and the appetite irregular. Although muscular, a man may be quite incapacitated for exertion; the tongue may be clean, the bowels regular, the evacuations normal or pale, the pulse tolerably full, or depressed and irregular. It would seem that dyspepsia has arisen from ordinary causes, but the sympathetic nerve reacts upon the cerebro-spinal centres, and these being easily disturbed from their healthy balance, again react upon the sympathetic nerve, perpetuating and aggravating the original and slighter malady. In this we find the close connection between dyspepsia or disordered chylopoietic viscera, and mental disease, mania, and melancholia.

By acting freely on the bowels so as thoroughly to unload the colon, and by the steady perseverance in the milder preparations of iron, this state may be greatly relieved; the mind should be occupied and some out-door exercise should be enjoined; continental travel or a sea voyage will often prove of great value, for nothing is of greater disadvantage than to allow the mind to prey upon itself, and to be absorbed with its own morbid sensations.

Disease of the nervous system is also associated with morbid states of the appetite. There may be a state of anorexia, or loss of appetite; we do not refer to the loss of appetite seen in acute disease, nor in general exhaustion from chronic or other disease, but to those cases in which food is refused, or gradually lessened till only a little bread and water may be taken; some of these are instances of religious melancholia, others are cases of cerebral disease, in which the will is at fault rather than the stomach, and to this group belong the vaunted instances of young women surviving for months without food—hysterical deception. The appearance of these patients is characteristic, sometimes anæmic and blanched, in other cases with haggard expression, wasted features, sunken eye, dressed in a manner as if to assume great sanctity, the chest and abdomen wasted to an extreme degree, the mind agitated with extravagant notions or perverse delusion, the bowels confined, the uterine functions in women disturbed. Most of these cases, as Sir Wm. Gull has justly said, are diseases of the mind, and require treatment directed

to the cerebral functions, in others kindness with firmness will enable the nervous system to overcome the objection to food, the will resumes its control over the emotions, and, as a proper diet is taken, the nervous system works in a healthy and vigorous manner. Aloes, steel, assafœtida, valerian, are remedies which are of service, but these are of no avail unless accompanied with proper diet and healthful exercise.

Of a somewhat different character are those cases of anorexia where disease of the uterus, amenorrhœa, and dysmenorrhœa have produced functional disturbance of the stomach; food may cause pain and vomiting; the appetite is gradually lessened, and one thing after another is left off; the increasing weakness renders the stomach still more enfeebled, digestion becomes a painful process, and great exhaustion may be produced. In these instances the patients require encouragement, and may be assured that, as they gain strength, the stomach will become less irritable and the pain will also lessen. Mild chalybeates in effervescence are often of value, and a nourishing with vegetable diet.

Another form of anorexia is that which follows irritability of the stomach after ulceration; whether of a chronic or superficial kind. The patient has left off one article of diet after another, and the system has become so weakened that appetite is entirely lost. Extreme emaciation is found in these cases; they resemble cancerous disease or still existing ulceration, but by careful management, and encouraging the patient to persist in taking suitable food, although a part may be rejected, the nervous system gains power; chalybeates, with gentle laxatives, are often of value in these instances.

The last form of nervous affection of the stomach to which I have to refer is perverted appetite, bulimia. It is not necessary to remark on the habits of some insane patients, who will swallow stones and even things of an offensive character, but to other states of functional disease. In diabetes we have craving, connected not only with the state of the nervous system, but with the condition of the whole organism; other instances often occur in which there is a sense of craving at the stomach, sometimes connected with excessive secretion of the gastric juice, to which we have already re-

ferred, but in other instances patients will complain that soon after a meal they experience a craving appetite; there is no pain, no evidence of sugar in the urine, no symptoms of cerebral disease, but the body is wasted and badly nourished, although abundant supplies of food are introduced into the stomach. These instances are connected with over-strained nervous energy, and the system generally requires rest and change, and mere medicine is only a very partial benefit. Ammonia, opium, and valerian may be of some service.

IV. The *impeded movements of the stomach* are not sufficiently considered as causes of dyspepsia. In hernia, when the omentum is fixed and the stomach is dragged from its position, pain in the hypochondrium is produced; and the habit of tight lacing, which few young ladies are willing to admit, is a fertile source of the same suffering; in most cases the mischief is done very early in life, the ribs are scarcely allowed to expand, and the stomach is gradually tilted into a vertical position whilst development is taking place. Neuralgic pain in the side, flatulent distension of the stomach, pain after food, spasm, borborygmi, hysteria, are the usual sequences of this folly. Digestion requires that the nutriment should slowly revolve within the stomach, and as it is converted into chyme, that it should pass into the duodenum. When the stomach is placed vertically, its semi-digested contents are more likely to be impelled at once into the pylorus. In the modern dress of ladies the suspension of the weight of the clothes from the waist often leads to interference with the functional activity of the abdominal viscera, and is a fertile source both of dyspepsia and dysmenorrhœa.

The dyspepsia which is so common in those who spend many hours over the desk, in writing, or in reading, or in any constrained position, is of the same kind; and amongst tailors, shoemakers, dressmakers, &c., this unnatural and long-continued posture is productive of severe indigestion, which is increased, in many cases, by irregular and intemperate habits.

Constant pain at the scrobiculus cordis and between the shoulders is complained of; eructations sometimes distress the patient; the bowels are often constipated; the tongue is

furred, and the mind depressed. We may often do much to remove the disease by enforcing an erect posture during the hours of occupation, by strict attention to diet, by well regulating the bowels, by relieving torpor of the liver, and, if needful, by administering mild alteratives, or nitric acid with taraxacum.

In tumours developed in the lesser omentum, or about the pancreas, &c., the pylorus becomes pressed upon, and a free passage is prevented; in this case, also, we find pain and heartburn, and sometimes the obstruction is sufficient to produce vomiting.

In other instances, the movements of the stomach are prevented by the presence of fluid in the peritoneal cavity; in ascites and in ovarian dropsy the stomach may be so much pressed upon, that expansion cannot take place, and its contents may be rejected or severe pain may be produced.

It is probable that in some cases of over-distension from flatus, the muscular coat of the stomach is unable to contract, or becomes paralysed. Dr. W. Philip gives such as his opinion; and cases are not very rare in which, after death, we find the stomach occupying nearly the whole of the abdomen, reaching nearly to the pubes, and apparently causing death, by interfering with the action of the diaphragm and of the heart. Lesser conditions doubtless arise, and are attended with much discomfort, as a sense of distension, flatus, and sometimes of intense pain. The symptoms are relieved by ether, by antispasmodics, by the gum resins, as galbanum, assafœtida, &c.

It must be borne in mind, however, that this tympanitic state sometimes arises from inflammation coming on insidiously, and involving the muscular as well as the peritoneal coats, as in some cases of strumous peritonitis. I have seen several such instances, in which fatal results followed without any pain from the commencement to the close. A short time ago, a policeman complained of fulness of the abdomen, which gradually became tympanitic, but no pain was produced; this state increased for six weeks, with prostration; about a fortnight before death the tympanitis was less, and fluctuation indistinct. He gradually sank, about ten weeks from the commencement of the illness, but he suffered no

pain throughout. There was chronic peritonitis, the whole serous membrane being studded over with whitish grains of lymph. There were bands of adhesion, and the peritoneum contained several pints of bloody serum. The serous investment of the spleen was a quarter of an inch in thickness, and contained small opaque cheesy masses. The small intestines were matted together, but not very firmly, and the ileum presented several passive ulcers. In the lungs, at the left apex, was puckering and iron-grey consolidation. We might readily mistake such cases for ordinary dyspepsia with flatulence, since they occur in youth as well as in middle life. These latter cases must be distinguished from the great distension of the stomach which we have described as connected both with pyloric disease and with paralysis of the muscular fibre of the stomach.

V. The *fermentation* of the contents of the stomach, and the symptoms consequent upon it, are due partly to an abnormal state of the secretions, in part to the muscular movements being impeded, or the pylorus obstructed, and sometimes to the character of the food itself. Dr. Budd has distinguished several varieties of fermentation; so also Dr. Turnbull. 1. The formation of carbonic acid, as in ordinary fermentation. 2. The formation of sarcina ventriculi. 3. Lactic or butyric acid fermentation; and, 4. The formation of sulphuretted hydrogen by simple putrefactive decomposition.

When the pylorus is obstructed by cancerous disease, by spasmodic contraction, and by tumours, the contents of the stomach are prevented from passing onwards; the viscus becomes distended by flatus; pain is produced; and vomiting, which affords partial relief to the patient, generally follows a few hours after food has been taken; the ejected matters are found partially dissolved, and undergoing fermentation; they have a sour smell, and a yeastlike surface; this action is allied to simple fermentation; alcohol is formed, and carbonic acid evolved; some acetic acid is produced; and the sarcina ventriculi discovered by Mr. Goodsir are often detected.*

Fermentation of this kind, and the presence of the sarcina,

* The Merismopædia Ventriculi of Robin, Pl. xii, fig. 1, p. 331.

may exist without any pyloric obstruction or organic disease; and sarcinæ have been detected in the urine, in the fæces, in pus, in pulmonary abscess, and on the healthy mucous membrane; Robin even states, "ce végétal semble être sans action nuisible sur l'animal qui le porte." Fermentation may be favoured by the imperfect mastication of food, and by taking exercise immediately after it; by drinking fermenting or new malt liquors; by indigestible vegetables, and fruit; by new bread, salads, &c. Distension is felt almost at once, and regurgitation of food into the œsophagus, eructation, palpitation of the heart, &c., take place; colic is often produced, and sometimes diarrhœa, by the continuance of the fermentation, or by the presence of semi-digested substances in the intestine.

In the more severe cases arising from obstruction the sulphite or hyposulphite of soda, as recommended by Sir Wm. Jenner, is a valuable remedy; the sulphurous acid is set free, and checks the fermentative action. Charcoal has the same effect, so also carbolic acid and creasote. The spasmodic pain from distension is relieved by sulphuric or chloric ether, by chloroform or by opium. In the more easily remediable cases arising from fruits, vegetable, or undigested food, an emetic or purgative may be given, and may be advantageously followed by ipecacuanha and capsicum, or by the nitro-hydrochloric acid with calumba, cascarilla, or gentian. These medicines apparently increase the secretion of the gastric juice or improve the tone of the mucous surface; but after the immediate relief of the urgent symptoms the most likely plan to afford permanent benefit is to change the diet to such substances as the stomach can easily digest.

Another form of chemical change described is that which takes place from the fermentation of starchy elements, milk, &c., and which leads to the formation of *lactic or butyric acid;* severe heartburn is produced with pain at the stomach and between the shoulders, sometimes with vomiting, but without distension; the pain is occasionally very severe and persistent, even after vomiting; there is often a sour, nauseous taste in the mouth, and there may be spasmodic attacks, or even alarming collapse. The state is much relieved by creasote, carbolic acid, opium, bismuth, or by magnesia and hydrocyanic acid.

In infants the most severe collapse ensues from the coagulation of milk in the stomach, and the patient may be utterly prostrate, as if suffering from perforation of the intestine or from cholera; if recovery take place, small masses of casein and fatty matter are sometimes passed from the intestine.

An infant about a year old was seized with sudden collapse shortly after being fed, deathly prostration followed, and it was believed by the parents that the child was poisoned; the flour, milk, water, &c., of which the food had consisted, were carefully analysed by my friend Dr. Odling, and pronounced normal. The infant became cold, and was apparently in severe pain; its eyes were sunken, and, after a few hours, several masses of cheesy substance, about half an inch in length, were passed; these I carefully analysed, and they were found to consist of oily matter and casein; and the symptoms arose from milk coagulated in the stomach having passed into the duodenum in a solid form. Such at least was my diagnosis of the case; and the rapid recovery of the little patient showed the correctness of the opinion.

In some persons affected with dyspepsia the breath becomes exceedingly offensive, almost of the odour of sulphuretted hydrogen, being similar to that caused by carious teeth, diseased tonsils, or ulcerated nares. This state is due to the *putrefactive decomposition* of food retained and undigested in the stomach; it is associated generally with vitiated secretions; there is headache, mental depression, the tongue is furred, a sense of uneasiness at the stomach comes on, or pain in the bowels; the evacuations are sometimes dark and unusually offensive, or there is slight diarrhœa. It would appear that, to some extent, effects similar to those observed when sulphuretted hydrogen is respired are the result of this state, and that the blood itself is contaminated by the absorption of gas from the alimentary canal. Putrefactive decomposition may also arise in obstructive disease at the pylorus.

In cases where no obstruction exists, it is well to prescribe a warm saline aperient, as sulphate of soda, and the potash tartrate with aromatic spirit of ammonia; again, rhubarb, soda, and calumba, or the compound gentian mixture, may

be advantageously given. Creasote tends to check the decomposition, but its employment is less suitable in these than in previously mentioned instances.

HÆMATEMESIS.

There are several symptoms of disease of the stomach which demand separate notice, and the first of these to which we shall allude is hæmatemesis, or vomiting of blood.

Great alarm is naturally excited by the rejection of blood from the stomach, whether in small or large quantities; but the import is very different, for whilst in some cases it is a symptom free from danger, in others it is the indication of serious, if not of fatal disease.

The causes of hæmatemesis are—

1st. Ulceration of the stomach.

2nd. A congested or obstructed state of the portal circulation.

3rd. Vicarious menstruation.

4th. Cancerous disease.

5th. A vitiated state of the blood, as in purpura, renal disease, yellow fever, typhus, &c.

6th. Aneurism.

The hæmorrhage may, however, have its origin in parts connected with the mouth, the throat, and the œsophagus (as from ulceration, cancerous disease, and aneurism, and from varicose conditions of the œsophageal veins*), and the rejection of blood from these sources may be erroneously regarded as hæmatemesis; or it may proceed from the nose, the larynx, and the lungs, and in some cases considerable difficulty arises in distinguishing the source of the discharge, for the blood may be swallowed and afterwards vomited.

As to the quantity of blood exuded, there may be the greatest diversity; sometimes it is only recognised by the most careful, or even microscopical examination; it may be merely coffee-ground fluid; at other times several pints or even quarts are rejected at once; and if a large vessel have been divided, the first hæmorrhage may cause fatal syncope.

* 'Schmidt's Jahrbuch,' 1859, Le Diberder und Fauvel.

Blood which is thus discharged into the stomach is generally coagulated, and is often deepened in colour by the action of the gastric juice; it is devoid of the bright frothy appearance presented by blood from the lungs, which is consequent on the admixture of air. A portion of the blood in the stomach becomes still further acted upon by the gastric juice, and passes into the duodenum. As it extends along the small and large intestine, the depth of the colour is increased, and at last it is discharged as a pitchy, liquid stool, constituting melæna. Sometimes this black evacuation or melæna is the only symptom of hæmorrhage into the stomach, for no blood may be rejected by the mouth; and when the blood is effused into the small or large intestine, and discharged, the depth of the colour is proportionate to the length of the tract through which the blood has passed, but it never assumes the black colour to which we have referred.

The green fluid which is sometimes vomited in states of great irritation of the stomach has been regarded by Dr. Fraser as altered blood; and the coffee-ground substance so often rejected towards the close of organic disease of the stomach, consists also of blood which has slowly exuded, the hæmatine being acted upon by the gastric juice. In some cases of purpura, a similar appearance is presented from a like cause. Much discussion has arisen as to the possibility of the transudation of blood through *un*ruptured capillaries; but the examination of a portion of intestine distended with blood, and presenting points of ecchymosis, as found after disease of the mitral valve, will suggest the probable explanation of instances in which blood has been vomited or discharged, and in which no apparent perforation of vessels has subsequently been found. In such a portion of intestine as is present with mitral valve disease, some of the capillaries are found to be beautifully injected, whilst others are collapsed, and blood is extravasated around them, but limited by the basement membrane, thus constituting a point of ecchymosis; if the basement membrane had given way, the blood previously extravasated would have escaped, and no ruptured vessel would have been detected. A similar action takes place in the stomach; ecchymosis is produced, but the action of the gastric juice prevents our observing the changes with

the same facility as in the intestine. There is little doubt that the capillaries thus become over-distended, and then ruptured in the ordinary form of hæmatemesis, when no ulceration has taken place. This statement of the pathological condition does not militate against the now generally received opinion of the extrusion of the blood-corpuscles through unruptured vessels.

The symptoms which precede hæmatemesis are a sense of faintness followed by weight at the scrobiculus cordis; the countenance becomes pallid, the pulse compressible and failing, the extremities cold, and sometimes actual syncope takes place; vomiting is then produced, and several pints, or even quarts, of half-coagulated blood are rejected; the patient becomes faint, blanched, and the bleeding is checked. After a few days or hours, there may be return of hæmorrhage, till at last, in some cases, the patient appears almost drained of blood. The subsequent symptoms are especially due to this loss, as found in other instances of anæmia; and severe headache, noises in the ears, disturbed vision, dilated pupils, palpitation or irregular action of the heart, with a sharp but compressible pulse, are present. If a large vessel have been divided, the first attack may, as we have before remarked, lead to fatal syncope. This sudden termination is, however, unusual; the patients slowly rally, and after a few hours, the black, pitchy discharge of altered blood takes place from the bowels.

The character of the disease which has led to the hæmorrhage must necessarily modify the preceding as well as the general symptoms and their termination; thus, in ulceration of the stomach, and in cancerous disease, the peculiar symptoms of those maladies are present; in aneurism a pulsating tumour may sometimes be felt, and severe local pain, or pain in the course of the spinal nerves, may be experienced. In a congested state of the portal system, the signs are those of engorged liver, as shown by pain in the right side, dyspepsia, a sallow or semi-jaundiced complexion, furred tongue, occasional nausea or vomiting, impaired appetite, spasmodic pain at the stomach or in the region of the colon, constipation of the bowels, disturbed sleep, and pain in the head; enlargement of the liver and hæmorrhoids are also frequently present. It

is this form of hæmorrhage that sometimes occurs in valvular disease of the heart.

In vicarious menstruation, local congestion of the mucous membrane, or of the edges of a pre-exciting ulcer—as we sometimes find in an ulcer on the leg—leads to the effusion of blood into the stomach. In these cases we may have very slight symptoms—an absence of the proper menstrual discharge, slight pain in the side, and periodical vomiting of blood, without constitutional disturbance, and without the blanched countenance that we find in hæmorrhage from other causes. With this vicarious discharge we not unfrequently find hysteria, neuralgic pains, and leucorrhœa, &c.

In purpura hæmorrhagica there is a blanched countenance, faintness, &c., but we have an indication of the cause in the changed character of the blood, as shewn by effusion into the mucous membranes and into the skin. The hæmatine is probably acted upon, and the corpuscles broken down, so that actual exosmosis of coloured serum takes place.

During the course of fever, hæmorrhage from the bowels, apparently of a critical character, occasionally takes place; the patient, who may be in a state of great prostration, with a dry and brown tongue, rapidly improves, and hence the discharge of blood has been regarded by some as indicating a "crisis" in the disease. In the few cases of profuse hæmorrhage which have come within the sphere of our own observation, the effusion of blood has probably taken place from ulcerated surfaces; in one, presently to be detailed, minute ulcers were found in the stomach, from which a profuse and fatal hæmorrhage occurred; in another instance, a young woman, whilst prostrate from typhoid fever, suffered from hæmorrhage to a great extent from the bowels; the patient became blanched, the pulse for many hours could scarcely be felt, but very slowly she completely recovered. These cases resemble those in which very minute quantities of blood are detected on microscopical examination of the evacuations during typhoid fever, but must be distinguished from the hæmorrhages described by Dr. Kennedy as occasionally taking place during typhus without ulceration, and followed by rapid recovery. We have known hæmorrhage from the stomach to occur both in lardaceous disease of the viscera and in chronic

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renal mischief; possibly from degeneration of the vessels, as has been described by Charcot* as occurring in the vessels of the brain, and by Lionville in the retina.†

When blood is poured out from the œsophagus or mouth, it is regurgitated or rejected without effort, rather than vomited, and we generally find either dysphagia or ulceration of the throat, &c.

The blood from the lungs is sometimes so retained in a vomica or dilated bronchus, that it loses its frothy appearance and florid colour, and the patient is often scarcely able to tell us whether he vomited or coughed it up; no actual cough may be produced, but the blood may easily be brought up into the throat and then spat out, or it may be swallowed and then vomited, or discharged by the bowels; in these cases we attach much importance to the general signs of disease, and to the physical examination of the lungs and heart.

As to the prognosis in hæmorrhage from the stomach, we must bear in mind that it is rare for a patient to die from simple hæmatemesis, although such cases occur; patients appear to be almost bloodless, but steadily convalesce. Still the cause of the symptom must be our guide as to its termination; sudden and large bleedings after symptoms of organic disease should always be regarded with alarm, for ulceration often extends into the larger arteries, and the dense fibrous tissue prevents contraction of the adjoining parts, and thus the hæmorrhage persists unchecked.

As to the treatment when bleeding takes place from ulceration or cancerous disease, the use of styptics is advisable—alum with dilute sulphuric acid, acetate of lead, gallic acid, catechu, tincture of iron, or oil of turpentine, may be used; but in cases where it arises from congestion of the liver, I have generally looked upon the hæmatemesis as to a great extent curative, and have prescribed remedies calculated to relieve the congested liver, as a grain or two of blue pill with conium, and magnesia mixture, in order to remove the effused blood from the intestines.

Ice and cold drinks are grateful to the patient, and beneficial in producing contraction of bleeding vessels; but food

* Brown-Séquard, 'Archives de Physiologie,' 1868.

† 'Gazette des Hôpitaux,' 1870, p. 141.

should be abstained from, because coagula may be removed by it from divided vessels, and hæmorrhage may be again produced. After a short time, fluid, demulcent nourishment can be given, but it should be in a nearly cold condition; and when there is evidence of a cessation of the hæmorrhage, solid substances, easy of digestion, may be taken in small quantities. Vegetable tonics with mineral acids, and the milder preparations of steel, will then be found of service; but we shall be often much disappointed by the various astringents, as gallic acid, alum, &c., which afford only partial relief; oil of turpentine, in doses of ɱxx, has been much recommended, and has been followed by beneficial results; its stimulant as well as astringent effects have been well marked.

It is exceedingly important that the patient should avoid those habits or excesses which have led to the disease, but advice on this subject is generally disregarded.

In vicarious menstruation, our efforts should consist in endeavouring to establish the proper and natural discharge, rather than immediately to check that which proceeds from the stomach, unless it be excessive. Hip baths, steel, aloes and myrrh, change of air, exercise, the avoidance of tight-lacing or unnatural excitement, will probably restore the health, but this form of hæmatemesis will sometimes continue for a considerable period.

In purpura, the preparations of steel with acids are generally the best remedies that we can use, as the tincture of the sesquichloride or the sulphate of iron, with sulphuric acid; the oil of turpentine also is sometimes of great value, although its taste may offend the palate.

Case LXXIX.—*Hæmatemesis from Cancer of the Liver.*—The most marked case of hæmatemesis and melæna from this cause that I have ever witnessed was in a man about 55 years of age; he was in an emaciated condition, cachectic, and semi-jaundiced; the liver was enlarged, and it was believed that he suffered from cancerous disease of that organ, a diagnosis which was found after death to be correct. He was suddenly seized with violent vomiting of blood, and black stools were passed. In about eight hours he died. On inspection, we found cancerous disease of the liver; there was no ulceration in the stomach, nor evidence of any ruptured vessel; the intestine contained a considerable quantity of blood, but no ulcer. On

opening the vena portæ, it was found that the cancerous disease had extended into the vessel, and completely occluded it, and that softened cancerous matter was injected along the branches of the vena portæ, so as completely to check the circulation. The cause of the hæmatemesis was at once apparent—the capillaries of the stomach had become suddenly engorged with blood, and had ruptured, leading to the fatal hæmorrhage; but no openings nor ruptured vessel could be found, for the distension had disappeared, and the minute vessels had collapsed. A similar result is found in many instances of vomiting of blood after intemperance.

Case LXXX.—*Hæmatemesis from Portal Congestion.*—James P—, æt. 45, residing at Milton Street, was admitted into Guy's Hospital, February 2nd, 1859. He was a man of intemperate habits, and whilst at work some time previously, packing hay and exerting his strength, sickness and flatulence came on, and he vomited about a pint and a half of grumous blood, and afterwards smaller quantities of clear blood. He was under treatment for fourteen days, and then returned to his work. From that time he had had pain across his chest, which sometimes moved to the epigastrium with much flatulence. Three weeks before admission, immediately after jumping to reach a handle above him, he vomited up half a gallon of brown-coloured blood in clots; and some blood passed per rectum. When brought to Guy's he had a yellowish, semi-jaundiced complexion, and suffered from pain at the scrobiculus cordis; the lungs were healthy; the pulse was full, soft, 80; the tongue coated; the appetite defective; the bowels open; the urine not albuminous. He was ordered infusion of roses with acid, and milk diet. 4th.—There was slight pain, no return of vomiting, but he had passed blood by the bowels; the tongue was furred. 8th.—He appeared nearly well, and was soon afterwards presented.

This case of hæmatemesis probably arose from hepatic engorgement, due to intemperance; and the hæmorrhage from the over-congested mucous membrane of the stomach was in itself curative.

Case LXXXI.—*Hæmatemesis after great Intemperance.*—Alfred W—, æt. 38, admitted into Guy's under my care in May, 1855, was a tall man, perfectly blanched in appearance, and on admission he was almost in a state of syncope. He had been for some time a porter at the Brighton Railway, and had drunk very freely of spirits, although accustomed to eat but little food. During the Epsom races, having harder work than usual, he drank still more intemperately; he had been troubled with occasional pain at the stomach, and with vomiting. The day before admission he felt a sense of weight at his stomach, which he tried to relieve by taking more spirits; a feeling of faintness came over him, and he vomited several pints of dark-coloured blood. He was much excited on admission, and there was considerable tremor

of the hands. The skin was moist, the tongue and lips pale, the bowels confined. The liver was much enlarged, and there was slight tenderness at the scrobiculus cordis.

There was evidence in this case of great engorgement of the portal system, and although some additional hæmorrhage took place, I adopted the plan of endeavouring to relieve the distended liver, and constipated bowels, rather than of administering styptics. Blue pill and conium were given, and magnesia mixture. In this way black blood, acted upon by the gastric and intestinal secretions, was discharged, and the patient rapidly improved. The hæmorrhage returned slightly on the third day, probably from spirits surreptitiously obtained. He steadily, however, convalesced; food was given as he could take it, and afterwards steel medicine.

Most of these cases arise from the rupture of over-distended capillaries, rather than from ulceration, and we may generally give a very favorable prognosis. Where ulceration exists, and arteries are perforated by the disease, a fatal result sometimes ensues; several cases of this kind are recorded with ulceration of the stomach, in one of which, although fatal hæmorrhage took place, nearly all the blood passed into the duodenum, and scarcely any was vomited. Death, however, does occasionally follow without any ulceration being detected.

Case LXXXII.—*Hæmatemesis, vicarious Menstruation, aggravated Hysteria, simulating Fever.*—Mary H—, æt. 19, was admitted into Guy's under my care in May, 1855. She had enjoyed good health till she was sixteen years of age, when she said that she had a convulsion followed by "brain fever;" and on recovery began to vomit blood three days successively at her regular monthly periods; if this did not occur she had pain between the shoulders, at the epigastrium, and dyspnœa; this vomiting of blood continued regularly for three years, but she never menstruated properly. For nine months the discharge had ceased altogether, and three months before admission she had a severe hysterical or epileptic fit.

On admission she appeared stout, tolerably nourished, but prostrate; the tongue was dry and brown, and almost black; she lay motionless in bed, without speaking, and altogether refused food, sometimes groaning, and if taken from her bed appeared to faint. She complained of pain at the lower part of the back, and in the inguinal region; the abdomen was tympanitic and distended: she stated that surgeons had twice removed clots of blood from her; but my friend and colleague, Dr. Oldham, could find no enlargement nor disease of the uterus, and believed that an attempt had been made to divide the os uteri. She

refused to swallow food; the pulse was feeble and very quick. There was slightly increased antero-posterior curvature of the spine in the lower part of the dorsal region.

Milk was poured into the mouth, and she was *made* to swallow it; in this way a considerable quantity of food was taken.

Galbanum and zinc with aloes and myrrh were prescribed, and the bowels were thoroughly cleared by blue pill with colocynth and henbane, and by enemata of rue or soap. Local depletion was used from the groins by the application of leeches, and afterwards quinine and steel were given with wine, and sparks of electricity were taken from the spine; a shower bath was occasionally used.

The stomach retained food, and the patient soon became able to walk, and left the hospital in a few weeks convalescent.

This was one of the most severe cases of hysteria that we ever witness; and the disturbance of the stomach and alimentary canal were no doubt produced by the functional disease of the uterus, aggravated by treatment which I think few obstetricians would approve of. The vicarious discharge of blood from the stomach was not observed during the period she was in the hospital, but it is received on the testimony of the patient and her friends.

Case LXXXIII.—*Vicarious Menstruation from the Stomach.*—Ellen H—, æt. 23, was admitted under my care into Guy's Hospital, August 28th, 1860. She was a needlewoman, who had resided at Kingsland, and she had for several years been in feeble health, complaining of pain at the chest and palpitation of the heart, &c. Menstruation commenced when she was eighteen years of age, but the function had been irregularly performed, sometimes ceasing for four to eight months. For six months prior to admission, she had vomited blood at her menstrual periods, but occasionally she had menstruated regularly, and no hæmatemesis then took place; before the attacks of hæmorrhage, and for several days before menstruation, she had pain at the stomach and in the right side, loss of appetite, and nausea; the vomiting of blood then came on and continued for several days. She was a spare, and somewhat anæmic woman, with an anxious expression of countenance, and rather dark complexion; her symptoms were those of amenorrhœa with dyspepsia; and during the time that she remained in the hospital she complained of pain at the scrobiculus cordis, and sometimes also at the right side, and the pain was increased by food; there was occasional nausea, but no vomiting; the bowels were regular. Her general health was improved by preparations of steel and quinine, with a carefully regulated diet; but during the time she was in the hospital there was neither return of hæmorrhage from the stomach, nor was menstruation established. She continued under my care as an out-patient, and was afterwards re-admitted, suffering still from dyspepsia;

but she had had no return of hæmorrhage. The dyspepsia was again relieved.

In this case there was probably ulceration of the stomach, and we regard a periodical congestion of the mucous surface, and consequent rupture of minute capillary vessels, as the cause of the repeated hæmorrhage. Although during the time the patient was under observation there was no hæmatemesis, we have no reason to doubt her very positive assertion that for several months she vomited blood at the ordinary period of menstruation, and the discharge was in that respect evidently vicarious. Normal menstruation has since been established, and has continued regularly, but she has suffered occasionally from severe dyspepsia.

Case LXXXIV.—*Typhus Fever. Hæmatemesis.*—Ann M—, æt. 19, a hawker in the streets, was admitted into Guy's Hospital, February 2nd, 1859, and died February 4th. Fever existed in the house where she lived, and she had been ill for nine days. When brought to the hospital she had the symptoms of fever, with great depression, and with mottling and lividity of the skin; still she was rational. On the evening of the 4th, the eleventh day of fever, vomiting of blood took place, and blood was passed per rectum; in a few hours she died.

On *inspection* the lungs were healthy; the heart was firm but empty; the *stomach* was full of blood, and at the lesser curvature there were several minute depressions or erosions affecting only the surface, and not penetrating the entire thickness of the membrane; one, a little deeper than the rest, appeared to have a minute vessel at the base; but this fact could not be satisfactorily established. The duodenum was reddened and congested, and blood was found in both the jejunum and ileum, and the colon was also full of blood. No ulceration nor disease of the intestine was found; the spleen was large and soft, but the mesenteric glands, as well as the liver and kidneys, were healthy.

This instance of hæmorrhage could not be regarded as precisely analogous to those which sometimes occur when the character of the blood is changed, as in yellow fever, purpura, &c., for erosions existed in the stomach from which the blood escaped; but the prostration of fever doubtless rendered the hæmorrhage more persistent, and perhaps had an important influence in determining the minute ulcerations. The patient was about the age at which perforating ulcer sometimes occurs. In her case, the loss of blood led to a rapidly fatal issue.

PAIN AS A SIGN OF DISEASE OF THE STOMACH.

The two symptoms which are regarded as especially indicative of disease of the stomach are, perhaps, more than any other liable to mislead; we refer to *vomiting* and to *pain* in the region of the stomach; and we shall briefly enumerate the causes from which these symptoms proceed as the best safeguard against error. The explanation of the uncertain diagnostic value of these symptoms is found first, in the intimate connection of the nerves of the sympathetic plexus with all the abdominal viscera and with the spinal nerves; and, secondly, in the extensive distribution of the pneumogastric nerve, which supplies, in the abdomen, not only the stomach, but the duodenum, the liver, the pancreas, the kidney, and the supra-renal capsule; and, in the chest, the same nerve extends to the lungs and respiratory tubes, and communicates with the cardiac ganglia. And, again, it is frequently found that irritation of one set of branches of nerves manifest itself in the disturbed fuction of another part supplied by the same nerve, and that disease at the central origin of the nerve is shown at the peripheral branches; thus, pain in the ear is produced by a decayed tooth, the branches of the fifth pair of nerves supplying both the tooth and the ear; disease at the origin of the pneumogastric nerve in the brain, or of the pulmonary branches, is often manifested by a disturbed condition of the filaments supplied to the stomach, and vomiting is the result.

As a sign of disease pain is of doubtful value: oftentimes it is a certain guide to the locality, if not to the character of the morbid action; at other times, on the contrary, its presence misleads, or its absence disposes us to underestimate changes which may be going on in the system. Generally speaking, we find that the mucous membranes, except where they approach the outlets of their respective canals, are free from ordinary sensibility, and may undergo very marked changes in their condition without any painful manifestation. Acute disease may take place in the mucous membrane of the small or large intestine, in the mucous membrane of the kidney or bladder, with complete immunity from suffering. A similar fact is observed in relation to

the parenchymatous viscera; thus the substance of the liver or the kidney is often changed in a marked degree; and if disease, such as an abscess, forms in their structure without much distension, the patient may be unconscious of morbid change. On the contrary, in serous membranes an opposite condition is found to exist, almost any change is appreciated, and in sudden or acute disease the pain is often extremely severe in its character. We well know the stabbing pain of pleurisy, the agony of acute peritonitis, and the intense suffering of severe synovitis. In each of these latter diseases rest is a very essential element in the alleviation of the malady, and this rest can be attained to a great extent without the cessation of life. In pericarditis, on the contrary, we find, as for many years shown by Dr. Addison, that there is an absence of pain, unless there be pleurisy occurring at the same time; for in the pericardium, however desirable rest may be, movement must continue as long as life lasts.

In reference to pain as an indication or non-indication of disease we have to remark—

I. That acute inflammation and disease of the stomach may exist, with entire freedom from pain, if the mucous membrane only be affected. Acute gastritis is generally regarded as an exceedingly rare form of disease, excepting when produced by irritant poisons. This may be the case; but we are of opinion that in many instances the absence of pain has led to this belief. In the gastro-enteritis of children, and not very unfrequently in that of more advanced life, conditions of great irritability with cessation of the right functions of the stomach, and probably with hyperæmia, must be regarded as closely approaching the character of gastritis. However this may be, we have evidence from the action of irritant poisons that, while the mucous membrane only is affected by them, pain may be entirely absent, excepting that consequent on the violent muscular action exerted in the act of repeated vomiting. Thus in a patient who had taken a large dose of oxalic acid, violent vomiting was produced, with failing pulse, and a sense of exhaustion, but no pain. In a few days after taking demulcent forms of diet, she completely recovered. In an instance of poisoning by sulphuric acid, in which a large portion of the mucous mem-

brane of the stomach was destroyed, and although the patient survived eleven days, she did not appear to suffer from any pain at the stomach. The same fact was still more strikingly shown in an instance in which chloride of zinc had been taken; life was prolonged for three months; the absence of suffering was remarkable till eight days before death; and the pain then, we do not doubt, was due to the formation of an abscess in the left hypochondriac region. I have witnessed the same immunity from suffering in poisoning by arsenic, and by corrosive sublimate; and we are, I think, warranted in the belief that acute disease may take place in the mucous membrane of the stomach without any pain.

II. Organic disease of the *mucous* membrane, as for instance cancer, may be comparatively free from pain. It frequently happens in cancerous disease of the liver, that after death tubercles or growths of similar character are observed on the mucous membrane, and of which there had been no indication during life. Thus, a patient, aged sixty, who died from cirrhosis, and in whom after death a large villous growth was found attached to the anterior surface of the stomach, although the orifices were free, made no complaint of any pain at the stomach, neither was there any vomiting; and it is probable that the burning pain she had before admission was of the character often observed in ordinary dyspepsia, for she was of intemperate habits. The freedom from any obstruction at the orifices, and the growth involving only the mucous membrane, were, we think, the causes of the absence of pain. No supposition was entertained of the presence of this growth in the stomach during life.

III. Disease extending to the muscular or peritoneal coats produces generally severe pain, as observed in ordinary ulceration or cancer. This symptom is present as one of the most ordinary signs of the conditions just mentioned, often coming on directly after food has been taken. In several instances, in which the suffering was exceedingly intense, we have found branches of the pneumogastric nerve involved in the thickened, dense, and fibrous edges of the ulcer. In a case of this kind which I watched with much interest, the cause of death was gradually increasing exhaustion, as the consequence of the intense pain and constant vomiting. It was a young woman

aged twenty-one, who suffered from constant and severe pain, with progressive emaciation, continuing for many months, unrelieved by the administration or application of any anodyne that we possess. A month before death symptoms of acute phthisis came on; and, at the inspection a large chronic ulcer was found at the lesser curvature, and several branches of the pneumogastric nerve were traced to the edges of the ulcer, and some passing across its base were only covered by fibrous tissue.

IV. Over-distension of the stomach produces severe pain. The formation of the stomach and its peritoneal attachments are such as to allow of moderate distension in the performance of ordinary digestion; but whenever the distension becomes greatly increased, pain is the result.

V. Disease, especially of an acute kind, affecting the peritoneum, is also, with few exceptions, accompanied by severe pain. In reference, however, to the position of the pain in peritonitis, it is not always a certain guide to the precise seat of injury. A young woman, under the care of the late Dr. Golding Bird, was seized with sudden severe pain at the scrobiculus cordis and towards the left side, followed by rapid collapse; from the seat of the pain perforation of the stomach was diagnosed; it was, however, found to be perforation of the appendix cæci.

VI. Dr. Osborne has shown, that in some cases of gastric ulcer the position which gives the greatest ease to the patient may serve as a guide to the exact seat of the disease; that if the ulcer be on the posterior surface, lying upon the face would be the most comfortable position, and *vice versâ*. Food, on its entrance into the stomach, generally passes directly along the lesser curvature; and if the viscus be contracted, it would come in contact with an ulcer, whether placed on the anterior or posterior aspect of the median line of the curvature. If more distended, there might be less direct application to the diseased surface; in the case of severe suffering from gastric ulcer previously referred to, the patient appeared to be most easy when leaning somewhat forward and towards the left side, which would have the effect of allowing fluids to gravitate from the ulcer, as mentioned by Dr. Osborne. We have seen several cases which tend to confirm this opinion.

VII. In disease of the lesser curvature, near the pyloric orifice, pain is sometimes experienced by the patient as soon as the food enters the stomach, and, in some cases, this conveys the idea of disease at the œsophageal orifice. This fact may lead to the supposition that the œsophagus is the part affected, and the opinion may be strengthened by the rejection of food almost before it has reached the stomach.

VIII. Many conditions of functional disease are entirely free from pain. It is, indeed, well for us that there is such insensibility, otherwise the least deviation from healthy action might be followed by suffering, and the strict rules of a dyspeptic would be essential in ordinary life.

IX. The pain, in many functional diseases of the stomach, is exceedingly severe; but it is often produced by a malcondition of the nerves or nerve-centres, and it arises from the intimate connection of the spinal and sympathetic nerves. In some states of exhaustion the whole of the nervous system appears to be in a state of great irritability, and the sensibility of structures becomes greatly increased. We often find, in these conditions, that the stomach is incapable of bearing the presence of food; it is at once rejected, or produces intense pain, or flatulent distension ensues, or a sense of fainting; and the means best calculated to relieve are those which invigorate and strengthen the whole system. Of this class are the stomach diseases observed in connection with uterine disease, with loss of blood, exhaustion, mental anxiety, &c. The deficient nervous supply also interfering, perhaps, with the right secretion of the gastric juice.

X. The effect of a diseased condition of the pneumogastric nerve at its centre, or at its peripheral branches, in connection with stomach disease, is of great interest, and it is probable that pain is sometimes the result. We have, however, more frequently observed vomiting rather than pain produced by an irritable condition of the pneumogastric nerve.

XI. In some forms of functional disease of the stomach, in which severe pain comes on three or four hours after food, it is probable, as we have elsewhere stated, that extreme irritability of the pyloric orifice exists.

XII. In functional, as in organic disease, pain often arises

from distension of the stomach, consequent on chemical decomposition of the alimentary mass.

XIII. The absence of pain sometimes arises from the destruction of the pneumogastric nerve. This fact was remarkably shown in a patient suffering from sloughing at the extremity of the œsophagus; and in cancerous disease of the stomach the same thing has been observed.

XIV. Pain at the scrobiculus cordis, simulating disease of the stomach, often arises from spinal disease, the pain being referred to the extremity of the irritated nerve.

XV. Severe pain at the scrobiculus cordis is frequently present in chronic bronchitis and in obstructive valvular disease of the heart; in fact, from any state which leads to over-distension of the cavities on the right side of the heart. In these conditions we very generally find that food produces pain and flatulence, and is very imperfectly digested; the vessels of the stomach and of the whole of the chylopoietic viscera are much engorged, and the surface of the stomach is very generally covered with a thick layer of mucus, a state of chronic catarrh of the gastric mucous membrane being produced. Many observers, however, attribute the almost constant pain at the scrobiculus cordis in these instances to the over-filled cavities of the right side of the heart, and we are disposed to refer part of the distress to this cause.

XVI. In aneurism of the abdominal aorta we have sometimes observed pain of a most intense kind, and the disease might very readily have been mistaken for cancerous disease of the stomach with glandular infiltration, producing pressure upon the aorta. In one instance, which I watched with much interest, the aneurism existed at the position of the cœliac axis; it was rightly diagnosed, and the patient became exhausted and died from the intensity of the pain, the false sac not having given way. I dissected large branches of the sympathetic nerve spread out upon the surface of the tumour; and the intense suffering and fatal exhaustion appeared to arise from the implication of the nerve structures; no other cause of death could be found on very careful inspection.

Enough has been said to show that the most careful investigation of this symptom is necessary in order to form a correct diagnosis of disease of the stomach.

VOMITING AS A SIGN OF DISEASE.

The causes of vomiting are still more varied than those of pain at the stomach; and the importance of carefully estimating these causes is in proportion to their complexity; and although some of them are not connected with gastric disease, we still make brief reference to them. They may be divided into those which originate in the stomach and intestines, and secondly, into those which arise from alteration in the nervous supply elsewhere, either central or peripheral.

In the first division we must place—

1. Inflammation of the stomach; gastritis and gastro-enteritis.
2. Undigested food, or foreign bodies in the stomach.
3. Irritants and medicines.
4. Great irritability of the mucous membrane.
5. Ulceration of the stomach.
6. Obstructive disease of the pylorus.
7. Cancerous disease.
8. Acute peritonitis.
9. Pressure on the stomach, as in ascites and ovarian dropsy, in abdominal tumours, &c.
10. Diseases of the duodenum.
11. Hernia, intestinal obstruction, intussusception.
12. Pharyngeal and œsophageal regurgitation.

In the second division are—

1. Diseases of the liver and gall-bladder.
2. Diseases of the kidney.
3. Diseases of the supra-renal capsules.
4. Diseases of the uterus and ovaries.
5. Diseased conditions of the blood and general nervous system, as at the onset of exanthems, fevers, pyæmia, erysipelas, &c.; ague, yellow fever, and cholera may, perhaps, be classed among these as arising from blood change.
6. Diseases of the spine.
7. Diseases of the brain.
8. Diseases of the lungs.

I. There is something remarkable in the presence of vomiting in circumstances where pain is absent; thus, in acute disease of the stomach, where only the mucous membrane is affected, the patient may be free from all suffering at the region of the stomach, excepting that produced by the violent straining of the muscles during vomiting. We need not do more than refer to the instances of poisoning by oxalic acid, by sulphuric acid, by arsenious acid, and by corrosive sublimate, which have been already given as illustrations of this fact; and in the symptoms of gastro-enteritis the same immunity from gastric pain occurs, whilst vomiting greatly distresses the patient.

II. Undigested substances often remain in the stomach for some time without producing pain, unless they pass within the pyloric valve; and we sometimes find that they are retained for many hours or even days before they are rejected by vomiting.

III. In reference to vomiting caused by medicine and by irritants, it is only necessary to mention that in some instances the action appears to be one of primary irritation of the stomach, in others it is secondary, through the medium of the blood; but whether this secondary action and its consequent vomiting arises from the excretion of the medicinal substance from the mucous membrane of the stomach is doubtful; thus tartar emetic produces vomiting when injected into the blood equally as when taken directly into the stomach.

IV. We have referred, in our remarks on functional disease of the stomach, to states of extreme irritability of the mucous membrane in which food of every kind is at once rejected. This form of functional irritability we have found to be generally associated with uterine and ovarian disease; or it has been produced, apparently, by irritation of the pulmonary branches of the pneumogastric, to which we shall presently have to refer; but in some instances we have not been able positively to trace the complaint to one or other of these causes, and at present we must acknowledge, though unwillingly, as a cause of vomiting, functional irritability of the stomach itself. It is to this form of disease that Sir H. Marsh has given the name of regurgitative disease, in which food is rejected *without any effort*, and often without *corresponding*

emaciation. In his valuable paper on this subject, he refers to its connection with pulmonary and with uterine disturbance.

V. In ulceration of the stomach, vomiting often comes on as soon as food enters the stomach, or a period of variable length intervenes, the pain increasing till the rejection takes place.

VI. In obstructive disease at the pylorus, the vomiting is generally deferred till nearly the close of the digestive process; much, however, may be done to diminish this symptom by the administration of fluid diet, and one that does not easily undergo fermentation, so that sometimes several days elapse between the attacks.

VII. *Cancerous disease* affecting the orifices of the stomach constitutes a common cause of persistent vomiting. It must, however, be borne in mind that vomiting is not a constant sign of cancerous disease of the stomach; if the orifices be free, it may be entirely absent, although the disease is very extensive; and again, if sloughing take place, even when the orifices also are diseased, vomiting often subsides, sometimes in consequence of the obstruction being removed by the sloughing; at other times, apparently, from the destruction of the branches of the pneumogastric nerve. Further, the period at which vomiting occurs does not always indicate the seat of the cancerous obstruction; in some instances of obstruction at the pylorus, with disease at the lesser curvature, vomiting takes place immediately after food has entered the stomach, so as to convey the idea of obstruction at the cardiac orifice or in the œsophagus itself, and the symptom has been regarded as dysphagia rather than vomiting.

VIII. *Acute peritonitis*, especially when the gastric peritoneum is involved, is often accompanied with severe vomiting. The statement has been made, that vomiting does not take place in acute peritonitis unless the peritoneum in the neighbourhood of the stomach is implicated; but although this is generally, it is not constantly the case. Chronic peritonitis is also a cause of vomiting; so also local peritonitis and effusion near the stomach. In some of these instances the stomach is affected by its direct implication in the disease; in others vomiting arises from the pressure of effused pus or the constriction of adhesions.

IX. *Pressure* on the stomach is a direct cause of vomiting.

In *ascites* and *ovarian dropsy*, the stomach is sometimes so compressed that vomiting comes on soon after food has been taken, apparently from this cause alone; and when paracentesis has been performed, the pressure being removed, the sickness ceases. When glandular tumours in the neighbourhood of the pancreas or disease of the pancreas itself exert pressure on the stomach, the symptoms closely resemble primary disease of the stomach, and the diagnosis is exceedingly difficult; but, since the pancreas receives a branch from the pneumogastric nerve, it is not easy to ascertain how far vomiting in some of these cases is due to nervous irritation, and how far it is due to direct pressure. In those cases in which the pancreas has been diseased, without great enlargement and without pressure on the stomach or duodenum, I have not observed vomiting as a prominent symptom.

In *aneurismal disease* of the abdomen, the remark which we made in reference to disease of the pancreas and its glands holds good; and the same difficulty arises in determining how far the vomiting is due to pressure or to sympathetic irritation.

In some cases we have found direct pressure made by the patient at the scrobiculus cordis the cause of vomiting; many persons can thus at once empty the stomach; and in an instance of a boy, some years ago, in Guy's Hospital, it was only after very careful watching that the true character of the complaint and the deceit of the patient was ascertained.

X. As to vomiting not dependent upon the condition of the stomach itself, we have to refer to morbid states of other abdominal viscera, and first to disease of the *duodenum*, as inflammation of its mucous membrane, ulceration, and especially obstruction. There is great similarity between the diseased conditions of the first portion of the duodenum and of the stomach. In the first portion, for instance, ulceration produces many of the symptoms of like disease in the stomach. A form of dyspepsia in which vomiting, with pain at the seat of the duodenum, comes on at the close of digestion has been attributed to the duodenum; but whether this class of cases is connected with the abnormal irritability of the pylorus itself, we cannot affirm. Again, in some cases

of acute jaundice, febrile symptoms arise with violent irritability of the stomach, but without pain; and the disease has been attributed to mischief commencing in the duodenum, and extending to the biliary ducts. In some fatal cases of this kind, great congestion in the duodenum has tended to confirm the idea; so also the fact, that these symptoms have come on after intemperance.

XI. *In hernia, obstructive disease of the intestines, intussusception, &c., vomiting* is generally present. If the obstruction be in the small intestine, the vomiting comes on very quickly; but if the colon, sigmoid flexure, or rectum, be the seat of disease, vomiting is often postponed for a considerable time, unless irritant medicines and violent purgatives have been administered. As the vomiting continues, the ejected matters present the character of the fluids at the seat of obstruction, and if that obstruction be intestinal, their odour and appearance have more or less of a fæcal character.

XII. The regurgitation of food, rather than vomiting, which is consequent on disease of the pharynx, larynx, or œsophagus, must be distinguished from actual vomiting. By carefully observing the process of deglutition, the seat of mischief may be accurately ascertained. In paralysis of the muscles of the soft palate and of the pharynx, deglutition cannot be properly completed, and food is rejected through the nares; so also when the epiglottis is ulcerated from strumous, syphilitic, or cancerous disease, the act of deglutition is scarcely performed before the substance swallowed is violently ejected, and severe pain in the throat, and cough, are set up. It is remarkable, too, in these cases, how a solid bolus of food may be formed and swallowed, slipping beyond the diseased surface, whilst the smallest quantity of fluid produces most violent pain and distress. In obstruction of the œsophagus, the act of deglutition being already completed, regurgitation takes place. Very extensive disease may, however, affect the œsophagus without this rejection of food; for ulceration or sloughing may have removed obstruction, or the branches of the pneumogastric nerve and the whole wall of the canal may be destroyed. Vomiting in other cases is the manifestation of the general and intimate connection of the stomach with other viscera; it is produced by reflex irritation, and is properly

designated sympathetic in its origin; its study as a symptom, is of essential importance in the diagnosis of disease of the stomach. As to vomiting due to other extraneous sources we shall do little more than enumerate them; and the first of this class to which we allude is—

XIII. Disease of the *liver* and of the *gall-bladder;* large branches of the pneumogastric nerve extend to the liver, as well as numerous nerves from the large sympathetic ganglia. In gall-stone, violent vomiting is generally associated with intense pain; and in many conditions of hepatic disease the same symptom is constantly present.

XIV. In disease of the *supra-renal capsule,* vomiting is rarely absent; but sometimes it is a sign of such prominence as to simulate primary disease of the stomach. On post-mortem examination we have found arborescent injection of the mucous membrane of the stomach, and sometimes slight superficial ulceration; but it must also be remembered, that the pneumogastric nerve affords a branch to the supra-renal capsule, and that the connection of the capsule with the semilunar ganglia is a very intimate one.

XV. Diseases of the kidneys and renal calculus constitute other causes of vomiting. During the passage of a calculus down the ureter, vomiting is a very distressing symptom. In acute albuminuria vomiting is also associated with nausea; and in chronic albuminuria it is sometimes the precursor of a fatal termination. So severe, indeed, may be this symptom in ischuria renalis, as even to suggest the possibility of intestinal obstruction, as shown by Dr. Barlow. The vomiting in albuminuria is not only due to the direct connection of the nerves constituting the renal plexus with those of the stomach, but to the urea excreted from the mucous membrane of the stomach and intestines. It is found to be present in large quantity in the blood, and is separated in all the excretions and secretions; and in the stomach, this abnormal excrementitious substance appears to act as a direct irritant.

XVI. Both functional and organic diseases of the uterus and ovaries are causes of vomiting. In dysmenorrhœa, most distressing irritability of the stomach is occasionally set up; and in pregnancy, vomiting may be so severe as to exhaust and completely to prostrate the patient, and in ovarian dis-

ease, the gastric symptoms are often mistaken for primary disease of the stomach.

XVII. The remaining causes of vomiting arise from the condition of the nervous system, and are most interesting and important in the correct diagnosis of disease; the first of these is a diseased condition of the *spine*. The splanchnic nerves pass from the spinal cord to the large sympathetic ganglion of the abdomen, and constitute an intimate connection between these centres of nerve-force; in those diseases, however, of the spine in which we have observed irritability of the stomach, other sources of disturbance have been present.

XVIII. At the onset of *acute diseases*, especially the exanthems, the continued fevers, pyæmia, erysipelas, &c., vomiting is often present. It is not known how this is produced, whether directly by the altered condition of the nervous system, or secondarily from the state of the blood. Sudden nervous shock, fright, &c., will produce vomiting; and in some more chronic diseases, when the blood is altered in character, as in renal disease and even gout, the same symptom is occasionally very intractable.

Dr. Graves, in his 'Clinical Medicine,' makes the following valuable remarks in reference to this subject:—"Every fever which commences with vomiting and diarrhœa, whether it be scarlatina, or measles, or typhus, is a fever of a threatening aspect; and in all such fevers the practitioner should be constantly on the watch, and pay the most unremitting attention to the state of the brain. There is much difference between the vomiting and diarrhœa of gastro-enteritis, and this *cerebral diarrhœa and vomiting*. The latter sets in generally at a very early period of the disease, perhaps on the first or second day, and is seldom accompanied by the red and furred tongue, the bitter taste of the mouth, the burning thirst, and the epigastric tenderness which belong to gastro-enteric inflammation." He also states very truly, that in cerebral disease there is often a large quantity of bile rejected by vomiting, and passed also by stool; and that leeching the abdomen is less efficacious in cerebral inflammation than in gastro-enteritis.

Very little is known as to the proximate cause of vomiting in cholera and in yellow fever; but we sometimes find in the intermittents of our own country that vomiting is a prominent

symptom; and we have several times witnessed instances in which vomiting, excited possibly by uterine or hepatic mischief, assumed regular periodicity in those who had been exposed to miasmatic poison.

A young person, who had resided in a low, marshy locality in Cambridgeshire, presented this periodicity of symptoms in a remarkable degree. She was a phthisical subject, and the mucous membrane was very irritable. A tertian irritability of the stomach and intestines existed; on every other day there were vomiting and diarrhœa with coldness and chilliness. Long residence in a miasmatic district had probably given this periodicity to the symptoms, and aggravated her anæmic condition.

XIX. Irritation of the peripheral branches of the pneumogastric nerve in the abdomen has already been referred to as one cause of vomiting in disease affecting the organs to which they are supplied; but the same nerve may be changed at the peripheral branches in the chest, and at its origin in the brain. *Disease of the brain*, then, is another cause of vomiting, and one which it is important to bear in mind in the diagnosis of disease; too often the so-called bilious attacks of children are the first indications of acute hydrocephalus. The irritability of the stomach is sometimes so great, that vomiting is at once produced when the patient is raised from the recumbent position. The diagnosis of these cases is sometimes exceedingly difficult when commencing with symptoms of true gastro-enteric disease; but it would be well if the remark of the great authority in clinical medicine just quoted were borne in mind, that, "*in all feverish complaints, where during the course of the disease the stomach becomes irritable without any obvious cause, and where vomiting occurs without any epigastric tenderness*, you may expect congestion or incipient inflammation of the brain or its membranes." In simple cerebral disease the abdomen is generally collapsed; in primary abdominal disease there is, on the contrary, distension. This difficulty in diagnosis is not, however, limited to very young subjects. In strumous disease of the brain, the vomiting is sometimes excessive, and I have seen it associated with chlorosis and anæmia.

After concussion of the brain, vomiting comes on; and in

some cases, when inflammatory disease has followed and suppuration has taken place, the vomiting is excessive. One of the most severe cases of secondary vomiting which I have ever witnessed was of this kind. A man in middle life had received a blow at the back of the head; cerebral symptoms came on, and suppuration took place at the origin of the pneumogastric nerve; the membranes were adherent at that part for the space of half an inch, and about half a drachm of pus was effused. The vomiting was excessive; anything swallowed was rejected with violence beyond the extremity of his bed.

XX. Disease of the lungs, or irritation of the pulmonary branches of the pneumogastric nerve, is the last cause of vomiting to which we refer. The vomiting in whooping-cough appears to be of this kind, and equally so the vomiting which is often present at the early stage of phthisis; the same symptom may occur in acute as well as in chronic disease of the lung. Sir Henry Marsh has mentioned early phthsis as one of the causes of the irritability of the stomach, to which he has given the name of regurgitative disease; and too frequently it leads to the unfortunate expression, that the symptoms of early consumption are "all stomach." It seems that as the pulmonary disease advances, and disorganisation takes places, this condition of irritability is lessened, although we often find that the paroxysms of cough are productive of violent vomiting.

Many interesting physiological questions in reference to vomiting might have been dwelt upon; but sufficient has been stated to show that it is impossible satisfactorily to diagnose and to treat disease of the stomach without duly recognising the value of each symptom in its general bearing; and further, that the most effective manner of alleviating *any* symptom, however distressing, is not by the treatment of that symptom, but by the removal of its cause.

The importance cannot be over-estimated of distinguishing between vomiting of cerebral, spinal, or nervine orgin, and that which arises from gastric or other abdominal disease.

CHAPTER VII.

DUODENUM.

The symptoms which have been regarded by some writers as proceeding from disease of the duodenum have by others been referred to states of the liver, of the stomach, or of the pancreas.

My own observations, and the facts which I adduce in the following remarks, show that there are symptoms of disease justly attributable to this portion of the alimentary canal; and that in some cases we may, with care, satisfactorily diagnose that the duodenum is diseased. The peculiarities of its position and structure deserve our careful attention. Extending from the pyloric extremity of the stomach to the jejunum, it is about twelve inches in length, and may be divided into three nearly equal portions; the first is the most movable, is almost surrounded by peritoneum, and is horizontal in its direction; it may be called the pyloric or stomachic portion of the duodenum, for it is associated with the stomach in its diseases. The second is vertical in direction, closely fixed near to the crura of the diaphragm, and to the vena cava; it receives the common bile and pancreatic ducts generally by a single opening, and is hepatic in its morbid relations. The pancreas is situated on the left side of the second portion; and the vena portæ, the hepatic artery, and the branches of the pancreatico-duodenal artery are also in relation with it. The third is horizontal in direction, and is simply intestinal in its function; the pancreas is situated above it; in front the superior mesenteric vessels enter the mesentery, and behind it are placed the aorta and the vena cava. The three portions of the duodenum are situated on *different planes*, the first portion being near to the anterior abdominal parietes, whilst the third part

is immediately upon the spine; and this arrangement allows the contents of the canal mechanically to gravitate quickly into the jejunum, and assists also the discharge of bile from the ducts.

The muscular layers of the duodenum are double; a circular and a longitudinal coat, as in other portions of the small intestine. The mucous coat is covered with villi, which commence at the duodenum, and soon become exceedingly numerous; so also the valvulæ conniventes are gradually developed, till we find them as large as in the jejunum. The whole of the surface is studded over with Lieberkühn's follicles; not unfrequently, expecially in young subjects, there are solitary glands, as in the jejunum and ileum. There are also the glands of Brunner, minute compound glands peculiar to the duodenum, and which are situated beneath the substance of the mucous membrane; these commence a few lines from the pylorus, and extend about as far as the common bile duct; their function is not definitely known, but they are believed to resemble minute salivary or pancreatic glands. It sometimes happens that the solitary glands are so distinct, that they may very easily be mistaken for Brunner's glands; the latter are, however, situated beneath the mucous membrane, and microscopical examination at once manifests their difference.

There is still another point in connection with the duodenum that deserves consideration, and which indicates its close connection with the stomach and with the liver. The pneumogastric nerves, branches of which supply the stomach, and also the liver, send filaments along the first portion of the duodenum, continued onwards from the lesser curvature of the stomach; this associates that part of the duodenum very intimately with the stomach. Besides this nervous supply we have, according to the observations of Meissner and Auerbach, minute plexuses of nerves, both in connection with the mucous and muscular coats.

The pancreatico-duodenal artery, which supplies the greater part of the duodenum, is from the hepatic, and the pyloric branch of the coronary extends into the first part of the duodenum, so that in the arterial supply we find the same association.

State of secretion.—The secretion is stated to be alkaline, and such is probably the case; the acid reaction after death arising from the gastric juice, which has gravitated through the pylorus. Whether a patulous, feeble contractile power in the pylorus, allowing the secretions of the stomach to pass at irregular periods into the duodenum, is the cause of the discomforts associated with these forms of dyspepsia, we have no data on which to form an opinion. Corvisart states that the pancreatic fluid discharged into the duodenum has the power of dissolving albuminous substances; this opinion is, however, controverted by Dr. Brinton; the former describes duodenal dyspepsia as arising from an abnormal condition of this secretion.

Congenital malformation.—The duodenum sometimes has a double sigmoid curvature—a peculiar arrangement which I observed in a patient who died from intestinal obstruction. The ascending colon was adherent to the sigmoid flexure, and the cæcum, twisted upon itself, was situated in the left hypochondriac region. The person had been born at the seventh month, and the cæcum was preternaturally free.

In a cyclopean monster, I found the viscera of a double fœtus in a single peritoneal cavity; a double œsophagus was united in a single stomach, with a large convexity extending across the abdomen; and a single duodenum, placed vertically, received the biliary pancreatic ducts on either side.

Diverticula are exceedingly rare as compared with those which arise from the lower part of the ileum; but small pouches are more frequently present, and they consist generally of mucous membrane, thus constituting a sort of hernial protrusion. In the museum of Guy's is one of these situated near the opening of the duct into the duodenum.

Some believe that the duodenum becomes distended with flatus, or with retained chyme, as the result of indigestion; and where there is mechanical obstruction, which we shall afterwards describe, this may be the case. It is possible also that an enormously distended transverse colon may impede the free passage of the contents of the third portion, but such is problematical. The distension which has been supposed to arise from the duodenum, will generally be

found to be distension of the stomach or the transverse colon; for the duodenum passes quickly to a lower level, and I believe its contents at once gravitate into the jejunum.

As to the strictly pathological states, we find congestion sometimes active, more frequently passive; ulceration, cancer, and lastly mechanical obstruction are also noticed.

To some it may appear altogether futile to speak of congestion or hyperæmia of the duodenum, but observation of the appearances after death convinces me that marked changes occur, and that in some instances a careful investigation might have pointed out their existence during life.

Great congestion of the duodenum is found in various diseases in which a similar condition extends to the whole tract of the alimentary canal, as in disease of the mitral valve, and in portal obstruction in hepatic disease; but there are other cases in which we find active congestion, especially in acute pneumonia. The latter state of acute hyperæmia is illustrated in the following case:

Case LXXXV.—*Inflammation of the Bronchi, of the Bile-Ducts, or Biliary Hepatitis, &c. Acute Congestion of the Duodenum.*—Thomas H—, æt. 42, was admitted into Guy's Hospital, March, 1852; he had been ill for three weeks. He was a large, stout man, who for fourteen years had been in the police service; his habits of life had been very intemperate. Four years previously he had received a severe blow in his right side from a prize-fighter, and for some time he had been subject to vomiting in the morning, and the bowels had at times been much relaxed; before admission jaundice came on; he had had more anxiety of mind than usual, and gradually became languid and icteric. For four days his legs had swollen, afterwards his abdomen, and his strength became prostrated. The skin was of a dusky yellow colour; the tongue was dry, brown, and furred; respiration 44; the pulse 100, soft and compressible; the abdomen was much distended with flatus, and fluctuation could also be felt; the liver extended several inches below the ribs, and there was tenderness on pressure in that part. In the chest there were general bronchial râles; he was delirious at night, and slept but little; the motions were light in colour, the bowels relaxed, the urine contained lithates and the colouring matter of bile. Three days after admission he was more prostrate, and was delirious; the pulse was very compressible; he had pain in the right hypogastric region, and on the following day he died.

On *inspection* severe capillary bronchitis was found; the larger bronchi were also diseased; they were somewhat congested, and contained yellow-coloured tenacious mucus. The heart was large, and had around it a considerable quantity of fat; the right ventricle was thin;

the left ventricle had undergone partial fatty degeneration. The valves were healthy, with the exception of slight thickening of the mitral. *Abdomen.*—There were several pints of yellow serum in the peritoneum; the intestines were considerably distended with flatus, and the liver extended several inches below the ribs. The duodenum contained *bloody mucus, the lining membrane was very much congested, and in some parts ecchymosed.* The lower part of the small intestine contained clayey fæces. There was a considerable quantity of fat in the omentum, and in the abdominal parietes.

The liver weighed 7 lbs.; its surface was smooth, and of a deep greenish-yellow colour, and some veins were seen upon it; the acini were whitish in colour. The section of the liver appeared coarse along the smaller branches of the vena portæ; the capillary vessels in Glisson's capsule were much distended, and some of them were quite turgid with blood. The smaller biliary vessels contained tenacious mucus, and their lining membrane was congested; this state of the bile-ducts contrasted remarkably with the pale colour of the veins. The cells of the liver were gorged with fat, some of them were distended with oil-globules; other hepatic cells appeared ruptured, and granules with oil-globules were dispersed upon the field of the microscope. The deep green spots did not present any cells, but only granular matter.

The larger bile-ducts were free, but the opening into the duodenum was very much congested; the gall-bladder was empty; the kidneys were large and congested; the spleen was firm, and contained several fibrinous masses.

The health of this man was much impaired by his intemperate habits, and his liver had probably been diseased for a considerable period. The affection of the chest came on subsequent to his admission into the hospital, and consequently after the jaundice. There was evidently acute disease of the smaller biliary tubes, as indicated by the congestion of Glisson's capsule, by the congestion of the lining membrane of the biliary tubes, and the tenacious mucus they contained; the hepatic structure was stained with bile. The bronchitis which subsequently took place was, perhaps, the cause of the fatal termination, and tended, doubtless, to increase the congestion of the mucous membrane. The very congested state of the duodenum near the entrance of the bile-ducts indicated an extension of disease from the duodenum to the bile-ducts, or *vice versâ;* it was much more *localized* than is observed in the secondary congestion of the mucous membrane in pulmonary obstruction. This did not appear to be an affection in which

much benefit could be obtained from the administration of mercury, but rather from salines with sedatives.

After burns the mucous membrane of the duodenum has been found greatly congested, and in several cases recorded by Mr. Curling in the 'Medico-Chirurgical Transactions' this part of the intestine was ulcerated. This statement has not been confirmed by the observations of Dr. Wilks, recorded in the 'Guy's Reports' for 1856. I witnessed many of the cases to which he refers; and although in some the first part of the duodenum was hyperæmic, in none did I observe ulceration. A case of ulceration of the duodenum after a burn has, however, been placed in the Museum at Guy's, by Sir Wm. Gull. The child survived twenty-five days, but died comatose; a small cicatrizing ulcer was found in the first part of the duodenum.

Since the former edition of this work was written three cases of ulcer of the duodenum after burns have occurred at Guy's.

In one the patient was admitted for an extensive scald, and died thirteen days after admission. The duodenum contained two small ulcers, one the size of a pea, the other of a hemp-seed, and Brunner's glands were swollen. The ulcers appear to have had nothing to do with the man's death.

The second, a male child, æt. 4, died nineteen days after a severe burn of the lower extremities. He was doing well, and the burn was healing, when three days before death he began to pass blood into the bed. A large ulcer was found in the duodenum, and the pancreatico-duodenal artery was opened. The child had also two small ulcers on its tongue, extending through the mucous membrane.

The last case occurred in a girl, æt. 13, who died from tetanus about thirteen days after an extensive burn. The stomach was ecchymosed, and immediately beyond the pylorus was a small ulcer with thick raised edges. The thickening was considerable, so as to cause a suspicion that the ulcer antedated the burn. There was irregular injection around it.

The pathology of such cases is still involved in much obscurity. Embolism and necrosis of tissue from blood extravasation after congestion have been suggested, as we

have already mentioned, in stating the hypothetical explanations of acute perforating ulcer of the stomach.

Mr. Curling describes diarrhœa, and the discharge of blood, as having arisen from this condition of the duodenum, and sometimes severe hæmatemesis and prostration. In some instances death took place from peritonitis consequent on perforation. After such severe injury to the skin, it is not surprising to find great disturbance of the circulation or of the internal organs, and especially of the mucous membranes, which are known to sympathise so closely with the skin; in some of these cases stimulants appear to have been administered freely, and these have probably conduced to this diseased appearance of the duodenum.

Chronic congestion produces grey discoloration of the mucous membrane; and in the examination of the discoloured part we find that the deep colour is produced by the deposit of irregular grains of pigment, very thickly placed in the substance of the mucous membrane, near to its upper surface, and probably in the coats of the capillaries; the apparent explanation of this state being, that gastro-enteritis, or long-continued hyperæmia, has been followed by the deposition of hæmatine or pigment in the substance of the membrane.

In several cases of this grey discoloration the appearance, both in children and in adults, has been uniform. A child, æt. 9, a thin, poorly nourished, pale boy, who had been subject for some time to looseness of bowels, whilst running, hurt his thigh; he shortly afterwards complained of pain at that part; he was admitted into Guy's in a typhoid state, and died two days afterwards. There was suppuration in the brain, and grey discoloration of the mucous membrane of nearly the whole of the small and large intestines.

Chronic congestion is observed, as before stated, in connection with pulmonary and hepatic congestion, in fact, in any disease which leads to distension of the vena portæ; and we also find a less general condition of congestion of the first part of the duodenum in disease of the pylorus, whether it be simple fibroid degeneration and hypertrophy, or true cancerous disease. The mucous membrane becomes thickened, its vessels congested, and its glands enlarged; sometimes,

indeed, so much so that the glands might easily be mistaken for minute cancerous tubercles. The continued irritation thus leads to hypertrophy of the glands of the mucous membrane, as we find in other similar structures.

The duodenum is sometimes found, after death, to be filled with blood, and a coagulum is occasionally moulded into its exact form. This is due to extravasation of blood from ulceration and perforation of an artery, in the duodenum or in the stomach.

As to the symptoms arising from the conditions just described, they appear to be so continually bound together with those indicative of simple disease of the contiguous viscera, that definiteness and certainty cannot be attained. The vomiting and pain connected with hepatic disease and gall-stone are possibly due partly to the condition of the duodenum. In the latter there is probably spasmodic contraction of the canal; but of this we do not speak with certainty. In the cases described by Mr. Curling, vomiting was a frequent symptom; and the bilious evacuation in violent vomiting indicates that the first and second portions of the duodenum have been involved.

Instances are not unfrequently met with in which, several hours after food, there is pain at the region of the duodenum, perhaps with violent vomiting, faintness, pallor of the countenance; and these symptoms have by some persons been referred to the duodenum, as a form of *duodenal dyspepsia or inflammation;* by others to the pyloric valve; but occasionally jaundice follows, which appears to strengthen the former supposition. After intemperance, also, violent bilious vomiting, a furred state of the tongue, loss of appetite and loathing of food, diarrhœa, tenderness of the right hypochondriac region, are followed by jaundice; and we are prone to regard the duodenum as being in, at least, a state of great hyperæmia. Exposure to cold, with great mental anxiety, tends also to promote this state of duodenal disease; and the mischief appears to be propagated to the bile-ducts. Sir H. Marsh has drawn attention to the occurrence of jaundice with disease of the duodenum, in the 'Dublin Medical and Surgical Journal;' so also Dr. Stokes, in the 'Encyclopædia of Practical Medicine.'

Congestion of the duodenum is best relieved by diminishing portal and hepatic engorgement, and by stimulating the abdominal excretory organs to increased action. These objects may be attained by giving saline and mercurial purgatives, by aperient enemata, and by the application of leeches to the anus or to the scrobiculus cordis. A free dose of calomel, blue pill, or grey powder, followed by a saline aperient draught, often acts very effectively as a purgative; but in many instances, especially where the morbid condition arises from chronic pulmonary disease or obstructive disease of the heart, small doses of mercurials may be very advantageously combined with squills and foxglove, so as thoroughly to act on the abdominal excretory glands; but to give mercury so as to produce salivation, or to prescribe it in every instance where bilious fluid is rejected, appears to be an unwise course. The most bland nourishment should be given, and abstinence from stimulants should be enjoined; ice and cold drinks often afford great relief when vomiting distresses the patient. In acute hyperæmic states, salines, as the solution of potash, the bicarbonates of potash or soda, the carbonates or the citrate of magnesia, may be given with diuretics in effervescence or otherwise, as the individual case may require. But in chronic hyperæmia, where there is profuse secretion of mucus, more advantage will be found from the dilute nitric or nitro-hydrochloric acids, with laxatives, as taraxacum, or with cinchona, and from the old compound gentian mixture of the London Pharmacopœia.

The most *acute* form of *inflammation* is sometimes observed after the administration of poisons. In a case of poisoning by sulphuric acid, where several square inches of the mucous membrane of the stomach had been destroyed, the duodenum was found intensely congested, and covered throughout by a thin, adherent, diphtheritic membrane. In this case the vomiting and dysphagia disappeared on the third day, and the patient, though extremely prostrate, did not appear to suffer much from pain. Arrowroot, lime-water, and milk, &c., were administered, and for a week it was thought that the patient might rally. (See "Diseases of Stomach.") In ordinary practice, however, we do not meet with this form of disease.

Ulceration of the duodenum varies both in degree and extent; sometimes it is merely superficial, and is associated with other diseases, as in a patient who died from albuminuria with pericarditis, in whom the duodenum presented superficial ulceration, the result of erythematous or acute inflammation; or there may be chronic ulcer, resembling that found in the stomach, and presenting many symptoms in common with that disease.

Some duodenal ulcers have raised and thickened edges, with depressed centres, being evidently of slow formation. They are mostly found in the first portion of the duodenum; and since this part of the intestine is almost surrounded by the peritoneum, we sometimes have fatal peritonitis, produced by perforation, as in the stomach, the muscular and peritoneal coats being also destroyed by the ulcer; or adhesion takes place with the adjoining structures, as the liver and pancreas, &c.; and these oftentimes constitute the floor of the ulcer.

Several cases have come under my own notice the early symptoms of which were exceedingly slight, till sudden and fatal peritonitis had been set up by perforation. In some instances these ulcers have been associated with violent vomiting, the persistence and aggravation of which were attributed to this diseased condition; this occurred in a young woman, aged twenty-four, who was admitted into Guy's Hospital with very urgent vomiting; the pulse was small and frequent; she was pregnant, aud died in a short time from peritonitis; a small ulcer was found in the duodenum.* The vomiting was probably referred to sympathetic irritation from the uterine state; and a favorable prognosis would in many such cases have been given till the symptoms of peritonitis came on.

The second portion of the duodenum is, however, also liable to ulceration, as in a case preserved in the museum of Guy's, where the coats of the whole of the vertical portion on the pancreatic side were destroyed, and the pancreas formed the base of a large chronic ulcer, in the centre of which was seen the opening of the biliary and pancreatic duct. There was a small ulcer in the third portion of the duodenum; and

* Dr. Hodgkin on 'The Pathology of Serous and Mucous Membranes.'

and peritonitis had been set up; the pancreas was enlarged. The patient was forty-four years of age, and had empyema; he became exceedingly emaciated before death, and suffered from vomiting as well as from melæna.

Ulceration is sometimes followed by constriction; and adhesions also frequently form between the first part of the duodenum and the gall-bladder; in some, ulceration extends from the gall-bladder into the duodenum, thus allowing the passage of calculi; and the gall-bladder is, in other cases, entirely obliterated.

Pain several hours after food, a sallow complexion, furred tongue, feebleness of circulation, mental depression, nausea, and irritable bowels, have been ascribed to ulceration of the duodenum, but the facts do not fully warrant this conclusion. In the several instances we have observed there were no such indications; in some, the ulceration was associated with disease of the gall-bladder; in others, with chronic disease of the liver; and the predisposing and exciting cause of the hepatic disturbance had probably induced the duodenal mischief.

Ulceration of the duodenum must be remembered both as a source of fatal perforation and of intestinal hæmorrhage, as well as of hæmatemesis.

The treatment of these cases is similar in all respects to that recommended for corresponding gastric disease.

Case LXXXVI.—*Ulceration of the Duodenum. Perforation.*—George E—, æt. 30, a man of light complexion, and of steady and temperate habits, was admitted into Guy's Hospital, October, 1851. He was by trade a surgical instrument maker, and accustomed, when at work, to exercise pressure against the umbilicus. Four months before admission he had slight expectoration of blood, but it was doubtful whether it proceeded from the lungs or stomach. On October 20th, whilst apparently in good health, he suddenly experienced severe pain in the abdomen; to use his expression, he was "doubled up;" he fell down in a fainting state, and was taken into a druggist's shop, where ammonia and some castor oil were administered. The pain was situated on the right side. On admission, he was in a state of collapse; the pain of which he complained passed in the course of the ureter. On the following morning he was exceedingly depressed, the skin hot, the abdomen tender, and there were the symptoms of general peritonitis; vomiting of coffee-ground fluid came on, and pulsation was felt at the scrobiculus cordis, which suggested the idea of aneurism. He survived fifty-six hours. On examination, the peritoneum was found to be intensely inflamed; lymph was effused, and castor oil was found floating

in the peritoneal cavity. At the first part of the duodenum, about one inch from the pylorus, an ulcer was found of the size of a shilling; and at its base there was a circular opening, the third of an inch in diameter. In the stomach several small aphthous ulcers were observed, and two small ones were covered with coagula. The remaining parts of the small intestine were healthy; so also the cæcum, colon, kidneys, spleen, and liver.

In the chest there were old pleuritic adhesions on both sides, especially on the left, where there was also a small vomica, with indurated lung, and thickened tubes.

The patient was only thirty years of age; and, as he believed, in good health, though evidently of feeble constitutional power, as indicated by the condition of the lungs and the previous hæmoptysis; he was doubtless phthisical, but the disease of the duodenum resembled, in its insidious character, corresponding disease of the stomach, and gave no previous indication of its existence.

The treatment of the patient, before his admission, precluded all chance of recovery; but such, unfortunately, is too frequently the case. Brandy and castor oil, probably both, found their way into the peritoneal sac; and the necessary removal of the man, at first into a druggist's shop, then to his own home, and afterwards a considerable distance to the hospital, tended to induce increased extravasation and peritonitis; the judicious administration of opium prolonged life many hours.

As to the cause, the stooping posture at his work probably assisted to produce the disease; but this is involved in much obscurity.

The position of the pain did not point out the seat of the perforation; but this is only what has frequently been observed in cases of gastric ulcer; the pain was principally in the right iliac fossa, and it was believed that the ileum, or appendix cæci, had given way.

Mr. Travers, in the 'Medico-Chirurgical Transactions,' mentions a case of perforation of the duodenum, about a finger's breadth from the pylorus, in a gentleman, aged thirty-five, who was strumous, but considered to be in good general health. There was a large irregular ulcer in the first part of the duodenum, with a small perforation, which had led to fatal peritonitis and death in thirteen hours; the

perforation took place a short time after a meal, the period at which such accidents are generally found to occur.

CASE LXXXVII.—*Chronic Ulcer in the Duodenum. Carcinoma of the Liver. Jaundice. Granular Kidneys. Obliteration of the Bile Duct.*—George C—,æt. 46, was admitted into Guy's Hospital December 14th, 1853, and died January 4th. For a fortnight he had had jaundice, vomiting, and typhoid symptoms, and for three months, after exposure to cold, œdema of the lower extremities had been present. In the liver there were from six to ten carcinomatous tubercles; the bile-duct was obliterated near its opening into the duodenum, and throughout the liver the ducts were very much distended; the cells of the liver were normal. In the first portion of the duodenum there was a chronic ulcer, about an inch in diameter, with raised thickened edges, but not cancerous in its character; the rest of the intestine was healthy; the kidneys were large, and their surface irregular and granular.

The disease in the duodenum was not discovered till after death; the cancerous condition of the liver, inducing pressure on, and obliteration of the ducts, and the albuminuria appeared sufficient to explain all the symptoms. The ulcer in the duodenum, however, was in a chronic and passive condition, but nothing was ascertained as to its cause; we suppose that intemperance increased it. We rarely find such a complication of disease as cancer of the liver, acute disease of the kidney, and the condition of the duodenum just mentioned.

CASE LXXXVIII.—*Strumous Disease of the Abdomen. Perforating Ulcer of the Duodenum and Cæcum.*—Jane B—, æt. 18, was admitted into Guy's Hospital February 19th, 1860, and died October 4th. At first the most prominent symptom was vomiting, which was supposed to be hysterical; but after a time the abdomen began to swell, diarrhœa came on, and emaciation, &c., increased, and these signs indicated the presence of organic disease. *On inspection,* the body was much emaciated; the legs were œdematous. The pleura was opaque, from the recent effusion of lymph, and the lungs were studded with tubercle. The peritoneum was acutely inflamed; the intestines were reddened, and there was lymph upon them; there were tubercular masses upon the peritoneum, covering the liver. On withdrawing the cæcum, a small collection of offensive pus was found at its posterior part, and the abscess communicated with the cæcum by means of an opening about an inch above the ileo-colic valve. At the seat of perforation was a transverse ulcer, the edges of which were injected; the ulcer was one inch in length, and the opening one third of an inch. A few other ulcers were observed in the colon, but none were found at the termination of the ileum. The mesenteric glands were enormously infiltrated

with cheesy deposit; so also were the lumbar glands. Behind the first portion of the duodenum, and close to the pancreas, was a collection of offensive pus in front of the spine. This abscess communicated with the first portion of the duodenum by an opening about a quarter of an inch in diameter; the ulceration of the mucous membrane was more extensive than the external opening; and near to the perforation was a second smaller ulcer involving the mucous membrane. The first portion of the duodenum appeared to be contracted. The stomach was healthy; so also the kidneys. The spleen contained a softening strumous mass. The liver also was fatty.

Although the history of this case is imperfect, I have introduced it as an illustration not only of the obscurity of strumous disease in its earlier stage, but as an instance of irritation of the duodenum and colon, followed by ulceration and perforation, and producing peritonitis, at first of a local, but afterwards of a general character. The perforations in both situations were not directly into the serous cavity; the abscess connected with the duodenum was close to the pancreas upon the spine, and the one in the colon was placed behind the cæcum.

In an interesting case of hæmatemesis under my care in Guy's Hospital in 1875, the hæmorrhage which proved fatal was supposed to have come from the stomach, but on examination after death, it was found that a large ulcer in the duodenum had perforated the intestine, and led into a sloughing abscess in the portal fissure, with which the vena portæ communicated by an ulcerated opening partially filled by clot; the common bile-duct and hepatic duct were also divided; the hepatic artery was obliterated.*

It is probable that this perforation of the duodenum was from without, as was also the case in a patient under my care in 1866. A woman, aged 46, died a few weeks after admission, and a large abscess was found on the right side of the abdomen in the neighbourhood of the ascending colon, along which it extended to the duodenum, where it opened by a rounded aperture an inch beyond the pylorus. The stomach contained a little altered blood. The patient had also cancerous disease of the gall-bladder, which, however, had no apparent connection with the peritoneal abscess.

* ' See ' Path. Trans.,' vol. xxvii, 1876.

CASE LXXXIX.—*Gall-stone. Ulceration of Gall-bladder and Duodenum. Large Gall-stone impacted in the Jejunum. Death from Hæmorrhage.*—A. B—, æt. 56, had suffered from loss of appetite and mental depression for some time, due to family anxiety and trouble. He was a strong, muscular man, rather stout, and he had generally enjoyed good health. On November 29th, after a late dinner, severe pain came on in the region of the stomach, and for several hours was very intense; there was vomiting, and the pain extended to the back. On the following day the intense pain had subsided, but left soreness at the stomach, at the scrobiculus cordis, and in the region of the gall-bladder. He had no appetite, and the tongue was furred; a purgative was given and saline medicine. On December 2nd he had become jaundiced; the pulse was good, but the tongue was furred; there was no appetite for food, but much mental depression, The symptoms of jaundice gradually lessened. On December 15th the urine was still deep in colour, but the motions were less pale. He lost the pain at the stomach, regained his appetite, the urine became normal in colour, and he was able about Christmas to visit his friends; the skin, however, did not completely regain its colour. On January 12th he returned to town, feeling tolerably well, but during the night nausea came on. On Saturday, 13th, sickness supervened, and he took blue pill with colocynth; the bowels acted a little. On 14th the vomiting persisted, and saline effervescing medicines were prescribed; in the evening vomiting of blood occurred mixed with acid fluid. On Monday, January 15th, I saw him in consultation. The stomach was very irritable; everything was at once rejected; the pulse was quiet, 80; temperature normal; the abdomen was full, but there was no tenderness; he complained of soreness across the abdomen, just above the umbilical region, and hardness could be felt at the scrobiculus cordis, which was thought to be the left lobe of the liver; there was no fixed pain, and no evidence of hernia. Bismuth medicine in effervescence was given, and a dose of calomel with colocynth. On the 16th he was rather easier, but there was no action from the bowels; the pain increased in the afternoon; the calomel and colocynth were repeated, and an injection used. On January 17th there was still no action of the bowels; a dose of castor oil was followed by violent vomiting of brown acid fluid; no flatus was passed; the pulse was 80, temp. 98°, the respiration easy; the abdomen was full and supple, and tympanitic, there was soreness in the epigastric region; no peristalsis could be seen. It seemed evident that there was obstruction in the bowels; purgatives were not repeated, but a grain of opium was given, and a turpentine enema was used. On January 18th.—The opium given night and morning had relieved the sickness; a full injection of oil and afterwards soap-and-water produced a discharge of hard scybala. Still there was no free action from the bowels; the pulse was 80, temperature still normal, the abdomen as before; the urine was normal in colour, tolerably free in quantity, sp. gr. 1017, and it contained a trace of albumen. On the 19th he felt better in the

morning, but as he could not pass urine freely a hip-bath was allowed. About 4 p.m. faintness came on, and he again vomited blood. The patient became restless. Still there was no action from the bowels; no flatus was passed, but the urinary bladder being distended a catheter was introduced, and about a pint of urine drawn off. Ice was applied externally, and some was swallowed, and astringents given. Nutrient injections were used repeatedly. At 10 p.m. he had rallied; about a pint of blood mixed with acid fluid had been rejected. On January 20th, about 5 a.m., more blood with clots were vomited, but he again rallied. On the 21st he had return of vomiting several times; in the evening he got out of bed, again vomited blood, faintness followed, and he died about 8 p.m.

Post-mortem examination by Dr. Goodhart twenty hours after death.—Abdominal wall thickly coated with fat. On opening the abdomen, the omentum and liver were found adherent to the abdominal wall in front at the upper part. The jejunum was much distended and dark in colour; on tracing the small bowel from the cæcum upwards, the ileum was small and paler till its upper part was reached. Here it was blocked by a gall-stone of black colour, somewhat irregular in shape, with a facet at either end of its long diameter, and measuring about $1\frac{1}{4} \times 1\frac{1}{2}$ inches. It moved about in the bowel under external manipulation with considerable freedom, though it would not pass far, and it quite filled the canal. Below, the bowel was empty or nearly so, and above, it was considerable dilated, and contained clayey and brownish pultaceous fæcal matter. The mucous membrane where the stone lodged was superficially ulcerated in some parts. About three inches higher up was a smaller gall-stone more like a fragment than a distinct calculus It lay loose in the intestine with some fluid, brownish fæcal matter, and was easily crushed between the fingers. Nothing else abnormal was found till the duodenum was reached. On raising the right lobe of the liver the first part of the duodenum was seen to be pulled upwards and adherent to the fissure for the gall-bladder, and to hide the gall-bladder from view. The latter was further concealed by the omentum, also adherent to the liver. To the right of these structures was a little treacly blood, about a drachm, lying close to the duodenum underneath the liver, but free in the peritoneum. Its position there, must have been of recent occurrence, as it was not shut in by adhesions, and yet no peritonitis was present. Dissecting out the gall-bladder and the vessels of the portal fissure, it was found that the fundus of the gall-bladder, the cavity of which was much contracted, opened by a large hole into a shreddy cavity which contained blood of treacly consistency; this cavity also opened by a large and irregular aperture into the duodenum, immediately beyond the pylorus at its anterior part. The vessels of the portal fissure ran to the left and in front of the cavity external to the gall bladder, and they were not implicated, with the exception of the main branch of the hepatic duct to the right lobe of the liver. This was quite destroyed, and the truncated extremity opened into the abscess immediately behind its junction with the duct

from the other side to form the main hepatic duct; the cystic duct was also destroyed. All the other vessels were normal. The cystic artery of the pancreatico-duodenal, the splenic and gastric arteries, were all quite sound, and so also were all the branches of the portal vein in the neighbourhood. The source of the hæmorrhage could, therefore, only be attributed to a venous oozing from the surface of the ulcer in the gall-bladder and the duodenum, and the sloughing cavity outside. The liver substance was unaffected by the ulcerative action, which was quite external to the capsule of the organ. The liver was small, but quite healthy, except a slight excess of fat. The kidneys were rather large and coarse; the right contained a cyst; the spleen was pale but healthy. The lungs were emphysematous. The muscular fibre of the heart was fatty.

From the observations I had made in November I felt convinced that the patient had gall-stone, and I supposed it had passed, although one was not detected. In the last attack the hæmorrhage was different from that which we generally observe in gastric ulcer; the blood was poured out more gradually. The clinical history was not that of gastric ulcer, neither was the hæmorrhage such as we have in engorgement of the portal circulation. From its gradual character, I thought it probable that it arose from the duodenum and was venous in character. It was evident, also, that there was mechanical obstruction of the intestine, for purgatives were instantly rejected, no true action from the bowels took place, and no flatus was passed. It occurred to me that possibly a gall-stone, impacted high up in the small intestine, was the cause of the obstruction, and this opinion was confirmed by the post-mortem examination, and also that the hæmorrhage arose from an ulcer in the duodenum.

No peristaltic movement, although several times looked for, could be detected, and yet the gall-stone was pushed down to the end of the jejunum. It is true that the abdomen was covered by a thick stratum of fat, which would render the observation of movement more difficult; again, the intestine was filled with blood, and it is possible that the peristaltic movements were very feeble on account of the hæmorrhage. Another circumstance of great interest was the comparative absence of pain, although an enormous gall-stone, more than an inch in diameter, had ulcerated its way through the gall-bladder, then outside the bile duct, into the duodenum; there was soreness, but no severe pain and no

rigor. This comparative absence of pain I have previously noticed in a case where a large gall-stone had led to fatal obstruction by impaction immediately beyond the duodenum.

The following is a table of the cases in which we have found ulceration of the duodenum.

Sex.	Age.	Disease or injury.	Cause of death.	Remarks.
F.	13	Burn	Tetanus	Thirteen days after; stomach.
M.	4	Burn	Hæmorrhage	Ecchymosed ulcer on the tongue.
M.	...	Scald	Exhaustion	Braune glands swollen.
F.	30	Primary disease	Portal pyæmia	
M.	39	Amyloid viscera	Scrofulous pyelitis	
M.	...	Diseased knee	Hæmorrhage	
M.	55	Hydrocephalus	Convulsions	Hypertrophy and dilatation; stomach.
F.	55	Renal disease	Large white kidney	
F.	12	Disease of hip	Hæmorrhage from ulcer	
M.	30	Primary disease	Perforation, peritonitis	
M.	46	Cancer of liver, &c.	Exhaustion from cancer, &c.	
F.	18	Tapes mesenterica	...	Abscess behind cæcum, &c.
M.	56	Gall-stone	Hæmorrhage; gall-stone impacted.	Ulcer due to the passage of a gall-stone.

Cancerous disease of the duodenum.—It is far more frequent to find the duodenum secondarily involved, than to be itself the primary seat of this fatal form of disease. In many cases the disease appears to have commenced in the pancreas or in the adjoining lymphatic glands, or in the liver; and although cancer of the stomach and of the pylorus is generally very defined and ceases abruptly at the commencement of the duodenum, such is not constantly the case, for the disease sometimes extends onward into the pyloric portion of the duodenum. Again, it is oftentimes very difficult to state precisely in which part the disease has commenced.

As to the symptoms, the earlier ones are often very insidious; and are more likely to be mistaken for hepatic disease than the early symptoms of cancer of the stomach; still the first indications are those of dyspepsia and malaise, sallowness of complexion, mental depression, followed by nausea, vomiting, and sometimes pain, several hours after food has been taken. The patient emaciates, and a hardness or tumour

is felt about the cartilage of the tenth rib; a very difficult question then arises, as to whether it is the pylorus that is affected, or the pancreas, or the lymphatic glands. Pulsation communicated to the growth may suggest the idea of aneurism. In aneurismal disease the vomiting is a less marked symptom, and the pulsation more uniform; the pain also is often very intense. In primary pancreatic disease the tumour is generally more central; the evacuations have been found sometimes to contain fat,* and until pressure take place on the duodenum, or the disease extend to the stomach, and to the lymphatic glands, the symptoms are less pronounced. Pyloric disease is indicated by more persistent vomiting than we find in simple duodenal disease. Occasionally local ulceration, with chronic thickening, takes place at the union of the transverse and ascending colon, or cancerous disease may be developed at this site, and subsequently perforate the duodenum. (See "Cancer of the Colon.") The formation of adhesions with the duodenum in these latter instances sometimes causes partial mechanical obstruction; vomiting is produced, and thus the diagnosis is rendered unusually difficult; such was the case in an instance which we shall presently give. In all these maladies there is emaciation, pallor, cachexia. Lastly, we must refer to numerous diseases of the omentum and of the liver as complicating the diagnosis. Here, however, the difficulty is less; for in the former the tumour is more central, there is greater mobility, and the gastric symptoms are less marked; in the latter, hepatic cancer, the tumour is more strictly in the hypochondrium, and the enlarged gland may be often felt with tubera projecting from its surface.

The termination of cancer of the duodenum is generally one of progressive emaciation and cachexia. If enlarged glands press upon the bile-ducts, jaundice will be added to the symptoms; if perforation or sloughing takes place, local abscess occasionally forms, which, by giving resonance on percussion, adds increased difficulty in forming a correct diagnosis.

The treatment of these cases generally consists in trying

* The observations of Bernard tend to show that this symptom would be a constant one, if the duct were always obstructed.

to relieve the distress and pain of the patient, and in sustaining his exhausted powers. Anodynes are required—opium, morphia, chloroform, or its preparations; and bland, but very nutrient diet, and especially of a fluid kind, should be given. Stimulants assist in keeping alive the flickering flame of life. When great sallowness of the complexion comes on, or jaundice, it is very unwise to give mercurials; they hasten degenerative changes, exhaust the patient, without any mitigation of his sufferings, and tend to hasten the fatal termination.

Case XC.—*Cancer of the Duodenum.* (Reported by Mr. C. Longmore.)—James R—, æt. 40, was admitted under my care into Guy's Hospital, June 23rd, 1858, and died July 5th. He was by trade a coach-builder, and he had resided at Newington; his habits of life had been temperate, and with the exception of a slight winter cough, he had enjoyed good health till Christmas of the preceding year. The first symptom of which he complained was a shooting pain in the back and stomach; the pain at last became very violent, especially at night after he had finished his work; there were also moving pains in both sides, especially on the right, and in the testicles; he had neither cough nor vomiting; about four weeks prior to his admission swelling of the feet came on, and after a few days his abdomen began to swell. He was a man of sallow complexion, with dark hair and eyes; he was much emaciated, but the feet and legs were anasarcous; there was dulness on percussion at the sides of the abdomen, and fluctuation was indistinctly felt. In the scrotum on the right side was a large hernial protrusion; and in the abdominal cavity a hard tumour could be felt, situated on the level of the umbilicus, and two inches to its left side; the tumour was an inch and a half to two inches in diameter, dull on percussion, but there was resonance around it; on pressure very slight pain was produced. Over the cartilage of the tenth rib there was also a minute pea-like tumour. The thoracic viscera were apparently healthy; the pulse feeble, compressible, 70. The surface of the body was cool. The tongue was coated with a brown fur in the centre, but was red at the tip. The bowels were freely acted upon, and the evacuations were paler than natural. The urine was scanty, sp. gr. 1032, free from albumen, but loaded with lithates. Small doses of acetate of morphia were given, and dilute nitric acid with infusion of cusparia. On June 25th, the abdomen had greatly increased in size, it was very tense and resonant on percussion except in the lumbar regions. On the 26th, the report states that, during the previous evening and on this day, he vomited about two quarts of bitter bilious fluid, but became more comfortable after its rejection; although a sensation of intense thirst came on. On the 28th he had become jaundiced, and complained of great pain across the loins, of an aching, dragging character.

On the evening of the 3rd July vomiting of coffee-ground substance

came on, and continued till his death on the 5th, at 11 p.m. The tumour several days previously seemed larger and more distinct. *Inspection* was made sixteen hours after death. There was rigor mortis; the whole body was jaundiced; the tissue of the heart was pale and softened. The liver was much enlarged. A tumour about the size of the fist surrounded the vessels at the fissure of the liver; the duodenum was situated in front of this growth, and was adherent to it. The commencement of the duodenum was quite destroyed by cancerous ulceration, and a large slough occupied the position of the first portion. The interior of the intestine communicated with the cancerous mass beneath it; the cancer tumour was altered in structure, and contained blood. The gall-bladder was distended to about twice its natural size, and contained a few gall-stones. The hepatic duct was slightly obstructed. The vena cava was in several places penetrated by the cancerous growth. The whole liver was filled with cancerous tubera, which were rounded, vascular, and softened. The disease appeared to run more especially in the course of the portal vessels, as if its entry into the liver had been by Glisson's capsule. The cancer growth consisted of large nucleated cells. The pancreas, supra-renal capsules, and kidneys, were healthy.

Instances of this kind are often very difficult of diagnosis, as to the precise seat of the disease; the glands close to the duodenum were probably first affected; but, although really behind the duodenum, the intestine did not cause resonance, probably on account of its becoming early implicated in the disease. The subsequent symptoms arose from pressure on the bile-ducts and the vena portæ, and from the degeneration of the cancerous growth. Mr. John Dix, of Hull, has recorded a very interesting case somewhat allied to this; and in which there was a tumour apparently connected with the liver, but resonant on percussion. "The tumour was hepatic and malignant. It was softening down—sloughing, in fact; and in this process it had involved and laid open the duodenum, to which it was attached; and whence air had escaped into a circumscribed cavity formed by the tumour behind, and the abdominal wall in front, to both of which the transverse colon was adherent below, forming the lower boundary" of the resonant space. The patient, "Mrs. M—, aged fifty-five, was pallid, feeble, and emaciated; she complained chiefly of pain in the right side of the abdomen, with vomiting and other symptoms referable to derangement of the hepatic and digestive functions. She had suffered, before that time, from jaundice and gall-stones." She died in about three months after the

first medical examination; but the resonance in front of the tumour remained till death.

Primary cancer of the duodenum is of rare occurrence; a patient, under my care in Guy's in 1872, aged forty-five, suffered eighteen months before admission from violent vomiting and purging; for a week he was jaundiced, and he gradually sank; the stomach and pylorus were healthy, but the first portion of the duodenum was occupied by a large cancerous growth as large as a cricket ball, soft, milky, vascular, and invading the liver by direct extension.

Instances also occur of primary disease of the pancreas extending to the duodenum, and we have witnessed such cases in which the mucous membrane of the duodenum had become infiltrated with medullary cancer. Cancerous cachexia is then generally well marked, but till the pylorus or duodenum become involved, vomiting is not generally a prominent symptom. We have also seen the duodenum perforated in cancerous disease of the cæcum, which had extended upwards; and in another case, one of villous cancer of the bile-ducts, a large cyst had formed in the right side of the abdomen below the liver and opened into the upper third of the duodenum by four separate ulcers.

Mechanical obstruction.—Other parts of the intestine are much more liable to obstruction of a mechanical character than the duodenum. In the course of several years we have observed, or have found recorded, isolated cases of this kind of obstruction, arising from the following causes:—

1. Peritoneal adhesions.
2. Gall-stones of large size, which having ulcerated through the coats of the gall-bladder, have become impacted in the duodenum, and have led to fatal obstruction.
3. Enlarged glands, infiltrated by cancer, compressing the second or third part of the duodenum.
4. Diseased pancreas.
5. Hydatid disease of the liver, opening into the duodenum.
6. Foreign bodies.

It is exceedingly common to find, after death, that adhesions have taken place between the *first* portion of the duodenum and adjoining viscera, either the inferior surface of the liver and gall-bladder, or the transverse colon; and, in many

instances, the impediment to the free passage of the chyme is so slight that no symptoms point to any disturbed function. In the following case adhesions with the colon were followed, however, by great distension of the first part of the duodenum; but there was also some ulceration of the same part of the intestine; there was chronic ulcer of the colon, and chronic as well as acute peritonitis, with strumous and glandular disease, so that there was considerable difficulty in unravelling the symptoms, which resembled those of organic disease of the stomach. Still we believe that the pain and the vomiting several hours after food had been taken, were the result of this duodenal obstruction.

Case XCI.—*Chronic Peritonitis. Acute Peritonitis. Tubercular Deposit on the Serous Membranes and in the Glands. Constriction of the Duodenum, and great Dilatation of its first portion. Small Ulcer in the Duodenum. Large Chronic Ulcer in the Colon.*—William C—, æt. 38, was admitted into Guy's Hospital under my care, April 15th, 1861. He was a married man, by trade a cooper, and he had resided at Dockhead. About seven years previously he suffered from severe pain at the epigastric region; and for several years since that time he had had pain at the same part, but less acute in its character. He had never had any hæmorrhage from the stomach, but he had complained of slight pain in the dorsal region, between the sixth and eighth vertebræ. Some years before he had had violent vomiting; but since that time vomiting had been slight, the attacks coming on some time after food had been taken. He had had slight pyrosis, and acid taste after vomiting. The pain at the epigastric region was not constant, but it was worse after food, and was especially aggravated by constipation.

On admission he was very much emaciated, with a sallow complexion, and on the forehead there was a bronzed condition of his skin; the skin at the elbows was also slightly discoloured. There was moderate tenderness at the scrobiculus cordis; the abdomen was rounded and supple; no tumour could be felt; the bowels were rather confined; the pulse was very compressible; the tongue was red in patches. No disease could be detected in the lungs or heart. The patient stated that the bronzed colour of the forehead had existed for three years, and had been produced by exposure to the sun; the lower part of the abdomen was also found to be slightly discoloured.

On April 20th the bowels were freely moved, and he had severe pain at the scrobiculus cordis; the pain was neither relieved nor modified by any change of position.

He continued in the same prostrate condition without pain or vomiting till June 11th, when violent pain and symptoms of acute peritonitis came on, and he sank on the 13th.

14th.—*Inspection.*—The body was very much emaciated. *Chest.*—

On the left side the pleura was firmly adherent, and on tearing it away, rounded, yellowish tubercles, two to three lines in diameter, were found thickly covering the costal surface. The left lung itself was very small; but there were no tubercles in it. The right pleura was free from adhesions or tubercles, and the lung was also quite healthy. The heart and pericardium were normal. There were several yellowish-white tubercular masses in the glands in the anterior mediastinum. On opening the abdomen, the intestines were seen to be distended; and the enlarged transverse colon, extending from one hypochondriac region to the other, prevented the stomach from being seen. There were numerous peritoneal adhesions, especially at the upper part of the abdomen, the transverse colon, stomach, and duodenum being united firmly to the under surface of the liver. The coils of the small intestine presented considerable injection at their lines of contact; but neither was lymph effused, nor had the serous membrane lost its shining colour. Numerous tubercles were present on the serous membrane; some were exceedingly small, others three or four lines in diameter, and they were situated on the intestines or on the peritoneal surface of the liver. The mesenteric glands were extensively diseased; and all the glands situated in the neighbourhood of the pancreas, and near the origin of the thoracic duct, were enlarged, although it could not be demonstrated that the duct was compressed. The glands contained much cheesy and cretaceous matter, and some more recent semi-transparent deposit. On removing the transverse colon, the stomach was found to be distended, and an elongated sac was produced, partially contracted, about three inches from the right extremity; this sac was at first supposed to be from hour-glass contraction of the stomach, but, on opening it, the first contraction was seen to be pylorus, and the second enlargement was an enormously distended first part of the duodenum. The stomach and duodenum contained greyish-green fluid and mucus. The mucous membrane of the stomach did not present any abrasion, thickening, nor ulceration, nor was the pylorus hypertrophied; there was a little arborescent injection. The sac formed by the first part of the duodenum was capable of holding eight to ten ounces of fluid, and was also injected. Immediately beyond the pylorus was a small ulcer about five lines by three in size, its edges rounded and without any injection; it did not extend into the muscular coat. Three inches from the pylorus the intestine was narrowed, and there was a constriction resembling a second pylorus; there was no thickening nor cicatrix, and it appeared probable that the peritoneal adhesions had looped up the intestine. On the gastric side of this constriction there was a small pouch, capable of admitting the tip of the finger. The rest of the duodenum, the jejunum, and the ileum, were healthy, with the exception of one or two small ulcers with tubercular deposit on their peritoneal surface. Peyer's glands were healthy. The cæcum and appendix also were normal. In the ascending colon the solitary glands were very distinct, and at the commencement of the transverse colon were the remains of an old ulcer; for two to three inches the mucous

membrane was irregularly destroyed and puckered, and of a grey colour. The rest of the intestine was normal. The supra-renal capsules, the kidneys, and the liver, were healthy; two or three strumous tubercles were, however, situated on the peritoneal surface of the liver.

In mechanical duodenal obstruction from the *second cause*, impaction of a gall-stone, the symptoms resemble those produced by internal strangulation of the intestine, or by hernia, but vomiting is set up at a very early period, and is of a severe character. The vomited matters, however, cannot have a stercoraceous odour nor appearance. The diagnosis is generally obscure and difficult; but where the symptoms of the passage of a gall-stone, namely, intense pain in the hypochondrium, vomiting, and subsequent jaundice, are followed also by the symptoms of insuperable obstruction, the nature of the malady is sufficiently clear; but in the ulceration of a large gall-stone through the coats of the gall-bladder into the duodenum, the indications of disease may be so slight as to be almost overlooked, and the subsequent obstruction cannot then be distinguished from strangulation taking place high up in the intestine. The impaction of the gall-stone is generally found to happen near the termination of the duodenum, or in the upper part of the jejunum.

In obstruction from diseased lymphatic glands in the neighbourhood of the duodenum, the occlusion sometimes becomes suddenly complete, and the symptoms are those of internal strangulation; but more frequently the pressure is less, and the symptoms are those which we shall presently have to refer to in connection with disease of the pancreas; thus, in an instance of femoral hernia after the intestine had been returned, the symptoms continued, and the patient quickly died. The third portion of the duodenum was then found to have become firmly impacted between two enlarged glands.

Case XCII.—*Obstruction from Biliary Calculus in the upper part of the Jejunum, thirty inches from the Pylorus.*—The calculus is in the museum of Guy's. The case was under the care of Ebenezer Pye Smith, Esq., and is recorded in the 'Pathological Transactions' of 1854. The patient was a stout woman, æt. 62. She had good health till three months before death, when she suffered slight pain in the right hypochondrium, which continued a fortnight, unaccompanied by sickness or prostration. She recovered, but continued her usual sedentary habits; five days before her death she began to feel sick, and vomited bile in

large quantities; the urine was moderately secreted. The vomiting increased in violence, but with only very slight pain in the abdomen; on the fifth day she became comatose. A calculus composed of inspissated bile, and measuring four and a half inches in the circumference of its long by two and a half in the circumference of its short axis, was found impacted about thirty inches from the pylorus. There was much fibrous tissue on the under surface of the liver; and an ulcerated opening extended from the gall-bladder into the duodenum, below the bile-ducts.

The case just recorded of gall-stone with hæmorrhage and obstruction is of a somewhat similar kind. An interesting case is recorded by Dr. T. S. Gray in the 'Transactions of the Clinical Society for 1873,' in which a large gall-stone led to obstruction and stercoraceous vomiting, but was subsequently discharged, and the patient, a man aged 40, recovered.

There are in these cases three symptoms which especially deserve attention, as guiding us to a right diagnosis, when viewed in connection with the previous history. The absence of abdominal distension, the early period at which vomiting takes place, with the character of the ejected matters, and the diminution in the quantity of urine which is voided.

The absence of distension of the abdomen is an important sign of occluded intestine in the early part of its course. In obstruction of the large intestine, or even at the lower part of the small, the abdomen becomes enormously distended, and the peristaltic movements can often be observed in spare persons through the parietes; this is especially the case in disease of the sigmoid flexure of the colon. The stoutness of the patient sometimes renders this sign less observable; again, where this duodenal obstruction exists with hernia, the diagnosis must necessarily be most obscure. As to vomiting, it comes on very early, and the matters rejected are bilious. In strangulation of the ileum, and obstruction of the colon, unless irritating purgatives are given, this distressing symptom may be considerably postponed; and when it does take place and is continued, the matters are of a stercoraceous character. Still, in acute peritonitis, as from perforation, the sudden bilious vomiting may greatly mislead us. Again, very violent bilious vomiting sometimes takes place in disease of the stomach, and in

cerebral disease; but the signs of obstruction are then wanting.

Gall-stone produces intense pain in the region of the gall-bladder, accompanied with vomiting and constipation; this severe character of pain we do not find in intestinal obstruction, but it must be acknowledged, that when slow ulcerative absorption has taken place between the walls of the gall-bladder and the duodenum, a calculus so extruded is followed by less severe suffering than in ordinary cases of biliary calculus.

A very interesting case, under the care of Dr. Lever, is mentioned by Dr. Barlow in the 'Guy's Reports,' for 1844:— The patient, aged fifty-one, a year before her death had the symptoms of gall-stone, and the bowels afterwards became constipated; a short time before her death, excessive pain, vomiting, and constipation came on, with scanty urine and collapsed abdomen. The gall-bladder and duodenum were firmly adherent; the two upper thirds of the duodenum were contracted, thickened, and would only admit a common quill; about the centre of the ileum was a biliary calculus of the size of a walnut, partially sacculated.

With regard to the quantity of urine excreted being a sign of the seat of obstruction, as mentioned in the paper by Dr. Barlow, just referred to, he argues that the quantity of urine must necessarily be small, from the diminished fluid brought within the range of the absorbing surface of the portal veins; and thus there must be diminished supply to the heart and kidneys; but there is often a large quantity of fluid ejected by vomiting, which would proportionately lessen the renal secretion. If the obstruction be incomplete, or low down in the intestine, the kidneys pour out a larger qanutity, and the vomiting is also less severe.

Dr. Barlow has, in the paper previously cited, dwelt upon the importance of bearing in mind, that in ischuria renalis, violent vomiting, constipation, and scanty urine are sometimes present.

In diseased pancreas the obstruction is less complete, but it acts by inducing firm adhesions about the first and second portions of the duodenum; and pressure is also exerted by the increased size and hardness of the pancreas, and by

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infiltrated glands. The symptoms resemble those of obstructed pylorus, namely, vomiting several hours after food, gradually increasing emaciation, with constipation; and these symptoms are slowly developed during several months. A tumour can generally be felt near the region of the pylorus.

The following very interesting case was regarded as one of cancerous disease of the glands in the neighbourhood of the pancreas, and secondary implication of the stomach; for the vomiting took place three or four hours after a meal, as in obstructive disease of the pylorus; and the general symptoms resembled those of organic gastric change.

Case XCIII.—*Disease of the Pancreas. Suppuration and Gangrene. Pressure on the Duodenum.*—James P—, æt. 60, by occupation a publican, and resident at Camberwell, was admitted under my care on July 4th, 1861. He stated that he had always enjoyed good health till four months prior to admission, when he was suddenly seized with severe pain in the region of the stomach, and with vomiting. The vomiting returned at intervals of three or four days, and came on several hours after food. Four years previously he had begun to feel slight pain at the region of the stomach, which came on every three or four months, but was relieved by taking a little cayenne pepper with brandy. He had not received any blow, nor had he suffered from any hæmatemesis. The pain was situated at the epigastric and umbilical regions, and extended to the spine; it was of an acute kind, and had not the gnawing character of pain often described by patients affected with ulcer of the stomach.

On admission he was very much emaciated, with an anxious countenance, sallow complexion, and sunken eyes; his skin was hot and dry, and he complained greatly of thirst; the tongue was furred, the pulse frequent and sharp, the respiration normal; he had slight cough, but it did not distress him; and there was no evidence of thoracic disease by percussion nor by auscultation. The abdomen was contracted moderately, except at the lower part of the epigastric and at the umbilical region, where there was a rounded tumour, evident on visual examination. The tumour was dull and tender on percussion; no fluctuation could be felt, and it had slight pulsation anteriorly from contact with the aorta, but no general aneurismal thrill. There was resonance between the tumour and the liver, as well as between the tumour and the spleen; in fact, both the hypochondriac regions were more than usually resonant. Pressure on the tumour produced a feeling of nausea; the bowels were constipated; and the appetite was very poor. His weakness compelled him to remain quietly in bed. The urine was high coloured and scanty, and was free from albumen. Fluid food was ordered, and soda-water with brandy, and chloric ether ℥x, with nitrate of bismuth gr. x in mucilage mixture.

July 5th.—He was slightly relieved by the medicine, but the vomiting continued; the ejected matters consisted of deep-green fluid, containing a large quantity of mucus, of squamous epithelium, and some nucleated cells (from gastric glands). These attacks of vomiting distressed him greatly; every kind of food was rejected at once, but the medicine and ice partially relieved his distress; his prostration, however, increased; hiccough distressed him; and he had an offensive taste in the mouth.

July 8th.—He was extremely restless and prostrate, and the vomited matters were of very deep-green colour. At 9 p.m. he was suddenly taken worse, and continued in great pain during the night. At 7 a.m. next morning he expired.

Inspection seven hours after death.—The body was very much emaciated. The thoracic viscera were healthy, excepting old pleuritic adhesions. The peritoneum contained some dirty grey fluid, and had in some parts lost its shining smoothness; the intestines were slightly distended. The sac of the lesser omentum was distended by a large abscess, which had constituted the tumour felt during life. On tracing the duodenum upwards, at its centre was found an œdematous portion bulging out; and containing fluid resembling that in the peritoneum; but there was no perforation. By dividing the peritoneum between the stomach and the colon, an abscess was opened; it had dense fibrous walls, about two lines in thickness, in some parts irregularly sinuous, and having several bands on its walls, the remains of occluded vessels. Above and partly in front of the abscess was the stomach; below was the colon, and at its superior, right, and inferior parts was the duodenum greatly distended, and its coil enlarged. The abscess contained dirty offensive pus, and at its posterior part was a black slough about two and a half inches in length; some concrete yellow matter was also found on its walls. The abscess rested on the spine, the crura of the diaphragm, and on the superior mesenteric and splenic veins as they formed the vena portæ. It extended on the left to the spleen. The pancreas for two to three inches towards the splenic extremity was healthy, but the rest of the gland was in a sloughy state, and constituted the black mass found at the floor of the abscess. The pancreatic duct existed in the centre, and degenerating gland tissue was observed under the microscope. The gland and duct were separated from their duodenal attachment. The common bile-duct was healthy, and its opening into the duodenum was free; but the gall-bladder contained numerous gall-stones about the size of peas. The liver and spleen were healthy. The stomach was very much enlarged and distended; it contained tenacious green mucus, such as was vomited during life; its mucous membrane presented numerous points of arborescent injection, so also that of the duodenum; but no direct communication with the abscess could be found, nor any ulceration of the surface.

The origin of the disease in this remarkable case could not be ascertained, viz., whether a pancreatic calculus had set up

the abscess, or whether inflammation had been produced in the cellular tissue about the gland. No direct blow had been received, and the disease slowly advanced. Acute peritonitis, from the transudation of offensive purulent serum into the general cavity of the peritoneum, was the cause of the fatal termination.

Dr. Bright believed that the fatty motions which he found in some of these cases were indicative of disease of the pancreas, but this symptom has not been constantly observed in pancreatic disease, possibly from the duct being only partially occluded.

The course taken by *hydatid disease* of the liver is uncertain; sometimes it is towards the surface, and a rounded tumour is then felt on the anterior abdominal parietes; or it extends through the diaphragm into the lungs. In a case under the care of Dr. Rees, in Guy's, the cyst opened into the duodenum. Hydatids were both vomited and passed by stool, and the former symptom was very severe. The patient was exceedingly ill, and a friction sound was audible over the seat of the tumour, evidently from local peritonitis; the patient steadily improved after the evacuation of the hydatids by vomiting; the tumour disappeared, and he left the hospital; but after a few weeks intense peritonitis came on, and he quickly died. The remains of hydatids were found in the liver; and the duodenum, colon, liver and kidney, were firmly united by adhesions. A large abscess existed between these structures, and had led to the fatal peritonitis. No communication existed between the liver and the colon; and although the duodenum at its second part was firmly adherent, no direct opening could be found.

The patient was twenty-nine years of age, and had resided at Twickenham; he was temperate in his habits; for nine years he had suffered from so-called "bilious attacks," and from vomiting, with slight sallowness of the skin; five years previously he had had severe jaundice, which continued for three weeks. Eight months before admission his appetite became ravenous, but he lost strength and became emaciated; for seven weeks he had been confined to his bed from severe pain about the umbilical region; jaundice came on, but disappeared, and was followed by very severe pain in the right

hypochondriac region, extending to the loins, and a rounded growth presented itself below the ribs on the right side.

A remarkable instance of mechanical obstruction in the duodenum, from a foreign body, is recorded by Dr. Blakeley Brown, in the 'Pathological Transactions' of 1851 and 1852:—A delicate young woman, aged eighteen, became gradually emaciated, and at last died from peritonitis. The stomach, duodenum, and upper part of the jejunum, contained casts composed of agglutinated and interwoven masses of string and hair.

Gastric Solution of Duodenum.—The mucus of the duodenum is frequently found in an acid condition after death, which is probably due to some of the gastric juice slowly gravitating through the pylorus; but in some instances the pylorus is so patulous, that gastric juice readily passes, and exerts its solvent power after death in the same manner as in the stomach. Such a state was found in a child who died under my care in Guy's.

Case XCIV.—*Perforation of Duodenum after Death from Solution by Gastric Juice.*—William B—, æt. 4, was admitted July 16th, 1856, and died on the 23rd. He was an anæmic child, with large head; on admission he was in a semi-comatose state, and the pupils were widely dilated; he had occasional vomiting, but no convulsions; six weeks previously he had had measles, and one week afterwards hydrocephalus gradually became developed; he was in an almost hopeless condition on admission.

Inspection was made fourteen hours after death. The arachnoid was covered with a slight layer of lymph, so as to give it a greasy appearance, and at the base of the brain there was considerable sub-arachnoid effusion. The ventricles contained two ounces of fluid, of sp. gr. 1001. There were miliary tubercles in the lungs and in the bronchial glands.

In the stomach there was considerable gastric solution, the mucous membrane being destroyed; but in the duodenum the intestine was quite divided, all the coats destroyed, and the end of the first portion terminated in an irregular ragged margin. The contents of the stomach were found in the peritoneal cavity. There were tubercles in the mesenteric glands, and an isolated one in the kidney.

CHAPTER VIII.

MUCO-ENTERITIS AND ENTERITIS.

There has been considerable confusion in the application of the term enteritis; Broussais considered it to be inflammation of the colon, Abercrombie regarded it as inflammation of the peritoneal and muscular coats of the intestine; others, again, more particularly apply the term to an inflammatory disease of the small intestine, which commences in the mucous membrane, and extends in severe cases, so as to involve all the coats of the intestine, even its peritoneal investment. These latter and more severe instances correspond to the enteritis phlegmonodea of Cullen; the former, when the mucous membrane only is affected, to his enteritis erythematica.

Watson, Barlow, and others, apply the term only to the more severe cases of inflammation of all the coats, but we shall in this chapter also consider those in which little more than the mucous membrane is affected, called muco-enteritis, and closely allied to gastro-enterite and gastric remittent fever. Dr. Copland describes glandular enteritis, and ileo-colitis; the former we consider in the remarks on strumous disease of the intestine and enteric fever, the latter with dysentery.

Enteritis, manifests itself under two forms: 1. That involving only the mucous membrane, and which has a disposition to extend in the course of the mucous membrane—*muco-enteritis* (this state may be acute or chronic and catarrhal in character);* and, 2. That in which the disease extends in

* See further reference to catarrhal inflammation in our remarks on catarrhal diarrhœa and catarrh of the colon.

depth, rather than on the surface, and implicates the muscular, and peritoneal coats, and the connecting tissues, whether diphtheritic, ulcerative, or phlegmonous in its nature; both forms commence in the mucous membrane.

In hernia, whether external or internal, acute enteritis is set up; and there may be symptoms in common with enteritis, as constipation, vomiting, &c., but the pathology and treatment of the two diseases are so diverse that a separate consideration of them is required.

It would be difficult to draw a defined separation between cases of inflammatory diarrhœa, as described by Dr. West, and the simplest forms of enteritis; they pass the one into the other. Diarrhœa, however, is not a constant symptom of enteritis; for the bowels in the latter disease are frequently constipated.

Pathological changes.—In muco-enteritis we may find very much less change than had been anticipated. Neither ulceration nor congestion may be observed throughout the whole canal. It is probable that the injected condition has in these instances, like erythema of the skin, entirely passed away; thus also some of the most severe forms of bronchitis present scarcely any morbid appearance of the bronchial tubes themselves, the congestion having disappeared, although the altered mucus remains. This state of congestion may, however, have caused marked symptoms of disease.

In catarrhal inflammation, a change in the character of the secretion from the mucous membrane is a sure indication of its deviation from the normal condition; but, unfortunately, we do not possess the same facility for the examination of the secretions from the digestive as from the respiratory mucous membrane. Adhesion of a thin stratum of fæcal matter is an indication of an imperfect secretion of mucus; or a lymph-like exudation takes place; this exudation resembles the diphtheritic membrane found in the throat, and it consists of an immense number of granules with nuclei; it may sometimes be easily scraped off, exposing an injected surface beneath; in other instances a section of the whole membrane shows that it is firmly united.

The mucus which is found in the intestine presents indications of rapid change having taken place, nuclei and elon-

gated cells of incomplete epithelium being found in great abundance; and mucus as well as pus are found in the evacuations during life.

Crystals of triple phosphate are frequently detected on the surface of the mucous membrane. It is probable that in many instances this is a post-mortem change; but in other cases we find such crystals when the inspection has been made a few hours after death; and they probably result from decomposition of the mucus, as in the urinary bladder after chronic inflammatory action.

The solitary glands may be very large and prominent, a state which is due to the age of the patient, and the functional activity of these structures, or to the excitement of morbid action. Sometimes these glands give to the mucous membrane the appearance as if sprinkled over with fine sand. Small aphthous ulcers sometimes exist, the ulceration commencing in the follicles; these ulcers may lead to perforation of the intestine, as in a case recorded among the inspections at Guy's, in which there were minute ulcers extending throughout the whole of the small and large intestine; and perforations of the cæcum and transverse colon had led to fatal peritonitis.

Grey discoloration is often observed around the solitary follicles, or it is more general in character, either in the large intestine, in the lower parts of the ileum, or even in the duodenum. This state consists in the deposit of pigment in the membrane in contact with the vessels, and is the result of continued congestion; it apparently follows also as an effect of muco-enteritis.

The most intense form of local enteritis exists when a portion of the intestine has become strangulated; the mucous membrane is then swollen, and it is also intensely injected; portions of fæces and mucus adhere to the valvulæ conniventes, or the whole surface of the mucous membrane is covered by a thin adherent layer of granular lymph; all the coats of the intestine become thickened, and the areolar tissue is œdematous; the peritoneum is covered by lymph; it is intensely congested and of a purple or slate colour, or even gangrenous. The thickening of the mucous membrane in all these cases arises from the presence in the submucous tissue

of a large number of cellular elements (pyoid), and, in the more severe cases, they extend between the muscular fasciculi and reach to the peritoneal coat.

A condition closely resembling that just described is sometimes found without any strangulation, either affecting only the ileum, or of a dysenteric character, and involving also the cæcum and colon; thus, a distended and congested state of the ileum may terminate suddenly, as if there had been a constriction, and the portion of small or large intestine below may be pale and contracted; on removing the intestine, the apparent constriction ceases, the canal becomes perfectly free, and the congestion is the only thing that marks the obstruction. There has been much discussion whether in these cases there is really obstruction by a twist of the intestine, by a spasmodic condition of the contracted part, or by a paralysed state of the distended one; the last supposition is now generally regarded as the correct explanation, namely, that the inflamed intestine becomes distended, and its peristaltic contraction enfeebled, so that at last it is unable to contract upon and propel its contents. The abrupt termination may be determined by a cicatrix, by slight peritoneal adhesion, or by old disease of the mesenteric glands. These instances closely resemble true ileus from strangulation or from other mechanical cause.

Ulceration and sloughing, or gangrene, generally follow this form of enteritis; but, although in hernia and internal strangulation the gangrenous part is at the seat of constriction, this is not always the case in obstruction from other causes; in obstructive disease of the sigmoid flexure, ulceration takes place above the seat of the obstruction; but the most acute inflammation and ulceration will often be found in the ileum, cæcum, and ascending colon. The inflamed mucous membrane in these parts gives way from the enormous distension; numerous ulcers, arranged in *transverse* lines, are closely set together in the ileum and cæcum, and some of these occasionally extend through the peritoneum.

Obstruction of the mesenteric vessels usually takes place in cases of internal hernia; but it is probable that obstruction of these vessels is sometimes the cause of the change rather than the effect. Intense engorgement of a few inches of intestine may be found, and the mucous membrane may be

almost in a sloughing state, without any symptom having been manifested during life, and without any obstruction being present after death. In such cases a thrombus has probably formed, or an embolus has obstructed the mesenteric vessels connected with the part, and has led to changes in the nutrition of the intestinal coats.

In inflammation of the mucous membranes there is a great tendency to the extension of the disease by continuity of structure. Sometimes the alimentary canal, in its whole tract, appears to be inflamed; at other times the disease commences in one part, and extends from that as from a centre. Inflammation of the colon will pass into the ileum; that of the ileum into the large intestine, as well as into the jejunum, duodenum, and stomach. In enteritis the small intestine only may be affected, or the cæcum and colon may be also implicated. Broussais* speaks of this extension of disease; but, though we are not disposed to agree with his opinions, we must, I think, acknowledge the truth of the frequent extension of disease to contiguous and continuous structures; and this is probably as true of the mucous membrane as it is of the skin, as exemplified in erysipelas.

These changes in the mucous membrane of the small intestine, even though only of a catarrhal character, may be followed by wasting of the mucous membrane, and in some cases the atrophy of all the coats of the intestine is so extreme that together they are scarcely thicker than tissue paper. In others the impairment of nutrition is followed, especially in young subjects, by the deposition of tubercular disease in the mucous membrane, involving first the follicles and lymphatic vessels of the bowel; to these cases we shall again have to refer in speaking of strumous disease. Lardaceous disease of the intestine may also be associated with symptoms of muco-enteritis; in these instances the mucous membrane is thickened and has a sodden appearance, sometimes it is ulcerated; the villi and the minute capillary arteries are found to be thickened, so also those surrounding the sacculi of Peyer's glands, and the membrane under examination is at once changed by the action of iodine. These

* Broussais, 'Phlegmasies Chroniques.'

forms of disease are generally found with lardaceous disease of other organs, as of the liver, the spleen, or the kidneys.

We shall first consider enteritis in the form of *muco-enteritis, enteritis erythematica,* or *catarrhal inflammation.** This is very frequent among children during dentition or weaning, and after the exanthemata; but in many cases of infantile diarrhœa and colic a more transient condition of congestion is set up, the indications of which are twisting pain in the bowels, and the evacuation of watery or green motions, with general fretfulness, &c.; these symptoms pass away in a very short time, and they arise from hyperæmia rather than from true inflammation of the mucous membrane.

In muco-enteritis a child is found to be fretful, without its usual playfulness and mirth. The lips are dry, and the little patient has a circumscribed flush on one or other cheek; the skin is dry or roughened; the abdomen is somewhat enlarged, or considerably distended and tympanitic, and varies in the amount of tenderness, but the restlessness of the child causes it to cry when no pain is produced; it is unwilling to be disturbed; the appetite is irregular and capricious, either craving for cooling drinks, as cold water, or for unsuitable food, which is oftentimes the cause of the malady. The bowels are irregular, either constipated for several days, or there may be diarrhœa; the motions are offensive and pale, or greenish in colour, or the evacuations consist of slimy mucus, or of food scarcely changed, and these conditions may alternate the one with the other; the tongue has a whitish fur, and its substance or papillæ are often much injected; vomiting may easily be induced, and probably arises from the extension of the mischief to the stomach, when the disease is called gastro-enteritis. In the evening the child becomes still more restless, the skin is hot, and even pungent; the temperature 101° to 103°; the sleep is disturbed, and accompanied with grinding of the teeth or starting, and the child often awakes alarmed; in the morning the febrile disturbance is less, and it may be cheerful and playful.

* This term is used in a less extended sense than that of German pathologists, who include under the word catarrh every form of inflammatory affection of the mucous surface.

This aggregation of symptoms constitutes the so-called gastric remittent or infantile remittent fever, and many look upon it in the same light as enteric fever, considering that the inflammatory condition of the intestine is a concomitant, not the essential part, of the disease. This is, I think, incorrect; the intestinal disturbance is the source and the cause of the continuance and extension of the disease, and not, as in enteric fever, the manifestation of a previously existing and general condition.

It is maintained by some authorities, such as West, Rilliet, and Barthez, that all these forms of disease are essentially enteric fever, but although there is febrile excitement, elevation of temperature, delirium, red and glazed tongue, &c., we do not find any rose spots; the duration of the disease is different, sometimes indefinitely prolonged, at other times passing off in a few days. Whilst in the one we have symptoms due to the reception of a specific drain poison, in the other we have no more than can be accounted for by simple intestinal inflammation, the same difference as between acute dermatitis and a specific exanthem.

It is also true that other blood poisons, as pyæmia, may produce intestinal lesions, but these could not be mistaken for enteric fever.

When the symptoms persist severely for several weeks great prostration ensues; the child wastes sometimes to an extreme degree, it appears haggard and aged, the lips have dry sordes upon them, the tongue is more injected, and often aphthous. There is less remission in the morning; the child will scarcely sleep at all, or, in very young children, allow itself to be taken from the arms of its nurse; the diarrhœa increases, watery evacuations are discharged or food unchanged is passed a short time after it has been taken; the pulse becomes very rapid, the eyes are half closed, and the child dies from exhaustion, almost before the nurse is aware of any change; or the brain becomes oppressed, and a drowsy, torpid condition, or convulsions sometimes precede death. The convulsions and coma, to which we refer as coming on at the close of this intestinal condition, are closely allied to those produced by exhaustion, as in the hydrencephaloid disease of Dr. Marshall Hall.

Muco-enteritis is frequently followed by tympanitis, and by strumous diseases of the peritoneum, or of the mesenteric glands. In such cases, although the more prominent symptoms of vomiting and purging subside, the child remains wasted, the abdomen enlarges, the appetite becomes ravenous, and exhaustion steadily progresses to a fatal termination. (See Strumous Disease.)

In young persons we sometimes find a state of muco-enteritis similar to that described, but without phthisis or tubercular disease; the eyes are sunken and bright, the lips parched, the tongue exceedingly injected, and beef-like; the cheek is occasionally flushed by a circumscribed patch on one or other side; the pulse is compressible, but frequent; the skin is at one time dry, at another perspiring; there is thirst, generally with loss of appetite, and sometimes with great irritability of the stomach; the bowels are constipated, or diarrhœa alternates with constipation. The urine is scanty and high coloured. This condition may persist for many weeks, with gradually increasing exhaustion, and in some cases it terminates fatally; in very many instances it yields to judicious treatment, but there is great danger of relapse. In young women this state is sometimes associated with painful or deficient menstruation, or with leucorrhœa; and it may be accompanied with severe neuralgic pain in the abdominal parietes, and below the mammæ. This neuralgia occasionally leads to a more unfavorable prognosis than the case warrants.

The *second* form of enteritis is more severe, and all the coats of the intestine are involved. The symptoms are exceedingly acute, and too frequently advance to a fatal termination with great rapidity; or they may be extended over many weeks or months. Severe pain is generally present, which has more or less of a paroxysmal character, and is accompanied with great tenderness and distension of the abdomen; there is frequently vomiting of bilious fluid, and the bowels are often constipated; the pulse is small, wiry, and sometimes compressible, the tongue is partially furred, the patient lies on the back with the legs drawn up, as in acute peritonitis, and prostration may rapidly ensue; or, whilst the more severe symptoms subside, the tongue becomes

dry, red, and glazed, the bowels loose, and the strength is gradually undermined; or, again, the convalescence may be as rapid as the occurrence of the symptoms. In these conditions the mind is generally perfectly clear.

Several instances which have come under my own observation will illustrate the disease.

Case XCV.—*Acute Enteritis.*—A child about seven years of age, after eating freely of raw apples, was seized with pain in the abdomen around the umbilicus; the bowels were constipated; the abdomen was tender and distended; the countenance was expressive of much distress; the pulse was rapid; the tongue had a slight fur upon it. The constipation continued; the abdomen became more tender and distended, and the child was found lying on its back in severe pain, with the legs drawn up, and with occasional vomiting. This state continued for several days; the bowels were then freely acted upon; but the child became prostrate, and shortly died, four or five days from the commencement of the disease. On opening the abdomen, the intestines were found much distended with flatus; the peritoneal surface was intensely injected where the coils were in contact, and was covered with lymph. The mucous membrane of the small intestine was congested, and portions of undigested apples were found in the intestine.

The inflammation had been set up by crude undigested food; it extended rapidly from the mucus to the muscular and connecting tissues, and to the peritoneum. The inflamed intestine was unable to propel its contents, and hence the constipation; and sometimes the constipation is so marked, that it is the most prominent symptom. The severe pain in this form of enteritis contrasts with the absence of it where the mucous membrane only is affected.

The symptoms in other instances closely resemble those consequent upon mechanical obstruction.

Case XCVI.—*Enteritis simulating Mechanical Obstruction.*—Henry V—, æt. 17, was admitted into Guy's Hospital in 1850. He was a tall, thin lad, who had been employed in a tobacconist's shop; and a week before admission he had had diarrhœa, which had been checked by an opium pill. The day before admission he felt well, and whilst walking out of doors he ate some apples and cherries; a few hours afterwards severe pain in the abdomen came on. Some rhubarb, with compound chalk powder and opium, was prescribed; the bowels were opened twice during the night; but at seven in the morning severe pain in the abdomen returned; his countenance was then expressive of great distress; the eyes were sunken, and the bowels were confined; the tongue was furred and clammy; he was rolling himself from one side

of the bed to the other, from the intensity of the pain; the recti muscles were rigid, but pressure could be borne; an emetic was administered, and some undigested apples and cherries were vomited. Calomel gr. v, with opium gr. iss, were given, but were at once returned; a turpentine injection was then administered. Vomiting then came on, at first of bilious, afterwards of stercoraceous fluid; the injection brought away some scybalous matter, but without relief to the pain. His pulse became exceedingly rapid, and he died at eleven the next morning, about thirty-six hours from the commencement of the attack.

On inspection, the intestines were found to be very much distended; the peritoneum was injected, and delicate portions of lymph passed between the coils; on turning aside the small intestines, the cæcum, colon, and about three feet of ileum were found collapsed, pale, and empty; at this point there was a sudden cessation of the intense congestion and distension, giving the appearance of constriction; but no constriction nor twist could be detected; the mesentery, however, attached to this part, and connected with the last lumbar vertebra, contained several hard and calcareous glands, and appeared slightly contracted; on raising the intestine, and placing it in a straight line, air at once passed, and the constriction disappeared. The intestine was full of pale yellow fluid fæces, and contained some undigested matter; no ulceration existed, and the other viscera were healthy.

In this case severe colic came on after taking indigestible food; inflammation of the mucous membrane of the small intestine was produced; this extended to the muscular and peritoneal coats, and was followed by intense pain, by distension, and by vomiting. It appeared that the slight interference with the movement of the ileum opposite to the calcareous mesenteric glands led to the limitation of the disease at that part, and that over-distension following inflammation was the principal cause of the obstruction. The abdomen for several hours was tolerant of pressure, and the symptoms of peritonitis came on later; could the enteritis have been subdued, the obstruction would probably have disappeared.

The following case is one in which the most acute enteritis produced scarcely any symptom; the patient was semi-comatose; but it is closely allied to cases in which local enteritis is apparently set up by obstruction of the vessels.*

Case XCVII.—*Sloughing Ileum. Thrombosis of the Mesenteric Veins.*

* See an interesting case recorded in the 'Path. Trans.,' vol. xxvii, p. 124, of acute thrombosis of the superior mesenteric and portal veins, by Dr. Hilton Fagge.

Peritonitis. Chronic Tubal Nephritis. Lobular Pneumonia.—Thomas C—, æt. 43, was admitted into Guy's Hospital, December 7th, 1853, and died December 31st. By trade he was a sailmaker, and during the last two years of his life had been very intemperate. He was admitted with anasarca, and coagulable urine; diarrhœa and wasting came on, and before death he passed into a semi-comatose condition. *The inspection* was made forty-seven hours after death. The body was spare and pallid; the lungs were very œdematous, and some lobules were softened and breaking down. *Abdomen.*—The intestines were distended; there was general peritonitis, but only slight injection of the peritoneum at the edges which were in contact; eight inches from the ileo-cæcal valve, the peritoneal surface of the intestine for several inches was of a dark grey colour, as if on the point of sloughing; but there was no constriction nor strangulation, nor had there been any symptom of it during life. The mucous membrane at the lower part of the ileum was in a sloughing condition, but this diseased portion was defined, and intensely congested at the margin; the slough was thin, but it affected the whole of the mucous membrane, and was not confined to Peyer's glands; *the mesenteric veins were filled with clot.* The left lobe of the liver was wasted, forming a fibrous mass, and was white in colour, probably syphilitic; the remaining part of the gland was fatty. The kidneys were large and white.

In this patient the disease of the kidney had led to uræmic poisoning, and to the semi-comatose condition; hence the non-complaint of pain in the severe peritonitis which ensued. There is great disposition in uræmia to serous inflammation of the pleura, pericardium, and peritoneum; but it is rare to find such a state of acute inflammation as that described in this case, which was probably secondary to thrombosis of the mesenteric vein.

Diagnosis.—Correct diagnosis is very important in enteritis, otherwise valuable time may be lost, and such aid as might have been of essential service may be neglected.

Hernia, external or internal, intussusception and mechanical obstruction from any cause, may be confounded with enteritis arising from simple inflammation.

It is well always to examine the ordinary positions of external hernia; many mistakes would have been avoided by this simple means. In internal strangulation the pain generally comes on after sudden muscular movements or after exertion of the strength; the patients often affirm that until the time of sudden exertion they enjoyed comfortable health, then something seemed to give way, or there was a "catch," and fixed

pain was felt, from which the subsequent pain radiated; the seat of pain, however, does not necessarily indicate the seat of obstruction, as found after death; because distension and the movement of viscera produce much alteration in the position of the intestine. After the sudden onset of pain, constipation and vomiting with varied degrees of severity come on, till prostration, collapse, and death ensue; and the rapidity of the symptoms may be as great as in external hernia. We do not observe this fixity of pain in enteritis, although it may be at first localized to a comparatively small space.

In internal obstruction without strangulation, we often find previous constipation, and the commencement of the attack is slower, the pain being sometimes very slight till towards the close of the malady.

In *intussusception* the sudden severe pain is very different from that of enteritis, and is more likely to be confounded with simple colic. When the symptoms of obstruction from intussusception become developed, an elongated tumour can generally be felt, and the discharge of bloody mucus is often observed; the value of this diagnostic indication has been shown by Mr. Gorham.* In enteritis it is very important carefully to ascertain the symptoms which marked the onset of the disease. In a case of chronic intussusception, where there was occasional diarrhœa with severe colic in a boy of fourteen years, the discharge simulated enteritis and a suspicion of irritant poison was entertained. (See "Intussusception.")

It is difficult to distinguish some cases of *chronic poisoning*, or even of *acute poisoning*, from enteritis arising from other causes. In these instances, inflammation of the mucous membrane is produced. I may refer to cases of chronic poisoning by arsenic; the vomiting is often very severe, and the irritability of the stomach a prominent symptom, but the vomited matter is never stercoraceous; the abdomen is generally less tender than in the worst cases of enteritis; in doubtful cases we must be guided by the concomitant symptoms and by the analysis of the vomited matters. In the enteritis from crude indigestible food and irritants, as some forms of mushrooms, the symptoms may be very similar to those consequent on

* 'Guy's Reports,' 1838, p. 300.

ordinary poisons, so that we may be unable to distinguish the one from the other.

In *simple colic* there is less difficulty; there is absence of tenderness, and the pain may be actually relieved by pressure.

In *peritonitis*, suddenly induced by perforated intestine, the collapse is greater; the abdomen becomes exquisitely tender and tympanitic; but vomiting is not generally produced, unless the peritoneal surface and other coats of the stomach become involved. From whatever cause enteritis is induced, peritonitis is a very common result; and the muscular coat being implicated, the peristaltic action is by a wise provision checked, and the bowels become constipated.

In *hysteria*, we sometimes find tympanitis with constipation, with irritable stomach, and with pain in the abdomen; and these symptoms might, by carelessness, be mistaken for acute inflammation. The expression of countenance is not that of severe abdominal disease; the vomiting may be induced by anything being put into the stomach, but it disappears at other times. The pain is superficial and the abdomen is tolerant of continued pressure, unless there be inflammatory disease of the ovaries. There is generally leucorrhœa, with painful or disordered menstruation; but the patient often remains in a tolerably nourished condition.

Ischuria renalis.—Dr. Barlow has pointed out the importance of bearing in mind the sympathetic symptoms connected with disease of the kidneys. In suppression of the urine, vomiting and constipation often exist; but the cerebral oppression is generally very marked, and the examination of the urine (drawn off by catheter, if none can be passed) would at once decide the character of the complaint, if there be any obscurity. A temporary ischuria renalis may exist in other abdominal diseases and even in mere flatulent distension.*

Cerebral disease.—It is not unfrequent, as we have before noticed, to find vomiting present as a symptom of disease of the brain, and then also associated with constipation; but there are some peculiarities in this state which distinguish it from enteritis and mechanical obstruction. There is no pain or distension about the abdomen; the tongue, the countenance, and the other symptoms of disease are different. In young

* Boyd, 'Edin. Med. Journal,' 1873, "On Infantile Enteralgia."

children it is sometimes difficult to distinguish muco-enteritis from true hydrocephalus ; there is irritability of the stomach in both, with perhaps diarrhœa, heat of skin, startings in the sleep, loss of appetite, unwillingness to be disturbed, &c. ; but in the former, the abdomen is more distended, in the latter it is collapsed ; the tongue is injected, and furred in the one case, but clean in the other. In hydrocephalus also there is greater pain in the head, or drowsiness ; there is disturbance of the pupils, which are contracted, or in the later stages widely dilated, with strabismus ; and the fontanelles become distended ; the vomiting in hydrocephalus is often induced by only raising the body from the recumbent posture. In the exhaustion which occasionally follows severe diarrhœa, or muco-enteritis in infants, a series of symptoms, resembling hydrocephalus, or, as they have been called, hydrencephaloid disease, supervenes ; these, however, are very different from true hydrocephalus ; they should be borne in mind, lest the effect of exhausting disease be misinterpreted ; in these cases we have the half-closed eye, the emaciated expression, diarrhœa, collapsed fontanelle ; and the early symptoms are seen to commence in abdominal, not in cerebral disease.

Causes.—The ordinary causes of enteritis are improper or indigestible food ; this is especially the case in infants and children in whom the disease is set up during dentition or weaning, or after exanthems, especially measles. Exposure to cold or wet, sleeping in damp beds, or in the open air, may induce it ; violent and sudden contortions of the body, excessive muscular exercise, as in walking, are other causes. It may be associated with acute disease of the lung, so also, with mechanical obstruction, however produced, whether by hernia, intussusception, internal strangulation, tumours, &c., and, lastly, with poisoned conditions of the blood, as pyæmia.

Prognosis.—The unfavorable symptoms of enteritis are the long persistence of the disease, emaciation, the development of peritonitis, distension of the abdomen, hiccough, prostration of strength, irregular pulse, a haggard and anxious expression, sunken eye ; or, after constipation of an obstinate character, the onset of severe diarrhœa, consisting of thin offensive or serous mucus ; also, partial sweats, inability to take food, persistent beef-like tongue.

In muco-enteritis, the continuance of diarrhœa, thin serous evacuations like the washing of beef, great exhaustion of the patient, exceedingly rapid pulse, and convulsions, are the precursors of a fatal termination.

Enteritis is less amenable to treatment when there is a strumous diathesis; the mesenteric glands are prone to become congested, swollen, and infiltrated; and the patient gradually becomes exhausted, or strumous disease is developed in other parts; but there is scarcely any condition of simple enteritis and muco-enteritis from which patients, especially infants, may not recover.

A more favorable prognosis may be given when the pain in the abdomen subsides, when the bowels act naturally, and the evacuations are of a healthy character; when the tongue is uninjected, the skin supple and generally perspiring, the pulse quiet, the countenance cheerful, and when there has been refreshing sheep.

Treatment.—We believe, then, in the existence, in these cases, of an inflamed condition of the mucous membrane, which may, or does already extend, to the submucous, muscular, and peritoneal coats; and, if we consider the pathological conditions of the disease, the indications of treatment becomes evident.

1. Allow the diseased part to rest.
2. Give the most bland and unirritating diet.
3. And avoid the use of purgatives.

It is exceedingly unadvisable to try and produce action on the bowels by violent purgative medicine, as by jalap, senna, scammony, calomel, blue pill, croton oil, crude mercury, and the like. The peristaltic action is checked by the inflamed state of the coats of the intestine, and additional irritation retards it still further. Leeches applied to the abdomen, or depletion from the arm, has, in some instances, been followed by free evacuation from the bowels, and by the relief of pain, but we should not recommend the resort in these cases to the latter remedy. Warm fomentations should be applied to the abdomen.

When irritating ingesta are retained, producing and perpetuating the disease, we may administer, at an early period, a purge of calomel or grey powder, followed by castor oil, or

linseed oil with opium, or a free saline purge, as the potassio-tartrate of soda, or sulphate of magnesia.

When, however, there is tenderness, it is more safe to give calomel, or grey powder, combined with opium, several times during the day; but it is well to avoid the continued use of mercurials.

Alkalies are of service, in acting as sedatives to the mucous membrane, in diminishing its engorged state, and in neutralising irritating secretions, as the bicarbonate of potash, in doses of gr. x, or gr. xv, and the solution of potash in doses of ɱxv to xx, properly diluted. Chlorate of potash, in gr. v to gr. x, and carbonate of soda, gr. v to gr. xv, combined with narcotic remedies, as hyoscyamus and conium, are in other instances apparently beneficial. The latter remedies appear to act on the involuntary muscular coat, and on the nerve supply of the intestine. A valuable combination in less severe cases is grey powder with Dover's powder.

Some administer magnesian salines, as sulphate of magnesia and calcined magnesia; but, where there is a tendency to extension of the disease to the peritoneal coat, I think sulphate of magnesia is injurious, in increasing the peristaltic action of the intestines, although in its direct effect on the inflamed membrane, it may lead to the emptying of the capillaries by watery evacuation.

Rest in bed is important, that the intestines may not be disturbed in their position, since perforation, in many cases, follows ulceration of the intestine; and, there may be also extension of peritonitis from inattention to this simple rule. There must also be abstinence from irritating food; in fact, nothing but the most mild and bland ingesta should be taken; demulcent drinks, milk alone, or united with lime-water or soda-water, as the case may be, will be grateful to the patient. Great care is necessary after the subsidence of the more active symptoms, in the return to nourishing and substantial food, as well as in the use of any active exertion. The warmth of the abdomen should be maintained, if there be pain, by the use of warm poultices; and in all cases the abdomen should be well surrounded with flannel.

In children with muco-enteritis, chlorate of potash is a valuable remedy, and in some cases, it appears to act with as

much benefit as in cases of stomatitis. Citrate or bicarbonate of potash are also of real service. In other cases, when the motions are clayey and white, minute doses of calomel are sometimes administered, with carbonate of soda, or chalk, as the compound soda powder of the Guy's Pharmacopœia; but much injury is often done by calomel and grey powder in these cases, and in numerous instances we have found their use unnecessary; astringents may be given, as chalk, with catechu, or krameria, or logwood, with small doses of opium; but in very young infants it is better altogether to avoid the use of opium, if possible.

Maunsell and Evanson mention the value of dilute nitric acid with minute doses of opium and simaruba, and I have often used this combination with advantage. Ipecacuanha is a valuable remedy where there is no irritability of the stomach, and it may be combined with chalk medicine or with alkalies. It has also been recommended as an injection.*

In children, also, it is essential only to administer food that can be easily digested, and although it may appear of a proper kind, if the symptoms continue, a change should be made. The disease often comes on at weaning; and the greatest care is required in seeking for a suitable diet at that period; "tops and bottoms," with water, and with or without a small quantity of milk; dried flour, biscuit powder, &c., may be given, or milk-and-water alone. I have seen cases where the only food that could be borne was water boiled for a considerable time with rice, and after partaking of this fluid the vomiting and purging ceased, and a gradual return to more substantial food was attained. For some infants, it may be necessary to obtain a wet nurse, but this is a measure to be avoided if possible. Asses' milk is the best substitute for the natural supply; and a small quantity of cream, with water, can sometimes be taken when simple milk cannot be borne. Swiss milk and Liebig's malt extract are sometimes very useful, and sometimes raw meat may be used as subsequently described.

The prostration in children is sometimes so great that stimulants are necessary. The aromatic spirit of ammonia may be given with infusion of cusparia, and with astringents; but in many instances I have seen life apparently saved by

* Boudon and Chouppe, 'Bulletin Générale de Thérapeutique,' 1874.

the timely use of brandy, or wine, administered very frequently and in small doses ; thus to a child aged three, almost in a dying state, the pulse scarcely perceptible, the extremities cold, the eyes half closed, brandy in doses of fifteen drops, diluted with water or demulcents, was given every quarter of an hour, and in a few days the child was really convaleseent. In other cases, white wine whey produces a similar beneficial result ; but the use of alcoholic stimulants in young children requires great care and caution ; they are often the cause of enteric inflammation, and I have in some instances known the exhaustion increased by their use, for the irritant effect due to their administration prevented the digestion of proper food.

CHAPTER IX.

STRUMOUS AND TUBERCULAR DISEASE OF THE ALIMENTARY CANAL. LARDACEOUS DISEASE.

Inflammatory disease of the alimentary canal in strumous subjects can scarcely be separated from the more slow and insidious strumous disease, which has less active symptoms and seems to originate spontaneously. Struma should not be looked upon as a disease of isolated organs of the body; but as one in which the power of assimilation is diminished, the nutritive functions are imperfectly performed, and the cellular elements of the tissues unnaturally prone to degeneration. Disease set up by the ordinary exciting causes in subjects of this kind leads to the various forms of strumous deposit and its subsequent changes. A blow on an epiphysis leads to strumous disease of the bone; a slight bronchitis to strumous pneumonia, and the formation of tubercular substance in the lungs; over-excitement of the brain to hydrocephalus and strumous meningitis; slight irritation of the mucous membrane of the intestine, or muco-enteritis, to caseous changes in the mesenteric glands, of the mucous membrane, and submucous tissues. The antecedent abnormal conditions are, I believe, common to these changes and to tuberculosis; damp air, a want of light and proper food, imperfect rest, hereditary disposition, and, perhaps, syphilitic taint, induce the imperfect elaboration of those products necessary for healthy growth and nutrition; and in this state the blood, the nervous force, the vital activity of every part of the body, are unable to return to the normal type on the slightest derangement, and strumous inflammation and degeneration take place.

The strumous and tubercular diatheses are closely allied, and may clinically be regarded as varieties of the same morbid condition. The tendency towards the preponderance of the changes characteristic of the one or the other will vary in different individuals. In one person, the tubercular form is so strongly marked that without any appreciable exciting cause, general tuberculosis will spread throughout the tissues; in another, a chronic disease of similar form is manifested; some will be affected by acute forms of strumous pneumonia, whilst in others chronic processes of caseation gradually extend over a greater or less extent of the lymphatic system; but all these varieties have intermediate states, and show their mutual affinities by combining in many patients their several pathological appearances. These remarks are especially applicable in treating of tubercular or strumous disease of the abdominal cavity; for on the one hand, we shall have to speak of tubercular peritonitis, a disease which may be so distinctive, that it has been proposed to separate it from other tubercular affections, and give it a separate name; * on the other hand, we shall find what is apparently the same disease mixed up with caseous changes, particularly in association with intestinal ulceration and diseases of the Fallopian tubes, and we shall also have to describe a caseous degeneration of the mesenteric glands without any miliary tubercle whatever.

Strumous and tubercular disease of the alimentary canal are observed under various forms:—

1. Severe diarrhœa as it occurs in children of strumous diathesis, without amyloid or other disease of the mesenteric glands or intestine.

2. Primary disease of the mesenteric glands—tabes mesenterica.

3. Tubercle in the peritoneum, and strumous peritonitis in its several forms.

4. Tubercle in the mucous membrane with enteritis, leading to softening, ulceration, and perforation, as is frequently observed in phthisis.

5. Tubercle in the appendix cæci.

* Granulia. See Dr. Bastian, "Discussion on Tubercle," 'Path. Soc. Trans., vol. xxv, p. 330.

1. *Diarrhœa in strumous children.*—The symptoms are very similar to those which we have described as present in gastro-enterite, but here, being engrafted upon a strumous constitution, they are more easily induced, and are less yielding to medicinal treatment. This disease causes the death of thousands of infants among the poor of London, nor does it spare the rich, when there is hereditary predisposition. The diarrhœa is frequently set up by some change in the diet or by other improper nourishmemt; by disordered secretion from the stomach, intestines, or liver; and it often follows the exhaustion of measles or scarlet fever. Many of these cases are cured by the removal of the exciting causes, and by the administration of simple, corrective medicines. When, however, these causes cannot be removed; when the infant cannot be taken from offensive exhalations, and from a damp or cold atmosphere; when no food can be administered or when there is a very feeble and strumous constitution, too frequently does the diarrhœa continue; the little patient becomes wasted, the countenance is expressive of extreme distress, and has an aged, care-worn appearance; the evacuations consist of greenish thin mucus, of food only partially changed, or they resemble the washings of meat, and are exceedingly offensive. The skin is dry, sallow, and wrinkled; the abdomen is full, sometimes hot and tender, and there is pain of paroxysmal character; the mouth is dry, and sometimes aphthous, the tongue is slightly furred, the breath is offensive, the eyes languid and the sleep is often disturbed with starting moans. Sometimes the stomach is irritable, or the appetite is craving, and the child distressed by thirst. Such are the symptoms of severe gastro-enterite rendered intractable by strumous deposit, and passing into the condition described as tabes mesenterica.

In some cases even of extreme exhaustion, the little patient rallies when proper remedial means can be employed; in others the diarrhœa persists day after day, slightly abating and then returning with renewed violence, till at last the infant dies exhausted, or convulsions come on before the close of life. It rarely happens that with very severe diarrhœa there is much cough, although the lungs may be throughout filled with miliary tubercles.

Post-mortem appearances.—After death we may find no apparent change in the whole tract of the mucous membrane; the liver, spleen, and lungs may be normal; the mesenteric glands may be enlarged and swollen, and in some instances they contain evidence of degeneration at their central parts. It might be questioned, whether a disordered mucous membrane did not induce this condition of the glands; but whether so produced or primary in its origin, there can be little doubt that it leads to the maintenance of an abnormal state of the mucous canal, and indicates strumous cachexia. When we have a more vigorous constitution, one free from struma or imperfect nutritive power, the patient often rallies, and the fatal symptoms are checked.

Treatment.—In the treatment of these cases, it is most important to remove all exciting causes of disease, and every impediment to the healthy performance of nutrition and growth; to inculcate perfect cleanliness, and the inhalation of pure air; to administer the most mild and unirritating food, and to afford warmth to the body.

The child should have warm baths; be clothed in flannel; and the air of the room must be maintained at an equable temperature. Milk will not agree with some infants, in whatever form it may be given; others will retain asses' milk, or milk with lime-water or soda-water, when pure milk is constantly rejected. In some cases the condensed milk properly diluted is kept down; and in others, again, only artificial foods can be taken; the best of these are, water boiled for a long time with rice; "tops and bottoms," gently simmered with water and without sugar; dried flour; biscuit-powder; and, as a *dernier ressort*, a wet-nurse must be obtained.

Another very useful food is *raw* meat, first recommended by Dr. Weisse, of St. Petersburgh, a piece of lean steak is procured and after grating it, it is to be beaten into a pulp; then mixed with a little sugar, and a teaspoonful may be given three or four times a day. Should the child refuse it in this form, it may be stirred into very thin chicken or mutton broth scarcely warm.

While advocating the occasional necessity of artificial food, it is to be remembered, that for young children it is only to be used to coax the stomach into a quiet state, and that as

soon as possible a gradual return to some form of milk diet is to be attempted.

In the medicinal treatment, where chalk mixture made with dill or cinnamon water, and with or without a few drops of ipecacuanha, does not avail, I have found great benefit from the administration of the compound logwood mixture of the Guy's Pharmacopœia :

Misturæ Cretæ fluidunc. vj ;
Extracti Hæmatoxyli, dr. j ;
Vini Ipecacuanhæ, fluidr. j ;
Vini Opii, fluidr. ss.

This in doses of one or two teaspoonfuls, *or*, the compound infusion of catechu, with a small quantity of opium, and, if need be, a few drops of aromatic spirit of ammonia is very useful. The krameria is also a valuable astringent, with or without chalk and opium, as in the following Guy's preparation .—Decoction of krameria ℥xv, (root ʒix, with water Oj, boiled to ℥xv). Ipecacuanha wine and tincture of catechu, of each ʒvj, and syrup ℥iss. A teaspoonful to a tablespoonful as a dose, according to the age of the child.

When a strumous condition exists, great benefit is derived from the administration of cod-liver oil, with steel wine, or from the latter medicine alone. If vomiting be absent, cod-liver oil is sometimes exceedingly serviceable ; when it cannot be taken, dilute nitric acid, with infusion of cusparia, and a few minims of compound tincture of camphor, are of benefit, especially when other means have somewhat moderated the diarrhœa.

In some cases small doses of sulphate of copper, as $\frac{1}{8}$ to $\frac{1}{4}$ of a grain, or of nitrate of silver in similar quantity, or of acetate of lead in $\frac{1}{2}$ or 1 grain doses may be prescribed with one or two grains of Dover's powder. Mercurials are, I have generally found, detrimental, and continued doses of calomel greatly aggravate the disease. Small enemata of starch may be used with benefit, and where we have a good nurse, other agents may be well applied in this way ; a weak solution of nitrate of silver or of borax tends to diminish the irritation of the lower bowel, and may prevent prolapse. When exhaustion is extreme, nourishment must be administered every few minutes, if the stomach can retain it ; and small

quantities of wine or brandy, as previously mentioned. In not a few cases alcohol has been the means of prolonging life and restoring infants to health who were apparently in a dying state.

This form of diarrhœa is, however, not confined to children. The following case is an instance of that kind, where apparently simple diarrhœa assumed an obstinate type; no form of medicine or diet checked it for many days, and at last the patient sank. There was evidence of some inflammatory action at the lower part of the ileum; intense congestion, slight diphtheritic effusion, and ulceration of the Peyer's glands were found; but these appearances were so local that they were not considered sufficient in themselves to explain the severity of the abdominal symptoms. There were minute tubercles in the peritoneum, and degenerating products in the mesenteric glands, which indicated the strumous constitution of the patient. The lungs contained neither vomica nor miliary tubercle, but some iron-grey deposit, and a little cheesy matter were found at the apex, and in the lower lobe there was ordinary hepatization, which had evidently come on a short time before death.

Case XCVIII.—*Slight Strumous Disease of the Mesenteric Glands. Diarrhœa. Pneumonia.*—Charles A—, æt. 30, a waiter, was admitted into Guy's Hospital, August 15th, 1855.

Three years previously he had had severe diarrhœa; and five weeks before admission, he had had pain at the stomach, with vomiting and loss of appetite. He lost flesh considerably; he was feverish and emaciated. The cause of the diarrhœa was not evident. The respiration was coarse at the apices of the lungs, but he had no cough. The abdomen was collapsed, and free from pain; no tumour nor abnormal condition could be detected on careful manipulation; his tongue was moist and not injected, and there was no hoarseness. His urine was non-albuminous; sp. gr. 1014. Chalk, kino, opium, copper, oxide of silver, were prescribed; the last appeared most effective; but although the diarrhœa ceased for a short time, he did not appear to derive nourishment from food; an attack of diarrhœa came on a few days before his death, on October 21st, 1855. *Inspection* twenty-six hours after death:—The body was extremely emaciated, and the eyes were sunken. In the chest there were slight pleuritic adhesions at the right apex; at the extreme apices there was old iron-gray deposit. No miliary tubercles existed. The lower lobe of the lung was hepatized. The larynx was healthy. The bronchial glands were normal. In the jejunum the mucous membrane was grey, and in the *ileum*, it was

intensely congested; one of Peyer's patches, about two feet from the cæcum, was ulcerated, and the membrane in several parts had a thin adherent brownish covering, as of epithelium stained by adherent fæces. On examination this was found to consist of columnar epithelium. The cæcum was intensely congested, and its membrane was ecchymosed. The surface presented epithelium, blood, and some mucus; and the capillaries were full of blood. The colon was in a similar state, but rather less intensely congested; no ulcer could be found. The appendix cæci was full of fæces. The mesenteric glands varied exceedingly in size, from that of a pea to a pigeon's egg; some were swollen, red, and œdematous; others contained caseous product; and in some parts beneath the peritoneum of the mesentery were minute tubercles. A minute examination of the abdominal viscera, nerves, and vessels, failed to show any other disease.

This case was believed to be one of phthisis, in which there was extensive ulceration of the colon; but this was not found after death; disease of the mesenteric glands appeared to have been the original malady; and this was the explanation of the gradual emaciation. The diarrhœa was the result of subacute disease of the mucous membrane, and of ulceration of the ileum, but it was increased by the great congestion of the mucous membrane of both small and large intestines. This was the most marked symptom, and tended more than any other to exhaust the patient. The ordinary remedies were unavailing; but of these, the oxide of silver, with conium, appeared to be the most effective. An attack of acute pneumonia was the immediate precursor of a fatal termination.

2. In *disease of the mesenteric glands*—tabes mesenterica—the cellular constituents of the glands themselves undergo multiplication, and subsequently degenerating, the structure of the glands becomes destroyed. Extensive disease of this character necessarily prevents the absorption of chyle into the system. The glands show the disease in various stages and gradations; in some there is but scanty abnormal product, in others the whole gland is destroyed and very much enlarged, constituting a whitish mass, the size of pigeon's or a hen's egg. The disease consists of glandular and fatty matter, and of imperfectly developed cells; and the swollen and injected state of less diseased glands appears to indicate that inflammation or hyperæmia is associated with the morbid change.

The pathological process appears in its outset to be essentially of an inflammatory or irritative character. The glands or lymphatic tissue become hyperæmic and fleshy, their cellular elements multiply, and crowding upon each other and upon the stroma in which they lie they cut off their own blood supply and speedily degenerate. While the cells in the central parts are degenerating into fatty material, those at the circumference are gradually infiltrating the surrounding unaffected parts and increasing the size of each nodule. These changes closely resemble those which take place in a single tubercle. The disease continues to increase, the cells dying in the centre, but growing at the circumference, till large masses of caseous material are formed; if the process be very chronic the outlying cells may be seen to form fibrous tissue so as to encapsule the disease; and it would appear that by the formation of this envelope the increase of the growth is arrested, and the disease becomes quiescent. Then it is that the last stage is reached, namely, that of calcareous change in the caseous cells. The spread of tubercle thus traced applies to all parts, whether it be in glands or in minute spots of tissue in the lymphatic spaces of a serous or mucous membrane, and whether it occur in the brain, the lung, the serous surfaces, or elsewhere.

Whilst these changes are going on in the glands the lacteals between them become enlarged and distended with similar material, and we can trace the distended ducts to the intestine, where they ramify on its surface. At this part we generally find a cluster of tubercles and ulceration of the mucous membrane; and were it not that the glands appear to be in a state of more advanced disease than the intestine, we should suppose that the ulceration of the mucosa was *followed* by absorption and then by glandular disease. The peritoneum is sometimes studded with miliary tubercles, or we merely find minute clusters opposite points of ulcerated intestine. Inflammatory products are also found in the serous membrane in various degrees, either constituting bands of adhesion, or uniting the intestine in one mass. (See Strumous Disease of the Peritoneum.)

Symptoms.—Diarrhœa, as we have previously mentioned, is one of the symptoms of mesenteric disease. There is

gradual wasting, from the obstruction of the chyle vessels, and from the cessation of the supply naturally poured into the thoracic duct. The patient has an anxious expression of countenance; there is dryness of the skin; injection of the tongue, which is more or less furred, and a craving appetite; the desire for food being insatiable. The bowels are irregular, for though often loose, they may be sometimes constipated. There are occasional attacks of severe pain, and the evacuations have sometimes been found to contain a large quantity of fatty matter.

The marasmus gradually becomes extreme, and, whilst the limbs are wasted, the abdomen is considerably enlarged, and protuberant. The abdomen is full and rounded, but it rarely happens that the enlarged glands can be felt on tactile examination; we more easily discover them in the neck and in the axillæ. Where peritonitis, and ulceration of the intestines have been produced, pain is a more common symptom.

A fatal termination may result from diarrhœa, or other organs become implicated, as the brain and lungs, causing death by tubercular bronchitis, by convulsion, or hydrocephalus. In other instances disease in the epiphyses of the bones takes place, but the patients in these cases present less advanced disease of the glands of the mesentery.

A fatal result does not necessarily follow this condition of the chylopoietic glands unless the disease be very extensive; we have evidence of this fact in the calcareous condition in which the glands are found when death has followed from other causes, as from phthisis, or from tubercular meningitis; but the interference with the elaboration of chyle increases the tendency to the formation of strumous products in other parts.

At the period when this less severe disease existed, and the subsidence of which had left the calcareous state just mentioned, gastro-enterite had probably occurred; or, without any febrile excitement, the child had been observed to be imperfectly nourished, its growth retarded, and its nutritive power evidently feeble. It is in this early stage of the disease that proper attention to the health of the child may correct commencing degenerative changes, which will, if

fully developed, necessarily prove fatal. Too frequently, however, the physician is consulted when the opportunity for checking morbid action has passed by.

Diagnosis.—In its earliest condition strumous disease of the mesenteric glands may easily be mistaken for simple diarrhœa, or gastro-enterite; and what is of greater importance, the sympathetic affection of the brain sometimes renders it exceedingly difficult to distinguish between strumous disease of the abdomen and tubercular meningitis. In the former there may be cerebral oppression, grinding of the teeth in sleep, starting, occasional vomiting, and convulsion; but in the latter the mind is generally less active, there is strabismus, or an evident abnormal condition of the pupils; the abdomen is collapsed rather than distended; there is greater unwillingness for exposure of the skin to cold air, the bed-clothes are drawn firmly down when the patient is sensible; and again, the superficial capillary circulation is more disturbed, and the vessels yield easily to distension. It is in this way that the so-called "tâche cerebrale" is produced. On drawing the finger across the skin, a deep line of congestion appears and remains for a short time; this indication, however, is by no means constant or certain. In the cerebral disease vomiting is often a marked symptom, especially at an early stage; and this with irregularity of the pulse are the two symptoms which are most reliable.

In the cachexia produced by enlarged spleen, by miasmatic disease, by lardaceous disease of the liver, or of other glands, by disordered viscera associated with worms, symptoms arise which in some respects simulate mesenteric disease. The history of the case, and the presence of enlargement of the liver or spleen, assist our diagnosis.

In children affected by any of the various kinds of intestinal worms, the symptoms are pallor, irregular bowels, wasting, distended abdomen, and voracious appetite; but there is often present more irritation about the nose and anus than in mesenteric disease; there is less emaciation, and the disease is more amenable to treatment.

Tubercular peritonitis is frequently associated with mesenteric disease, and is with great difficulty distinguished from it. The abdomen is less supple when the peritoneum is

implicated, and when the disease is advanced the intestines move *en masse;* there is tenderness and distension, the pain is more severe; but the emaciation is less manifest. Ulceration of the small or large intestine and diarrhœa may be present in either disease, but very many of the cases usually designated tabes mesenterica are really tubercular peritonitis.

In strumous subjects, however, after gastro-enterite, or slight peritonitis, the intestines sometimes become much distended with flatus, and these cases at first sight resemble ascites; a very unfavorable prognosis may be given, whilst with rest, good air, cod-liver oil and steel, and occasional alteratives, the health becomes established, and the distension and pain disappear. The insidious character of strumous peritonitis must be well remembered; pain may be *entirely* absent, and the emaciation steadily progressive.

The *prognosis* in well-marked cases of mesenteric disease must be exceedingly unfavorable; for when there is any general affection of the glands the obstruction to the introduction of food into the system is scarcely less complete than in direct pressure on the thoracic duct. Numerous inspections after death, however, show us that there may be degeneration of many of these glands. Some become calcareous and pass evidently into a passive state, whilst others of them are restored to their normal condition, and life may thus be prolonged for many years, till strumous disease in some other form, or another malady, proves fatal. Such cases also occasionally terminate fatally from intestinal obstruction many years after they have been apparently cured. The inflammatory deposit causes contraction or leads to bending of the intestine upon itself at an acute angle.

The age of infancy is most liable to mesenteric disease, but it is frequent at any period from the first to the completion of the second dentition; in those who attain to early manhood it is much more frequently found associated with strumous peritonitis and with phthisis.

The *causes* of this disease have been previously mentioned; they are hereditary predisposition, improper food, and the substitution of artificial foods for the mother's milk, insufficient rest, the want of cleanliness and light, the exanthems, as measles, scarlet fever, and small-pox, exposure to cold, and

to a damp, humid atmosphere, probably also congenital syphilis. Each of these causes diminishes the nutritive energy of the system, and a slight exciting cause then becomes sufficient to set up the disease; and when it is developed to accelerate it, so that it becomes quickly manifest in a marked degree.

Simple mesenteric disease is, however, rare, even in strumous subjects; for we generally find that there is also tubercular disease of the peritoneum or of the mucous membrane; and in many cases of tubercular peritonitis, and of phthisis with ulcerated intestine, the glands are unaffected.

Treatment.—It must always be remembered, that in this disease waste advances and increases, whilst the supply of reparative material to the blood is cut off.

Our chief aim, therefore, must be to facilitate and assist nutrition; whatever is given must be easy of absorption and assimilation, as we have stated in speaking of the diarrhœa of strumous children. Wine may be often taken with advantage, for alcoholic liquors probably prevent waste going on with such great rapidity; and it has been shown by the observations of Dr. Anstie, and of others, that during the administration of alcohol the excretion of urea is checked, and the function of other organs, especially that of the lungs, is diminished.

If there be febrile excitement, salines, as the bicarbonate of potash, or the citrate of ammonia, in doses of a few grains, may be administered; and when great restlessness exists, gr. j or ij of Dover's powder, or ℥iij or v of the solution of hydrochlorate of morphia, are of service. Mercurials are better avoided; but when the motions are clayey and pale, and the bowels constipated, their use, in the form of grey powder, or calomel with bicarbonate of soda, is occasionally beneficial. A change to sea air is very desirable in the early stages of mesenteric disease. With cod-liver oil we may with advantage combine iodide of potassium, iodide of iron, &c. The preparations of iron, however, cannot in many cases be taken; pain in the bowels is produced; but this is less likely to follow the use of steel wine, and the saccharine carbonate of iron, than the stronger compounds. Iodide of potassium with solution of potash, with very minute doses of

opium if necessary, continued for a lengthened period, are sometimes of considerable service.

As to external remedies, the tincture of iodine may be painted over the abdomen, or slips of the ammoniacum plaster with mercury may be applied; but the maintenance of an equable and warm state of the skin is of greater importance than external medicinal application.

3. *Tubercles in the peritoneum and strumous peritonitis.*—The state of the peritoneum is so closely associated with that of the alimentary canal, that a consideration of strumous disease affecting that part renders some notice of the diseased peritoneum necessary.

Tubercular peritonitis is manifested in several conditions.

1. As miliary tubercles covering the general surface of the peritoneum—visceral, parietal, and mesenteric, and in some instances associated with ascites. In some of these cases of ascites there may be very little proof of tubercular growth; but tubercle may be subsequently developed as the result of chronic irritation in patients constitutionally predisposed to it.

2. Caseous thickening of the peritoneum and subperitoneal connective tissue by tubercular growth which rapidly degenerates. This form is associated with deposit in the glands, and with inflammation leading to matting together of the intestines; sometimes to perforation from without, and to the formation of small fæcal abscesses and sometimes to tympanitis in a marked degree.

The presence of miliary tubercles on the peritoneum is found in many cases of phthisis, where there is ulceration of the intestine, the corresponding surface of the peritoneum being covered with minute tubercles, and this condition of local tuberculosis may cause an affection of the whole peritoneum.

In children who have died from hydrocephalus, with miliary tubercles in the pia mater, or from acute pneumonia with miliary tubercles studding the whole of the lung, the peritoneum is frequently found affected in the manner described, but the disease of the serous membrane does not assume a condition of clinical or pathological importance.

The formation is generally seen as semi-transparent grains, and appears to be situated both on the surface and in the deeper

layer of the peritoneum; it consists of an almost amorphous blastema with minute granules, and of imperfectly developed cells, which rapidly caseate in the centre; but sometimes around the deposit elongated fibre cells and branching cells are observed, and there is in all cases of general tuberculosis a great amount of inflammatory growth and lymph product.

In some cases of peritonitis, thin layers of lymph are deposited on the peritoneum, and the surface assumes a minutely granular appearance, almost as if sprinkled with sand; the grains thus produced must not be mistaken for true miliary tubercles; they can occasionally be scraped off, and they leave the serous membrane smooth beneath, but this cannot always be effected. The movement of one part of the intestine on another, and the gradual deposition of lymph, appear to produce this condition. Sometimes there is a great amount of serous exudation, and ascites is produced, whilst another more severe form of disease is that in which, with strumous deposit, there is ordinary inflammatory change; the intestines become matted together by lymph, and by low organised product, which rapidly undergoes degeneration, constituting cheesy masses. These masses are formed between the coils of intestine, in the omentum, and in the adhesions themselves; so that we find the peritoneal tunic of the liver, spleen, &c., considerably thickened—three to five lines, or more—and in the fibrous tissue constituting the firmer part of the deposit are tubercles or strumous infiltration. The stomach rarely, if ever, presents tubercles or tubercular ulceration on its mucous surface, but it is not uncommon to find tubercles on its peritoneal surface. The mesentery and its glands are also generally found in a similar condition.

The product thus formed leads to union of the intestine, one part with another, so that the peritoneal cavity becomes entirely obliterated; fresh deposition takes place as the disease advances, and the tendency to degenerate increases. The masses soften down, the peritoneal and muscular coats ulcerate, and this proccess continues till the mucous surface gives way, and an opening is formed into the intestinal canal. The perforation takes place from without, beginning at the peritoneal surface. This perforation does not, however, lead to more extensive peritonitis; the firm adhesions which have

already taken place have obliterated the peritoneal cavity, and thus prevent effusion. Thus, either no extravasation follows, or a very small fæcal abscess is the result. The extension of ulceration amongst contiguous coils of intestine sometimes leads to several portions becoming completely truncated and opening into a fæcal abscess in which six or eight communications may exist. I have examined several cases in which there were from twelve to fifteen communications between portions of the intestine in different parts, but without fæcal abscess. In these cases it is quite impossible to unravel the intestine, or even to distinguish the various parts in many instances. The intestine becomes, indeed, a sac of many pouches rather than a contiuous tube. Should the adhesions be less extensive, perforation will produce more marked symptoms, if a fatal result does not very quickly follow. It is generally the small intestine which is found perforated; but it may open into the colon; and once I observed the jejunum communicating with the transverse colon. In a recent case, a child, aged three years, after measles had tympanitic distension of the abdomen with diarrhœa; perforation took place into the bladder; fæces were passed by the penis, and urine was apparently discharged by the rectum. There was no pain, but the child sank in a few days.

It is more rare in strumous than in cancerous disease of the abdomen and intestines, to find fæcal abscesses followed by perforation of the abdominal parietes. In struma the disease is often very general, and several fæcal abscesses exist; but the adhesions and secondary perforations allow the contents of the canal to be passed onwards; in cancer the ulceration is more localized in character, and gradually extends through all the contiguous structures. We have seen, however, in a child aged six, strumous disease of the abdomen followed by perforation of the parietes. The effusion in some instances is of an ascitic character, and dropsy is the result. The peritoneum is thickened, clear serum is effused, and with it more or less strumous product. This is not a rare disease among children, but it is of a slow, insidious character, and very intractable. It sometimes exists with a lardaceous condition of the liver or of the spleen, but this is not always the case, nor is it always preceded by one of the exanthems.

In some instances of strumous peritonitis the intestine appears to lose its contractile power, and yields to distension, so that most distressing tympanitis takes place, or there is simple distension *without pain*, the muscular fibre having simply lost its power of contraction. The coats of the intestine become so much softened that after death they readily separate the one from the other, and may be torn in long shreds. Dr. Hodgkin placed in the museum at Guy's several specimens showing this condition in a remarkable degree.*

The *symptoms* of this form of disease are also sometimes obscure at the commencement; with a well marked strumous diathesis we have pain in the abdomen of a severe character, resembling colic; and it is accompanied with considerable tenderness; diarrhœa and febrile excitement come on, with injected, slightly furred tongue and with a distressed expression of the countenance. There is a circumscribed flush on one cheek. Under suitable treatment and precaution the active symptoms subside, and the patient feels relieved; in a few days or weeks, however, the pain returns, and there is renewed aggravation of the symptoms and of the febrile state; it may be that a defined mass is felt in the abdomen, in the umbilical, hypogastric or iliac regions; the tumour is tender on pressure, and imperfectly resonant on percussion.

These attacks are repeated from time to time, and the diarrhœa becomes severe, and occasionally is accompanied by vomiting. The body wastes, but the abdomen is large, and in most cases it loses its suppleness, and moves *en masse*. The tongue becomes more injected, oftentimes red and morbidly clean. The strength of the patient is broken, severe hectic is set up, attacks of pain are more frequent, and portions of the abdomen become exquisitely tender, at length the exhaustion becomes extreme, or more general tuberculosis is set up; the brain may be affected with tubercular meningitis, and coma or convulsions come on before death.

The symptoms somewhat resemble those of mesenteric disease; the abdomen is hot, often distended, and tympanitic;

* Hodgkin, 'On Mucous and Serous Membranes.'

the recti are rigid; the body wastes, the countenance becomes anxious, and the eyes sunken; the patient is fretful and irritable; the bowels often act with irregularity; the pain is sometimes a marked symptom, but it is often absent, or it merely resembles occasional colic. The wasting of the body is, however, less than in severe disease of the mesenteric glands.

The second form is that in which there is less serous effusion, but the strumous product is accompanied by greater inflammation, lymph is effused, and the intestines are matted together by bands of adhesion, or there is cough from strumous disease of the lungs; but this aggravation of the suffering is generally absent, for the pulmonary disease remains latent. The severe attacks of pain often indicate the formation of fæcal abscess or fresh accessions of inflammation; but we shall dwell hereafter on the sudden peritonitis, which is sometimes set up in subjects affected with cæcal disease and phthisis.

The symptoms may be exceedingly insidious in those cases in which there is serous effusion into the peritoneal cavity. The patient becomes anæmic and emaciated, pain is occasionally paroxysmal, or less severe but continued. After a time the abdomen becomes enlarged and the fluctuation is perceived; but there may be neither febrile symptoms nor pain, nor any evidence of enlargement of the liver or spleen, nor disease of other viscera. Strumous disease of other organs, however, generally follows, and leads to fatal results. There is great difficulty in producing absorption of this peritonitic fluid; for the peritoneum is in a passive condition, and medicines which act on the excretory organs, as diuretics, solution of potash, or iodide of potassium, often fail in the desired effect; and mercurials tend in many instances to increase the effusion.

Causes.—Children in their first dentition, and at the age of puberty, in whom the rapid developmental changes are perverted by struma, are very prone to this disease, but early manhood from 15 to 25, or 30, is by no means exempt; and we sometimes observe it at much later periods of life, even in patients of 50 to 60 years of age.

The predisposing causes are those of strumous disease generally—hereditary taint, unwholesome food, the want of

cleanliness, a damp humid state of atmosphere, exposure to cold, insufficient light, &c. Light is as essential to healthy growth as cleanliness; but unfortunately the absence of the one often entails the loss of the other. The dark offensive dwellings of poverty present terrible manifestations of some of the sources of struma; but it is also to be found amongst the rich in whom hereditary tendency, exposure to cold, &c., are sufficient, with very slight exciting causes, to induce these affections.

The hyperæmic state of the ovaries at commencing menstruation sometimes suffices to determine the deposition of strumous product, and to cause strumous peritonitis extending from the pelvic viscera; this is especially the case when menstruation in young subjects has been checked by exposure to cold.

Peritoneal disease of this form is sometimes excited by blows or falls on the abdomen, or it follows diarrhœa from injudicious food or excess; we observe it also as a sequel to typhoid fever; the follicular ulceration of the intestine and irritation of the mesenteric glands being followed by strumous disease.

The *diagnosis* has already been spoken of in mesenteric affections; we may further add, that when strumous disease of the abdomen is associated with like disease of the brain, the symptoms are often more than usually obscure; cerebral symptoms, such as delirium and coma, may be followed by prostration, distension of the abdomen, and vomiting; and the general aspect of the disease may closely resemble enteric fever.

The *prognosis* in well-marked cases is very unfavorable; but at an early stage, before the disease has become pronounced, much may be done to render the changes which have occurred passive, and to prevent the accession of fresh disease.

Treatment.—The indications for treatment are very similar to those mentioned in mesenteric disease. As far as possible the exciting cause of the disease should be taken away; and although this is less practicable, we must attempt the removal of the condition which constitutes the disease. This may in part be effected by sea air, by iodine, cod-liver oil, iodide of potassium, and the milder preparations of steel. Nourish-

ment should be freely given, and of a character that can be easily assimilated. Improper food may induce most severe colic, and defeat all remedial measnres.

The inflammatory state is best counteracted by the application of leeches and counter-irritants; as cantharides, or iodine, applied externally; in children, it is well to place a portion of tissue paper between the cantharides and the skin, and only to apply the plaster for two or three hours; or to use for a short time the acetum cantharides; or still better, the Cantharidine Blistering Tissue.

When fluid exists, diuretics may be tried, but they are not of much service. Great care is required in allowing exercise, because at the same time that fresh air and change are exceedingly desirable to improve the health, rest is most important for the abdominal organs themselves. Slight movements may break down adhesions, and lead to rapid extension of disease, and to a fatal termination. The importance of rest to the viscera of the abdomen can scarcely be urged with sufficient force.

Again, it is most desirable that mercurial medicines and drastic purges should be avoided; the gentlest laxatives and mild enemata are all that are required.

Various symptoms arise which demand almost daily attention, as diarrhœa or occasional vomiting, each of which must be checked by appropriate treatment. In a case of strumous peritonitis recorded by Dr. Hughes in the 'Guy's Reports' of 1856, creasote was prescribed to check severe vomiting; it produced urine almost of the colour of indigo, but it relieved the patient. Pain must be moderated by opium in small doses, or by morphia; by warm fomentations or cataplasms; by chloroform; or by belladonna applied to the parietes.

Gentle pressure by a bandage, and the irritation of the ammoniacum with mercury plaster, are sometimes of service; and in those cases in which fluid is poured out, tapping is sometimes advisable; for in chronic peritonitis the serous membrane often forms a thickened, and almost a passive sac.

Case XCIX.—*Strumous Peritonitis. Fæcal Abscess. Artificial Anus.*—A little girl, æt. 6, had been suffering from chronic peritonitis for about a year. The abdomen became much distended, and there was

severe vomiting, with great emaciation. Six months before death a circumscribed tumour formed near the umbilicus; this afterwards broke, and discharged fæces.

On inspection, the lungs were found studded with tubercles; the intestines were adherent, and several portions were perforated; they had formed a fæcal abscess near the umbilicus, which had discharged externally. The Fallopian tubes were filled with soft strumous product. (Prep. in Guy's Museum, 2446[50].)

4. *Disease of intestine in phthisis pulmonalis.*—The mucous membrane of the intestine is frequently the seat of tubercle; and although tubercles are rarely, if ever, found in the mucous membrane primarily, they are often associated with strumous disease of the lung, of the serous membranes, of the brain, or of the bones.

A very common position for this deposit is in the substance of the mucous membrane, at the lower part of the ileum, and generally in the aggregate or solitary glands. The deposition takes place, as in the lungs, without any evidence of inflammatory disease, and the tubercles are found as minute grains, one sixteenth to one eight of an inch in diameter, and of an opaque, cheesy appearance. On examination they will be found to consist, in most instances, of an immense number of granules of fat, with imperfect nuciei, though if they are found in their earliest stages they consist of the same kind of growth as we have previously described; in other instances the centre is semi-fluid, softened down; still more advanced, we find that the slight covering of the mucous membrane has given way, and a small ulcer is formed, with a depression in its centre, and with an irregular and slightly excavated margin. This formation is probably in most cases preceded by hyperæmia of the mucous membrane, or by inflammatory action; and although it appears nearly established that inflammatory action is not essential to its deposition, this state tends to accelerate degeneration, and the repeated deposition of strumous product at the margin of the ulcer. When inflammatory action has taken place, the edge of the ulcer is found to be injected and irregular, and to have extended rapidly; in some cases, also, sloughing has taken place. The extent of this diseased state varies exceedingly; generally only the

lower part of the ileum is affected, and next in frequency the rest of the ileum and the cæcum. With these parts, the colon is sometimes diseased in its whole length; and lastly, also, the other portions of the small intestines, the jejunum, and even the duodenum.

We frequently find, that, at the base of the ulcer, immediately beneath the peritoneum, there are numerous minute tubercles, apparently caused by a direct process of spreading to adjoining parts or infection. In other instances the mucous membrane is raised, and presents a small swelling, about a quarter of an inch in elevation, and a quarter to half an inch in diameter; and on making a section of this minute tumour, a collection of pus is found in it; a sort of small abscess in the mucous membrane. (*See* Cases on Disease of the cæcum.)

But strumous ulceration of the intestine, when associated with phthisis, sometimes manifests itself differently. There is scarcely any diarrhœa, but sudden intense pain is followed by collapse, and too often by fatal peritonitis. A minute ulcer has increased in depth, so as to extend through the muscular coat, and then through the peritoneum. It may be that this peritonitis is localized, or that a fæcal abscess is formed, and of these several accidents we shall have to speak more fully. The affections of the appendix cæci will also require a fuller notice.

In other instances the diseased intestine is found to be in a healing condition, while the affection of the lungs has steadily progressed, or, having become rapidly aggravated, has led to a fatal result. I have several times seen cicatrices in the intestine in phthisis, when there was no evidence to show previous disease of a different kind, as typhoid fever. In one instance, admitted into Guy's Hospital several years ago, there were symptoms of intestinal, and it was feared insuperable, obstruction; but the patient was spared to linger on for many weeks, and died from phthisis pulmonalis. A cicatrix was found in the ileum, leading to very considerable contraction of the intestine, and no doubt it had been the cause of the previous symptoms of obstruction.

In some patients in whom the jejunum and ileum have been ulcerated throughout, with less affection of the colon,

the diarrhœa has been exceedingly severe. When the mesenteric glands are also affected, we have several times observed, extending from an ulcer in the jejunum or ileum, distended lacteals, reaching to the infiltrated glands, and filled with yellow cheesy product. Some regard the ulceration of the intestine as the cause of the disease in the lacteals and glands; others consider that the gland was primarily diseased, and that the obstructed lacteals and local congestion consequent upon it have set up the ulceration at that part of the intestine. Simple distension of the lacteals is more common in cancerous disease, from pressure on the thoracic duct; whilst in struma abnormal product fills and enlarges the lacteals.

In many cases of phthisis the intestine appears to have taken part in the general atrophy of the whole body, and we find the coats of the intestine much thinned, of a pale colour, and even semi-transparent. Again, the mucous membrane sometimes does not present any lesion, although the patient may have had severe diarrhœa, and this without any evidence of lardaceous disease.

The extent and severity of the affection of the intestine are very diverse. In cases where the phthisis is of a pneumonic character, when there is extensive effusion into the lung tissue, rapid disorganization, considerable fever, and speedy termination, the intestines are sometimes unaffected. It is in more chronic cases that we generally find this condition most marked.

In one hundred cases of phthisis in only thirteen were the intestines found to be healthy, and those were cases of the character just mentioned, namely, pneumonic phthisis. In sixty-nine cases the ileum was diseased, and generally the colon also, in a greater or less degree; in seventeen cases the colon only was diseased. The ileum is the part most frequently affected. In more severe cases, the colon is also diseased, sometimes in its whole length, or merely at the sigmoid flexure; or we find the whole alimentary tract diseased, and the jejunum, ileum, and colon are all ulcerated and inflamed.

Attacks of diarrhœa generally alternate with constipation in phthisical disease of the intestine, and thin bilious evacuations are occasionally mixed with blood. The discharge from the bowels is sometimes composed of mucus passed in

long strings or casts, or it presents the character of yeast; in a case of this kind under my care, the evacuation closely resembled the matters discharged from the stomach in obstructed pylorus, but with a fæcal instead of a sour odour. Under microscopical examination minute cells and grains in a state of change were observed, but not the ordinary torula, nor the sarcina ventriculi. In other instances the disease resembles acute dysentery, blood and mucus are passed, with considerable tenesmus; there is slight griping pain, but the discharge from the bowels resists all treatment; it may be checked for a few days, but again returns, and it is remarkable in some cases how completely the thoracic symptoms are in *abeyance; neither cough, dyspnœa, pain, nor distress about the chest may trouble the patient, although after death considerable vomicæ may be detected in the lung.* In some of these instances the appearances of the colon are quite those of a dysenteric character, the extent of the ulceration destroying in some cases the mucous and muscular coats, leaving but small islets of injected mucous membrane; in other instances the surface is covered by diphtheritic membrane, and presents isolated patches of superficial ulceration beneath. Many of these appearances have been observed in the numerous cases of phthisis which have died at Guy's Hospital, and it is probable that the more damp air of the Borough of Southwark, the ill-ventilated homes in Bermondsey and Rotherhithe, from which some of these patients have come, have induced this dysenteric state.

It would appear that exposure to cold and wet is sometimes the cause of the unusual severity in the affection of the alimentary canal in phthisis. In other cases, the administration of mercurial medicines, of drastic purgatives, and of improper food, induces this condition.

The presence of fistula in ano, as a complication of phthisis, is frequent; and it is a question upon which opinions are varied, whether the division of the sphincter is advisable in such cases. Most surgeons would dissuade from the operation at the later stages, but in the earlier condition, before there is any disorganization of the lung, the removal of a depressing and exhausting discharge may tend to re-establish health, so also when hæmorrhage takes place from the part; some-

times, however, the pulmonary symptoms rapidly increase after the operation.

With albuminuria in strumous subjects, disease of the colon leads sometimes to severe diarrhœa and great exhaustion. The association of phthisis with renal disease is not of very frequent occurrence; in these cases the ileum and colon, as in ordinary phthisis, may be ulcerated, or the rectum may be especially diseased. The use of purgatives to relieve anasarca has been followed in some of these cases by serous diarrhœa of a very intractable nature; inflammation and ulceration are set up, and, like ulceration on the extremities in dropsy, may be the immediate cause of death.

Treatment.—The 1st object should be as much as possible to remove the exciting causes of diarrhœa; 2nd, to check irritating secretions by correctives and astringents; 3rd, to soothe the inflamed membrane by demulcents and by opiates.

In most cases the avoidance of indigestible food, of uncooked fruit, and of malt liquors, is sufficient to check the purging in ordinary phthisical disease of the intestine; if not, an injection of starch and opium may be used with benefit. Suet and milk is an unirritating form of nourishment, and is often of much service; other demulcents, too, are used with advantage; and when the powers of the patient are much depressed, port wine or brandy must be prescribed.

Opium alone, or in combination, is of great value, as in Dover's powder, the compound kino powder; and it may be given with acetate of lead, with sulphate of copper, with bismuth, or with oxide of silver. Bismuth alone will oftentimes quiet this irritable condition of the alimentary canal; alkalies also, and astringents, as the compound krameria mixture and the compound logwood mixture of the Guy's Pharmacopœia, will often be found valuable remedial agents.

Although in some cases cod-liver oil acts on the bowels, in other instances it moderates diarrhœa, and the bowels act with less violence and pain.

I have found the injection of borax with barley water, or powdered charcoal with the same agent, of more service in some cases where the colon is much affected, than simple starch with opium.*

* See Dr. Th. Thompson, 'On Consumption.'

If there be severe pain the application of hot cataplasms or of mustard affords partial relief.

It is the exception to find phthisis free from abdominal complication, but the following instances present some peculiarities in reference to this affection: in one case the mesenteric glands were very extensively diseased, and the lacteals distended with strumous product; the diarrhœa was exceedingly obstinate, and hastened the fatal termination. In another, the pulmonary symptoms were entirely masked, but there is no doubt that the dysenteric inflammation was more intractable in character on account of the disorganization of the lungs. If there had been no inspection after death, the latter would probably have been considered by many practitioners, who did not take the trouble carefully to examine the chest, as simple disease of intestine. Each case of phthisis must be considered by itself; the different degrees of pneumonic inflammation, of laryngeal disease, and of glandular or abdominal complication, &c., render the secondary symptoms exceedingly modified and varied, whilst the broad general characters bear very close similarity; much relief may be afforded by suiting the treatment to these sources of discomfort and danger.

Case C.—*Strumous Disease of the Mesenteric Glands. Obstruction of the Lacteals. Ulceration of the Small and Large Intestine. Dysentery. Phthisis.*—William S—, æt. 20, was admitted into Guy's Hospital, August 29th, and died November 1st, 1855. With the exception of a slight cough, he had enjoyed good health till the January previous; he then had severe cold, and his cough increased in severity; he had gradually become more feeble and emaciated till his admission. His chest was narrow and contracted. There was dulness on percussion below the clavicles; and in the supra- and infra-scapular regions there was also roughness in the respiratory murmur, with bronchial respiration.

The diarrhœa continued with short intermissions, and his affection of the throat increased; he became extremely emaciated, and died November 1st.

Inspection twenty-one hours after death. The larynx was extensively ulcerated. At the apices of the lungs were several vomicæ, and throughout both lungs were numerous tubercular deposits and miliary tubercles. The bronchial glands were much enlarged; and they were infiltrated with strumous product.

Abdomen.—The intestines were tolerably distended; the peritoneum presented granular tubercular deposit, and there was considerable

injection of it at the parts of the small intestine opposite to the ulcerated portions of the mucous membrane; the mesenteric glands were very large and prominent, of a yellowish-white colour, and infiltrated with low organised product; some of them were the size of a pigeon's egg, and they occupied the whole of the mesentery. In several parts of the small intestine, lacteals were observed to extend from the enlarged glands to the walls of the intestine; these vessels were white, irregularly distended, and in some places had a moniliform appearance; they extended in several places upon the walls of the intestine, and beneath the mucous membrane to ulcers situated there. On opening the small intestine, numerous ulcers were observed; they commenced in the upper portion of the jejunum, and extended with greater or less intervals to the cæcum; some were one and a half inches in length; their margins were congested, and were irregular and undermined; their surfaces were granular, as if presenting minute strumous deposit. The ulcers were scattered about six inches apart, and were larger at the jejunum than in the ileum; strumous tubercles were observed in many parts of the ileum in the substance of the mucous membrane, and there were several minute ulcers about the size of peas. The ileo-cæcal valve was much congested, and was swollen and œdematous. The whole of the cæcum and colon had a remarkable appearance; with the exception of a few islets of raised congested membrane, the whole surface, as far as the sigmoid flexure, was destroyed. The surface was of a whitish granular appearance, presenting some congested points or irregular pits; the section showed that there was low organised product in the superficial layer; some true tubercles and cellular tissue dipped down into the muscular coat, and on the surface itself there was granular and imperfectly formed cellular deposit, like diphtheritic membrane. The descending colon presented transverse irregular ulcers, with larger intervening spaces; the rectum was still less affected. The appendix was much distended at its superior two thirds, and was ulcerated; it contained strumous tubercles. The white substance in the lacteals consisted of particles of fat irregularly aggregated into numerous spherical masses; and in the mesenteric glands there was ordinary strumous and imperfectly formed cellular growth. The liver was normal and not fatty; the spleen was healthy.

Case CI.—*Ulcerated Colon. Phthisis. No Cough.*—Mich. M'C—, æt. 53, was admitted with violent purging, which had existed a week; much mucus was passed per rectum, but he had no cough. He sank in a very short time. The whole of the large intestine was intensely inflamed and ulcerated, and the small intestines congested; an old vomica at the apex of the lung was surrounded by iron-grey pneumonia.

The pulmonary symptoms were masked; he had no cough, but the severity of the abdominal symptoms, dysentery of an acute form, rapidly led to a fatal result.

Case CII.—*Phthisis. Ulceration of the Rectum and Sigmoid Flexure.*

MANCHESTER MEDICAL

Hæmorrhage from the Bowels. Ulceration of the Appendix Cæci.—A. B— was admitted into Guy's Hospital, under my care, March 18th, 1857. He was a married man, of temperate habits, who had considered himself in health till one month before admission; his principal symptom had been discharge of blood from the rectum with diarrhœa; he had cough, had rapidly emaciated, and he had become completely blanched. He had evidence of phthisis at the left apex. Emaciation rapidly increased, the cough became more severe, and the evidence of disorganization of the lung more decided. He died in one month; and for several days he appeared to be in articulo mortis.

On *inspection* there was tubercular affection of both lungs, and also of the larynx. Small vomicæ and red hepatization were found. The intestines, especially the small, were empty and contracted; and in the lower part of the ileum were a few tubercles and commencing ulceration. The transverse colon presented a sigmoid twist near the spleen, and the ascending and transverse colon contained some scybala, and presented several ulcers, oval in form, about half an inch in breadth, with injected irregular margins. In the sigmoid flexure and rectum, the whole of the mucous membrane was injected; it was almost covered with patches of ulceration, and in some parts there were portions of adherent diphtheritic membrane. The appendix cæci was twisted in a sigmoid form; and at the right of the cæcum, near its terminal third, it became very much dilated; the mucous membrane at this part was entirely destroyed, and the muscular coat much hypertrophied. The kidneys, liver, and spleen were healthy.

The ulceration of the rectum and sigmoid flexure had led to the hæmorrhage which blanched the patient; and in consequence of this exhaustion the disease of the lung rapidly advanced. It was not the part of the intestine usually affected in phthisis; and he had no pain, distension of the abdomen, nor severe tenesmus; diarrhœa and discharge of blood, were the most marked symptoms of abdominal disease. The mesenteric glands were more than usually affected. The appendix cæci was so diseased that ulceration would probably have extended into the peritoneum or into the cellular tissue, if life had been prolonged. The loss of blood apparently hastened the diseased action in the intestine rather than diminished it; and although the purging was checked, the patient never appeared to rally to any extent. He was unable to take cod-liver oil, but appeared partially benefited by hydrochloric acid, with small doses of opium and calumba.

These instances, and many others which might have been adduced, show the general constitutional character of phthisi-

cal disease; and that although it may manifest itself with greater severity in one organ than in another, we shouldc losely observe the state of all the viscera, as having a most important influence on the curability of the disease, for these simultaneous developments of morbid action go on very insidiously, and even when the general state of strumous disorganization may be past the stage of reparative action, much may be done in partially relieving distressing urgent complications.

LARDACEOUS DISEASE.

There are numerous conditions of the system which manifest themselves in local changes; those glandular diseases which we have described as the result of a strumous or scrofulous state are the result of a constitutional defect, and in lardaceous or amyloid disease, we have a local affection especially of the coats of the minute capillary arteries which though not strictly constitutional, is produced by a general cause. This condition had been recognised as a degenerative change many years ago and was believed to be closely allied to strumous deposit; the bacon-like appearance in the liver when affected with this disease had long been known, hence the name lardaceous and waxy; but it was about 1854 that Virchow adopted the term amyloid disease from the supposed identity of the morbid product with the vegetable principle starch; the laminated appearance of the corpora amylacea observed in the brain, and the colour produced by sulphuric acid and iodine, led that acute observer to regard the blue matter produced, as identical with iodide of farina; it has, however, been subsequently shewn that the iodine is itself deposited and thus produces the blue discoloration. Still there is a reaction with iodine although of a different kind; the affected tissue assumes with a dilute solution of free iodine a deep brown colour, and it is deeply and persistently stained by the blue of indigo. As to the tissue affected, it is found that the coats of the minute capillary arterioles become thickened by abnormal deposit, at first the muscular, then the other coats become involved, and when coloured by iodine the vessels are very easily observed. These thickened vessels may be seen in the mucous membrane of the intestine,

in the kidney, in the Malpighian tufts, and in the lymphatic glands; and in the liver they may be traced to the circumference of the lobules; but it is not the capillaries alone that are affected, the cells of the glands, especially of the liver, lose their normal appearance, they become infiltrated with similar dense product; other structures may be likewise affected, the lymphatic glands, the tonsil, the supra-renal capsule, the thyroid, the muscles, the membranes of the brain, the bladder, and the serous membranes are all mentioned by my colleague Dr. Moxon as liable to this change.* As to the nature of the deposit it is albuminous in character, although, according to Dr. Marcet, it contains a diminished quantity of nitrogen. Dr. Dickinson † states, that it is a fibrinous matter with a deficiency of alkalies, potash and soda. "In the healthy specimens the alkaline salts varied between 89 and 118 parts in 1000. With the amyloid the variation was between 48 and 107." He refers the disease to a "dealkalised fibrine," and proposes the term "depurative" as indicating the nature of the process. This term is suggested by the ordinary cause of the disease, for in numerous instances it is found to follow long continued suppuration; thus it comes on after disease of the bones, as necrosis, caries, chronic abscess, disease of the spine, and suppuration of other kinds, as that which is associated with chronic phthisis, and with long continued ulceration of the intestine, and possibly the cachexia of tuberculosis and struma may also induce the disease; but syphilis is the second great cause of lardaceous disease, for nearly every case is found to be connected either with syphilis or chronic suppuration. It would appear that unless the part be extensively affected, its functional activity may be continued; still, in later stages whether the mucous membrane of the intestine, the liver, the spleen or the kidneys be involved, the healthy action of the part is seriously interfered with. It has been shewn by my colleagues, Dr. Fagge and Dr. Goodhart that a small amount of lardaceous disease of the vessels of the kidney soon induces decided changes in the uriniferous tubules with proportionate disturbance of the function of the gland.

* Wilks and Moxon, 'Pathological Anatomy,' p. 641.

† 'On Waxy, Lardaceous, or Amyloid Deposit," Dr. Dickinson, 'Med.-Chir. Trans.,' vol. l.

If the liver is diseased it assumes a dense, waxy appearance; it is heavy, and on a thin section it appears semi-transparent under the microscope; the cells are found to be dense and smaller than normal, the nuclei less distinct; and if iodine has been used the capillaries are observed to be thickened as previously mentioned: similar changes are found in the kidney, &c. We have, however, especially to do with the mucous membrane of the stomach and intestine; the stomach is less frequently involved than the small intestine; the mucous membrane appears pale, thickened, and sodden, and under the microscope the thickened vessels are very easily observed. Peyer's patches are said to be less affected than the surrounding membrane; after the arteries, the adjoining tissue becomes infiltrated.

As to the *symptoms*, it is often difficult to distinguish those which are due to the primary change, the chronic suppuration and its consequent cachexia, from the true symptoms of lardaceous disease. As it is an affection in which there is a general cachexia, several organs become affected, and we often find both the liver and the kidneys, the spleen and the mucous membrane of the intestine implicated at the same time. The manner in which one or other of these organs is involved, modifies the symptoms.

The patient becomes pale, cachectic, and if the mucous membrane of the intestine be diseased a troublesome and persistent diarrhœa is set up, and hastens the fatal termination; if the kidney be affected the albuminuria and its consequent change upon the condition of the blood increases the anæmia, the exhaustion is progressive, the legs become swollen, the abdomen is often distended with fluid, the patient generally remains conscious, but drowsiness or convulsions may precede the fatal termination.

The prognosis is necessarily very unfavorable, and as to treatment very little, beyond palliative measures, can be attempted. It is well to try and check the diarrhœa by stringent remedies. The ordinary vegetable astringents may be given, as tannin, krameria, logwood, catechu; so also the mineral astringents, as lead; afterwards the alkaline preparations of iron as the tartarated iron.

Of 150 consecutive cases of lardaceous disease—

The stomach was affected	... ...	9 times.
„ intestine	... ...	63 „
„ liver	... ...	73 „
„ spleen	... ...	99 „
„ kidney	... ...	110 „
„ supra-renal capsule	... ...	8 „
„ muscle	... ...	1 „

Or stating it in a percentage scale—

The stomach is affected in	... ...	6 per cent. of all cases.
„ intestine	... ...	42 „ „
„ liver	... ...	48·7 „ „
„ spleen	... ...	66 „ „
„ kidney	... ...	73·3 „ „
„ supra-renal capsule	... ...	5·3 „ „
„ muscle	... ...	0·6 „ „

This table is probably a correct statement of the average occurrence of lardaceous disease in the various organs, except with regard to the stomach. In this viscus the affection occurs much more frequently than the figures would lead us to believe, but it is not examined specially in many cases, and the lardaceous change is overlooked. Still, it should be stated that the stomach is not so frequently affected as the other viscera, and generally only when the change is extreme in them. It has, however, been found to be diseased when the other organs were nearly healthy.

CHAPTER X.

ON DISEASES OF THE CÆCUM AND APPENDIX CÆCI.

The diseases of the cæcum and of its appendix are of so peculiar and important a character, as to call for special consideration.

To a certain extent, the cæcum is apart from the direct current of the contents of the alimentary canal; for the valvular opening from the ileum enters at two to four inches from its lowest part, and the capacity of the sac is several times greater than that of an equal length of the ileum. Hence also its contents move more slowly; and at the same time they become less fluid in their character. The mucous membrane is here destitute of villi, but it is exceedingly vascular, and is furnished with numerous solitary glands. At this part of the intestine also the longitudinal muscular fibres assume a different arrangement; they here form three bands, which arise from the position at which the appendix is attached, and they are continuous with its muscular layer. The appendix cæci is an elongated glandular sac, which opens into the intestine at the termination of the cæcum, and generally towards its iliac side.

The cæcum is situated in the right iliac fossa, and is only covered by peritoneum on its anterior and lateral surfaces; a considerable quantity of loose tissue separates it from the fascia, and from the nerves and vessels in relation with the psoas and iliacus muscles. The mobility of the cæcum is therefore considerably less than that of the jejunum or ileum; but in this respect there is much variation, for it is occasionally found with a long mesenteric attachment, and the right iliac fossa is then completely covered by peritoneum.

This freedom is far from being of rare occurrence; it is probably of congenital origin, and is of great pathological

importance; for, it allows the cæcum to pass into hernial sacs, and to change its position when there is intestinal obstruction or great distension from other causes.

In reference to the rotatory movements of the intestine, Rokitansky describes three varieties: first, rotation of the intestine upon its own axis; secondly, upon the mesentery as an axis; and, thirdly, upon another coil of intestine. The cæcum may be regarded as moving either on its long or short axis. In the former it tends inwards towards the spine, and the colon will thus assume a direction more or less to the right, or even a horizontal course. (Fig. 1, Pl. IV.) This condition we have observed without any apparent impediment to the passage of its contents; but when it is associated with habitual constipation, there is greater liability to distension of the cæcum and disease of the appendix. By rotation on its long axis the cæcum may be so twisted, that the ileum opens on the right side, but when revolving upon its short axis, the appendix may be placed towards the anterior abdominal parietes, or it may be situated at the posterior aspect of the intestine. When these movements are combined the cæcum assumes various positions; in one case we noticed that the appendix was directed towards the liver, and the transverse colon was adherent to the cæcum, forming a sigmoid curve in the centre of the abdomen. There had not been any evidence of obstruction, but if such had occurred, the diagnosis would have been greatly obscured. The ileum was in another found to open on the right, or on the posterior aspect, but the head of the cæcum was completely inverted, so as to be directed towards the diaphragm. In this state constriction may readily be produced as in a case where an inverted cæcum became distended to the utmost, and led to a fatal result. (Fig. 2, Pl. IV.)

In the second form of rotation of the cæcum, namely, upon the mesentery as an axis, there seems to be a still greater probability of obstruction. This rotation can only take place when the cæcum is very free, and it may then pass into the pelvis, or be completely rotated. We have seen the cæcum in the pelvis, enormously distended and ruptured; it was twisted upon its mesenteric axis, and the passage into the colon obstructed. In another case—one of fatal obstruction

—the cæcum was apparently twisted on the mesentery as well as on its own axis. These twisted conditions of the cæcum, and the freedom of its mesenteric attachment, are generally found in strumous subjects; they predispose to disease of this part of the intestine, and to lodgments in and ulceration of the appendix. We have not, however, observed that they have any connection with an abnormal state of the rest of the intestine.

The appendix presents characters still more diverse; but some of these appearances are the result of pathological changes, which we shall presently consider. It is generally three inches in length, but is sometimes only one and a half inch, and at other times it is as much as five inches. It is attached on the inner aspect of the cæcum by folds of peritoneum, constituting a mesentery; but whilst it is generally free, it is occasionally hidden behind the cæcum, or curved in a sigmoid form to the right side.

The mesentery of the appendix is generally short, and is sometimes fixed to the brim of the pelvis, and the appendix is then pendant in the pelvis. Not unfrequently the mesentery of the appendix is attached to the lower part of the true or iliac mesentery; in such a case the appendix runs parallel with the ileum for an inch or an inch and a half, and is then, beyond its mesentery, free. The direction thus assumed is parallel to that of the brim of the pelvis towards the left, and the appendix nearly reaches the attachment of the sigmoid flexure. When this condition is present, we frequently have a more or less dependent pouch formed between the appendix and the ileum, consisting of the folds of peritoneum. This pouch is worthy of notice, because from irregular pressure it becomes atrophied, then probably perforated, so as to form an opening through which other coils of small intestine may pass. The opening thus formed oftentimes becomes the cause of internal hernia: the traction on the borders of this opening being especially manifested in the direction of the attachment of the mesentery of the appendix, that is, along the brim of the pelvis towards the sigmoid flexure, leads to fibroid thickening in that position, and as the band becomes more and more drawn forward, it assumes the appearance of an inflammatory adhesion. The same traction may be the

the predisposing cause of ulceration of the appendix, and we have seen perforation and internal strangulation thus produced, associated with ulceration and perforation of the appendix. Immediately above the ileum, at its angle of union with the cæcum, we not unfrequently have another pouch, which undergoes similar changes, and may also lead to strangulation.

When the appendix cæci is fixed by abnormal adhesions, the rotatory movements of the cæcum to which we have referred must necessarily be modified. Again, as to the position of the cæcum, we may further remark, that another congenital peculiarity is sometimes found, namely, its presence in the left, instead of the right iliac fossa; this we observed in a patient who died from chronic bronchitis and emphysema, and in whom the whole of the abdominal viscera were laterally transposed, the stomach, spleen, and descending colon occupying the right side, whilst the cæcum, the liver, and ascending colon were found on the left. The thoracic viscera were also transposed.

In a normal state of parts, the ileo-colic valve prevents the regurgitation of fluid from the large into the small intestine; the greater the distension of the cæcum, the more closely are the component parts of the valve compressed, and after death the colon may be fully distended, without escape of fluid into the ileum. Dr. Brinton and Dr. Roper have shown that, if the ileum be also over-distended, the valve ceases to act; there is equal pressure on both sides, and the contents of the cavities may intermingle, or pass from the cæcum into the ileum.

The secretion of the cæcum is alkaline in its character. Tiedemann and Gmelin considered it acid, but in many cases that I have examined, it has been found alkaline. Chemical action probably takes place on particles of alimentary matter left unacted upon by the gastric juice, and by the secretions poured into the small intestine.

This action is very much less than that which takes place in the small intestine, and there does not appear to be sufficient warrant for the statement that the cæcum constitutes a second stomach and that true digestion takes place there. It is more probable that the watery parts of

the chyme, if the semi-fæcal contents of the ileum may be so called, become absorbed by a very extensive capillary circulation; and that the glands remove from the blood excrementitious material no longer of any service to the system.

The appendix is an elongated gland of a very simple character, resembling the pancreatic cæca of the intestine of the fish, and, as far as is at present known, its secretion is of the character of ordinary mucus. Since the fæces here become more solid, were it not for such a secretion, assisted by that of the ordinary mucous follicles, adhesion of fæces would be more likely to take place with the parietes, and thus cause distension. The secretion is poured out at that part which is most likely to effect this separation, namely, at the origin of the triple muscular band.

Pathology.—The unusual mobility of the cæcum, which has previously been referred to, is of a congenital character, but it may induce serious pathological conditions, as before mentioned.

The villi cease at the ileo-colic valve, but we sometimes find in the cæcum and ascending colon elongated processes, resembling enormously hypertrophied villi scattered over the mucous membrane. In a case which occurred at Guy's, they were nearly half an inch in length, about one line in breadth, and they covered the cæcum and ascending colon, but were not known to have produced any symptoms, nor to have had any influence on the cause of death.

Atrophy.—Since only a part of the cæcum is covered by the longitudinal bands, we frequently find that in atrophic states of the intestine, the right side bulges out in a globular and almost hernial form. This condition is more common in advanced life, and in struma and phthisis; and we have observed that by the contraction of a cicatrix this sacculated portion has become almost shut off, so as to render the passage from the ileum to the ascending colon about the size of the ileum itself.

Distension.—Abnormal distension of the cæcum is sometimes the consequence of obstruction in the colon, or its own muscular parietes contract with less than their wonted vigour, and then it easily becomes distended by the accumulation of fæces or of flatus. It is probable that diminished

secretion from the appendix cæci may favour this accumulation of fæces, which is often amongst the exciting causes of serious disease, and requires attention. Considerable fæcal distension in the cæcum and ascending colon produces pain in the iliac region, and by pressure on the last dorsal and genito-crural nerve, induces pain also over the hip, as far as the great trochanter, the groin, and the testicle, &c.

The pain thus produced is sometimes of an acute character, resembling colic, and it may excite considerable alarm. Dr. Copland mentions œdema of the right leg as a result of distended cæcum ; this I have not observed, except with very feeble power, or a varicose condition of the veins. Pressure of this kind would, doubtless, perpetuate and aggravate a varicose condition of the veins of the lower extremity.

Many instances of pain in the region of the cæcum arise from distension, and the symptoms entirely disappear when the colon is gently but freely acted upon, and emptied.

Œdema of the mucous membrane is often observed with renal anasarca, and with long-continued congestion of the vena portæ.

Congestion.—The depending position of the vessels often produces a passive fulness of the capillaries of this part of the alimentary canal ; but we also find an active congestion, as shown by arborescent injection of the minute vessels. This is probably sometimes produced by medicine administered a short time before death ; as the elaterium powder in ascites, renal, hepatic, or pulmonary disease, or it is the result of the transmission of irritating substances and secretions from the small intestine, as an excess of bile or excreta of an acrid character, or from undigested food.

Inflammation.—Typhlitis. The distension of the cæcum, to which we have previously referred, induces local enteritis, namely, inflammation of the mucous membrane of the cæcum, and of the peritoneum which invests the part. A numerous class of cases is thus constituted, which are happily more tractable than those in which peritonitis is set up by a concretion in the appendix cæci. The mucous membrane is congested, its secretion altered, the fæces become adherent, the muscular coat is unable to propel the contents, which constitute a tumour felt on palpation, and the inflamed peritoneum

produces tenderness. In most cases, this tumour consists of portions of intestine united by inflammatory adhesions, and in still more rare instances it is composed of effusion behind the cæcum, in the iliac fossa.

The direct continuity of mucous membrane from the ileum appears in many cases to allow the extension of disease to the cæcum, which in all probability would not otherwise occur; we find this in enteric fever and in strumous disease, in which the ileo-colic valve is often acutely inflamed, swollen, injected, and ulcerated.

The cæcum is also found acutely inflamed in some cases of dysentery; it becomes injected, the mucus scanty, the fæces adherent, or the surface covered with a delicate false membrane; it is here affected as a part of the colon from continuity of structure.

Grey Discoloration.—This is liable to occur from any chronic disease either congestive or inflammatory. It is sometimes general, at other times it constitutes minute zones around the solitary glands; or there are small circular ulcers, which have originated in disease of the solitary glands, or mucous follicles, around which this grey deposition has taken place.

A *granular condition* of the mucous membrane, as if minutely studded with particles of sand, has been already alluded to and appears to be the result of long-continued slight inflammation, associated with thickening of the mucous and sub-mucous coats.

Ulceration of the cæcum is rare as a disease simply affecting this part, but when associated with other morbid states it is of frequent occurrence; thus in phthisis, tubercle is dedeposited, and as a consequence ulceration is often observed, in the mucous membrane; so also in enteric fever, it is not unfrequent to find some scatterred ulcers in the cæcum. In dysentery also, the cæcum is not only acutely inflamed, as before mentioned, but it frequently presents extensive ulceration; sometimes a transverse ulcer is found to present ragged and injected margins; at other times the mucous membrane is even in a sloughing state, or suppuration takes place between the layers of the intestines, as was found in a remarkable degree in one of the cases of dysentery subsequently detailed.

In the acute inflammation and ulceration of the colon consequent on the taking of poisonous substances, as arsenious acid or corrosive sublimate, the rectum and sigmoid flexure are generally more severely affected than the cæcum and ascending colon; this, however, is not invariably the case. Again, ulceration is often present from over-stretching, as we have frequently found in obstruction of the sigmoid flexure; the mucous membrane yields in transverse lines, as when the skin has been similarly over-stretched and ulcerates.

In several instances of enteritis affecting this part of the intestine, or typhlo-enteritis as it is sometimes termed, the peritoneum becomes also involved; this may arise from the propagation of the disease from the mucous to the serous layer, or from rupture of the intestinal coats; but perforation into the peritoneal cavity is more frequently found to arise from disease of the appendix than from simple ulceration of the cæcum; extravasation and sudden fatal peritonitis, even when perforation has taken place, may, however, be prevented by adhesions; or if these adhesions be less extensive, fæcal abscess is formed. We shall again have to refer more fully to perforation of the appendix cæci from ulceration variously produced. The peritonitis which ensues when no adhesions exist, is almost as sudden in its symptoms, and as fatal in its results, as perforation of the stomach; but in cases much more numerous than is generally supposed, extravasation is prevented by antecedent adhesions, as has been shown by M. Leudet, the accuracy of whose observations I can fully confirm. But perforation from ulceration may take place on the attached surface of the intestine behind the peritoneum; the disease then extends into the cellular tissue in the iliac fossa; pus burrows beneath the fascia, and forms an opening near the anterior superior spinous process of the ileum, in the loin, or below Poupart's ligament on the thigh, or it may pass upwards behind the ascending colon, and may reach the under surface of the liver. These cases are, however, rare; and ulceration of the appendix much more frequently leads to adhesions of the peritoneum, to fæcal abscess, or to general peritonitis.

Cancerous disease not unfrequently attacks the cæcum; sometimes the ileo-cæcal valve presents an appearance similar

to that found in like disease at the pylorus, and an extensive cancerous ulcer is found to extend upon the anterior or posterior surface of the cæcum; when the former course is followed, peritoneal adhesion or inflammation takes place; and when the latter, the cellular tissue in the iliac fossa is involved, and suppuration sometimes occurs; in either case fæcal abscess and artificial anus may be produced.

Cancerous disease manifests itself under different forms; it may be of a scirrhous character and slow in its growth. This variety is more likely to lead to chronic obstruction, and is then associated with dilatation of the intestine and hypertrophy of its muscular coat. Sometimes, indeed, there is so much fibrous tissue deposited that it is difficult to find true cancerous product; and it may be doubted whether these cases are not at first inflammatory obstruction, upon which cancer is engrafted. We have alluded to parallel cases when speaking of the relation of chronic ulcer of the stomach to cancerous disease. On the contrary, the disease is sometimes soft and fungating, and has the microscopical and general appearance of a medullary growth. Again, epithelioma and colloid cancer are occasionally observed. The disease has a greater tendency to extend along the coats of the cæcum itself than to pass backwards into the ileum. In lymphadenoma the thickening of the coats of the intestine, and dilatation of the canal, are often well marked. It may be further remarked that the cæcum is less frequently affected with cancer than the sigmoid flexure and the rectum.

The *Tricocephalus dispar* is described as being frequently present in the cæcum. I have only observed them about three times from many hundreds of inspections, in very many of which the intestines were examined throughout with care.

Appendix.—*Increase of length.*—The appendix is sometimes five or six inches in length, and perfectly free in its movements. It may be free among the coils of the small intestine, or in other cases it becomes adherent to the brim of the pelvis, to the parietes of the abdomen, or to the mesentery. In this way loops are formed, which in many cases

become the cause of fatal internal strangulation, a portion of small intestine passing beneath the band thus formed. Cases have been recorded of the appendix being found in a hernial sac.

Atrophy.—The orifice of the appendix is occasionally obliterated, and the appendix itself bound down by adhesions; in this way it becomes wasted, and at last almost destroyed.

Dilatation takes place from obstruction at or near the orifice, so that the secretion is unable to make its escape; the canal then dilates, and becomes one fourth to one half of an inch in diameter; the walls are sometimes thickened, and the muscular coat hypertrophied, as if the attempt had been made to overcome the obstruction, or, on the contrary, it becomes exceedingly thinned almost to perforation; when so dilated it is filled with thin mucus, and the follicles have the appearance of minute semi-transparent cysts.

Concretions.—Substances of diverse character are found lodged in the appendix cæci, and whilst sometimes harmless, they often produce very serious consequences. Some are extraneous, others are entirely formed within the canal itself; and, lastly, there are those which have a nucleus consisting of some foreign substance, but covered over by layers of concretion, from the irritation produced.

1. Extraneous bodies are found, consisting of nails, pins, stones of fruit, shot, bristles,* entozoa, and most frequently, fæces.

2. Concretions, as of albuminous mucus, are formed in the appendix. These are not uncommon, and constitute firm semi-transparent masses, which, when dry, are fragile, and free from earthy matter.

3. Calculi, which generally present a nucleus of fæces, or of some foreign body.

I have frequently found the appendix filled with fæces; sometimes in its whole length, or only forming one or more hard nodules. These minute fæcal masses frequently constitute the nuclei of calculi, and become encrusted with layers, composed of carbonate and phosphate of lime, according to the analyses of Dr. Odling and of the late Dr. Golding Bird. A concretion, examined by Dr. Prout, was found to consist of

* 'Transactions of Pathological Society,' 1855. Mr. N. Ward's case.

phosphate of lime, with a little carbonate, and contained a small quantity of animal and oleaginous matter.* Thus constituted, layer after layer becomes applied, till the size of a cherry stone is attained; and many of the so-called cherry stones in the appendix are thus formed. The calcareous matters appear to be derived from the mucous membrane itself in the same manner as a calculus in the urinary bladder becomes encrusted with phosphate of lime from the abundant mucus thrown out from the irritated surface. In some cases a larger size is attained, and the mass becomes as large as a date stone or a hen's egg. In the museum of Guy's (No. 1893[25]) is a large calculus the size of a hen's egg, the surface of which is rounded and fissured; it was removed from a sinus leading from the parietes of the abdomen to the cæcum; no appendix was found, but a large abscess extended from the cæcum to the liver. The calculus was composed of phosphate of lime, with alkaline chlorides.

In some it is very difficult to discover a nucleus, a white laminated substance being present throughout. The nucleus, however, may be exceedingly small, as in a case described by Mr. N. Ward, where the bristle of a tooth-brush formed the centre of a calculus; or it may be a portion of pin, or a hair.

Diminished contractile power of the muscular coat, with distension of the intestine are the probable causes of the propulsion of fæces into the appendix, usually determined by some sudden muscular effort; or it may be that the peristaltic contraction is rendered irregular by an irritated condition, from acrid and crude materials impelled into the cæcum, and that this irregularity of action causes the fæces, perhaps more fluid than normal, to pass into the appendix. In whatever way produced, any concretion in this part may lead to very serious results.

I. It excites irritation and ulceration of the mucous membrane.

II. This ulceration may extend through the muscular coat, and often through the peritoneum.

III. Inflammatory action consequent on the perforation may be of a purely local character: effusion of fibrinous

* 'Medical Gazette,' vol. vi.

material takes place, and adhesions form, which prevent extension to the general surface of the peritoneum. Coils of the small intestine may be thus firmly united to the cæcum, and constitute a compact mass, felt on manual examination of the abdomen.

IV. The inflammatory action, although local, may produce a less organizable product; and suppuration may take place, constituting an abscess, into which a greater or less quantity of fæces may escape. The subsequent course of this abscess may vary much:—1. It may resolve into a dried mass of semi-calcareous product. 2. After sudden exertion the adhesions which localize the pus may break down, and extrasation take place into the general cavity of the peritoneum, with a speedily fatal result. 3rdly. It may pass into the intestine by a second opening, and thus be harmlessly discharged. This opening may be into the ascending colon or the ileum, and in a specimen in the Guy's Hospital Museum, an elongated and ulcerated appendix had opened into the rectum. 4thly. It may burrow down into the pelvis; or the cellular tissue behind the cæcum may become involved, the abscess extending sometimes upward behind the ascending colon, or down towards Poupart's ligament. In the latter case the opening is either below that ligament, or near the anterior and superior spinous process of the ilium.

In a case under Dr. Barlow's care, in Guy's, this ulcerative extension of cæcal disease destroyed a part of the wall of the iliac artery, and led to almost immediate death, from the sudden and uncontrollable hæmorrhage.

Abscesses of this kind sometimes contain fæces; but, even if they have an external opening, it is difficult to procure their complete evacuation; and we have but little chance of preventing repeated attacks of inflammatory action. The strength at last gives way or life is cut short by intense and general peritonitis.

V. The perforation sometimes takes place directly into the peritoneum, and sets up peritonitis so severe and general, that a fatal result follows in a few hours, or at most in a few days.

The position of the concretion, whether fæcal or otherwise, varies; sometimes it is quite at the termination of the ap-

pendix, at other times close to the opening into the cæcum. Fæcal masses are also found adherent beneath the ileo-colic valve, and in sacculated depressions on the surface of the cæcum; but I have never witnessed true concretions in these parts as in the appendix.

In strumous patients, these concretions more readily tend to an unfavorable result, leading to perforation, and to fæcal abscess or peritonitis. But it must not be assumed in such cases that because there is perforation therefore there has been a concretion, the appendix may be itself the seat of ulceration, without the irritation of concretions; and especially so in strumous subjects. In phthisis it is very common to find ulceration in the appendix cæci, from the degeneration of tubercle; sometimes several small ulcers are present, at other times the appendix is almost cut in two. This condition sometimes leads to fatal peritonitis in the earliest stage of phthisis.

Symptoms.—The symptoms of some of these pathological conditions have been already alluded to; others afford no sign indicative of their presence during life, and after death conditions are found which would have acted as disturbing causes, predisposing to serious, if not to fatal disease, if life had been prolonged.

Distension of the cæcum is indicated by fulness and pain in the iliac region, especially when the erect posture is assumed, or after walking; it is generally accompanied by fulness in that part, dulness on percussion, and slight febrile excitement with congested portal circulation, and with loaded colon. Hence, we often find other symptoms present, not arising from the cæcum, but from associated disease; thus depression of mental energy, sallow complexion, furred tongue, offensive breath, pain in the head, arise not from the condition of the cæcum, but from the retention in the blood of waste material, which would be thrown off, if the liver and excretory glands of the whole alimentary canal rightly performed their functions. The mechanical distension, however, sometimes by its pressure leads to pain in the loins, or in the course of the last dorsal or genito-crural nerve, the pain extending over the dorsum of the ilium, or into the groin or

testicle; in women this pressure may interfere with the proper function of the ovaries and uterus.

Typhlitis.—Irritation or inflammation of the mucous membrane of the cæcum may be productive of diarrhœa. Such cases are generally associated with but slight pain in the region of the cæcum. This form of disease is, however, in most cases, only part of a more general affection of the mucous membrane; as in bilious diarrhœa, from acrid excreta, in dysentery, and in struma; disease of the mucous membrane alone is not productive of pain. If *all* the coats be affected, or ulceration have taken place, a very marked train of symptoms follows. After some irregularity of the bowels, either diarrhœa or constipation, generally the latter, and perhaps after more than wonted exertion, severe pain comes on, in many cases suddenly, in the right iliac fossa. It may be confined to this spot, and be accompanied by excessive tenderness, radiating over the abdomen, and be very quickly followed by collapse, and the signs of general peritonitis, or the tenderness and pain in the neighbourhood of the cæcum are accompanied with fulness and slight dulness on percussion. There are febrile symptoms, the skin is hot, temperature 102°—104°, the tongue is slightly furred, the pulse is often compressible and somewhat excited, and local peritonitis is set up in connexion with ulceration or inflammation of the coats of the cæcum. These are the symptoms of what has been called typhlo-enteritis. There is often a gradual subsidence of these symptoms, the pain and distress cease, the fulness disappears, the bowels return to healthy action, and the patient is restored to health. In other cases the fulness, tenderness, and pain continue, and a more defined tumour is perceptible; repeated attacks of severe pain come on, and gradual loss of strength, or sudden accession of fatal and general peritonitis. The local peritonitis has in these cases given rise to suppuration or to fæcal abscess; and perforation of this abscess is the cause of the sudden collapse and speedy death. Or, we may have the same result as before described, but retarded for a time by local adhesions. Again, instead of peritonitis, diarrhœa may be set up, irritability of stomach, injected and brown tongue, failing pulse, and the ordinary symptoms of hectic fever. But even from this condition recovery

sometimes takes place, by the discharge of pus from the peritoneal abscess into the intestine itself, or through the abdominal parietes; or by the absorption of the fluid parts of the pus, when a semi-cretaceous mass is left; if, however, fæcal abscess have formed, recurrent attacks of peritonitis, with increasing prostration, generally lead to a fatal result.

In those cases where sudden perforation of the cæcum or appendix takes place there are scarcely any premonitory symptoms; the patient is struck down in fatal collapse, resembling the equally fatal case of perforation of the stomach. In these cases the pain is not necessarily situated in the region of the cæcum, but above, nearer the stomach; conversely I have seen a case where the pain preceding fatal collapse was in the region of the cæcum, when the perforation arose in the stomach. It is difficult to explain this occasional event, but, generally speaking, the pain is situated in the neighbourhood of the diseased viscus.

In *cancerous* disease of the cæcum, the symptoms are very similar to those already described, namely, pain and fulness in the region of the cæcum, tenderness on pressure, and a more or less distinct tumour; there is diarrhœa or constipation, but generally the latter; the cæcal pain is often greatly aggravated by food, especially of a fluid kind; and the accession of pain is sometimes found to arise directly after the nourishment has been taken; the febrile symptoms are, however, less decided, and the pain is of a less severe character.

There is a greater tendency to the local form of disease in early manhood than in later life. Many cases occur under 20, but the disease is not rare at later periods of life, 30, 40, or 50 years of age.

Diagnosis.—In the diagnosis of inflammation of the cæcum it must be borne in mind (1), that simple excessive distension of the cæcum is sometimes accompanied with severe pain.

2. That after blows on the abdominal parietes, or from other causes, suppuration sometimes takes place in the cellular tissue, or even in the muscles of the iliac fossa, and may be accompanied by local pain or peritonitis without cæcal disease.

3. That suppuration connected with the right kidney, or its envelopes, sometimes extends into the iliac fossa.

4. That we may have disease of the vertebræ, or iliac bones, leading to suppuration in the iliac fossa.

5. Pain arises in the course of the last dorsal nerve from diseased spine, or in the course of the genito-crural nerve from renal calculus, and might be confounded with cæcal inflammation.

6. Inflammatory disease in connection with the ovaries, leading to local peritonitis and severe pain, is frequently mistaken for cæcal disease.

7. Cancerous disease of the cæcum, and

8. Disease of the ileum in struma or after typhoid fever, as well as

9. Strumous peritonitis must each be remembered in forming a correct diagnosis.

10. I have known cases where the peritonitis from cæcal perforation was regarded at first as gall-stone, the sudden pain on the right side, with violent vomiting, closely simulating the symptoms of that disease.

Dr. Battersby, in a very interesting paper in the 'Dublin Quarterly' of 1857, refers to other fallacies, as hernia, disease of the hip, and of the genital organs.

The pain in simple distension of the cæcum is less severe than in acute inflammation. Disease in the parietes in a very short time manifests its local character; but at first the diagnosis is obscure, and the mere fæcal odour of pus does not necessarily imply communication with the intestine. The pain and swelling connected with suppuration of the spine or kidney differ in position; with the kidney they are more in the loins, or, if extending anteriorly, they are nearer to the median line. Spinal suppuration extends beneath the iliac fascia, and would be distinguished from cæcal abscess burrowing beneath Poupart's ligament, by the fæcal character of the discharge in the latter.

The neuralgic pains connected with urino-genital disease are not accompanied with the tenderness or the other symptoms of intestinal affection. It is, however, sometimes difficult to distinguish inflammatory disease about the right ovary from cæcal disease. There may be in both excessive tenderness, febrile excitement, constipation, severe pain in the lower part of the iliac fossa. The symptoms which will

serve to guide us are, that the ovarian disease comes on with irregular menstruation or with sudden cessation of that flux, and that the pain is situated lower down in the hypogastric region; in some cases, observers have believed that they have felt the swollen ovary. Dr. Barlow records a case in which peritonitis of so severe a character was set up around an inflamed ovary, that the patient succumbed. In cancerous disease of the cæcum, which sometimes occurs in young subjects, it is almost impossible, unless there be indication of cancerous disease in other parts, rightly to diagnose its character. These are, however, rare cases. In strumous peritonitis the disease is not confined to one part of the abdomen, but in severe cases the intestines are so completely united by peritoneal adhesions as to move *en masse*. It is impossible to distinguish perforation of the ileum in struma or phthisis from perforation of the appendix cæci; this is, however, of little moment, since the only remedial agents which are likely to be of service in these almost universally fatal cases are precisely similar in both.

Prognosis.—In cases of cæcal distension, when the mucous membrane only is affected without ulceration, our prognosis is generally a favorable one, unless we find the patient of a strumous habit, in which case there is greater tendency to ulceration and perforation. When, again, there are the symptoms of local peritonitis, many patients do well; the reverse, however, is the case when the onset of the disease is marked by severe collapse, or by urgent vomiting and by general abdominal pain.

Causes.—The *predisposing causes* are a strumous diathesis, sedentary habits, habitual constipation, typhoid fever, &c.

The *exciting* causes are, over-exercise, much standing, violent athletic exercises; in many cases cæcal disease has come on after very long pedestrian excursions, after indigestible food has been taken, after blows upon the abdomen, after constipation, or an irregular condition of the bowels.

Treatment.—I cannot urge in too strong language the importance of avoiding in cæcal disease powerful drastic purgatives. They tend to increase the disease by inducing violent peristaltic action; by increasing the irritation of an already inflamed membrane they hasten ulceration; and if ulceration

have taken place, or if peritonitis have resulted, the only hope of the patient would be taken away by these remedies.

If there be simple distension, with only very slight pain in the erect posture, we should enjoin rest, and administer grey powder with Dover's powder, followed by a dose of castor-oil, or by a castor-oil enema; afterwards mild aperient tonics, as the compound gentian mixture, are useful.

If tenderness exist, or there be the symptoms of local peritonitis, rest is still more positively required; the patient should not move from the bed on any consideration. Local depletion is exceedingly valuable; ten or fifteen leeches applied to the region of the cæcum, and warm fomentations, are often followed by most marked benefit. At the same time mild mercurials may be administered, with opium, such as equal parts of grey powder and Dover's powder, or small doses of calomel with opium; but I prefer opium or Dover's powder without the mercury. These remedies may be combined with saline medicines, with the acetate of ammonia and bicarbonate of potash or nitric ether, according to circumstances. But little food should be taken, and only of bland unstimulating kind. When the pain has subsided, and the febrile excitement has disappeared, the patient is often tempted to try and get out of bed and use slight muscular effort; but this is exceedingly injudicious, and is sometimes followed by a fatal result.

The remedies just mentioned often induce action on the bowels; but if not, although the pain may have subsided, it is better to wait, than to administer even a gruel or castor-oil injection, still less than to give more powerful purgatives, as aloes, jalap, senna, colocynth, scammony, &c.

If there be persistence of slight pain, with fulness and dulness, it is well to continue the opium, and a blister may be applied to the iliac region.

Iodide of potassium and mild vegetable tonics are afterwards of great service, rest being still maintained. Irritability of stomach sometimes arises, and may be alleviated by saline effervescing medicine, by hydrocyanic acid, by soda-water with milk, or with brandy, &c.

If there be evidence of suppuration or of fæcal abscess, whilst we endeavour to limit the action by slight counter-

irritants, or by occasional local depletion, we must sustain the power of the patient by a generous diet, by quinine, and by tonic treatment. Opium is often of great value by its anodyne and narcotic effect, in checking peristaltic action, in relieving pain, in soothing an over-excited nervous system, in diminishing the irritability of exhaustion, and often in procuring refreshing sleep.

When there is collapse and tympanitis, evincing perforation of the appendix or intestine, nothing should induce us to administer any aperient, or to urge an action from the bowels. We desire to limit the mischief produced by checking the movement of the intestines, and to diminish inflammatory action by soothing the nervous system; opium must be given very freely, and only a very small quantity of food administered.

Cases.—Abnormal position of the cæcum; several were connected with fatal obstruction, and a similar instance is recorded by Mr. Avery, in the 'Pathological Transactions' for 1850, where the operation for artificial anus was performed.

Case CIII.—*Unusually Free Cæcum.*—A boy, æt. 5, died from loss of blood consequent upon an accidental wound of his internal jugular vein.

Case CIV.—*Unusually Free Cæcum.*—A young woman died after a miscarriage.

The viscera were healthy, but the cæcum was situated among the small intestines, quite surrounded by peritoneum, and as free as a portion of the ileum.

The *cæcum* was attached by a long mesentery to the right side of the spinal column, so that the whole iliac fossa was perfectly free, and covered by peritoneum.

Such conditions are congenital. They are of importance in modifying symptoms of subsequent disease.

Case CV.—*Cæcum inverted.*—A man, æt. 42, died from phthisis, local empyema, and chronic tubal nephritis.

On examining the intestine, the appendix cæci was found to be long, and extending over the brim of the pelvis, where it was fixed. The rounded termination of the cæcum was directed towards the diaphragm as if inverted. The ascending colon was contracted, and attached deeply at the side of the right iliac fossa, directly opposite the ileo-colic valve, and at an acute angle with the cæcum (see Plate IV, fig. 1). Very great distension of the cæcum in this twisted state might lead to obstruction, for the ascending colon appeared, even in this case, constricted by the sudden twist and by the acute angle which was formed.

No symptom had apparently been produced by this condition of the cæcum; but in a state of constipation, when the cæcum is distended with fæces, considerable impediment to the free passage would be the result. It is probable there would be a greater tendency to ulceration, and to the passage of fæces into the appendix cæci.

Case CVI.—*Intestinal Obstruction of the Ascending Colon. The Cæcum twisted to the left side into the Left Iliac and Hypochondriac Regions. Death on the 20th day.* (Reported by Mr. Galton.)—Eliza S—, æt. 40, a cook, was admitted into Guy's Hospital under the care of Dr. Addison, November 9th, 1856. She had lived regularly and temperately. There were marks of distension upon the abdomen, but she stated that she had never been pregnant, but that when a child her abdomen had been much enlarged. She enjoyed good health until she was fourteen years of age, when she fell against the kerbstone at the head of a well, whilst she was drawing water, and pain in the loins, with difficulty in micturition and hæmaturia, came on. Many years before admission she had jaundice, with great pain in the stomach, and was told she had inflammation of the bowels; she, however, had good health until 1846, when, during frosty weather, she fell down in a yard, striking her left side against the corner of a stool; she suffered from pain and tenderness at the part, with cold chills; the urine was scanty, but no blood was passed; after remaining in bed for three or four days she felt no further inconvenience. The bowels had been frequently confined for three or four days together, but without any pain or distress. On admission into Guy's she was anæmic, but her complexion was rather dark; three days previously, without apparent cause, pains came on in the right side, extending to the umbilicus. No improper food had been taken, nor was there any stomach derangement. She felt chilly; the bowels had been open previously, and again very slightly, at the time of admission. There had been no vomiting till just before admission, but when once it had supervened everything was rejected. There was no tenderness of the abdomen, but it was distended with flatus. The skin was cool and moist, the urine abundant, pulse 80, the tongue slightly furred. A soap injection was administered, and ℥ss of castor-oil given. The vomiting became stercoraceous and then lessened in severity, but the pain was aggravated.

Various measures were tried for her relief; all were of no avail, nor did they succeed in even modifying the symptoms or in any way aiding the formation of a diagnosis, and with gradually increasing prostration she died on the 27th, about twenty days after the commencement of the symptoms.

On opening the abdomen the small intestine was found enormously distended, and the cæcum was situated in the left hypochondriac region and iliac fossa, forming a large, greatly distended, almost

spherical sac; the appendix was situated on the left side. The whole of the visceral and of the parietal peritoneum was intensely injected, and was covered with lymph. The right iliac fossa was filled by coils of small intestine, the peritoneum being perfectly smooth. By attempting to unravel the intestine, and tracing the large intestine upward from the sigmoid flexure, which was normally situated and perfectly collapsed, a stricture was found about the middle of the ascending colon; the stricture, however, was situated near the brim of the pelvis, on the *left* side, and adhesion of the omentum was found at this part, between the ascending colon, sigmoid flexure, and a coil of ileum.

The line of obstruction was perfectly defined, all the intestine below being quite empty, collapsed, and non-injected. The obstruction was four feet four inches from the anus, and appeared to have been produced by the cæcum revolving on the termination of the ileum, which was fixed by its adhesion to the sigmoid flexure. No transverse colon could be found, because it was hidden behind the cæcum near the left iliac fossa. (See Plate IV, fig. 2.) On removing the intestine the stricture disappeared.

The mucous membrane of the cæcum was intensely injected, and a patch on the interior surface was of a leaden colour; at the centre of this part was a minute slough, and perforation extended into the peritoneal cavity; but no fæcal extravasation had taken place.

The mucous membrane of the ileum was healthy, but congested, and contained both solid and fluid fæces. The stomach contained fluid fæcal matter, such as was found in the cæcum. The duodenum was healthy, and the liver, kidneys, spleen, &c., were normal.

The previous attack of inflammation of the bowels had probably led to the adhesion between the termination of the ileum and the sigmoid flexure; and this was one of the causes of the fatal obstruction. The cæcum was apparently unnaturally free, and its distension associated with this adhesion had led to the twisted and inverted position which was found after death. The pain had commenced at the seat of the disease, near the right iliac fossa extending to the umbilicus. The patient had had severe falls and blows upon the abdomen, one in particular, in which she struck the right side, and which perhaps, tended to produce displacement or inflammatory mischief. The bowels had generally been confined, but she had occasionally suffered from diarrhœa. The first symptom was pain in the right iliac fossa, and then constipation; the severe colic, distension, tenderness, and vomiting were later symptoms. The mode of commencement appeared to indicate that they did not arise from simple impacted fæces. For

four days there had been no vomiting, which showed the absence of internal hernia, of sudden strangulation, and of intussusception. The symptoms were neither those of enteritis nor of acute peritonitis.

It was evident that there had been some chronic changes in the intestines or peritoneum, and it was difficult to decide the character of those changes.

No tumour could be felt; but there were three causes of obstruction left, between which it was exceedingly difficult to decide. 1. A slow growth connected with the intestine itself, as cancer or one producing chronic contraction. 2. Old bands of adhesion; and, 3, Twisted intestine. An approximate opinion was formed as to the seat of obstruction; either that it was at the colon, or at the termination of the ileum. The vomite dmatters were so fæcal in their character that it was even suggested that the tranverse colon might have formed a communication with the stomach.

A somewhat similar case is recorded by Sir W. Gull in the 'Guy's Hospital Reports,' 1858, p. 179.

Case CVII.—*Twisted Cæcum. Obstruction. Peritonitis.*—A man, æt. 30, was admitted into Guy's Hospital, October 11th, 1859. He was a strong muscular man, and for three weeks his bowels had acted irregularly, but their precise mode of action could not be ascertained. On October 9th he partook freely of pork, ale, &c., and was soon afterwards seized with intense pain in the abdomen, which "doubled him up;" vomiting soon afterwards came on; these symptoms continued, and excessive prostration followed. The bowels had acted on Friday the 7th, but not afterwards till the day of his death. At the time of his admission into Guy's, on the evening of the 11th, he was cold, almost pulseless, perfectly sensible, but collapsed; he suffered intense pain in the abdomen; the abdomen was tympanitic, and presented distension in the epigastric region. Opium was given; an enema tube was introduced into the rectum, but only passed about six inches, and returned smeared with blood; a catheter drew off no urine from the bladder. Mr. Stocker thought that the introduction of an acupuncture needle into the distended part might relieve the enormous distension; several punctures were made, and not affording relief, a minute trochar was introduced, much flatus passed, and a small quantity of thin fæces; but this discharge afforded the patient much relief.

Tincture of opium ℥xl, chloroform ℥x, were given in camphor mixture. On the following morning he still lived, cold, almost pulseless, legs drawn up; abdomen less distended, but very painful; he had passed water during the night; he stated that he had passed flatus

several times from the bowels since the commencement of the severe symptoms. About 11 o'clock there was an evacuation from the bowels, but the state of collapse continued, and he died about 3 p.m.

Inspection on the 13th, nearly twenty-four hours after death.—Decomposition was commencing in the abdomen, which was still much distended. The thoracic viscera were quite healthy. On opening the peritoneal sac the appendix cæci was observed about the centre of the abdomen, and a very large, distended cæcum occupied the greater part of the epigastric, umbilical, and *left* hypachondriac regions; a distended coil of ileum and a portion of ascending colon were attached to its inferior part; these portions were all of a green colour, and evidently strangulated. The rest of the serous membrane was much injected, reddish, covered with a thin layer of adhesive lymph, and smeared with red-coloured, opaque serum. The small intestines were distended. On passing the hand beneath the strangulated mass the constriction was found to be situated near the *right* iliac fossa, and was produced by the cæcum having rotated on a free mesentery, and then twisted on its axis. By turning the cæcum downwards all constriction disappeared. The line of strangulation was very distinctly marked across the colon, about four inches above the cæcum, and rather less distinctly across the ileum, about fifteen inches from the valve. The mucous membrane of the whole of this part was intensely injected, in some parts presenting ecchymosis; it very readily separated, and was covered with a thin, grey, diphtheritic layer; there was effusion of blood also into the constricted mesentery. The intestine in this part and above it contained fluid fæces, but some half-digested masses of food were also found in the cæcum. The stomach was healthy, as also the rest of the small intestine; the stomach contained green fluid almost of the character of that in the small intestine. The descending colon was contracted, and in the rectum was found a small ulcer immediately above the sphincter. The course of the intestine was very peculiar. The sigmoid flexure was situated in the *right* iliac fossa, the left being perfectly smooth and free from intestine; the descending colon crossed the spine in the centre of the lumbar region, frem the inferior part of the spleen; the transverse colon was in its ordinary position, but had the enlarged and twisted cæcum concealing it; the ascending colon had a curved position in the right loin, passing from the cæcum, which was situated immediately in front of the spine; and at the lower part of its curve old adhesions existed between the ascending colon and the sigmoid flexure, situated in the right iliac fossa. The left kidney was situated at the brim of the pelvis, and received its arterial supply from the aorta and the common iliac arteries; the ureter left the kidney anteriorly. The left supra-renal capsule was in its normal position. The liver, spleen, kidneys, &c., were healthy.

The cæcum in this case was preternaturally free, and the sigmoid plexure in the right instead of the left iliac fossa. It is probable that several weeks before death the cæcum

had a twisted position, and that after an indigestible meal flatulent distension increased the twist, and rendered the obstruction complete. The cæcum had apparently turned on its mesentery, as an axis, and then on its own axis. The adhesion between the ascending colon and sigmoid flexure was old, and possibly formed during fœtal life. The position of the kidney, partly in the pelvis, and its unusual arterial supply, were evidence of congenital malformation. The introduction of the needle afforded no relief, but the trochar gave immediate cessation of pain, and the patient begged to have the operation repeated. The instrument had perforated the distended cæcum, and had diminished the distension of the strangulated part; it was left in the wound, so that no extravasation took place, and it is probable that this relief to the distended bowel prolonged the patient's life several hours, though we are not prepared to recommend the repetition of such an operation in any but exceptional cases.

The following are instances of a form of cæcal disease very frequently met with; they arise from distension of the cæcum, which induces local enteritis, with partial peritonitis; the latter varies greatly in intensity, being sometimes severe, at other times scarcely observable. With proper care and judicious treatment, most of them recover. The symptoms are less severe than those in which the appendix is ulcerated, or contains a concretion; they come on more gradually, the pain is less intense, the dulness and tenderness are entirely removed as the inflammation subsides, and the bowel is freed from its contents. As in cases of more general enteritis, purgatives do considerable harm; they fail to empty the distended bowel, they increase the enteritis, lead to ulceration, and in some to perforation and fatal peritonitis. The benefit arising from the action of the opium is very marked—the bowels act, the pain subsides, and the dulness lessens; mild mercurials with the opium are sometimes used, but we prefer opium alone; abstinence from solid food and absolute rest are very important, and should be continued for several days after the subsidence of the pain. If the pain be severe, local depletion by leeches affords considerable relief, and should be followed by hot fomentations.

CASE CVIII.—*Cæcal Distension and Inflammation. Typhlitis.*—Crota

W—, a strumous-looking boy, an apprentice to a cook at a large tavern, after harder work than usual, was seized with severe pain in the abdomen on the right side; after a few hours this partially subsided, but again returned on his making exertion, so that he was obliged altogether to discontinue his work. The bowels were occasionally constipated.

He was of fair complexion, with long eyelashes, and his countenance had an anxious expression; the abdomen was hot, tender and full, especially in the region of the cæcum; the tongue was red, the pulse soft, the thoracic viscera normal; he had no vomiting.

Calomel gr. j, opium gr. ss, were given every six hours, and a hot poultice applied to the abdomen. Eight leeches were afterwards applied, and spare diet allowed. He rapidly improved, and in a few days was convalescent. He was kept in bed, however, for a longer period, although all the symptoms had subsided.

Case CIX.—*Cæcitis or Typhlitis.*—Benjamin B—, æt. 15, a pale, thin lad, who had been employed on the river, was admitted into Guy's Hospital, January 14th, 1852. About three days before admission he had experienced griping pain in the abdomen, which had increased in severity. The bowels were constipated, but there was no vomiting, nor could it be ascertained that he had partaken of improper diet. There was fulness of the right iliac region, with dulness and considerable tenderness. Eight leeches were applied, and he took calomel and opium gr. j of each every four hours. On the 19th the pain had considerably diminished, but still much fulness and hardness remained; there was no febrile disturbance; the tongue was clean and the pulse natural. The calomel and opium were omitted.

February 3*rd.*—He felt much relieved, but had a haggard look; the eyes were sunken, and occasional pain came on across the abdomen. There was no marked indication of progressive disease, and the fulness in the iliac region gradually disappeared.

23*rd.*—There was again very perceptible fulness and some tumefaction in the right iliac region, and gurgling on pressure; slight pain had returned; the symptoms were, however, very much less severe than before, and he was allowed to move about the ward. He afterwards left the hospital convalescent.

The symptoms in this case were at first very severe, and warranted a very cautious prognosis. They were probably associated with a strumous diathesis, and more than usual disturbance of the other abdominal viscera. There is much fear that slow strumous disorganization would extend in this case, and ultimately lead to a fatal result.

The permission to sit up led probably to the increase of the symptoms, but happily the relapse was not of a character

to prevent his convalescence. This was an instance in which great care, nourishing diet, and change of air, might be followed by complete restoration to health.

Case CX.—*Typhlitis.* Sarah A. M—, æt. 20, was admitted December 27th, 1876, into Guy's Hospital, under my care. Her father and brother had died of phthisis. On Wednesday, December 20th, whilst doing her work as a collar dresser, she was suddenly seized with severe pain in the stomach, and in half an hour the pain became of a griping character, accompanied by severe sickness and purging. She went home to bed, and hot poultices were applied; the purging soon subsided, but the sickness and pain continued till admission. The abdomen was rather tense, and she suffered from severe pain in the cæcum, where an enlargement could be felt about the size of a cocoa nut; the resonance at this part was imperfect, and the abdominal muscles were fixed. The tongue was moist, but had a whitish fur; there was thirst; no appetite; vomiting came on if food was taken; the pulse was 130; temperature 103°; the heart and lungs were healthy. She was directed to remain perfectly quiet in bed, and gr. j of opium was given every four hours; poultices were applied to the abdomen. The following day she was free from pain, and there was scarcely any sickness. The pulse was 108, and the temperature 98·8°. On January 1st the abdomen was less tense and more resonant; the patient was free from pain, and looked more cheerful; there had been no action from the bowels; temp. 97·8°; pulse 100. The same treatment of perfect rest, with opium less frequently administered, was continued. On January 6th, ten days after admission, as she complained of forcing pain in the rectum, a simple enema was used, which relieved the bowels. Fish was now allowed, and the opium given night and morning. The fulness in the cæcum had considerably lessened. On January 13th the bowels acted twice without any enema; the patient expressed herself as well. The opium was discontinued. A little thickening in the cæcal region could be felt on deep pressure, but it disappeared before she left the hospital well on the 23rd.

Case CXI.—*Cæcal Inflammation simulating Hip-joint Disease.*—James C—, æt. 11, living at Gravesend, was admitted into Guy's Hospital, under my care, February 18th, 1857. He was a strumous child, but he was stated to have had good health until three months before admission. He was roughly used and beaten whilst at work; and he did not feel well afterwards; pain came on in the abdomen; but it did not become severe till a short time before admission, when his foot slipped, and his abdominal muscles were brought into powerful action. Severe pain in the region of the cæcum then came on, and was much aggravated by pressure; the rest of the abdomen was soft; the tongue was clean; pulse 75. The bowels were confined, and the urine was normal. The right leg was flexed at the thigh, and could not

be straightened; rotation of the hip, striking the heel, &c., did not produce pain, nor was there any pain in the knee or in the spine. Seven leeches were applied to the right iliac fossa; grey powder gr. iij, Dover's powder gr. iij were ordered three times a day, with rest and low diet.

The leeches and hot poultice afforded much relief; he was able then partially to straighten the hip, which had evidently been drawn up to relieve the pain, by relaxing the flexor muscles of the joint. The bowels on the second day acted by soap injection, and on the third day the leg was straight. The pain and fulness gradually ceased; he was, however, kept in bed; the medicine was continued once a day for a short time, and animal food was allowed very sparingly The bowels acted without trouble. On March 2nd he was convalescent; cod-liver oil was given three times a day, and on the 13th he left the hospital well.

Case CXII.—*Cæcal Disease. Typhlitis. Recovery.* (*Reported by* Mr. Brietzcke.)—James B—, æt 23, a draper's assistant, residing in the Borough, was admitted under my care into Guy's Hospital, November 2nd, 1861. Whilst sitting at breakfast, on the 31st of October, he was suddenly seized with severe pain on the right side below the ribs; the severity of the pain bent him double, and rendered him almost insensible; medical advice was at once sought, and medicine given every two or three hours, which however, produced vomiting whenever it was taken. On the 1st November he was partially relieved, but was worse again in the evening. On the 2nd he was brought to the hospital; the pain, which had subsided, again returned severely, and was accompanied with an urgent but ineffectual desire to pass water. The bowels were acted upon once daily till the 31st October, but no evacuation was again passed till after admission. He had a pale and anxious expression of countenance; he had lost his appetite, and, since the attack, had been deprived of sleep. In the right iliac region there was defined hardness, imperfect resonance, and great tenderness on pressure; but the abdomen generally was neither distended nor tender. There was pain on passing water, and only a small quantity was discharged. The tongue was furred, and the mouth and throat were dry. The pulse was 64, and compressible. There was no pain produced by respiration; the urine contained a small quantity of sugar. He was ordered, of soap and opium pill gr. v night and morning, and to have an injection of castor oil, and a diet of beef tea and arrow-root.

This treatment was continued, and the bowels acted, no vomiting was produced, and the tenderness in the cæcal region subsided, and on the 7th both pain and swelling had disappeared. The bowels on that day acted regularly, pulse 60, tongue clean, and there was no difficulty

in passing water. Infusion of cusparia ʒj was given twice a day. On the 11th he left the hospital quite well.

In this case the symptoms of cæcal disease were well marked; there was severe pain, with hardness and swelling in the region of the cæcum, and obstinate constipation; vomiting had apparently been produced by attempts to obtain action from the bowels; but by the continued use of opium, with bland, demulcent diet and a castor-oil injection, the severe pain subsided, the tenderness ceased, and the bowels acted naturally. No mercurial was given, nor did it seem necessary, for the bowels would not have acted more readily if mercury had been conjoined with the opium, and the convalescence would probably have been less rapid.

Case CXIII.—The following is of great interest, as showing a state of *strumous inflammation of the cæcum*, in itself probably not of a fatal character, and allied to, if not identical with those previously detailed, but rendered fatal by its association with phthisis.

Ann C—, æt. 46, was admitted into Guy's Hospital under my care February 28th, 1855, and died March 30th. She was a married woman, who had resided in Southwark, and in her employment as a milkwoman had been much exposed to the weather. Some of her family had died from phthisis. For several years she had been subject to cough, which had become more severe during the last eighteen months. She was thin and haggard, the face was slightly congested, and the physical signs were those of general bronchitis with phthisis. The pulse was irregular and intermittent, and there was a systolic bruit below the nipple. The bronchitis was slightly relieved, and then the signs of disorganization of the lung became more marked. Three days before death severe pain came on in the right side, accompanied with increased dyspnœa. Some irritation of the bowels supervened, but not to a great extent, and she gradually sank.

On inspection the abdomen was distended and tympanitic. The larynx was healthy; the bronchi were much dilated; this bronchial dilatation was very marked on teh right side, and on section the dilated tubes covered a considerable portion of the surface. Their mucous membrane was much congested, and covered with tenacious mucus; they were surrounded by crepitant lung. The bronchi on the left side were much less dilated. The left pleura was universally adherent, but the right only so at its apex; at the right base the pleura was covered with lymph, and the cavity contained about a pint of pus; a small vomica immediately beneath the pleura had opened into the

pleural sac. There was a large, irregular vomica at the left apex, and in the lower lobe were other smaller ones, and numerous miliary tubercles. The heart was healthy. *Abdomen.*—There were old adhesions generally in the peritoneum, and several adherent cretaceous deposits. The *cæcum* was inflamed, and presented raised patches about the size of peas, soft, situated in the mucous membrane and containing pus; some of these collections of tuberculo-inflammatory product had given way, and slight ulceration was the result. The ascending colon was in a similar condition. The appendix cæci and the other portions of the intestine were healthy. The liver was fatty, the kidneys healthy, so also were the mesenteric glands.

This case might be considered as one of chronic bronchitis, and afterwards of phthisical disorganization. In the cæcum it is probable that the solitary glands became diseased, and degeneration of tubercle led to the production of minute abscesses and ulceration.

Case CXIV.—*Perforation of the Cæcum. Abscess extending to the Groin. Phthisis.*—Michael R—, æt. 34, was admitted into Guy's Hospital under Mr. Key's care, in September 1835; he was a temperate man, but of strumous habit, and by trade a compositor. For a year and a half he had been subject to flatulence, indigestion, and occasional purging. Four days before admission, after four days of diarrhœa, he had experienced sudden pain in the right iliac fossa, where was a firm swelling, with persistent pain; the bowels were variable; the constitutional disturbance was slight; the pulse was soft and quickened, and the tongue was slightly furred. Leeches were applied, and antimony was administered; suppuration and fluctuation became more manifest in the tumour, and hectic supervened. Six weeks after admission an opening was made and ℥viij of offensive pus evacuated; symptoms of phthisis gradually developed themselves, and the patient died in the following June. Two openings existed above the right groin; they communicated with a contracted space, which was surrounded by dense membrane. The cæcum was found bound down by firm cellular adhesions to the neighbourhood of Poupart's ligament. The appendix was thick, opaque, and filled with a pasty fluid, and communicated with the cæcum. A sinuous canal of one and a half inches in length, narrow and apparently closing, led from the opening on the surface into the cæcum at its posterior part, nearly opposite to the opening of the ileum. The coats of the intestine were thickened, but the mucous membrane did not appear to be changed, except that a few contractions from cicatrices were evident. (Prep. in Museum, 1879[20].)

In this case the patient survived the immediate effects of the cæcal disease; the perforation, instead of setting up inflammation in the peritoneum, produced suppuration in the

cellular tissue of the iliac fossa, and the pus was discharged near the anterior and superior spinous process. If there had not been any cicatrices in the cæcum, we should have questioned whether the disease had not commenced in the iliac fossa, and afterwards extended into the cæcum, as we have found to occur in connexion with the sigmoid flexure. The commencement resembled that of ordinary cæcal disease; but in its progress it might easily have been mistaken for abscess in the parietes of the abdomen.

Disease of the appendix sometimes exists without manifesting any symptom; this is especially the case in phthisis. The appendix often presents strumous deposit in larger or smaller masses; it is often filled with fæces; and not unfrequently we find it distended with thin pus, with occlusion of the orifice, or with ulceration, without any pain or tenderness having been complained of, as in the following instance:

Case CXV.—*Tuberculosis. Ulceration of the Intestine. Ulceration of the Cæcum. Perforation. Abscess behind the Ascending Colon. Old Hydatid in the Liver.* (*Reported by* Mr. H. A. Latimer.)—Thomas A. T—, æt. 54, was admitted under my care on April 4th, 1871. He had resided at Hackney, and had been employed as a tea warehouseman. He had formerly drank freely of beer, but he became a teetotaler in 1855. Till three years ago his general health had been good, but he then had an attack of pleurisy on the left side; he was ill for two or three months, but afterwards went to work, and continued at his employment till twelve weeks before admission. For at least twelve months he had been complaining of pain in the right side at the region of the liver, and he had been unable to hold himself upright in consequence of the pain.

When quite young he had a fall from a horse, and antero-posterior spinal curvature in the dorsal region was produced. He had also suffered from double hernia, for which he had worn a truss. Some weeks before he was seized with more severe pain on the right side, and there was enlargement in the region of the right hypochondrium. The practitioner in attendance regarded the disease as hepatic abscess, and this opinion was confirmed by the discharge of pus from the bowel, and the subsidence of the swelling. On April 2nd vomiting and purging came on, and continued till admission on the 4th. He had emaciated rapidly before being brought to the hospital. He was then pale and anæmic; he was free from pain when perfectly quiet, but pain came on when he was moved; it was located in the right hypochondrium. He was very sick, and vomited almost every ten minutes, all food being at once rejected. He complained of faintness. The left leg was enormously swollen and

distended, the veins were much enlarged, and there were some petechial blotches below the knee. The leg began to swell on April 2nd, and attained its great size in an hour and a half. It was very painful when touched or moved. The right leg was of natural size and free from pain. On pressure in the right hypochondrium a distinct nodular hardness could be felt, and there was fulness and tenderness extending to the iliac region; the rectus was rigid. The tongue had a yellowish fur upon it; the pulse was 126, very small and feeble. The heart and lungs did not present any signs of disease. The urine had a sp. gr. of 1016, and was very albuminous.

The left leg was wrapped in cotton wool and a cradle was placed over it. Brandy was allowed. When admitted the patient seemed almost in a dying state. The vomiting, however, ceased, and he rallied. On the 8th the temperature was 97·4°, the pulse 103; he felt stronger and more comfortable, and there was freedom from sickness. There was still much uneasiness on the right side. The sedative mixture of bismuth (Guy's) was ordered.

On the 15th opium and belladonna were given to relieve pain and sickness, which again distressed him, and relief was thus afforded to those symptoms.

On the 25th he complained of great weakness. A rounded swelling of great density could be felt in the liver; the mouth was aphthous and ulcerated. Borax and honey were ordered.

On the 26th the left leg had nearly regained its natural size. The right leg, however, became suddenly swollen as the left had been, and the patient soon sank, but was sensible till nearly the close.

Inspection was made on the 27th. There were extensive old pleuritic adhesions; the lungs contained an excess of fibrous tissue; there were numerous scattered tubercles, and a few small cavities filled with pus. The heart was healthy, so also was the stomach. There were numerous tubercular ulcers scattered through the ileum. These were most frequent and largest near to the cæcum; and there was tubercular deposit on the peritoneal surface of the intestine beneath the ulcers. The appendix cæci was healthy, but the cæcum was perforated by ulceration close to its base. The perforation opened into a fæcal abscess, which extended behind the colon upwards to the under side of the liver. There had been chronic peritonitis, and the colon had become glued to the peritoneal walls. In the liver, which was rather fatty, there were two old hydatid cysts filled with calcareous substance. One of these, about the size of a small hen's egg, was superficial, and had been felt during life, The mesenteric glands were much enlarged, but did not contain any cancerous product. Hooklets of the echinococcus were detected in the fluid from the cysts. The spleen was healthy; the kidneys were fatty, rather large, and their cortex was wasted. The femoral veins were obstructed by old fibrinous clots.

The diagnosis of this case was obscure; the history was that of inflammatory disease in the neighbourhood of the ascending

colon, but the emaciated and cachectic appearanceof the patient and the presence of a hard nodule in the liver, favoured the idea of malignant disease; the enlargement of the legs evidently arose from venous obstruction. When brought to the hospital it was believed that he could not survive many hours, and he was too ill to be raised from a recumbent position or for the chest to be examined posteriorly. He was, however, free from cough or symptoms of thoracic disease. The post-mortem examination fully explained the nature of the case; tubercular ulceration of the small intestine and of the cæcum had been followed by perforation of the latter; a post-peritoneal abscess was formed, which extended to the under surface of the liver; the distension of this abscess with pus and fæces led to the swelling below the liver, and the discharge of pus from the bowel appeared to confirm the supposition of abscess in the liver. Local peritonitis and adhesion had taken place, fixing the colon to the liver and preventing the extension of the disease. The exhaustion consequent on this fæcal abscess was the cause of death. Tubercles were present in the lungs, and small vomicæ were found filled with pus, but the latter would not have afforded any physical sign whilst filled with fluid secretion. The enlargement of the mesenteric glands was tubercular. The malady was one of phthisical disease affecting especially the intestine, leading to perforation, and causing death before the pulmonary disease had made extensive progress. The hydatid cysts were very old, and the calcareous envelope prevented the detection of fluctuation; they were mere coincidental conditions, but they tended to render the diagnosis obscure.

Case CXVI.—*Inflammation of the Colon from Plum-Stones. Ulceration. Perforation. Peritoneal Abscess. Thickening and Contraction of the Bowel.*—(*Reported by* Mr. F. C. Coley.)—Charles G—, æt. 49, was a married man, who had resided at Kensington, of temperate habits and healthy, with the exception of attacks of indigestion. Some years before he had resided in the country, and had much anxiety in his business; he then came to London and became a warehouseman. His long hours of work led to exhaustion; he lost his appetite, was unable to digest his food, and he occasionally suffered from rigors at night. Two years before admission his work was lessened by his removal into the counting-house, and his symptoms were relieved. About

three weeks before admission into Guy's Hospital, on September 23rd, 1874, the indigestion increased, and the patient suffered from pain in the right lumbar and inguinal regions. He was a well-built man, rather thin and sallow, with a care-worn expression of countenance. He complained of pain in the right side of the abdomen below the liver, and a lobulated swelling could be detected at this part, which was with difficulty separated from the liver. It extended partly into the loin, and was moderately tender on palpation; the dulness in the swelling was not complete. The lungs and heart were normal. The tongue was white and marked with the teeth. Urine healthy. He was ordered the bismuth mixture, and allowed fish and ʒiv of wine. The bowels acted by medicine; the motion was pale and fluid, and free from blood. It was found after admission that taking food increased the pain in the right side. The mucous membrane of the lower lip was raised on its inner side by extravasated blood, but there was no breach of surface. The swelling gave pain during mastication. On the 29th the motion was olive-green in colour and free from blood; the pain in the abdomen was less. The temperature was taken many times, and varied from 98° to 99·4°. The bowels became constipated, and a small quantity of blood was passed. Full injections of water—2 to 4 pints—brought away hardened fæces; they were repeated on successive days, and carbonate of ammonia mixture given instead of the bismuth. On October 22nd the swelling was smaller, but still tender and painful; it could be separated from the liver, and appeared to be adherent to the abdominal walls. The castor-oil mixture was given, and acted gently but freely on the bowels. Iodine was applied externally. The swelling remained tender, but the patient gained strength, and wished to return home, which he did on November 30th. On December 28th I saw him at his own home in consultation with Dr. Cortis. The patient appeared thin and emaciated; he had lost strength, and the bowels acted sluggishly; the hardness on the right side was as distinct as when he left the hospital; the pulse was very compressible, and the appetite poor. He sank more quickly than we expected, and died on January 3rd.

Dr. Cortis made a post-mortem examination, and was kind enough to send me the following report:—"On opening the abdomen a large portion of the liver was found very firmly adherent to the walls. Between the two at one part was found a circumscribed cavity containing four plum-stones and the kernel of a fifth. This cavity communicated by a small opening with the colon, which, beyond the cavity, was very much thickened and contracted, forming a stricture, through which an ordinary holder of a steel pen could just pass. The stones had evidently, years ago, lodged in the colon, produced inflammation and perforation (after adhesion), and afterwards kept up the irritation and consequently the inflammation round the gut, producing the deposit and causing the stricture. The cæcum was firmly adherent at the under surface of the liver, and the perforation was at the anterior and external portion."

In this case the diagnosis was obscure; there was evidently disease of the ascending colon and cæcum, but the hardness was at first separated with difficulty from the liver; this separation could, however, be well made out afterwards when the bowel was emptied by enemata, &c. It was more difficult to diagnose the nature of the malady than to recognise its position. There was hindrance to the free action of the bowel, and blood with mucus was passed. These signs indicated some ulceration with narrowing of the bowel. The onset of pain about four hours after food also indicated disease of the larger bowel. The mischief had come on gradually, and without any history of febrile disturbance such as we generally find in acute disease of the cæcum; it was irregular and nodular in character, hard and tender, and resembling in these respects malignant disease. We certainly did not suspect that there was such a source of irritation as a peritoneal abscess containing plum-stones. It would seem that inflammation of the mucous membrane had been followed by ulceration and perforation; peritoneal adhesion had localized the effusion; the presence of the foreign bodies in the peritoneum led to gradual thickening of the coats of the bowel and to obstruction. The obstruction increased, but the exhaustion of strength kept pace with the narrowing of the bowel, and the patient sank from exhaustion rather than from intestinal obstruction. The perforation in the first case was in the posterior part of the cæcum, and the abscess burrowed upwards behind the intestine; in this, it was at the anterior part of the ascending colon, not far from the angle of the transverse colon and near to the liver.

Case CXVII.—*Phthisis. Ulceration of the Larynx and of the Ileum. Concretion in the Appendix.*—Thomas E—, æt. 18, a delicate, strumous lad, was admitted with phthisis on February 27th, and died May 4th. *On inspection*, eighteen hours after death, the lungs were found to contain caseous and pneumonic deposit, old grey induration, and a large vomica at the left apex. The larynx was deeply ulcerated at the inferior vocal cords. The ileum contained in its mucous membrane strumous deposit, and a large ulcer existed at the valve; the appendix contained a waxy concretion, white, lamellated, about an inch long, and placed at its extremity; the remainder of its canal was filled with mucus. This concretion appeared to be composed of inspissated mucus.

In another case of phthisis we found that an ulcerated appendix cæci opened into the ileum.

CASE CXVIII.—*Pyæmia. Necrosed Humerus. Cæcal Disease.*—Wm. S—, æt. 72, was admitted into the hospital January 30th, and died February 16th, 1856. He had received six months before death a compound fracture of the left humerus, and Mr. Birkett had removed a portion of the resulting necrosed bone; the wound did not heal, and the patient became increasingly prostrate; nine days before death he suffered from pain in the abdomen.

Inspection was made forty hours after death. The body was much decomposed; the lungs, liver, and kidneys were too much changed to decide as to the existence of acute disease. There was considerable development of fat; the peritoneum was greasy, and in the right cæcal region several coats of intestine were adherent; on removing them about a cupful of pus was poured out; this was found to arise from the neighbourhood of the appendix cæci. The appendix contained several small, circular ulcers, and one of these had a pinhole opening into the peritoneal cavity. The whole of its parietes were much thickened, expecially at the extremity, which was white and fibrous; the appendix contained pus. The cæcum itself, the ileum, and the rest of the intestines were healthy. There were no tubercles, nor evidence of phthisical disease in the lungs. The right shoulder-joint, the sterno-clavicular articulation, &c., were filled with pus. On the left side was an oblique, ununited fracture of the humerus.

It is very unusual to find a patient at seventy-two years of age the subject of cæcal disease; neither did it appear to be the direct cause of death; the man died from pyæmia, consequent on necrosed bone. Cases, however, may arise of pyæmia produced by cæcal disease alone; the probability is, that in a poisoned condition of the blood, slight irritation at the cæcum had been followed by ulceration, perforation, and subsequent suppuration.

CASE CXIX.—*Disease of the Cæcum following a Blow. Perforation of the Appendix. Suppuration. General Peritonitis. Almost complete secondary Perforation of the Cæcum.*—Christopher B—, æt. 21, was admitted into Guy's Hospital, in a dying state, June 1st, 1859, and expired a few hours afterwards. Two years previously he had received a severe blow in the region of the cæcum, but it was a week before admission that sudden pain came on in the abdomen. *On inspection* the abdominal serous membrane was found to be intensely injected and acutely inflamed. On separating the last coil of the small intestine from the cæcum, a small abscess was observed, which communicated with the appendix cæci; nearly the whole side of the appendix was destroyed by ulceration, and the pus had separated the coats of the intestine as far as the cæcum, with which it was on the point of forming

a second opening. The mucous membrane of the rest of the intestine, and the other viscera, were healthy.

The blow had probably in this instance set up cæcal disease, which manifested but slight symptoms till perforation took place a week before his death. Suppuration followed, and was localized by adhesions; but, most unwisely, he was taken from his bed, and shaken in his transit to the hospital, which he reached in a dying state; the adhesions, on which the prolongation of life depended, were broken down, and general peritonitis was established. The almost complete secondary perforation of the cæcum is an illustration of the course which suppuration sometimes takes.

Case CXX.—*Local Peritonitis. Perforation of Appendix Cæci. Strangulation of the Ileum by the Appendix.*—A young lady about twenty-three years of age jumped from a gate about a year before her death and experienced pain at the lower part of the abdomen, with slight vomiting and some uneasiness for several days; she remained, however, in apparently good health till August 13th, 1858, when, after partaking of veal and a glass of port wine at dinner, severe pain at the lower part of the abdomen came on, the pain extending from the hypogastric to the epigastric region. The next day the bowels were moved, but the pain towards the right iliac region still remained, and she felt ill. On the 16th her medical attendant saw her, and found her suffering from pain in the abdomen, with an anxiety of expression which appeared to indicate more than ordinary colic. Aperient medicine was administered, and the bowels were moved on the 17th; she stated that the pain was partially relieved, and that she felt better. On August 18th, in the evening, severe vomiting of offensive matter came on; the pain continued at the lower part of the abdomen, and there was very little tympanitis. The vomiting ceased, and the pain partially subsided; the abdomen was still tense at the lower part, and the tympanitis increased; the pulse continued below 100; the urine was abundant; but the patient became more prostrate. A large injection of cold water was administered. The bowels acted at 2 a.m. on August 27th, and I was requested to see her in consultation the same day. At 10 a.m. I found her with a flushed face and with a distressed and anxious expression; the skin was clammy; the abdomen was flattened at its upper part; but below the umbilicus, and especially towards the right iliac region, it was very tense, tympanitic, and tender on pressure. A rounded and dense mass could be felt in the region of the cæcum and at the termination of the ileum. No evidence could be found of distension of the transverse or descending colon, nor could enlarged coils of intestine be observed through the parietes, and there was evidently greater distension of the right than of the left loin. The vomiting had ceased, the tongue was slightly furred, the gums were sore from the

action of mercury; about a pint of urine had passed, and menstruation had come on. The pulse was 120, and irritable; the respiration 40. She had not passed any flatus nor blood from the bowels, but an evacuation had been produced by the injection a few hours previously; she had had sleep during the night. The mercurial which had been ordered was now omitted, and opium gr. ss given every four hours. Till September 3rd she continued in a hopeful state, but was very prostrate, and the bowels acted. In the afternoon of that day she suddenly awoke from sleep with great distress of breathing, and died in a few hours.

Post-mortem examination.—On opening the abdomen the peritoneal serous membrane was found to be dry, but no lymph was effused. At the left side of the cæcum there was considerable peritoneal inflammation, bounded by coils of ileum, and by the cæcum. At this part, deeply situated, the appendix cæci passed over the termination of the ileum, and extended to the mesentery of a portion of adjoining ileum, where it was strongly united, and formed, with its own mesentery, a firm loop. The mesentery of the appendix was adherent to a small gland, which completed the band of adhesion with the ileum; at the same site another coil of ileum was also adherent by a broad band of organised adhesion. The termination of the appendix was softened, sloughy, ragged, and perforated; but the appendix itself was pale. Above these partially constricting bands the ileum was somewhat distended, but the cæcum was also distended with flatus and fæces, showing that the strangulation had not been complete. The coats of the ileum towards its termination were exceedingly softened, and broke down in several parts on removal; but there was no evidence of fæcal extravasation before death. The cæcum was also softened. The opening into the appendix was free. The uterus and ovaries, &c., were healthy.

In this case there was evidence during life of local peritonitis in the neighbourhood of the cæcum and at the termination of the ileum; and although there was obstruction of the bowels, this was peculiar in its character; it was more severe than in ordinary cæcal disease—for, during a short time, there was stercoraceous vomiting—and, on the contrary, it was less severe than in complete strangulation of the intestine, for the bowels were many times acted upon. In reference to the position of the obstruction of the bowels, the ileum and cæcum were manifestly concerned; there was dulness and tympanitic distension at that part, with tenderness, and there was no distension of the transverse nor of the descending colon; but the pain was situated near to the pubes, and nearer to the median line of the abdomen than in simple disease of the cæcum; and, although it was evident

that the symptoms were principally due to inflammation connected with the cæcum or the appendix, it appeared more than probable that the pain which had been experienced a year before, and which came on after sudden muscular exertion, might have been induced by some abnormal movements of the intestine. These opinions were confirmed by post-mortem examination; the appendix cæci had been adherent for some time across the lower part of the ileum. A slight attack of enteritis produced pain, distension, and almost complete occlusion of the intestine; more severe inflammatory changes then became manifested, closely resembling those of ordinary disease of the appendix; softening and perforation of the appendix took place, but the peritonitis was localized by adhesions. The strangulation of the intestine then lessened, and the bowels were acted upon several times. Although prostrate and exhausted, there was hope of recovery; but sudden collapse supervened, and death followed in a few hours. This, we believe, arose from the extension of the disease to the general peritoneum, which was found to be dry, although sufficient time had not elapsed for lymph to be effused. The value of an opiate plan of treatment was well shown in this case, when associated with complete rest; the pain subsided, the bowels acted, and the vomiting ceased. The mercurials had rendered the contents of the canal more fluid, but had probably induced less plasticity and firmness of those adhesions, on the stability of which the prolongation of life depended, for by them only was the peritonitis localized.

Case CXXI.—*Perforation of Appendix Cœci. Abscess behind the Ascending Colon, reopening into the Colon. Clot in Vena Portæ and Mesenteric Vein. Pyæmia.*—G— D—, æt. 23, was admitted into Guy's on December 29th, 1875. She was a married woman; but had not had any children. Four months previous to admission she had had a miscarriage. Her general health was good, and her illness began three weeks before admission with severe pain in the back, and with diarrhœa and vomiting. When brought to the hospital, she had an anxious expression of countenance, was wasted, and appeared to suffer pain. She lay on her back with the legs drawn up. The tongue was dry, the teeth and gums covered with sordes, bowels loose, and the motions fluid and of a yellow colour. The hepatic dulness was increased, and there was much tenderness on pressure. The pulse was small and compressible, 140. Temperature 102·6°. Respiration 30.

There were no maculæ observed. A little crepitation was audible at the bases of the lungs, but otherwise they were healthy. The heart was healthy. About forty ounces of urine were drawn off, sp. gr. 1010; it contained a slight trace of albumen and diminished chlorides. The patient moaned from pain, but appeared in a drowsy state. The pupils were normal; she had not suffered from any rigor. On the following day she was in the same state, but on the 31st she had rigors and vomiting. The previous evening there was constant diarrhœa, with vomiting and retching. Temperature 100°. Pulse 130. Respiration 44. On January 1st she was still in great pain, and the diarrhœa returned, motions ochry colour and loose. Pulse 140, weak and fluttering. There were flatulent eructations, and again vomiting. She complained of severe pain about the heart, and great restlessness preceded death. She remained sensible till near her death at 6 p.m.

On examination, the appendix cæci was quite divided about an inch from the intestine, and it opened into a sloughy abscess, which extended behind the bowel; the abscess opened into the ascending colon by a round opening, about the size of a sixpenny-piece. There was no tubercle in the lung nor in the intestine, and no other ulceration in the intestine. There was no evidence of enteric fever, nor of any foreign body having lodged in the bowel. The mesenteric vein contained pus. The vena portæ contained a clot, which had formed in a double layer upon the coats of the vein, and had allowed some blood to pass in the centre of the vessel. There were numerous peripheral abscesses of small size in the liver. The spleen was healthy, so also the kidneys.

The diagnosis in this case was extremely obscure when she was brought into the hospital. It was evident that there was acute disease of the abdomen, with peritonitis, but how it had originated was not clear. There had been diarrhœa, but there was no proof of enteric fever, nor was there evidence of phthisis or tubercular disease. Insidious disease of the appendix led to ulceration, then to suppuration behind the cæcum, and a second opening formed into the bowel, at the ascending colon. Suppuration then extended into one of the branches of the mesenteric vein, and led to the obstruction in the vena portæ and to the abscesses in the liver. The pyæmia was the cause of the later symptoms and of death.

This case may be contrasted with one more recently under my care in Guy's, in which equal obscurity attended the diagnosis. There was acute inflammatory disease in the region of the cæcum, but in this instance the cæcum was pushed aside from its normal position and the disease in the iliac fossa was produced by perforation of the termination of the ileum, perhaps from enteric fever.

Many of these cases of perforation occur even at an earlier period of life than those just recorded. In my notes I have

cases at the age of 12, 14, 19, &c., death generally taking place from the third to the seventh day; but although the leading symptoms are very similar, and well marked, each one has its own minor peculiarities. The detection of foreign substances in the appendix, without any severe irritation having been produced, is by no means uncommon; thus a pin was found with its head downwards, and its point extending into the coats, half surrounded by fibrous membrane. Again, I have observed an iron nail in the appendix, without injury having resulted from its presence; shot, and various substances are sometimes thus lodged. The presence of fæces in the appendix is often the precursor of ulceration and fatal perforation. In the volume of the 'Guy's Reports' for 1856 there is a case of much interest, recorded by Dr. Hughes, of strumous peritonitis and perforation of the cæcum coming on in a boy aged fourteen, after typhoid fever. Seven months after fever, while at work, sudden and severe pain came on in the abdomen, which subsided in a few days, but again returned, continuing for several hours in each attack. When brought to Guy's, the pain in the abdomen was general, with tenderness, and there was much febrile excitement. After several weeks the general distension subsided, but a hard, tolerably defined mass was felt in the region of the cæcum. This hardness continued, and he had occasional attacks of severe pain, sometimes with diarrhœa; hectic supervened, the skin became hot, the stomach irritable, and he exceedingly restless, fretful, and distressed; the abdominal viscera moved *en masse;* he sank about ten weeks after admission.

There was slight tubercular deposit in the lungs; but the abdomen presented the usual appearance of strumous peritonitis; the disease, however, was most marked in the region of the cæcum, the anterior surface of which was destroyed, and a fæcal abscess had resulted; the termination of the ileum was also perforated. Other parts of the small and large intestine were ulcerated.

The ulceration consequent on the typhoid fever in this child appears to have predisposed to slow organic changes of a strumous character in the abdomen.

Cases of Cancerous Disease.

CASE CXXII.—*Cancer of the Cæcum. Abscess in the Groin.*—William J—, æt. 56, by trade a coach trimmer, of very temperate habits, had enjoyed excellent health till he ruptured himself in carrying a heavy weight; he afterwards had an abscess in the right groin. In October, 1855, he experienced pain and sense of heat at the lower part of the abdomen, and then found a swelling about the size of a walnut, which gave him great pain on pressure, or on walking. The swelling enlarged day by day, but became less painful; and night sweats came on.

On admission he had a cachectic appearance; and in the right iliac region was a hard swelling extending into the umbilical region; it descended also below Poupart's ligament on the right side; the inferior part was firmer than the upper; the pain was increased by pressure and during defecation. The respiration was difficult, but the chest was normal; the urine was healthy, but there was pain after passing it. The appetite was tolerably good. He was ordered to take a dose of castor-oil; four leeches were applied to the tumour; and Dover's powder with grey powder were given night and morning. Free action on the bowels took place, which lessened the abdominal tumour, in fact it had almost disappeared; but the tumour in the thigh remained hard and tender. It became red, more swollen, and crepitant. Severe pain in the thigh then came on, and a free incision was made into the abscess; about a pint of fæcal matter, with gas, was discharged. This fæcal discharge with pus continued very abundant; the edges of the wound sloughed, and a second opening formed near the crest of the ileum. The patient gradually became prostrate; and for more than a month before his death he had very troublesome diarrhœa. He died about three months after admission.

On inspection of the abdomen the general peritoneal surface was found to be healthy; the small intestines were collapsed. There was an old inguinal sac on the right side quite free and empty. Several coils of small intestine, the lower parts of the ileum, were firmly adherent on the inner side of the cæcum, at the brim of the pelvis; and the cæcum itself formed the anterior surface of a firm tumour. On carefully removing the cæcum and intestine, it was found that the posterior wall of the cæcum was destroyed by carcinomatous ulceration, and offensive fæcal matter was poured out from beneath the iliac fascia; and the abscess extended downwards to the opening on the thigh. There was also an irregular nodulated growth extending from the mucous membrane of the cæcum, attached anteriorly near the valve, and surrounding the intestine; the edges were exceedingly vascular, but not flocculent. The section of the thicker portion near the ileum presented yellowish-white medullary structure, and consisted of an aggregation of large nuclei, evidently medullary cancer; near the margin, beautiful capillaries were observed distended with blood. At the posterior part some of the cellular tissue was infil-

trated. The coil of ileum which was adherent to the cæcum had an irregular transverse opening into it, and was much injected. The remaining part of the intestinal canal was healthy, so also the mesenteric and lumbar glands. The liver was pale and somewhat fatty. The kidneys and bladder were healthy; so also the thoracic viscera.

The commencement of this disease was different from ordinary cæcal mischief. There was at first a small painful tumour in the abdomen, which had more resemblance to cancerous growth, or diseased gland, than cæcal disease of a simple inflammatory character; the disease was slow in its progress, hectic was developed, and the patient ultimately sank from exhaustion. The course of the disease beneath the iliac fascia was that followed in most cases of suppuration in the iliac fossa. In other cases which I have witnessed of ulceration commencing at the posterior surface of the cæcum, and leading to extravasation into the cellular tissue of the iliac fossa, the disease has generally been of a cancerous character.

Case CXXIII.—*Colloid Cancer of the Cæcum. Jaundice.*—Ann C—, æt. 28, was admitted into Guy's Hospital, July 31st, 1860. She had resided in service at Woolwich; and her previous health had been tolerably good, but the bowels had always been irregular. On July 22nd she was seized with vomiting, which continued till the time of admission, but was relieved by milk and lime water. The vomiting came on in the evening, and was preceded by pain and soreness in the mouth; pain then came on in the right side. Since July there had been no appearance of the menses; previously she had suffered from dysmenorrhœa. On admission she was pale, and had an anxious and distressed expression; she was nervous and easily excited. The pulse was compressible and the heart irritable; the chest was healthy, and she had no cough. The abdominal muscles were rigid; and immediately beneath the skin a defined, hard, and elongated tumour, placed somewhat transversely, could be felt in the region of the cæcum and ascending colon; the pain on pressure was severe, but was especially complained of when the pressure was sudden. The part was dull on percussion; the bowels were easily acted upon. After food flatulent distension came on, and she often complained of severe pain in the region of the cæcum directly after swallowing fluids. She was nervous and excitable, and the pain was manifestly increased when attention was directed to the part. Dover's powder, and the steel and aloetic pill afforded considerable relief, and she left the hospital on November 13th. She returned, however, in six weeks, much worse; jaundice had come on a few days previously, and she was very ill. The

mind was oppressed, the pulse was very compressible, and she died in ten days from this hepatic complication.

Inspection.—The thoracic viscera were healthy. In the posterior wall of the right lumbar and ileo-hypogastric regions the peritoneum was studded with small yellowish tubercles of cancerous matter. The stomach was drawn down by the great omentum, so as to be visible below the liver. The ileum near the cæcum became gradually thickened and rigid, from the growth of cancerous matter of the appearance and consistence of old honey in a crystalline state. The ileo-cæcal valve was obliterated; the cæcum and ascending colon were very thick and rigid; the peritoneum over them was involved in cancerous disease, and the muscular coat could not be distinguished. The coats of the intestine were an inch in thickness just above the cæcum, and the calibre of the bowel was much diminished in size; at this part also the mucous membrance was ulcerated for the space of several square inches. The mesenteric glands were enlarged and infiltrated with cancerous matter. The glands about the head of the pancreas compressed the common bile-duct. The lumbar glands also were infiltrated. The kidney contained some cancerous tubercles. The right ovary was enlarged to the size of an egg, and was roughened and tubercular on the surface. The peritoneal veins at that part of the pelvis were enlarged. The walls of the cæcum and the last six inches of the ileum presented a beautiful specimen of colloid cancer. The mucous membrane was nearly half an inch in thickness, and of a gummy appearance; it presented delicate fibres forming cellular spaces, which were filled with large nucleated cells; portions of the cellular interspaces consisted of very minute granules, as if from degenerating fibre; numerous clusters of granules were also observed. Beneath the thicker portion of the diseased mucous membrane was a red layer, consisting apparently of degenerated muscular fibre, or rather of cancerous tissue, in the place of the muscular, and formed by an immense number of nucleated cells.

The cause of death in this case, was the obstruction of the bile-ducts by enlarged pancreatic glands. The patient was extremely nervous and excitable, and at the onset of the disease it seemed doubtful whether the symptoms arose from ovarian irritation. It was, however, soon evident that there was organic disease of the cæcum or small intestine. The mischief was more circumscribed than in ordinary cæcal inflammation, and there was an absence of febrile symptoms and of local peritonitis. It might have been doubtful whether ovarian disease had set up enlargement of the lumbar glands; but the manner in which pain came on in the tumour directly after food had been swallowed, pointed to intestinal mischief; and the tumour appeared in her ema-

ciated state to be very superficial, immediately beneath the skin, and more distinct than it would have been from enlarged glands; nether was the growth in the position of mesenteric or omental tumours.

Case CXXIV.—*Appendix Cæci in the Inguinal Canal.*—James C—, æt. 16. The testes had not descended, and the appendix was adherent in the inguinal canal; the small intestine was fixed in the pelvis. The symptoms of hernia came on, and an explorative operation was performed. Peritonitis supervened, and after death purulent effusion was found in the abdominal cavity.

These cases are recognised by surgeons as belonging to one of the forms of irreducible hernia.

Intussusception of the ileum into the cæcum and ascending colon is of not unfrequent occurrence; and its symptoms might be mistaken for simple inflammatory disease of the cæcum. This subject will be again referred to in speaking of intussusception generally.

In many of the morbid changes of the cæcum to which allusion has been made, constipation is a more or less constant sign, and there is danger of yielding to the temptation of administering purgatives; these medicines rarely effect the desired object until inflammatory irritation has subsided.

CHAPTER XI.

ON DIARRHŒA.

DIARRHŒA consists in the abnormal frequency of evacuation of the bowels, as defined by Cullen, "Dejectio frequens; morbus non contagiosa; pyrexia nulla primaria:" and it arises generally, but not exclusively, from an irritated condition of the large intestine.

It manifests itself in various forms, some of which have received distinctive appellations, as *Diarrhœa crapulosa, biliosa, mucosa or catarrhalis, dysenterica,* and *choleraica,* to which might be added *nervosa,* and *colliquativa.*

Diarrhœa crapulosa is that state in which there is an unnatural fluidity and excess of fæcal excretion, in which the evacuations are healthy in character, but in excessive frequency and fluidity; in some cases very large quantities are discharged without any discomfort, but, on the contrary, with relief to the patient. This form of diarrhœa should not be checked when it is a natural discharge; but more frequently it is the sequence of irritating and undigested food. Too great a quantity may have been taken, and a portion of it may have passed into the intestine crude and partially dissolved; or from its insoluble character portions of the food, as the woody fibre of vegetables and fruit, may have remained unchanged by the gastric juice, and irritate the intestine. Again, active mental or bodily exercise immediately after a meal, which has been suitable both as to quality and quantity, may interfere with the proper solution of food, and lead to its hasty passage into the duodenum.

When the alimentary canal becomes in this way loaded with undissolved ingesta, pain of a griping and twisting character ensues, from irregular peristaltic action and from distension. The abdomen becomes full; the skin and complexion

sallow; the tongue is furred; the pulse is compressible; headache and giddiness are often present; the sleep is disturbed; the bowels act frequently and irregularly, and the motions contain undigested substances, with fluid fæces or with firm scybala. Considerable soreness is at times experienced in the course of the large intestine, and distressing tenesmus arises from the irritation of the mucous membrane of the rectum.

The term lientery is used to designate the condition in which the food is passed almost unacted upon, either by the gastric or intestinal secretions, and in a very short time after having been taken. This state arises from excessive irritability of the whole intestinal tract, with disordered secretions; it is not unfrequent in children after protracted diarrhœa, and gastro-enteritis. It is of common occurrence among the out-patients of large hospitals; and in not a few cases leads to a fatal termination.

Bilious Diarrhœa is also a form of disease produced by the effusion of irritating substances into the intestine; not, however, from without, but from the liver, and possibly from the pancreas and follicular glands.

The secretion of the liver becomes either excessive in quantity, or irritating in quality; and the contents of the canal are apparently hurried onward, and evacuated as frequent loose and bilious dejections. The causes of this state are various, and sometimes the disorder of the liver is really secondary to an irritable condition of the intestine itself, due to excess, especially of stimulants. Exposure to cold and wet induces diseases of this kind, especially in the autumnal season of the year. The symptoms are somewhat similar to those previously mentioned; the pain is slight, unless the disease become aggravated; the tongue is furred; the complexion is sallow; some febrile excitement is present with frontal headache; pain in the abdomen and in the hypochondriac region. This form of diarrhœa is sometimes epidemic, attacking considerable numbers exposed to similar exciting causes; and when severe, and accompanied with colic or spasmodic pain in the abdomen and legs, and especially with vomiting, it constitutes English cholera, and often leads to great prostration of strength. The countenance becomes

haggard, the eyes appear sunken, the pulse is exceedingly compressible and failing, the temperature below normal, the tongue is brown, and the patient too frequently sinks exhausted, especially if very young, or advanced in life, or if already prostrate from other disease.

Abnormal conditions of the bile tend to produce other modifications; thus, the motions in diarrhœa are sometimes in a state of fermentation; they are watery, frothy, and only contain fluid fæcal matter. This I have seen very prominently in a case of phthisis, in which there was probably some ulceration of the intestine, when the evacuations consisted of long shreds of mucus and casts composed of columnar epithelium and nuclei. After a few weeks this condition subsided under the use of cusparia, sulphuric acid, and opium, with occasional starch injections, but it was followed by very severe pain in the course of the colon, and by frothy, yeast-like evacuations. For this state I used injections of charcoal,* ℥ij to about a pint of thin barley-water, with great relief; the character of the evacuations improved, and in a short time became naturally fæcal, the pain diminished, and the strength increased. I afterwards gave the patient several grains of myrrh, twice or three times a day, with manifest improvement, till she left the hospital several months later.

Diarrhœa sometimes occurs with an absence of bile in the evacuations; in jaundice this may be the case; it is so in cholera; and towards the close of chronic disease, the liver may cease to pour out its ordinary secretion. I have seen it in a patient slowly sinking from the exhaustion consequent on diabetes, without phthisis. The motions were in that case often quite white, like water frothy from an abundance of soap.

There is, also, a form of diarrhœa arising from the inhalation of noxious effluvia, which is closely allied to that just described; the fumes of sulphuretted hydrogen gas are absorbed by the lungs, and through their minute capillaries enter the blood; the gas is circulated and acts as a poisonous agent on that vital fluid, and if concentrated, proves rapidly fatal; if less concentrated, it produces headache, and frequently,

* See Dr. Theophilus Thompson's Lectures on Phthisis.

also diarrhœa. It appears, that not only are the secretions of the liver and alimentary canal changed, but that, by means of this excessive action of the abdominal viscera, the poison is eliminated from the system. So rapid is this agent in its action, that to be present for a short time, even a quarter of an hour, in a dissecting room, will, in some persons, produce distressing diarrhœa.

In typhoid fever, and in phthisis, ulceration of the small intestine is frequently found to be accompanied with diarrhœa; of these we have spoken elsewhere; in some of these cases, the large intestine is involved, but in others, when the diarrhœa has been severe, such has not been the case. It would appear that the continuity of structure with the ulcerated ileum, the irritating excreta, as well as the changed and probably accelerated peristaltic action of the small intestine, tend to excite over-action of the colon, and thus to set up diarrhœa.

Catarrhal and *mucous diarrhœa* arise from a state of slight inflammatory disease, closely allied to ordinary coryza, affecting the mucous membrane of the *large* intestine. The secretion is at first checked, but afterwards greatly increased, and a watery fæculent mucus is discharged mixed with the ordinary fæces. This state may continue for several days, or even for a much longer period: the motions are loose, and somewhat watery; and if the rectum be affected, considerable tenesmus is produced; the pain and febrile excitement are slight, but the strength of the patient is reduced, and he is unequal to his usual duties; the tongue is clean, the pulse is compressible; the bladder sometimes sympathises with this irritation, and a frequent desire to pass urine is induced; in little girls, also, a muco-purulent secretion often takes place from the vulva; redness of the parts is produced with smarting pain, and the idea has sometimes been suggested that the child has been cruelly treated.

In this form of diarrhœa the evacuations contain a considerable quantity of mucus, and a little blood is often observed; these are especially present when irritation occurs very low down in the rectum, or is set up by hæmorrhoids; and the mucus will sometimes pass both before and after the dejection.

In infants the disease closely resembles gastro-enteritis,

or it is, perhaps, rather identical with it, but differing in degree, as a greater or less part of the alimentary canal is affected; in these cases the whole tract sometimes becomes rapidly involved, and great, if not fatal prostration, rapidly ensues. (See Muco-Enteritis.)

As with bilious diarrhœa, before mentioned, it is in very young or aged subjects that catarrhal diarrhœa, or catarrhal inflammation of the large intestine, leads to more serious disease, but it is also found amongst those in whom chronic or more exhausting disease has existed.

This catarrhal diarrhœa not unfrequently becomes a chronic disease, the more severe symptoms cease, but still the bowels do not act in their normal manner; constipation often ensues, and afterwards a fresh looseness of the bowels, and this alternation is oftentimes repeated, or the more solid motions are followed by a discharge of mucus coating the fæces; sometimes the mucus is passed in considerable quantity after the evacuation, or it forms an elongated flake or cast of the intestine. I have observed this condition following severe disease of the intestines of a dysenteric character, and it is sometimes associated with a state of chronic congestion of the liver; again, it is often perpetuated by the presence of hæmorrhoids, and by ovarian disease. It may exist for many years without causing much derangement of health.

Morbid anatomy.—Many instances have been known of fatal diarrhœa in which the appearance of the mucous membrane has been normal, its congestion has entirely disappeared, and a thin mucus only has been found upon the membrane. But this is not always the case, and there are several recognised pathological changes which are frequently present. First of these, because most frequent and therefore the more important, is a vivid injection in more or less isolated patches.

2ndly. When the diarrhœa has been chronic, the mucous membrane is not unfrequently covered by a thick layer of mucus, and presents a grey colour. I have frequently examined membranes thus changed (as before described; see Duodenum and Cæcum,) and have observed that the colour arises from minute particles of dark pigmental matter

deposited in the substance of the mucous membrane. Prolonged congestion is known to give rise to similar pigmentary changes in many parts, as in the skin, liver, lung, heart &c., and wherever this pigmentary deposit occurs it is found to be due, as I have described here, to grains of varying tint—orange, red, brown, or black. One must regard these grains as the remnants of actually extravasated blood or to the arrest of some of the oxidizing or other processes which the blood colouring matter probably undergoes in its passage through the various tissues.

In the large intestine, this pigmental deposit is found in minute circles around the follicles.

3rdly. The mucous membrane, and also the connecting cellular tissue, become thickened.

4thly. Minute ulceration, probably follicular, is found extending through more or less of the length of the colon. These ulcerations are about one sixteenth of an inch in diameter, and present a minute black zone around each of them. This state would be regarded by many as the result of dysentery.

Dysenteric Diarrhœa.—Purging is the most marked symptom of dysentery, and the lesser degrees of irritation which we have considered under the term of catarrhal diarrhœa might be regarded as a form of dysentery of the mildest character. In dysentery, however, the diseased mucous membrane rapidly passes into a state of ulceration, and blood is discharged with the fæcal excreta.

In *Choleraic Diarrhœa* a thin, very abundant watery mucus is discharged from the alimentary canal. The evacuation may have very little colour, and present the appearance of rice-water. It is often alkaline in character, and consists of nuclei and epithelial cells in various degrees of development. After death the membrane is found to be entire, and pale or sodden; the solitary and Peyer's glands are enlarged. In many cases of uncomplicated cholera which I have examined, no further morbid appearance was presented.

Of late years a belief in a fungous growth has been revived, and the dejections of cholera have been said by Hallier and others to contain specific spores. Some very careful and

prolonged observations, however, by Drs. Lewis and Cunningham in India, controvert this opinion.

The symptoms are those of rapid prostration, with pallor and sunken eye; the pulse is compressible, the tongue is cool, and the voice is often scarcely audible; the abdomen is collapsed, and the urine is scanty in quantity; the stomach is often exceedingly irritable, so that everything is at once rejected from it; the alvine evacuations are generally frequent, and of the character before mentioned; and severe cramps in the legs and in the abdomen are often present. This state may pass into one of profound collapse, even after one evacuation of the character of rice-water, but as the prostration subsides, in favorable cases, I have never observed the febrile excitement which is secondary to true cholera.

Another kind of diarrhœa is that which has been correctly called *Serous*, and which is frequently observed in albuminuria. A dropsical condition of the mucous membrane is induced, and the serous exudation from the overcharged capillaries leads to watery discharge into the colon, and thus to diarrhœa. This state of the mucous membrane is precisely analogous to the œdema of the lungs, and to anasarca of the cellular tissue in renal disease. So frequently is diarrhœa present in these cases, that it may almost be regarded as a symptom of the disease, and when moderate is beneficial in its results. It is the action we often seek to produce artificially by powerful hydragogue cathartics, so as to diminish the quantity of urea circulating in the blood, and to relieve the oppressed kidney. All these fluid evacuations contain urea, as does the gastric juice and the mucus discharged from the lungs.

Another class of cases which can scarcely be placed among those previously mentioned, arise from fright, from excessive mental agitation, from want of food, and from exhausting disease; the former cases are of mental origin, the latter constitute what is sometimes called "colliquative diarrhœa;" and the condition of the mucous membrane corresponds to that of the skin, from which profuse partial sweats break out.

In fright the capillaries of the face become blanched, and the blood leaves the whole of the surface; the cavities of the

heart are increasingly distended, hence the discomfort there experienced, and the mucous membrane of the intestine is probably also engorged; therefore the discharge from the mucous membrane is to a certain extent beneficial in relieving internal congestion. The intimate connection of the sympathetic nerve with the centres of thought and feeling is the probable explanation of these instances of diarrhœa following mental agitation.

In scurvy, purpura, starvation, &c., the altered character of the blood leads to the effusion of serum, or blood, into the mucous membrane, or into the canal itself, corresponding to the effusion into the skin. In some fatal cases of purpura, the whole of the mucous membrane of the alimentary canal is studded with spots of ecchymosis. An interesting case of this kind occurred at Guy's Hospital in 1856, in a young man who had been starved to death.

Discharge of blood, or melæna.—Obstruction of the portal circulation, either from pulmonary, from cardiac, or from hepatic disease, leads to great engorgement of the mucous membrane of the whole alimentary canal; and this congestion may cause hæmorrhage from the bowels. In examining the mucous membrane in these cases, it is very common to find points of ecchymosis, and the capillary vessels of the membrane much distended. Under a low magnifying power we find the capillaries beautifully injected, with extravasated blood between them, still, however, restrained by the unbroken epithelial surface and its basement membrane; if the rupture of this membrane occur blood is extravasated. The discharge of blood may be a symptom of various diseases; thus, ulceration is a frequent cause of hæmorrhage from the bowels, and the ulcer may be located in any part of the canal; in the stomach and duodenum from various causes; in the small intestine in fever and in phthisis; in the colon in dysentery, &c.

The blood does not always present the same appearance; if it arise from hæmorrhoidal vessels the blood will be florid, and precede or follow the dejection; if it come from some higher part of the canal it is incorporated with the fæces; and when it has traversed a considerable portion of the canal, it becomes altered by admixture with the secretions from the mucous membrane. This is the case, to some extent, when the blood

is poured into the cæcum, but is especially so whenever it has been extravasated into the stomach; the acids of the gastric juice act upon the effused blood, so that it becomes black, and when discharged from the intestine it resembles a pitchy fluid, constituting true melæna.

The *symptoms* of diarrhœa have, perhaps, been sufficiently described in mentioning its several forms; and they vary according to the cause. In the simplest form there is neither pain nor constitutional disturbance; in more aggravated cases there may be severe colic, and febrile excitement; and generally, unless there be hepatic disturbance and derangement of the whole mucous tract, the tongue is clean, it is then furred and injected, and in typhoid prostration assumes a brownish colour. The pulse is compressible, and the consequent prostration is often very alarming, especially in infants and aged persons, and in some cases it leads to a fatal result.

It is important carefully to mark the character of the evacuations; first, as to the admixture of undigested substances; secondly, as to the *fluidity* of the evacuations; a simple fluid state, with normal excreta, indicates irritation of the mucous membrane in a slight degree; thirdly, the *presence of mucus* is evidence of more severe irritation of the colon; this is sometimes found in excessive quantity, and is easily recognised by pouring the evacuation from one vessel into another; fourthly, if more acute disease of the colon exist, detached portions of fæces are found floating on the fluid, which from the rapidity of its discharge, and possibly also from intestinal changes, is often frothy, from the admixture of air; fifthly, in severe diarrhœa, thin watery fluid may be discharged with scybala, and with sedimentary portions of fæcal matter;* sixthly, thin fluid, almost like clear water, may be passed, as in some cases of albuminuria, from an œdematous condition of the membrane, or like rice-water in choleraic diarrhœa, or like soap-suds when with colliquative diarrhœa the hepatic secretion is also checked; seventhly, the fæces are sometimes discharged in a state indicative of fermentative action, and a frothy surface is produced of the appearance of yeast, and the whole discharge

* Dr. Osborne "On the Examination of the Fæces," 'Dublin Quart.,' 1853.

closely resembles the matters occasionally ejected from the stomach in obstructive disease at the pylorus; eighthly, as to the *colour* of the evacuation, we have evidence thereby of the excess and of the paucity of *bile*, sometimes the stool being of a deep brown colour, at others almost as pale as chalk; ninthly, the colour may be changed by the admixture of such substances as logwood administered medicinally, or blackened by steel medicines, the sulphide of iron having been formed; and tenthly, the colour is a guide to the detection of blood. Blood in the alvine discharges may be only observable by microscopical examination; but if in larger quantity, the colour varies from the ordinary appearance of blood to the black pitchy stool of melæna, as we have before mentioned, according to the position of the hæmorrhage in the canal. The green colour of the discharges in the severe diarrhœa of children, we believe, with Dr. Golding Bird, to be altered blood from an irritated and perhaps aphthous surface. Again, in severe dysentery, thin watery fluid, like the washing of beef, is sometimes discharged, consisting of blood with mucus, and of imperfect epithelial elements. To these dysenteric evacuations we shall have again to refer. Lastly, the *odour* of the fæces is not altogether unimportant; sometimes they are intolerably fetid from rapid degenerative changes, at other times they have scarcely any odour. In many instances the microscope enables us to detect an excess of mucus, the presence of blood, the rapid discharge of epithelial elements and nuclei, and other organic and inorganic substances, which the unassisted eye would in vain search for. We have elsewhere referred to the occasional presence of phosphatic crystals upon the mucous membrane of the intestines, and they are sometimes found in the alvine discharges, in simple as well as in typhoid diarrhœa. The presence of fatty matters in the evacuations was first noticed by Dr. Bright, in connection with disease of the pancreas; and the observations more recently made in reference to the physiological effects of the pancreatic fluid have directed increased attention to the subject. It must not be forgotten that we sometimes find oleaginous substances discharged after the administration of large quantities of milk and of cod-liver oil; thus in one case masses of fat as large as filberts

were sent to me by a patient affected with phthisis, who had partaken of milk very freely; still, the observation has been confirmed by subsequent observers, that fatty matters are sometimes discharged in the alvine evacuations in disease of the pancreas, and sometimes in extensive disease of the mesenteric glands.

The *causes* of diarrhœa have been partially referred to. The most common cause of ordinary diarrhœa is exposure to cold and wet; standing in damp places; allowing the legs and loins to become damped and chilled; sitting down upon the ground, and falling asleep in the open air; injudicious bathing; the habit of leaving off flannel garments in hot weather, by which perspiration more rapidly evaporates, and the blood is driven from the surface towards the internal organs.

2nd. Improper and indigestible food, unripe fruit, and an *excess* of uncooked fruit; salads, pastries, and much that modern cookery produces, especially when an excess in quantity is combined with an injurious quality.

In infants a fertile source of diarrhœa, often passing into severe gastro-enteritis, is the administration of unsuitable food, the injurious effects of which are greatly increased by exposure to cold. In hospital and dispensary practice, this cause of disease is observed to a frightful extent; at seven or eight months, even while the infant is, in a great measure, nourished by the breast of the mother, meat, raw vegetables, and fruits, sweets, almost *ad libitum*, are given; and a few months later we often find, that before the child has the power of mastication, the mother gives the food of which she herself partakes, sometimes adding malt liquors and ardent spirits. The consequences of this dietary are such as might be anticipated; the food passes onwards undigested, severe gastro-enteritis is induced; and the malady is often aggravated by a want of cleanliness, and by exposure to night air and dampness. The mortality in London from these causes is exceedingly great. In other infants the food, although in itself proper, is unsuited to the condition then existing, and perpetuates diarrhœa; or it may be, that the milk of the mother disagrees with the child, from the impairment of her health. In such subjects we occasionally find, that an alteration in the character of the gastric juice of the infant leads

to coagulation of the milk, and to severe diarrhœa, with colic, &c., the stools containing portions of curdled and undigested milk, namely, oleaginous matter mixed with casein.

3rd. Diarrhœa is set up by exhaustion, either from want of food, starvation and its attendants of misery, or as the consequence of chronic disease. This form of diarrhœa is sometimes observed in women who have nursed their infants too long. Enfeebled by bearing children rapidly, their strength is additionally taxed by nursing for twelve, fifteen, or eighteen months without proper nourishment or invigorating air. The whole mucous membrane is affected; the nerve of organic life shows its ebbing powers; the blanched cheek, the dilated pupil, the desponding countenance, and impulses of a mind verging on insanity, are symptomatic of this condition. There is intense pain in the head, the heart is enfeebled, the pulse sharp, and sometimes irregular; there is a distressing sensation of exhaustion at the scrobiculus cordis, with severe pain in the back, and in this state a very slight irregularity of food will sometimes set up diarrhœa and vomiting. Cancerous and strumous disease of the mesenteric glands, obstruction of the thoracic duct, chronic disease of the pancreas, diabetes, &c., sometimes have uncontrollable diarrhœa as one of their latest symptoms.

4th. *Epidemic causes.*—At some seasons of the year, in our own climate during the spring and autumn months, diarrhœa of varying severity is set up, and appears to arise from the condition of the atmosphere, perhaps from germs of vegetable or animal growth.

5th. *Endemic causes* are more numerous, and with them may be classed the diarrhœa arising from offensive drains, from decaying animal and vegetable matters. Causes of this kind operate with greater severity upon the young and enfeebled, upon the strumous and ill-nourished. Many infants are thus affected with diarrhœa, and with severe general gastro-enteritis. It is now well known, that an impure water supply, especially if contaminated by sewage, will lead to diarrhœa as well as to enteric fever, and probably to cholera. Again, a general dampness of locality, as from a clay subsoil, will set up, or will increase and perpetuate diarrhœa. We have witnessed the removal into dry bracing

air followed by cessation of the disease, and the return to the same district repeatedly cause its recurrence.

6th. *Excessive secretion* of bile, and other diseases of the liver, as well as disease of other intestinal glands, set up diarrhœa.

7th. Other causes are, tubercular disease of the mucous membrane of the intestine and the mesenteric glands; œdema and long-continued congestion of the mucous membrane; mental agitation and fright; ulceration of the small and large intestine, as in fever, phthisis, &c.; cancerous diseases; purpura and scurvy; large draughts of water; miasmatic disease; poisons.

Prognosis.—Diarrhœa is never altogether free from danger in aged persons, or in very young children; but the prognosis differs according to its cause and character. If associated with chronic disease, or an enfeebled condition of the system, it is often the immediate precursor of death; but when the cause can be removed, and the subject is young, however severe the case may be, we should encourage the prospect of recovery. Many of such cases, when apparently quite *in extremis*, have gradually and almost miraculously recovered.

The prognosis is unfavorable, when diarrhœa has been long continued, and is very severe in its character; in some of these cases scarcely any treatment appears to arrest the purging, and the patient gradually sinks into a typhoid condition.

It may appear unnecessary to say anything in reference to the *diagnosis* of diarrhœa; it is well, always, if possible, to ascertain personally the character of the evacuations; since there may be apparent diarrhœa, without the reality. I have seen starch enemata used, when patients were greatly exhausted, and on inspection, found the intestine loaded with solid fæcal matter. In spinal disease, a weak sphincter ani with involuntary defecation is often mistaken for diarrhœa, and I have known astringents continued for several months ineffectively, whereas rest to the spine quickly relieved the malady. A hardened mass of fæces, which the patient is unable to expel from the rectum, frequently leads to the repeated evacuation of small quantities of fluid fæces or of mucus, which is regarded as diarrhœa or even dysentery;

the effort at expulsion is constant and painful, but ineffective; the removal of the mass at once checks the supposed diarrhœa. Or again, in an exhausted state of the system, or during epidemic diarrhœa, a single loose motion may require immediate attention; for the character rather than the quantity should be our guide. In persistent diarrhœa it is important always to examine the rectum, for I have frequently known cancerous disease entirely overlooked from the want of digital examination.

Treatment.—The primary object must be to ascertain the character of the diarrhœa, and to remove, if possible, its cause. If food be improper, to change it, and administer such as shall be of the least irritating kind. If the air be impure, to order removal to a healthy atmosphere. If the mucous membrane and the secretions be disordered, to try and restore them to a healthy state. To check the diarrhœa by various astringents and by rest.

Warmth.—Warm baths, warmth applied to the feet, and flannel to the abdominal parietes, a warm but pure air, &c., assist in checking many of the simpler forms, and in diminishing those arising from chronic disease. Local warmth may be attained by the application of a hot fomentation, or poultice to the abdomen, or by such rubefacients as a mustard poultice, or turpentine embrocation.

Food.—In diarrhœa the least irritating and the most easily digestible kinds of nourishment are advisable. Many of the forms of amylaceous aliment, arrowroot, sago, are of this kind, and may be given made with milk; these are in themselves soothing applications to irritated mucous membranes, whilst they serve as nourishment to the system. Milk, rice, soaked bread and toast, lightly-boiled puddings of flour and eggs, &c., may be also taken with advantage, and in chronic diarrhœa suet and milk is often of great benefit.

The avoidance of stimulants, of rich and greasy food, of highly seasoned dishes, of vegetables, especially when uncooked, of fruits, &c., is essential; and it is well in many cases to abstain for a short time from solid animal food altogether. The forms of animal food which are most easily digestible are chicken, sweetbread, and some forms of fish, as sole, cod, and whiting; then venison, mutton, and beef; but

much depends on the mode in which these viands are dressed. When dried, salted, and cold, they require a much longer period for their digestion, and portions often pass into the intestine undissolved. Beef-tea sometimes appears to increase diarrhœa, when veal and mutton broth can be taken with benefit.

Rest, and the avoidance of muscular excitement and sudden movements, are very important in checking diarrhœa; and in many instances, especially in severe cases, a recumbent posture should be maintained. In the erect position the gravitation of fluids increases their rapid movement over the irritated mucous membrane.

Pure and dry air is very desirable; many patients at once recover when removed from a damp atmosphere to a dry and bracing one; and when the contamination of decomposing animal and vegetable substances is setting up the disease, removal is still more important, and is often essential to permanent restoration. In miasmatic districts, diarrhœa may not only be rendered paroxysmal, but be perpetuated by the marsh poison.

Many cases of diarrhœa will be cured by this attention to warmth and diet, to rest and pure air; but other means often promote the comfort and favour the restoration to health.

If the large intestine, and especially the rectum, be affected, much benefit is derived from enemata. These are composed of various ingredients, simple starch, thin gruel, and barley-water; and to these we may add tincture of opium and biborate of soda. Or they may be made astringent, as decoction of oak bark with tragacanth, or glycerine of tannin with water; or a very dilute solution of nitrate of silver may be used; an infusion of ipecacuanha has been favorably recommended as an injection by Boudin and Chouppe.

To restore the diseased mucous membrane and to correct secretions.—The alkalies are of very great service in diminishing congestion, as well as in rendering the secretions less irritating. Solution of potash, lime-water, chalk, some salines, as chlorate of potash, bicarbonate of potash, and nitrate of bismuth, act in this manner.

When the hepatic secretions are disordered, as shown by

furred tongue, and pale evacuations, the moderate use of mercurials is of value, as grey powder or calomel, combined with Dover's powder, with soda or with opium; but we should strongly urge that mercurials be very carefully administered, because in many forms of diarrhœa they tend greatly to aggravate the disease. It is only in some cases, even with a foul tongue, and deficient hepatic secretions, that we would recommend their use.

Demulcents.—These act by directly sheathing the mucous membrane; the most important are those mentioned as food, but others are of considerable utility, as acacia, tragacanth, linseed, liquorice, glycerine, spermaceti, &c.

Castor-oil, Linseed-oil.—These are of great value, when improper food, retained secretions and scybala irritate the alimentary canal. They are combined with great advantage with the compound tincture of rhubarb, and sometimes with a small dose of opium, ɱv or x. These remedies are of most service in some forms of dysenteric diarrhœa, when scybala irritate the mucous membrane.

Ipecacuanha is a remedy which acts, apparently, on all the mucous membranes, and is as valuable in disease of the alimentary as of the respiratory mucous membrane. Ipecacuanha not only increases the quantity of mucus but it mitigates inflammatory congestion. It is of great service in the dysenteric diarrhœa of adults, and equally so in the diarrhœa of infants. In the former, Dover's powder is a valuable form for its administration, or the ipecacuanha may be combined with astringents, as in the compound infusion of krameria,* and the compound logwood mixture of the Guy's Pharmacopœia, or it may be administered alone as in the treatment of pure dysentery.

Astringents and Desiccants.—These may be divided into several classes. The *saline,* as chalk; the *vegetable,* as tannic and gallic acids, krameria, kino, catechu, logwood, Indian bael, cusparia, opium; *metallic,* as sulphate of copper, acetate of lead, nitrate of silver, nitrate of bismuth, &c.

Opium acts not only as an astringent, but also as a narcotic; it diminishes the secretion from the mucous mem-

* Infusum Krameriæ compositum. Infusion of Rhatany Root fl. ʒxj; Ipecacuanha Wine ʒiv, Tincture of Catechu ʒiv.

brane, and the peristaltic movement of the intestine, and it relieves the pain of colic. It is of great value in diarrhœa, and may be combined with other remedies, as with chalk and ipecacuanha; but, when irritating ingesta and disordered secretions perpetuate diarrhœa, opium and astringents are not appropriate remedies. When the disease is chronic, opium may be given with the more active vegetable astringents, catechu, krameria, and logwood, and sometimes very advantageously with quinine.

The metallic astringents are combined in a similar manner with opium and ipecacuanha, but are more frequently used in chronic dysentery, and in tubercular ulceration of the intestine, than in simple diarrhœa.

Mineral Acids.—Much has been written upon the use of dilute sulphuric acid in diarrhœa; and its use has certainly been attended with benefit, although not to the extent we were led to suppose. Both dilute sulphuric acid, and dilute nitric acid, are of value after the more severe symptoms have passed off; they act at first possibly by checking chemical and fermentative changes, and afterwards as tonics to the relaxed mucous membrane. Combined with slighthly astringent and mucilaginous tonics, as with cusparia and simaruba, or with calumba root and elm bark, they are of great service in some cases.

When there is much pain, we may associate narcotics with other remedies before mentioned. Spirit of chloroform and spirit of camphor in small doses sometimes afford great relief, so also the tincture of henbane; in other cases, simple carminative medicines are sufficient to relieve the pain, as ginger, cardamoms, &c., especially where the diarrhœa is associated with flatulent colic.

In the colliquative diarrhœa of weaned children, Dr. I. F. Weisse has strongly advocated the administration of raw meat, scraped and reduced to a pulp, as we have previously mentioned in the remarks on enteritis.

Leeches.—The application of leeches to the anus is a remedy which greatly relieves inflammatory congestion of the mucous membrane of the large intestine, but it is one which we should scarcely recommend, unless the disease assume a severe and dysenteric character.

Suppositories, composed of the compound soap pill or morphia, are often of great service when there is distressing tenesmus which disturbs the rest of the patient; and when it is undesirable to administer an opiate by the mouth, or inconvenient to use an enema. Tannin may also in this way be conveniently used, so also bismuth.

In chronic mucous discharge from the bowels, we must first seek to remove the disease of the liver, if such exist, by mild alteratives, by taraxacum, and by nitro-muriatic acid. These remedies, also, assist in relieving the chronic congestion and inflammation of the intestine, and are more effective than astringents. It is well, however, to be assured that no polypoid growth, nor disease of the rectum and sigmoid flexure, is setting up the disease.

If astringents be required in these instances, the oxide and nitrate of silver, sulphate of copper with opium, or the vegetable astringents just mentioned, may be used; and as enemata, glycerine of tannin diluted with water, the solution of nitrate of silver (gr. x—xv to Oj*), the infusion of quassia, the decoction of oak bark, and the decoction of poppies with or without the addition of borax, may be employed with advantage.

In the treatment of choleraic diarrhœa, rest in the recumbent position, warmth to the abdomen and the feet, and gentle friction, if muscular spasm distress the patient, are valuable remedies. A full dose of chalk and opium with catechu and aromatic spirit of ammonia should be given, and repeated in two or three hours, if necessary. Demulcent nutriment, as mutton broth and arrowroot, may be allowed; and if vomiting supervene, ice or cold water will be beneficial. Dilute sulphuric acid has been sometimes used with great advantage, and by some calomel has been freely given in these cases, especially when vomiting has come on. When the collapse of true cholera has attacked the patient, general experience does not favour the free use of either opium or brandy; but to enter fully into the treatment of cholera is foreign to our purpose.

The following cases of diarrhœa are of considerable interest:

* Trousseau.

Case CXXV.—*Inanition. Diarrhœa.*—John M—, æt. 26, was admitted into Guy's Hospital Dec. 17th, 1856, and died Dec. 20th. He had been a sailor, and stated that he had had dysentery, but this was not satisfactorily ascertained, on account of his prostrate condition. It appeared that he had been on board an American vessel from China to Liverpool, and arrived at the latter place on December 6th; he then came up to London. He informed the nurse that there had been a mutiny on board, and that he had been put in irons in the hold. He was in the most emaciated state; the voice was scarcely perceptible; the pulse was exceedingly compressible, and the tongue and mouth presented yellowish white aphthous patches; he had no vomiting, but the stools escaped from him, and were white and very offensive; the respiration was easy, and the mind perfectly conscious. Milk was ordered. The following day he was better, but sank on the third day after admission, and was sensible till nearly the last.

Inspection, December 22, 1856.—There were ecchymoses on both thighs, and old cicatrices on the wrist and leg. The brain was less firm than normal; the lungs were collapsed and healthy. The heart was small. The liver was healthy. The gall-bladder was not distended, and the spleen and kidneys were healthy. The stomach presented gastric solution at the cardiac portion. The small intestines were healthy. The large intestine was throughout of a gray colour, and was filled with dry, white fæces. At the root of the mesentery were several white strumous masses in the glands, but it could not be found that the thoracic duct was obstructed. The urinary bladder was distended.

This case presents us with a well-marked instance of a man dying from the effect of starvation. The diarrhœa was probably the result of want of nourishment, of good air, and of light, &c.; so that supplies having been cut off and the conditions necessary for reparation excluded, the whole body wasted, and the spark of life gradually expired.

Case CXXVI.—*Chronic Diarrhœa. Hysteria. Great Relief from Tincture of Iron.*—Georgiana B—, æt. 40, a single woman, who had resided in the Commercial Road, and had supported herself by her needle, applied at Guy's Hospital May 23rd, 1860, and was admitted under my care. She had suffered from uterine ulceration. During eighteen months she had been affected with diarrhœa, and when she had mental anxiety the disease increased in severity. The slightest exertion produced perspiration. She was a tall woman, extremely nervous, the eyes sunken, the countenance dejected. The heart and lungs were normal. She complained of great pain in the abdomen, on the right side below the liver, in the region of the ascending colon; there was tympanitic distension in the same region; the bowels were opened six times in twenty-four hours, but there was no evidence that blood had been passed. She had not taken meat during several

months. Astringents of different kinds were administered and enemata used, with only partial relief, till the tincture of iron was given persistently for several weeks. The diarrhœa then subsided, and she left the hospital convalescent, stating that she had not been so well for eight years.

This case appeared to be one of passive mucous diarrhœa in a very hysterical subject, and the uterine irritation had tended to perpetuate the disease. Astringents were less efficacious than preparations of steel, which diminished the nervous irritability and gave tone and strength to the whole system. The regulated and more generous diet which was given must not be overlooked; and by persuasive measures she was induced to take a meat diet, which lessened the fluid contents of the colon, and thereby increased the consistence of the alvine discharges.

CHAPTER XII.

ON DYSENTERY AND CATARRHAL INFLAMMATION OF THE COLON.

Numerous authors, as Sydenham, Annesley, Parkes, Ballingall, Sir J. McGrigor, and Morehead, have described the terrible forms of this disease as they are manifested in tropical climates, and in military campaigns, and as formerly seen in England. In our own country, however, dysentery has very much diminished in severity and in frequency, so that in its acute form it is rarely seen amongst us, unless contracted in foreign climes, and then brought to our shores. Still true dysentery occurs more commonly than some of very great experience will admit; sometimes it is the only disease from which the patient suffers, and is quickly fatal; or it is found in association with a general inflammatory condition of other mucous membranes; or lastly, it aggravates varied forms of chronic disease, or it causes their sudden termination.

Particular localities and periods of the year cause the manifestation of this disease, and its complication with others in a very marked degree. This fact is shown by the observations of Dr. Latham and Dr. Baly at the Millbank prison; and the greater humidity of the atmosphere is probably the reason of the more frequent occurrence of dysentery in the hospitals in Southwark than elsewhere in London. When other diseases are complicated by dysentery a very important consideration is introduced into their prognosis and treatment; thus incipient phthisis may become altogether hopeless, and in a very short time fatal, not from the severity of the pulmonary affection, nor from tubercular disease of the intestines, but from acute inflammation of the mucous membrane of the colon.

Abercrombie defined diarrhœa as purging, arising from irritating substances in the canal, and from secretions poured into it; and dysentery, as acute inflammation originating in the mucous membrane of the large intestine. This distinction is probably, to a considerable extent, correct; but some forms of disease usually considered as diarrhœa, arise from catarrhal inflammation of the colon and small intestine, and after death may present scarcely any trace of abnormal change. Dysentery is generally limited to the colon, and when severe the disease rapidly passes into ulceration and sloughing, unless from its extent, or the previous condition of the patient, it prove fatal at an anterior stage, as in several of the fatal cases recorded in this chapter, which terminated before extensive ulceration had taken place.

DYSENTERY.

Dysentery does not embrace every form of inflammation of the mucous membrane of the colon and we would distinguish it from catarrhal inflammation, confining the term dysentery to that more severe inflammation which rapidly passes into ulceration. In catarrh the condition of the mucous membrane is altered, as we described in speaking of enteritis, the membrane is congested, and the secretion is at first checked, afterwards it becomes excessive. This state may soon subside, or it may continue for months, and even for years. Like dysentery it may be brought on by endemic causes, by cold and wet, and by unwholesome diet; at the commencement of a dysenteric attack the symptoms may at first be those of acute catarrh of the colon, and on the subsidence of the dysenteric ulceration, troublesome catarrh of the bowels may persist for a lengthened period.

Dr. Lyon, in his Crimean report, has divided dysentery into two forms, the exudative and the follicular. The former is, however, probably the earlier stage, or that preceding ulceration and sloughing. The cases which have come under my own observation may be divided, practically, into three classes:

1. Those instances in which acute disease of the colon is

the primary disease, and sometimes it terminates fatally in a short time.

2. Those cases in which dysentery is associated with inflammation of other membranes and organs, as when bronchitis, laryngitis, and pneumonia arise at the same time, and are produced apparently by the same cause as the disease of the intestine; in some instances the disease is closely allied to pyæmia.

3. Those cases in which inflammation of the colon has hastened the fatal termination of other more chronic disease.

Morbid anatomy.—The dysenteric process is well described by Rokitansky, who divides it into four stages, and considers that it consists in inflammation of the mucous membrane of the colon, terminating in severe cases in sphacelus. Dr. Parkes believes that, in true dysentery, ulceration is always present, and attaches great importance to the affection of the glands; whilst Dr. Baly describes the process as sloughing, rather than ulceration. Are we then to look upon inflammation of the colon, in which there is no destruction of the mucous membrane, as true dysentery? It will be generally acknowledged, that death may take place prior to the ulceration or sloughing, although we rarely, if ever, find the mucous membrane entire; it is probable that the diseased condition is closely allied to that of the pharynx in diphtheria; and, that in severe cases the membrane rapidly sloughs, without antecedent ulceration.

In the earliest stage of dysentery, the mucous membrane becomes injected, œdematous, and thickened; the mucus is scanty, and the fæces become adherent; this condition may be universal in the colon, or limited to the rectum, to the sigmoid flexure, or to the cæcum. The solitary glands will be found to be distinct, prominent and enlarged.

The secretion from the membrane then becomes further changed, and a thin exudatiou, consisting of epithelium with a considerable quantity of granular amorphous matter, coats the intestine. This exudation is found in patches, or in lines, or it is spread generally, upon the surface. It has been described as dipping into the follicles; an appearance which I have myself observed, and it may also be seen closely incorporated with the surface of the membrane, so

that it can only be separated by considerable violence. The colour of the exudation is generally a greenish yellow; but it varies somewhat according to the character of the fæces. On scraping off the effusion from the surface, the membrane beneath is found intensely congested, and often superficially ulcerated; or, there may be merely minute circular patches of ulceration, with portions of the false membrane adhering at that part. This tendency to ulcerate, or to slough, resembles diphtheritic disease in the pharynx and nares; but the character of the false membrane in the throat is more fibrinous than that developed in the intestine. The muscular coat of the colon appears thickened in this stage of dysentery, probably because it is contracted; and the submucous cellular tissue is often whitish and distinct from inflammatory œdema. Dr. Baly, whilst describing this epithelial degeneration, states, that in most cases these minute adherent coverings on the surface of superficial erosions, or small ulcers, consist of thin sloughs of the mucous membrane. He believes, that in all cases, the destruction of the mucous membrane consists in a process of mortification and sloughing, and not of simple ulceration; and that the disease commences in the solitary glands of the intestines. Other parts, however, beside the solitary glands, are found to be diseased; but whether primarily or by extension, is matter of opinion. Many instances of *diarrhœa* are observed, in which, after death, the solitary glands are found enlarged, or minute points of ulceration are presented; the whole colon may be studded over with minute ulcers, arising apparently in the glands, as is well shown in a specimen in the Guy's Museum, to which reference has before been made. Dr. Baly would probably consider these to be instances of the dysenteric process in its mildest form, and that in other instances, previously alluded to, more acute changes had spread from the glands to the general surface of the membrane.

Dr. Morehead has in some cases observed diphtheritic membrane effused in dysentery, and believes that the mucous follicles are more frequently affected than the solitary glands.*

In the third stage, we find ulceration, sometimes merely as

* Morehead, 'On Diseases of India.'

minute circular ulcers, but generally of a more extensive character; the ulcers are often oval in form, and placed in the transverse axis of the intestine; and their edges are raised and injected, irregular and undermined; and their base is formed by the cellular or muscular coats. These ulcerations gradually extend so as to coalesce, till at last nearly the whole of the mucous surface is destroyed, except here and there in prominent isolated portions, which become intensely congested, and resemble polypoid growths. In severe cases the whole colon, from the cæcum to the rectum, is in this condition; or greater spaces intervene between the ulcers, which are only found in the rectum, or in the sigmoid flexure, or in the cæcum; but generally the rectum and the sigmoid flexure are the parts most severely implicated. It sometimes happens, that the ulceration extends through the muscular and the peritoneal coat, leading to fatal peritonitis from perforation, but this is a rare occurrence; or, the coats of the intestine become sinuous abscesses, so that on dividing a prominent portion of mucous membrane between two ulcers, several drachms of pus escape. This extensive suppuration is very different from the small local collections of pus, which sometimes form in the substance of the mucous membrane after follicular and glandular inflammation, where small eminences about half an inch in diameter are observed, covered by thin layers of mucous membrane. The latter is a less general and less severe form of inflammation of the colon, but one which I have several times observed.

The liver is generally found to be congested, and the gall-bladder to be partially distended either with inspissated bile or orange-coloured mucus. The mesenteric glands are often somewhat congested; and in some instances the ileum and the jejunum are both diseased, becoming intensely injected, partially ulcerated, and covered with diphtheritic membrane; Peyer's glands are also found to be congested and enlarged; although never raised and infiltrated with deposit, as in enteric fever.

Dr. Morehead gives an instance of fæcal abscess, in the right iliac fossa, from perforation of the cæcum in dysentery.

If the acute symptoms have subsided, the injection is less deep in colour, and often becomes grey; the edges of the

ulcers assume a rounded and less prominent aspect; their surface has a smooth and fibrous appearance; ulcerative action has been checked, and cicatrization has commenced. The healing process may go on, so that the cicatrix has an irregular and puckered appearance. The base of the cicatrix is formed by fibro-cellular tissue, but the gland structure is not reproduced. The contraction of the cicatrix sometimes produces considerable constriction of the intestine, and occasionally tends to fatal obstruction. Very frequently above the cicatrix all the coats become hypertrophied, showing that there has been much impediment. Dr. Wilks has informed me of a case, and there are many others now on record in which the cicatrix presented a growth at its margin, evidently of a carcinomatous character, indicating a greater tendency to heterologous growth in the new than in a normal tissue.

In a fourth stage of dysentery the mucous membrane presents a grey, ashy appearance, and considerable portions of it constitute ragged and semi-detached sloughs.

Dysentery often terminates in complete recovery; at other times death quickly supervenes from the severity of the disease; or, thirdly, it passes into a chronic state, which may continue with intermissions for several years.

Other *sequelæ* of dysentery are—perforation of the intestine and fatal peritonitis; fæcal abscess; gradually increasing exhaustion from the destruction of the mucous membrane, and continued purging; constipation, arising from the contraction of cicatrices, leading to a very troublesome and irregular condition of the bowels, and sometimes to fatal obstruction; pyæmia and suppuration in the substance of the liver, from the absorption of pus, as described by Dr. Budd, in his work on 'Diseases of the Liver.' This last result I have only once observed at Guy's, in simple English dysentery, which is nearly in accordance with the experience of Dr. Baly, at the Millbank Penitentiary, and shows that whilst the disease may be the same in its general character and pathology with tropical dysentery, there is some modifying cause.

It must be borne in mind, however, that abscess in the liver may occur without dysentery, and that the abscesses which are generally found in pyæmia are different both in character and in position from those observed in connection

with tropical disease and with dysentery; in ordinary pyæmia the abscesses are small, peripheral and often numerous, in the hepatic abscess found with dysentery, the abscess is often larger and it may be single; so also in the abscesses following tropical hepatitis. Dr. Mayne, in a very interesting article in the Dublin 'Quarterly Review,' also mentions a state resembling phlegmatia dolens as the occasional sequence of dysentery, and speaks of spontaneous salivation as sometimes supervening after the disease.

Symptoms.—A sensation of coldness in the loins, chilliness, or actual rigor, is followed by a loose evacuation from the bowels; this alvine discharge is repeated, and the evacuations become scanty, and are often accompanied with tenesmus, or a forcing sensation as if the intestine retained its fæcal contents. With this, there may be slight pain or soreness in the iliac region or position of the transverse colon, and even severe griping; febrile disturbance supervenes, and the tongue has a whitish fur, or is injected at the tip and edges, but the latter symptoms are often absent. In mild cases the energies and mental activity are unimpaired, but the face becomes pallid, and the strength is not equal to accustomed duty.

This condition may continue for several days, the patient becoming more feeble, the motions watery, or they contain mucus and blood, and scybala are passed with pain. The countenance becomes haggard, and expressive of distress, the skin clammy, and the pulse compressible; the abdomen is collapsed, and tolerant of pressure; the pain is paroxysmal, and occasionally very severe, and vomiting sometimes supervenes.

If the disease continue unchecked, the strength fails, the pulse is rapid and compressible, and the eyes are sunken; the tongue is brown, or it is dry and cracked; the motions are passed involuntarily, and often are of a greenish colour, or they resemble the washing of meat; the lower extremities are cold, and the hands and face are covered with a clammy sweat; occasional cramps, with hiccough and subsultus tendinum, come on; the patient is sensible, but speaks in a feeble tone of voice, and at last dies, more suddenly, perhaps, than those around him had anticipated.

These symptoms may only extend over a very few days or hours, and sometimes are accompanied with much febrile disturbance, with tenderness of the abdomen, and with a furred and brown, or red, dry and glazed tongue. If the severity of the disease abate, the bowels become more composed, and the patient rallies; or the diseased condition returns with greater severity; for the first exhaustion is scarcely recovered from before the strength is still further reduced, and in this way the malady may extend over weeks, or months. The patient then has a peculiar and characteristic appearance; he is much emaciated; he has a sallow complexion; his mind is active, but physical strength fails gradually, till at last he is obliged entirely to take to his bed from a sense of utter prostration.

In the dysentery of the tropics, or the equally severe disease observed in the hardships of war and after famine, the prostration is more rapid, the disease more quickly fatal, and in some instances has been accompanied with violent delirium.

In reviewing the symptoms of inflammation of the colon in its severe forms, we have been struck with the occasional absence of febrile symptoms, as indicated by a hot skin, furred tongue, or excited pulse. The tongue, unless it be itself affected with local disease, indicates the condition of all the nutritive functions, rather than that of any isolated portions of the alimentary canal. The temperature in dysentery may remain about the normal standard or it may be considerably raised, especially in those instances which are connected with blood-poisoning.

If the peritoneum becomes inflamed, or if the extension of disease to the muscular coat produces irregular muscular contraction, pain often of a severe, griping, and of a paroxysmal character is the result. The amount of pain appears to be greater in disease of the small than of the large intestine, perhaps on account of its greater mobility.

The character of the evacuations deserves particular attention. They may consist of fluid fæces containing scybala, or only of mucus with blood. The mucus is often tenacious, and passed in considerable quantity, with much tenesmus, forming a gelatinous mass, and is occasionally accompanied with small scybalous masses. The discharge becomes in severe cases thinner, greenish in colour, and even like spinach; or from the admix-

ture of more blood it resembles the "washings of meat." The inflamed colon, by its spasmodic contraction, prevents the discharge of the more healthy contents, which are retained above the seat of disease; or they are passed very rapidly, in a fluid state, whilst the pouches of the colon are filled with consolidated masses, which when discharged form the scybala previously alluded to.

The cessation of the discharge of blood and of mucus, the absence of tenesmus, and the presence of bilious fæcal evacuations, are signs of returning health.

The violent and often most distressing tenesmus is caused by the involuntary action of the muscular fibres of the rectum, and by the abnormal sensibility of the lower bowel; for where the latter part is not affected the tenesmus is much less severe.

The sympathetic connection of the large intestine with the cerebro-spinal system and with other organs, although of an intimate kind, is less than that of the small intestine or of the stomach; the function of these parts is very different in relation to the vital processes. The large intestine is an elongated receptacle for waste material; it is excretive in its function, although closely connected with the condition of the blood, and affected by general causes; the small intestine, on the contrary, whilst in part excretive, is more especially connected with the absorption of nutritive substances, by its capillaries and its villi, and with the subsequent elaboration of chyle, by means of the mesenteric and other glandular structures. Hence we find *less* disturbance of the pulse, and of the circulation generally, less acute changes in the cerebral functions, and less modification of the appetite, &c., in disease of the large than of the small intestine. The urino-genital organs, however, sometimes sympathise in attacks of dysentery, and we find the patient suffering from difficulty in micturition.

Cerebral symptoms have been described by many observers as being present in the worst forms of dysentery, as stupor, delirium, and typhoid symptoms closely resembling fever; but these symptoms were not present in the cases that have come under my notice, unless associated with pneumonia; but it must not be forgotten that true enteric or other fevers may be combined with dysentery.

Severe symptoms, indicative of great functional excitement of the nervous system, were observed in the Millbank Penitentiary, such as cramps, catalepsy, tetanus, &c. The peculiar condition of the patients, depressed in mind, deprived of their wonted excitement, and of the influence of their usual habits and associations, a spare diet, &c., were probably, as Dr. Baly* states, the causes of the latter symptoms. In some the cramps were as severe as in Asiatic cholera.

Intermittent and remittent fevers are sometimes associated with dysentery, and increase the severity of the disease. Dr. Morehead, however, has rarely observed them.†

Causes.—Exposure to noxious and miasmatic effluvia appears to be the most fertile source of the disease, especially when associated with sudden changes in the temperature. If with the predisposing cause of offensive effluvia there be associated exposure to cold and wet, especially during the hours of night, if the common attendants of poverty be present, as sleeping in damp rooms, clothing inadequate to counteract the inclemency of the weather, diet improper and scarcely sufficient to sustain life, intemperance, anxious and depressing cares, we have ample exciting causes of dysentery; and many of those who are thus attacked are also enfeebled by other diseases, as by struma, or phthisis.

The effluvia from drains and from decomposing organic substances are common causes of dysentery, and are sufficient alone to produce the disease.

Dysentery often prevails after scarcity of food, and terrible manifestations of this fact have occurred in Ireland. The observations there made by some of its most accomplished physicians, and the valuable reports they have furnished, give some of the most faithful descriptions which we possess of dysentery in its worst forms. I refer to the labours of Drs. Mayne, Malcolm, Lalor, Harty and Young, &c.

In the active life of a soldier, especially in the tropics and in marshy districts, these causes operate in all their intensity; and the disease thus manifested is more fatal than the field of battle itself. Such has been the testimony of nearly all the writers on military surgery and medicine.

* Baly on 'Dysentery.' 'Gulstonian Lectures.'

† Morehead on 'Diseases of India.'

Inflammation of the colon is, however, set up without any miasmatic influence; thus, from poisons, inflammation of the stomach and the colon may be produced without the intervening small intestine being affected; so also from irritating ingesta and excretions which appear in some instances to be the sole cause of the complaint. Cold drinks in excess during summer heat also tend to produce dysentery.

Many believe in the contagious character of the disease. They have found it to extend from one patient to another, to attendants, or from house to house, &c.; but it must be remembered, 1st, that in many of these cases there is a general pervading atmospheric influence, miasmatic or otherwise; 2nd, that the effluvia from the dysenteric discharges are exceedingly offensive; 3rd, that animal effiuvia are of themselves sufficient to induce the complaint; 4th, that the effect of night-watching, and of witnessing the rapidly fatal termination of the disease, is to depress the healthy tone, and weaken the power of resisting the complaint.

The occasional similarity of dysentery to enteric fever, or the occurrence of the two diseases at the same time and in the same patient, do not warrant us in considering the one as of the same character or type of disease as the other, namely, a blood disease associated with special changes in the glands of the intestine. There are few diseases that have not more or less of a constitutional origin, and dysentery is doubtless of that character; but while in some there is evidence of a poison contaminating the blood, and leading to a special train of symptoms, as in smallpox, or in pyæmia, there does not appear to be any warrant for supposing that such is the case in dysentery, more than in ulcerative stomatitis. Some cases of dysentery, as of pneumonia, doubtless arise from a diseased condition of blood, whilst others are of a local character; thus, pneumonia may be produced by direct exposure to cold; or, the blood may be in such a condition from pyæmia and other septic changes, that it is induced without any other exciting cause; in like manner some of the cases of dysentery here recorded appeared to be produced by irritation extending from the rectum; others from direct irritation caused by improper food; while a third class arises from a morbid condition of the whole circulating fluid.

As far as our observations extend, we are disposed to agree with the statements of Dr. Harty, in the 'Dublin Quarterly Review'—1st, that genuine and simple dysentery is unattended with idiopathic fever, and is never of itself contagious; 2nd, that every form of the disease when epidemic is a combination of the simple dysentery either with intermittent, remittent, or continued fever; and 3rd, that the form of dysentery which is combined with fever is alone contagious.

The *Prognosis* of dysentery is unfavorable when purging of blood, and thin serous offensive discharge like the washings of meat continue; when there is involuntary discharge from the bowels, with great tenderness of the abdomen, vomiting, red and glazed tongue, typhoid symptoms, irregular pulse, refusal of food, restlessness, and great prostration of strength, or when these symptoms have continued for a considerable time, and one relapse has followed another, without the patient in the interval regaining strength, but retaining the same sallow and haggard expression; when, also, there are cerebral symptoms, as coma, delirium, convulsions, we judge unfavorably. On the contrary, when, on the removal of the causes of the disease, the evacuations assume a healthy appearance, and contain bile, when the pulse remains firm, and the prostration becomes less, when the tenesmus ceases, and the patient gains strength, we may give a cheering prognosis.

Diagnosis.—There are several conditions which may, unless due care be used, be mistaken for dysentery.

1. The *discharge of blood from hæmorrhoids*, accompanied with diarrhœa and prostration. Ordinary care alone is necessary to guard against this error.

2. *Disease of the rectum.*—The lower part of the rectum sometimes becomes ulcerated, and leads to a discharge of mucus and blood with tenesmus, and with great anxiety and sympathetic nervous disturbance to the patient. It will be found in many of these cases, that a small quantity of mucus or pus escapes from the rectum at irregular intervals. In organic constriction of the rectum, whether cancerous or otherwise, the bowels are sometimes in a loose condition.

3. *Polypus in the rectum* will produce like symptoms. Many of these growths can be detected by examination per

rectum; others, however, are beyond the reach of the finger, and we can then only decide by the clinical history of the case. In these instances healthy fæces are passed, but coated or followed by mucus or pus, and the constitutional disturbance is less severe.

4. *Fibro-cellular ulceration.*—By this we mean a condition of rectum which is not cancerous, but in which the mucous membrane is ulcerated and the coats of the intestine are converted into dense fibrous tissue, and often syphilitic in its origin.

5. Some of the forms of *diarrhœa* resemble the earlier symptoms of dysentery, but they are generally distinguished by the absence of blood with mucus. In some cases, however, where there is disease of the mesenteric glands, with persistent diarrhœa, and prostration of strength, we are apt to believe that ulceration of the colon exists; the stools, however are different; there is less of mucus, and no blood can be detected in the evacuation even by microscopical examination.

6. A feeble condition of the *sphincter ani,* and of the muscular coat of the intestine, leading to the involuntary discharge of fluid fæces, might induce a belief in an abnormal condition of the mucous membrane of the colon.

7. A mass of hard fæces in the rectum which the patient is unable to expel produces incessant straining, and is accompanied with the almost constant discharge of mucus or fluid fæces. This painful condition is often mistaken for dysentery.

Treatment.—Amongst the most important points for consideration in the treatment of dysentery are the removal of all exciting causes, and of the general conditions in which the disease has had its origin. The patient should be clothed in flannel, and the temperature of the body maintained, dampness and cold carefully warded off, improper diet avoided, and, if possible, good and pure air inhaled.

Demulcents administered by the mouth have a long distance to traverse before reaching the large intestine, but they nevertheless act very beneficially by rendering the excreta poured into the colon less irritating, and by thus soothing the diseased membrane. In this way arrowroot, linseed tea,

mutton and veal broth, milk with suet, rice milk, tapioca, &c., may be both grateful to the patient, and act remedially, but, fluid drinks should not be taken in great excess; water alone has been used, although it is inferior to demulcent drinks. By these simple means many attacks may be relieved, and the patients speedily recover.

The diet calls for much attention, equally in the early stages and milder forms, as at a later period or in cases of a more severe character; but in the former it is often more difficult to persuade the patient to follow our directions; being free from pain, the tongue clean, the appetite craving, he does not at once see the importance of using proper care. Any imprudence perpetuates and aggravates the disease. Malt liquors and spirits should be abstained from. Meat in a solid form is generally better avoided in the acute disease, but when taken it should be in an easily assimilable form, and neither richly dressed nor highly seasoned.

In protracted cases of dysentery, it is necessary to take animal food, and it is very desirable in other ways to sustain the strength of the patient as far as possible. For a short time, at least, it is well to omit vegetables and fruit, especially when uncooked; but oranges, grapes, &c., by supplying to the system that which is necessary for the maintenance of sound action, without much indigestible product, may sometimes be taken with great benefit in chronic dysentery, although apples, and stone fruit, melons, salads, &c., do harm.

Rest is important, and in very many cases the patient is too ill to leave the recumbent posture; in the chronic disease also, fatiguing muscular exertion and horse exercise must be avoided. It is useless to attempt to treat a case of dysentery if the patient be allowed to walk about, or to assume the erect position, for he ought to be perfectly quiet and in bed.

Other remedies in most frequent use, have been opium, astringents, both metallic and vegetable, ipecacuanha, mercurials, depletion, enemata of various kinds, &c.

Opium is of almost universal application, but it cannot be given *indiscriminately*, either alone or in combination; it acts partly by its astringent properties, and partly as a narcotic,

by its secondary influence upon the inflamed mucous membrane, through the sympathetic system of nerves. It is often administered alone, but more frequently in combination with ipecacuanha, as in Dover's powder; or with astringents, as in the compound infusion of krameria, or compound logwood mixture of Guy's; or in combination with mercurials, as calomel and grey powder; and lastly, in enemata. When the excreta are depraved, and cause irritation of the intestine by their presence, no beneficial result is attained by seeking to check their removal by astringents.

Mercurials.—Calomel has been very largely and notoriously administered in dysentery. In India ℈j doses are described by Annesley as productive of essential benefit; others have now given up its use altogether, in the severe dysenteries of the East. Its administration, in more moderate doses, is often advantageous. In the earliest stages, where the motions are of an unhealthy character, pale, or containing hard and scybalous masses, it may be well to give a dose of calomel, or of grey powder, followed by castor oil, guarded by opium; or the opium may be combined with the mercurial, as calomel with opium, or grey powder with Dover's powder; in this way offending substances may be removed, and acrid excretions rectified and corrected; but it is, we believe, unwise and uncalled-for, to persist in the use of mercurials. We have no facts to show that the inflammation of the mucous membrane is diminished by its action, but rather that it is increased, and ulceration accelerated, although the abdominal glands may be stimulated to a more healthy action.

Purgatives.—Almost the same may be said of these remedies, as of mercury. In the earlier stages of dysentery and dysenteric diarrhœa, when oftentimes, irritating and crude materials are retained, and equally irritating secretions are poured out, purgatives are of great value; castor oil and linseed oil, with tincture of rhubarb, and with small doses of tincture of opium, are old and valuable remedies for this purpose. They may be repeated several times during the day, with manifest improvement of the alvine evacuations, and relief to the tenesmus and the pain. This administration of a laxative draught, followed by a full dose of Dover's powder, or chalk with opium is the best treatment for ordinary

dysentery at its onset. Violent purgatives are, however, neither beneficial nor warrantable.

Ipecacuanha was introduced iuto Europe as a remedy for dysentery, nearly 170 years ago, and has been used with success since that time; large doses have been given without producing vomiting, as by Sir J. Pringle, in gr. v, to ℈j, and by Mr. Twining, with extract of gentian; but much smaller doses are equally effective. Ipecacuanha appears to have the same beneficial action in inflammation of the alimentary as of the respiratory mucous membrane, in relieving the congestion, and in restoring healthy secretion. It is one of the most valuable remedies in acute dysentery, and much larger doses can be tolerated by the stomach if given soon after nourishment. It has been given in various combinations, frequently with opium, and with vegetable astringents, as kino, krameria, logwood, catechu, &c.

Astringents are of greater value in chronic than in acute dysentery; sulphate of copper, acetate of lead, oxide and nitrate of silver, nitrate of bismuth, sulphate and pernitrate of iron, have all been used; several of these act by their direct astringent property, others become absorbed and are sedatives to the mucous membrane; some of these remedies have been used in combination with opium, as copper and lead; others with considerable success as injections, and in that way applied directly to the diseased surface; thus nitrate of silver has been used as an enema by Trousseau, in the proportion of gr. x to xv to a pint of distilled water; so also borax in about ℈j doses; in some cases I have used charcoal, ʒij, with Oss of thin gruel, with evident relief.

Vegetable astringents are valuable remedies in the chronic disease, and even in the acute stage after the removal of irritating excreta and scybala, as krameria, kino, logwood, and catechu, tormentilla, and simaruba; they are of especial service when given in combination, as ipecacuanha with catechu and krameria (Infusum Krameriæ Compositum. Ph. Guy's). Cusparia is a more stimulating astringent and tonic, and is often of great benefit after the more active symptoms have subsided. Tannin and gallic acid have been used, and may be given advantageously in doses of ♏xx—xxx of the solution in glycerine, with ♏x—xx of spirit of chloroform and water. The

rind of the pomegranate root is a favorite remedy with some, but it is a less effective astringent than others just mentioned. I have tried the Indian Bael in many instances of chronic dysentery, but I have not seen it followed by the benefits which were anticipated from the high encomiums given to it by practitioners in India. The solution of potash, as well as the bicarbonate of potash, and the corresponding preparations of soda, diminish intestinal irritation in the acute disease; they are best given, however, in combination with opium, or henbane and astringents.

Earthy astringents.—Chalk, alone or combined with opium and astringents, is one of the ordinary remedies at the outset of dysenteric diarrhœa, and is frequently sufficient to check the purging; but in many cases no form of astringent or sedative will serve to restrain this symptom, whilst irritating excreta and other substances are retained; and in others, so great is the extent of the disease, that it is futile to attempt to check it by a grain or two of medicine which acts locally, whilst the disease extends over many feet of intestine. By demulcents, by removing the cause of the disease, by rest, by correcting the general disturbance, and by sustaining the patient during the degenerative changes which are in operation, we must seek to shorten the morbid process and to restore health.

Mineral acids.—After the urgency of the symptoms have subsided, mineral acids, both sulphuric and nitric, appear to act beneficially on the mucous membrane in restoring healthy vigour. I have not found the benefit from dilute sulphuric acid that some practitioners have observed; still it is a remedy of value, and well deserves a trial; and in chronic dysentery the nitric and nitro-hydrochloric acids are often of service when combined with opium, and with the milder vegetable astringents. *Quinine.*—The combination of quinine with Dover's powder, or with mineral acids and astringents, is productive of considerable relief in those cases of chronic dysentery which have been perpetuated and aggravated by residence in miasmatic districts.

Warm enemata often afford very great relief by washing out the lower part of the rectum, and by soothing the inflamed membrane; in this way gruel, thin starch, and barley water

may be used with much relief; but their efficiency is increased by the addition of tincture of opium. Borax and nitrate of silver are used, as we have before mentioned, and sometimes charcoal; these agents and vegetable astringents, as oak bark, have been more especially tried in chronic dysentery.

Suppositories, composed of opiates or anodynes, or bismuth afford much relief to the tenesmus, but are less effective than enemata. In the constipation which follows the cicatrization of dysenteric ulcers, much relief is afforded by the use of sedatives with aperient medicine, as by the colocynth and henbane with ipecacuanha, and by belladonna with rhubarb and capsicum.

A change to more genial climate is often productive of the most beneficial result; this applies especially to residents in India, and to those who have contracted dysentery in our own country in damp and miasmatic districts.

The following 39 fatal cases of dysentery were, with one or two exceptions, produced in our own country, and will illustrate the causes of death in this disease: they indicate,

I. That dysentery of a most severe form arises in our own country, and is not of unfrequent occurrence.

II. That the cause of death in some is the extent and severity of the affection.

III. That others die from perforation and fæcal abscess.

IV. That suppuration in some of the branches of the portal vein and hepatic abscess follow some of the worst forms of English dysentery.

V. That the constriction of the intestine sometimes leads to abscess in the parietes and to artificial anus.

VI. That in the worst cases astringents and opiates are ineffective.

VII. That injections and demulcent remedies afford considerable relief, and in mild cases will alone be sufficient; but are inferior in their efficacy to astringents and opium.

VIII. That rest even in mild cases is desirable.

Many cases have presented themselves, in my own practice and spheres of observation, where these means checked the purging, and restored health.

IX. That as far as can be judged, mercurial preparations, if continued, would have been injurious.

Dysentery.

Sex.	Age.	Illness.	Symptoms of dysentery.	Post-mortem appearances.
M.	34	Dysentery contracted abroad	Not stated	Ulceration of colon and ileum.
M.	39	... ...	... ...	Inflammation of colon. Perforation, abscess.
M.	9	Pyæmia after amputation	... ...	Cæcum and ascending colon much inflamed.
M.	25	Knee-joint	Severe diarrhœa	Sloughing large intestines. Perforation.
F.	27	Phthisis	... ...	Old cicatrised ulceration of the whole of the colon.
M.	37	Cirrhosis	... ...	Dysentery. Ileitis. Peritonitis.
M.	6½	No history	... ...	Much ulceration of colon and ileum.
F.	21	Typhoid symptoms	... ...	Extensive sloughing of colon.
F.	44	Disease of the rectum	Had passed pus in the stools	Ulcerative colitis.
M.	40	Old stricture of rectum	None	Colon thickened with old ulceration.
M.	38	Dysentery	Mucus and blood passed for a year	General colitis. Some ulcers healed.
F.	45	„	Obstinate diarrhœa	Irregular serpiginous ulcers from mid-colon downwards.
M.	21	Cirrhosis. Amyloid disease	Dysentery some years; contracted abroad	Extensive ulceration throughout the colon.
F.	30	Hepatic abscess	Uncontrollable diarrhœa	Excessive ulceration of colon.
M.	25	Psoas abscess	... ...	Old healed ulceration of transverse colon. Duodeno-colic fistula.
M.	36	Cancer of stomach and liver	... ...	Acute colitis.
M.	52	Hepatic abscess	... ...	Colitis. Perforation. Portal pyæmia.
F.	34	... ...	... ...	„ „ of colon.
F.	56	Sloughing of leg	Diarrhœa a few days	Large intestine full of ulcers.
M.	?	Cystitis	„ a fortnight	Whole of large intestine ulcerated. Local peritonitis.
M.	30	Old knee-joint	Much diarrhœa	Ulceration of solitary glands. Perforation.
F.	42	Dysentery	Diarrhœa	„ of rectum, colon, and vagina.
M.	58	Aortic and renal disease	Not stated	Diphtheritic colitis.
F.	17	Diphtheria	Diarrhœa nine hours	„ „
M.	31	Intemperance—Indian climate	Not stated	Disease of whole of large intestine thoroughly healed, and hepatic abscess cured.

Sex.	Age.	Illness.	Symptoms of dysentery.	Post-mortem appearances.
F.	7	Chorea	Blood passed in the stools	Diphtheritic colitis.
F.	28	Diphtheria	Vomiting and discharge of blood per anum	„ „
M.	40	Renal disease	Had been in India	Chronic healing ulcers of colon.
M.	32	? Cerebral	Dysenteric diarrhœa	Ulceration of whole of colon.
F.	60	Strangulated hernia	... ...	Diphtheritic colitis and enteritis after the administration of purgatives.
M.	44	?	Diarrhœa and vomiting	Diphtheritic colitis.
M.	20	Admitted for enteric fever	„	Acute colitis.
M.	50	Aortic disease	Hæmorrhage from bowel	Extensive ulceration of colon.
M.	35	Phagedænic ulcer of neck	Diarrhœa eighteen months	Colon ulcerated throughout.
M.	40	Dysentery	Diarrhea, had been abroad	Acute diphtheritic colitis.
M.	25	Pyæmia	... ...	Chronic colitis. Hepatic abscess. Cerebral abscess.
M.	32	Empyema	... ...	Dysentery. Abscess of liver perforating the diaphragm.
M.	33	Stricture of rectum	... ...	The stricture due to old dysentery.
M.	35	„ „	... ...	Contraction of bowel from old dysentery. Abscess near crest of ileum.

Of the preceding cases we have

Males, 27

Females, 12

—

Total, 39

Perforation occurred four times;

Hepatic abscess occurred five times; one of these being a remarkable case of hepatic abscess cured.

CASE CXXVII.—*Inflammation of Colon. Diphtheria of the Pharynx.* —Harriet S—, æt. 28, was admitted July 18th, 1855, under my care.

She was a pale, thin woman, who had resided in the Borough, the wife of a butcher, and she had been out of health for six months, with occasional diarrhœa; but during seven weeks she had become much worse. Her illness came on after exposure to cold on entering a new house; she had great lassitude, weariness, and severe pain in the limbs. These symptoms increased, and she was admitted into St. Thomas's Hospital, and whilst there she passed blood and mucus from the bowels. She stated that her family were healthy, but that she had previously had an attack of inflammation of the bowels. On admission she had the appearance of a patient suffering from acute pneumonic phthisis; the lips and nostrils were thin; the cheeks were sunken; the skin was hot and clammy; the conjunctiva and skin generally were of a very slight jaundiced colour. Along the gums was a pale red line; the tongue was coated with a yellow fur, dry and brown, and at its centre there were several aphthous patches; the throat was dry and injected; she complained of difficulty in swallowing, and it was painful to her to speak much. The pulse was 112, soft and full. In the abdomen a large mass of the form of the liver could be felt, extending nearly to the crest of the ileum, and across the umbilical region. The abdomen was flaccid, but slightly tender on manipulating the right hypochondriac region. The motions were passed involuntarily, and were slimy and of a green colour; three or four were passed in an hour. She was treated with astringents and opium, but gradually became more prostrate, and died on the 23rd.

On inspection, the pharynx, the posterior part of the tongue, the tonsils, and the anterior part of the epiglottis, were covered with a yellowish-white crust; this was very adherent to the lateral portions of the root of the tongue; and on the glossal surface of the epiglottis this membrane was so fixed that it could not be washed off by water. The surface of the epiglottis beneath it was much injected, but only towards the tongue. On examining a portion of this substance it was found to consist of delicate interlacing torulæ, some jointed, and much resembling the torula cerevisiæ; it was mixed with particles of fat. The larynx, internal surface of the epiglottis, trachea and bronchi were all free from disease. The lungs were healthy, so also the pleura. The muguet did not extend to the œsophagus, excepting at its upper part. The heart and pericardium were healthy.

Abdomen.—There were old adhesions of the omentum. The stomach was healthy, and on microscopical inspection its follicles were full of secreting cells and granules, with a small quantity of highly refracting particles. The liver extended to the right iliac region; it was exceedingly fatty, of pale yellow colour, and *lighter* than water. The gall-bladder was contracted and empty; the weight of the liver 8lb. 6 oz. *Spleen*, corpuscles distinct, its weight 6½oz.

The peritoneum was healthy; there was a moderate amount of fat in the mesentery, and the glands near the cæcum were enlarged and some-

what swollen. The intestines were moderately distended. On opening the colon it was found to contain fluid fæces; the whole mucous membrane was covered by an adherent whitish layer, having a granular, almost villous appearance; it was of a yellowish-red colour, which was more marked towards the rectum; the mucous membrane was swollen, and in some parts presented small aphthous ulcers about a quarter of an inch in diameter. The submucous cellular tissue was white and thickened; the muscular coat also appeared very thick and distinct. The false membrane consisted of a blastema containing granules, highly refracting particles, and some cells, but no well-marked cells nor epithelium. The last foot of the ileum was much injected, and presented several irregular ulcers, but no membrane similar to that in the cæcum and colon.

The kidneys were pale and large, their weight 11oz. The uriniferous tubes contained granules and oil particles.

This case of acute inflammation of the colon came on gradually. For six months the patient had attacks of diarrhœa, but for seven weeks the symptoms were severe, and of the character of dysentery; the motions contained blood and mucus, and became afterwards green and slimy. On admission into Guy's Hospital she was in a typhoid condition, and almost dying. Her general appearance resembled a case of pneumonic phthisis with dysentery, but there were no physical signs of phthisis. The astringents which were administered afforded only very temporary relief, and opium quickly produced torpor of the brain.

Case CXXVIII.—*Diphtherite of the Colon. Dysentery. Chorea.*—Elizabeth H—, æt. 7 years, was admitted into Guy's, February, 1855. She was a dark, strumous child, who five weeks previously, without apparent cause, became affected with chorea; she improved under the use of sulphate of zinc gradually increased, and purgatives had been required, for the bowels were generally constipated. A few days before death diarrhœa came on with prostration, and with symptoms very much resembling Asiatic cholera; the motions consisted at first of blood and mucus, but afterwards of thin and watery fluid. On the seventh day after the onset of the purging the child died.

Inspection.—The eyes were much sunken. The cerebral veins were full of partially decolorized clot, and the ventricles of the brain contained more than the normal quantity of fluid. The lungs appeared healthy, except a circumscribed patch at the middle of the left lung, where was a strumous mass about the size of a hazel nut, and some tubercles around it. The inner aspect of the mitral valve was fringed with minute vegetations, firm, semi-transparent and surrounding the edge of the valve; the largest of them was of the size of a pin's head.

The inner surface of the tricuspid was slightly roughened. The pericardium was healthy. The weight of the heart was 3½ oz.

The stomach was healthy. In the jejunum a few of Peyer's patches were visible and were injected; in the ileum they were very distinct, and near the cæcum were covered with a delicate inflammatory deposit of lymph. The large intestine was diseased throughout. The whole of the mucous membrane was of a dark-green colour, covered with a firm granular deposit of lymph. The disease increased in severity from the cæcum downwards. The cæcum was acutely inflamed, being of a red colour, and the mucous membrane was entire. Lower down the mucous membrane became green, and was covered with inflammatory deposit; and in the rectum the inner surface was raised into folds or irregularly shaped eminences. In the descending colon, when the adventitious product was removed, the tissue was seen to be swollen, full of blood, and in some parts superficially ulcerated. The muscular coat was much thickened. The kidneys were healthy.

This case was supposed to be one of Asiatic cholera, and, unless a careful inspection had been made, it might have been so recorded. The suddenness of the diarrhœa, the rapid collapse and prostration, closely resembled that disease. Other cases of cholera had occurred about the time. The treatment used—starch and opium injections, &c., did not appear to have any effect upon the malady.

Case CXXIX.—*Inflammation of the Colon. Hernia.*—Ann H, æt. 60 was a single woman, a servant, who had resided at Peckham, and she was admitted into Guy's Hospital February 6th, 1857. For ten years she had had hernia, but her general health was good. Five days before admission the hernia came down, she was seen by a practitioner, and after taking croton oil, various purgatives, shot, &c., was admitted into Guy's. She was much depressed and collapsed; the symptoms were constipation, stercoraceous vomiting, great pain in the abdomen, and some tenderness. A tolerably large femoral hernia was found in the right inguinal region. A grain of opium was given at once, and the hernia was reduced by taxis without difficulty. On the following day, the 7th, the bowels were opened, and the patient felt better. A grain of calomel and one of opium were administered, and repeated every four hours; and she was allowed beef tea. The diarrhœa continued notwithstanding the use of various remedies, and she died from exhaustion on the nineteenth day after the commencement of the illness. For some time before death there was low muttering delirium, cold extremities, and an almost imperceptible pulse.

Inspection was made a few hours after death. The body was much wasted, and the eyes were sunken. The lungs and pleura were quite healthy, and the lungs were collapsed; the heart was small.

Abdomen.—The peritoneum was healthy; the œsophagus was normal, so also was the stomach; the jejunum was congested, the valvulæ conni-

ventes were covered with mucus. Eight feet from the cæcum a portion of the ileum about four inches long was of a deep purple colour, and had evidently been strangulated; it appeared to be recovering. Below the strangulation the ileum became much more congested, and for four feet from the cæcum the intestine was acutely inflamed; the mucous membrane was covered by a yellowish-green adherent exudation, nearly a line in thickness, which was with difficulty removed. The valvulæ conniventes were exceedingly prominent, rigid, and erect. The whole of the mucous membrane was much thickened, the muscular coat more than a line in thickness, and the areolar tissue very œdematous.

On making a section of this portion of intestine (see Plate III, fig. 1), the exudation was found to consist of cells and granules, and appeared to be quite continuous with the follicles of the mucous membrane (Leiberkühn's); these follicles were exceedingly distinct, and were evidently distended to the utmost. It appeared that the secretion from these follicles was changed by the diseased action, that it was excessive in quantity, and abnormal in quality; the form of the follicles was retained by the exudation on the surface, as if it had been exuded rapidly. The submucous cellular tissue was much thickened from inflammatory œdema.

The colon from the cæcum to the rectum was still more diseased; in the cæcum the mucous membrane had a reddish-grey colour, with minute highly injected points studding the surface; some of these points presented a darker coloured centre, others were scarlet. In the place of others were minute ulcers; the mucous membrane being eroded; the edges of the ulcers were injected; their surface whitish-grey, but there was no apparent slough. In the ascending colon more of the mucous membrane was destroyed, and elongated ulcers were found, about half an inch in length, with irregular, injected or partially undermined margins, their base consisting of whitish lymph-like exudation; between these ulcers there were minute red points or red mucous membrane covered with exudation. The whole of the colon presented a similar appearance, even to the rectum. The appendix cæci was long, and at its extremity were about a half a dozen small shot.

The examination of the mucous membrane of the cæcum showed that the minute red points were solitary glands (see Plate III, fig. 2, which represents one of these red glands, having a deeply coloured centre). The portion above the level of the mucous membrane showed distended capillaries, and there was in the centre an opening extending into the gland. In the gland were minute nuclei, and a large nucleated cell was observed. It appeared probable, from the darker colour of the congested part, that the circulation in these capillaries had nearly ceased, and that in a short time sloughing would have taken place. The adjoining mucous membrane presented an appearance somewhat similar to that found in the ileum, but the follicles were less distinct. Some crystals were observed on the surface.

The liver was healthy, so also the spleen, kidneys, bladder, uterus,

ovaries, and the mesenteric glands; in fact no disease was found except in the intestines. The hernial sac was empty, and its opening nearly closed.

In this case there was acute inflammation of the whole of the colon, and of several feet of the ileum; the changes were of a degenerative kind, and rapid in their action. Was the disease dysentery, or inflammation of a different kind? In the cæcum and colon we found that the solitary glands were diseased, and that destruction of the membrane had ensued; but these glands were not the only parts affected, the follicles and all the structures were diseased, as we found with the follicles in the ileum; the mucous membrane and the muscular coat were œdematous. Very drastic purgatives and violent means had been used at the onset of the disease, and these probably contributed to the severity of the affection. The bowels began to act very shortly after the hernia had been reduced, and did not cease to act till death. As to the symptoms, they were those of dysentery; the stools consisted of blood and mucus, the prostration became gradually extreme, the pain was sometimes severe, but the patient did not suffer from the tenderness of peritonitis. The disease was probably, to a great extent, constitutional in its character, but it was excited by direct irritation.

Case CXXX.—*Dysentery. Ulceration of the Small Intestines. Perforation. Fæcal Abscess. Peritonitis.*—Edward B—, æt 39, was admitted October 19th, 1853, and died November 8th. He had been a stout, hearty man, living at Walworth, and a labourer in the London Docks. His health had been unimpaired, and his habits of life regular. Six weeks before admission, he ate a considerable quantity of coarse sugar, and three days afterwards he had diarrhœa, with copious liquid evacuations, and severe colic. This state continued till admission; he had become thin and weak, having been unable to take any food since the commencement of his illness. On admission, the bowels acted every half hour. The evacuations were of a dark-brown colour, and no blood was passed. There was tenderness over the cæcum and descending colon; he had no appetite, the mouth was dry and parched, and he had considerable thirst; he had nausea, but did not vomit. The countenance was dejected, and the body emaciated and feeble.

The heart and lungs appeared to be healthy. The tongue became very red and injected. Great prostration came on, and sordes formed on the teeth, the purging continuing unabated. Kino, cusparia, opium, gallic and sulphuric acids, &c., were administered, with only slight relief.

Inspection eighteen hours after death. *Chest.*—With the exception of calcareous induration at the right apex, the thoracic viscera were healthy. The abdomen was collapsed. The intestines were contracted, but there was universal moderate injection of the peritoneum, and the coils of the intestine were united by fibrinous adhesions. On separating the abdominal parietes from the sigmoid flexure, a part of the intestine was found to be perforated, and all its coats destroyed for a considerable part of its circumference; a small fæcal abscess had been formed. At the cæcum also and rectum, extravasation of fæces was only prevented by external adhesions. The large intestine was ulcerated in its whole length; at the cæcum were several transverse patches of ulceration; immediately above the cæcum the mucus and muscular coats were much thickened, apparently from older disease; beyond this the mucous membrane presented a large slough, and nearly all the mucous membrane was destroyed. Here and there were granular masses like tubercles, or larger portions which had become intensely congested, and were raised above the ulcerated surface, giving it a polypoid appearance. The sigmoid flexure and rectum were equally ulcerated; in some parts the mucous membrane only was destroyed, in others nearly all the coats. In the small intestine, about 8 inches from the cæcum, the lining membrane was intensely congested, and Peyer's glands presented several small aphthous ulcers. The columnar epithelium was scanty, but numerous cells like mucus were observed. The mesenteric glands were enlarged. In the stomach were several points of arborescent injection. The spleen was healthy; the liver fatty, and its weight was 4 lbs.; the gall-bladder was moderately distended.

The destruction of the mucous membrane of the colon in this case was very great, both as to extent and depth; fæcal abscess had been formed subsequent to the perforation. The disease lasted nearly nine weeks, and the remedies did not at all check the symptoms. It is probable that on admission (for the disease had then continued for six weeks) considerable sloughing of the colon existed.

There was no evidence of any miasmatic influence nor noxious effluvia, but the diarrhœa and subsequent dysentery were produced by the foolish excess of the patient.

Case CXXXI.—*Ulceration of the Large Intestine. Perforation. Submucous suppuration. Pus in the Portal Vein, and Inflammatory Patches in the Liver.*—James T—, æt. 59, was admitted into Guy's October 12th, 1853, and died on the following day. He was a labourer in the London Docks, and had had "bowel complaint" for two months; the symptoms had gradually become worse, and a week before his death he was confined to his bed; he had repeated purging of blood, and became much emaciated.

On admission the abdomen was tumid and tympanitic, but tolerant of pressure; the skin was of a dingy colour, and the tongue was red, glazed, and dry; he was in a prostrate condition, and died the following morning.

Inspection fifty-seven hours after death.—The body was spare. *Chest.*—The pleura at the left apex presented a little cartilaginous thickening. There was a white patch over the ventricles of the heart, the right side was distended with clot, the left was empty; the mitral valve was thickened and slightly contracted.

The peritoneum was universally inflamed, injected and covered with effused lymph. The cavity contained dirty fluid, green in colour, and of an offensive feculent odour. On turning aside the large intestine, an opening was found above the cæcum. The whole length of the large intestine was ulcerated. These ulcers were transverse, and were generally about two inches in length. The mucous membrane was ragged, and covered with a black slough; the circumference of these ulcers was thickened. In some parts the mucous membrane was quite destroyed, and the intervening portions of mucous membrane were œdematous. The peritoneal surface of the large intestine was observed to be here and there of a yellow colour; on making a section at these parts, the subserous coat was found to be infiltrated with pus extending from the submucous coat. These abscesses were situated on the mesenteric side of the intestine. The mucous and muscular coats of the rectum were much thickened, and at the lower part of the descending colon was a puckered portion of intestine, ecchymosed and injected.

The small intestines were healthy. The stomach presented partial injection. The spleen and kidneys were healthy. The liver showed a thickened layer of peritoneum at its lower border (attrition). On the convex surface of the right lobe was an irregular congested portion about one inch in diameter, and at its centre was a branch of the portal vein filled with pus. Glisson's capsule was thickened; no apparent disease of the trunk of the portal vein nor of the inferior mesenteric vein existed; the liver generally was fatty; weight 3 lbs. 10 oz.

This was one of the most severe cases of inflammation of the intestine that I have seen; large ragged abscesses extended throughout the colon, and had led to perforation and to peritonitis. The commencing suppuration in the liver, and the pus in the portal vein, were confirmatory of the views first propounded by Dr. Budd, and now generally admitted, as to one of the causes of abscess of the liver. When admitted into Guy's the patient was in a dying condition, but the disease had existed for two months.

CASE XXXII.—*Dysentery. Perforation of Colon.*—Sarah W—, æt. 34, was admitted into Guy's Hospital April, 1874, after having been ill

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for three months, and severely so for three weeks. She had resided at Huntingdon, then at Lambeth, and was the wife of a fishmonger. Three months previously she had had pitchy evacuations, evidently containing blood; but she had been free from pain. Three weeks before admission she had profuse purging; the evacuations contained blood, and scarcely any solid fæces; she suffered much tenesmus and general pain in the abdomen; the pain was occasionally aggravated, but was especially situated in the right iliac fossa. Scybala were occasionally passed. There was febrile excitement, and before death vomiting came on.

She took opium alone, then lead, ipecacuanha, and copper; mercurial inunction was used; leeches and blisters, &c., were applied to the abdomen. Wine and suet and milk were administered.

Inspection.—The body was well nourished, and there was a considerable amount of fat in the abdominal parietes. On opening the peritoneum, it was found to be exceedingly dry; the transverse colon was adherent to neighbouring viscera by soft adhesions; the omentum extended to the pelvis, and on raising it soft adhesions were found between it and the intestine, which were also much injected at their points of contact with each other. In the left iliac region, on drawing aside the sigmoid flexure, soft adhesions gave way, and a small circular perforation was found; no extravasation had taken place. In the right iliac fossa, the cæcum was more firmly adherent; and close to the union of the vermiform appendix a long defined opening was observed, but closed by adhesions.

There were also several perforations in the ascending and transverse colon similarly closed; in other parts the peritoneum only was left. Perforations had also taken place in the rectum, but no extravasation had followed from any part. The vermiform appendix was healthy. The cæcum and ascending colon were distended and thickened.

On opening the whole length of the large intestine, the following appearances presented themselves:—Portions of mucous membrane which had escaped ulceration were softened, and were of a greenish or red colour; large transverse ulcers were found at other parts, their margins were defined; in some the peritoneum formed the base, and in nearly a dozen places the peritoneum also was destroyed. Hard, dry scybala adhered in some parts. About six inches above the cæcum the intestine appeared somewhat contracted, and large pouches were formed both above and below. The small intestines were pale and no disease was observed in them; they contained fluid fæces. The mucous membrane of the stomach was thickened and softened. The liver was pale and soft. The gall-bladder was much contracted and adherent to the colon; it contained a small quantity of white, thick mucus, and crystals of cholesterine; the duct was blocked up by a gall-stone, which was about half an inch in circumference. The spleen was larger than natural and it was softened. The kidney presented an irregular contraction on its surface.

The lungs were emphysematous; one or two consolidated lobules were

situated at the apex. The heart was flabby; but, with the exception of slight atheroma, the valves were healthy.

In this case the most severe inflammation of the colon had been set up, the coats of the intestine had sloughed, and numerous perforations had resulted. The disease had lasted for three months; but a short time before admission it became much aggravated. It could scarcely be expected that the administration of small doses of astringents could check such extensive degeneration; and it was evident that the patient died, not from exhaustion, but from the severity of the disease, and its extension to the peritoneum.

Case CXXXIII.—*Chronic Bronchitic Phthisis. Cirrhosed and Lardaceous Liver. Contracted Abscess of Liver. Chronic Dysentery, and Chronic Peritonitis.*—Thomas R—, æt. 31, a soldier, or rather pensioner, was admitted under my care Oct. 24th, 1856. He had been in the West Indies as a soldier, and had been exceedingly intemperate in his habits, spending all his money in rum, &c. He stated, however, that till three years previously he enjoyed good health, but had had syphilis six or seven times, and had been salivated five times; and that when a child he had had ague.

Two and a half years before, while serving in Bermuda, he was exposed to cold at night; the following morning he had severe cold and cough; but did not report himself as ill for six months, having then gradually become much worse. At that time he spat blood, and had night sweats, and had great pain in the precordial region. He remained in hospital for nine months, and left very little relieved. He subsequently went to the Crimea, but was at once invalided, and sent to Scutari. Sixteen days before his admission into Guy's his ancle became swollen, and dropsy rapidly increased.

He was a tall, emaciated man, with an exceedingly anxious, haggard expression; the nails were clubbed; the respiration was difficult and hurried; and he was almost in a dying condition. He complained of pain in the chest and abdomen; the respiration was 24 per minute, and he expectorated much thick, greenish and rusty-coloured mucus.

There were signs of advanced phthisis in both lungs. The abdomen was hot and distended; the superficial veins were enlarged; fluctuation was very perceptible; the bowels were relaxed; urine high-coloured, non-albuminous, sp. gr. 1·012. He gradually sank.

Inspection, Nov. 3rd.—The body was much emaciated. The abdomen was distended, but the enlargement of the superficial veins had disappeared. *Chest.*—The lungs presented advanced disease, with some recent pneumonia.

Abdomen.—The peritoneum contained several gallons of fluid; the

intestines were moderately distended. The peritoneum was opaque, slightly granular, and very delicate bands were found between the intestine. The liver was much contracted, nodulated, and its surface was opaque. On section, an irregular cheesy mass was found, about three inches in length, extending from the surface of the liver into its substance, and surrounded by slight fibrinous investment; the surface was contracted. This mass appeared to consist of two or three collections appended the one to the other. There were numerous other small cheesy masses of smaller size, situated throughout the liver, in the course of the portal branches. They were all apparently the result of inflammatory action, or dried abscesses. The rest of the liver was semi-transparent, and in many parts was lardaceous. The gall-bladder was contracted. The spleen was enlarged and lardaceous. The kidneys were healthy.

Colon.—The whole of the colon presented irregularly healed ulcers, and was granular and thickened; and scarcely any healthy mucous membrane was observable. Small circular, smooth spaces, evidently healed ulcers, studded the whole surface. The coats of the intestine were thickened. The ileum and stomach were healthy; so also were the kidneys. The omentum was adherent near the inguinal canal on the left side.

The original malady appeared to have been dysentery, contracted in the West Indies, and it was followed by abscesses in the liver; these abscesses dried, and probably constituted the cheesy masses found after death, affording a remarkable instance of abscess of the liver, and perhaps of pyæmia not at once fatal. The intemperate and dissolute habits of the patient set up chronic fibroid disease in the lungs. The lardaceous state of the liver was interesting in its connexion with syphilis, and struma. The colon was filled with cicatrices; and they had led to partial obstruction, as shown by the hypertrophy of the intestinal coats.

Case CXXXIV.—*Chronic Dysentery. Hepatic Abscess. Pyæmia. Abscess in the Brain and Lung.*—Thomas D—, æt. 25, was admitted February 14th, and died March 19th, 1855. He was a sailor, and had been for two years in the East Indies. At Burmah he had ague and dysentery, and was ill for several weeks; and for two months he had had pain in the side.

On admission, he was sallow and generally cachectic. There was pain in the right side; the chest was dull; and it was supposed from the history that he had abscess in the liver.

On February 21st, when sitting by the fire, he fell down in a fit, and was convulsed for several days he continued in a semi-conscious condition. On the 28th, he could speak and give his name; he continued

apparently to improve till the 14th, when he again fell into a semi-conscious state. On the 16th he was able to sit up and take his breakfast; but shortly afterwards became quite insensible; and had stertorous breathing, which continued till death. It was observed throughout, that the right leg was weak, and at last was paralysed; the right pupil was smaller than the left; but a few hours before death it became widely dilated.

Inspection twenty-four hours after death. *Brain.*—The surface of the hemisphere was dry; and at the base were slight adhesions between the surfaces of the arachnoid. In the posterior lobe of the left hemisphere was an abscess about the size of a hen's egg, containing thick, tenacious pus; it nearly reached the surface, and was surrounded with softened brain substance; at the anterior part of the abscess was a clot of blood, also surrounded by softened tissue. The abscess had broken into the left lateral venticle at its posterior corner; the left ventricle was filled with pus; the right with about ℥j of clear serum; the fourth ventricle was healthy.

In the *chest* were old and recent adhesions at the bases of both pleural cavities. The bronchi were slightly inflamed, and contained mucopurulent secretion. The base of the left lung contained a small abscess; the base of the right was in a state of incipient pneumonia.

Liver.—In the right lobe, at the upper surface, were two chronic abscesses, capable of holding about ℥iij of pus; the pus was thick and green; the walls of the abscess were very thick, bounded by a smooth cyst, and firm tissue about one eighth of an inch in thickness; on the circumference of the abscess a compressed vein was observed.

In the *colon* the mucous membrane was thickened; several well-marked cicatrices were found in the ascending colon; the mucous membrane was puckered, and in some parts was of a slate colour; the muscular coat was slightly hypertrophied.

It appears probable that the dysentery, which had been contracted in Burmah, had led to abscess in the liver, and that this remained passive for many months, producing hectic, with pain in the side, &c., and at last, from some fresh exciting cause, new action was set up, producing acute pyæmia, and abscess in the brain as the consequence. Dr. Hughes diagnosed this course of morbid changes, which was completely confirmed on inspection after death.

Case CXXXV.—*Dysentery. Abscess of the Liver. Perforation of the Diaphragm. Empyema.*—John J—, æt. 32, admitted into Guy's Hospital July 28th, 1858, under the care of Dr. Wilks. Till February, 1857, he had been perfectly well, and went to the coast of Guinea; during two months he remained on that coast, and had dysentery, producing much purging, with tenesmus, and a discharge of a small quantity of blood The dysenteric symptoms continued for two months, and quite incapacitated him from work. The symptoms came on suddenly, and were

accompanied with severe pain; he took spirits for relief, but the following day pain again returned, with a febrile condition, and with severe headache, &c., he was then completely laid aside, and for a month was unable to take food. On June 14th, he arrived in London and had been under treatment till application at the hospital.

He was a man of fair complexion, slightly sallow, and emaciated. He complained of pain in the right side, and had occasional rigors, but did not suffer from cough; the bowels acted regularly; the tongue was slightly furred. The abdomen was collapsed; but there was pain in the right side of the chest, which was uniformly dull; tubular breathing was audible, and on the left side puerile respiration; and it was evident that fluid effusion had taken place into the right pleura. One week before death, his distress greatly increased, and paracentesis thoracis was performed, and a pint of pus was evacuated; he died, August 20th.

On inspection, the right pleura was found to be filled with several pints of grey purulent fluid; the compressed lung being at the posterior and upper part of the chest; a large opening in the diaphragm on the right side allowed free communication between the pleura and an abscess situated between the liver and the diaphragm, it was this abscess which had been opened by the paracentesis. The left lung and the heart were healthy. In the abdomen there were local adhesions between the intestines in various parts; at the lower part of the ileum, and in the ascending colon, there was some recent ulceration, and in some other parts a small quantity of granular lymph was found covering the mucous membrane. In the cæcum were two large ulcers of older date, with raised thickened edges, and the mucous membrane was destroyed; towards the rectum the mucous membrane was of a slate colour.

The large abscess above the liver was between the liver and the diaphragm, and the capsule of the liver formed part of the walls of the abscess; there were several abscesses in the substance of the liver itself, and the whole of the gland was filled with small deposits of pus. Many of the hepatic veins were filled with clot and pus, the latter having apparently entered the veins secondarily from the tissue; the liver weighed 9½ lbs. The spleen and kidneys were healthy.

This was a case of great interest. Acute dysentery, which the patient had contracted on the coast of Guinea, was followed by hepatic abscess. This latter abscess extended to the surface of the liver, and led to perforation of the diaphragm; the symptoms of pleuritic effusion were then produced, and led ultimately to a fatal termination. Dr. Wilks had diagnosed the purulent collection, and determined to draw off the fluid: the trochar passed above instead of beneath the diaphragm; but since the communication through the diaphragm was perfectly free, the whole of the contents of the abscess and of the pleura could be emptied at the

same time. There was evidence of old disease in the mucous membrane of the colon.

Case CXXXVI.—*Chronic Ulceration of the Intestine. Dysentery. Cicatrization. Contraction. Perforation. Abscess near the crest of the Ilium.* (From the Museum Records).—A young man of intemperate habits, and who had had syphilis, several years before death had a dysenteric affection, on the subsidence of which his bowels were habitually constipated; this state was attributed to stricture of the rectum, which was felt at no great distance from the anus. A bougie was passed with the effect of considerably dilating the stricture. He subsequently went to America, but he did not prosper. The death of his wife and other misfortunes were followed by declining health. An abscess formed above the crest of the ilium, towards the posterior part on the left side, and there was continual pain at that part; after the application of leeches several sinuses formed, diarrhœa came on, and he wasted rapidly.

On inspection, except pleuritic adhesions, the thoracic viscera were healthy. In the left iliac region the integuments were separated from the tendon of the external oblique by sinuous ulceration. In that region, the intestines were glued together; the peritoneum and adjacent cellular membrane were much thickened; the rest of the peritoneum was healthy. In the sigmoid flexure there were numerous traces of old ulceration, of a lightish green colour, the surface was uneven, and the structure of the intestine at the part was thickened and condensed; the calibre of the intestine was also much contracted. There were three or four small perforations in the intestine at this part; the rectum was healthy, except immediately above the anus, where there was considerable thickening with induration. This evidently depended on an old ulcer, occupying about half the intestine; and the part was of a leaden colour. The liver was much enlarged and fatty. The gall-bladder contained some ropy mucus. The kidneys and the rest of the intestines were healthy.

This case is a very interesting one, for although the dysentery was relieved, the cicatrization and subsequent contraction were followed by constipation; ulceration was set up above the points of contraction, and ultimately the intestine was perforated. The sinuses opened near the crest of the ilium; fæces do not appear to have been discharged; but the case might easily have been mistaken for suppuration from diseased bone.

The constriction in these instances arises from fibro-elastic tissue, which becomes more dense than the original muscular coat; it closely resembles that found after the destruction of the skin in burns, and has a similar disposition to contract.

II. Acute inflammation of the colon sometimes takes place in common with diseases of other organs; and these cases present a marked difference from those previously detailed.

Thus the thoracic viscera are affected with acute disease; the bronchial tubes and lungs are inflamed, and so, in fact, are almost all the mucous membranes. The symptoms of disease of the chest are more marked than those of the abdomen; dyspnœa, cough, febrile excitement are present with the physical signs of thoracic disease. The countenance is anxious and flushed, the skin hot and dry, or clammy, the pulse becomes gradually more depressed, the tongue brown and dry, and the patient is prostrate. These symptoms are accompanied by dysenteric diarrhœa, which indicates a diseased state of the colon.

In some of these cases, the exciting cause of the inflammation of the lungs and bronchi is also the cause of like disease of the mucous membrane of the alimentary canal. In others, the symptoms appear to be allied to those of pyæmia, and the affection of the colon is merely another expression of the morbid state of the blood; here also, the indications of inflammation of the colon are not well marked. Nearly all these cases are of a very severe character, and tend to a fatal result.

In the treatment, the thoracic disease demands most urgent atention; but it must be borne in mind, that the disease of the alimentary canal tends still further to depress the powers of life; and we must not add to the inflammation there existing, by the administration of powerful drastic purgatives.

Case CXXXVII.—*Dysentery. Pneumonia. Hydrencephaloid Disease.* Charles O—, æt. 32, was admitted June 26, 1854, in an unconscious state. He had been a blacksmith at Brixton. About six months previously, while at work, he was seized with a fit, which deprived him of speech for half an hour, when he returned to his work; and from that time he suffered from pain in his head, At one time he was very sleepy and unable to work; at other times he became excited, and his speech was affected. He continued more or less at work till ten days before admission, when he seemed quite lost, and he was taken home from his employment. He complained of pain in his head and of giddiness, and was said to be suffering from inflammation of the brain, and was bled His symptoms increased, and when admitted he spoke incoherently,

and threw his arms and head about. He placed his hand on his head, as if he suffered there. He was very pale, which was attributed to loss of blood; the pupils were dilated, and he had dysenteric diarrhœa. For the next seven days he gradually became more prostrate; he seemed for a moment to return to consciousness, and then relapsed into an insensible condition. July 3rd. He was able to speak rationally; the right pupil was contracted, but the left was dilated; he appeared paralysed, but continued sensible till his death, on the 5th.

Inspection, eighteen hours after death. *Brain.*—There was an increased amount of clear serum in the membranes on the surface of the brain. The brain substance was very pale and watery, its weight 2 lbs. 14½ ozs.; no tubercle was discoverable. The ventricles contained an excess of fluid, 3 or 4 drachms each; the central parts were not softened; the microscope showed no inflammatory corpuscles. There were a few purpuric spots on the pleura. The lower lobe of the right lung was in a state of red hepatization, heavy, soft, and œdematous. Both apices contained a few groups of tubercles.

Heart healthy. The whole of the large intestine, from the cæcum to the rectum, was in a state of acute inflammation. In the transverse colon were isolated ragged ulcers; these were close together in the cæcum. In the sigmoid flexure and in the rectum the whole surface was ulcerated, and covered with a thick membranous exudation; the muscular coat in some parts was thickened. The spleen and liver were healthy; the kidneys were large and coarse; the bladder presented a few spots, purplish in colour and ulcerated in the centre.

Case CXXXVIII.—*Diphtherite of the Cæcum and Colon. Bronchitis. Pneumonia. Cirrhosis.*—Charles G—, æt. 34, was admitted, March 8th, 1854. He was a tall man, of dark complexion, and intemperate in his habits of life. For three years he had served as a soldier in the East Indies. Five days before admission he was taken ill, with febrile symptoms, cough, pain in his side, and dark-coloured expectoration dropsical effusion came on, and subsequently jaundice. When first seen he was prostrate, comatose, and restless; the lips were dry and cracked; there were sordes on the tongue; the skin was hot and dry, and slightly jaundiced; the pulse was 156. There were symptoms of pneumonia; pain was produced by pressure on the abdomen, and there were a few petechial spots. He became more comatose before death.

Inspection, eight and a half hours after death. The body was jaundiced; numerous spots of purpura were observed on its surface, and on the leg was a chronic ulcer. The trachea and right bronchus were granular and congested. The lungs did not collapse; the right was covered with a delicate layer of lymph, the lower lobe was granular, consolidated, and of a yellow colour at the lower part. The left lung was healthy, but its lower lobe was much congested. Over the left ventricle of the heart was an old adhesion, about the size of half a crown; the heart was thirteen ounces in weight, but otherwise healthy.

The whole of the mucous membrane of the stomach, ileum, cæcum, and colon, were much congested; this congestion at the cæcum and colon became intense, and the folds were everywhere covered over with a delicate diphtheritic layer. The liver was covered with false membrane; it was contracted, partially cirrhosed, and very firm, and was much congested with bile. The gall-bladder contained ʒss of bile. The spleen was large, soft, and pale, weighing 2¼ lbs. The kidneys also were large, and much congested.

Case CXXXIX.—*Inflammation of the Colon and Rectum with false Membrane, and superficial Ulceration, &c. Pneumonia. Enterica?*—James S—, æt. 20, was a labourer on the Sydenham railway, who had lodged at Norwood; his habits had been temperate; and his general health good; he was brought to Guy's July 18th, 1855. One month previously he had been wet through, and experienced pain in his head and back; a week afterwards cough came on, and mucus was expectorated with blood, and these symptoms increased till admission. His countenance was anxious and flushed, his pupils dilated, the skin hot and dry, the tongue was covered with a thick fur; the expectoration was viscid, tenacious, yellow, and rust-coloured; pulse 90. He was greatly depressed, lying on his back, and had tremor of the hands and tongue, with occasional delirium. He had severe diarrhœa; there was dulness of the chest, especially of the left lung, with general submucous crepitation. He had the appearance of a person affected with typhoid fever, but without the cerebral oppression. The symptoms of acute pneumonia became more marked, with rusty sputum and low muttering delirium.

The prostration increased, and the patient gradually sank; he died August 3rd. There were no maculæ on or after admission; the diarrhœa did not continue after the first few days, nor was any blood discharged with the motions.

Inspection, August 6. The body was of moderate stature. *Chest.*—On the right side there was an effusion of fibrin, and about a pint of bloody purulent serum in the pleural sac. The lower lobe of the right lung was compressed, the upper pneumonic; the left pleura also was quite free from adhesions; the lower lobe was in a state of pulmonary apoplexy, the upper part of the same lobe was very much congested and consolidated; it sank in water. The *pericardium* contained several ounces of bloody serum; the heart was flabby, but was otherwise healthy. The *abdomen* was moderately distended; the peritoneum was smooth and healthy; the stomach presented advanced gastric solution, the mucous membrane at the cardiac extremity being exceedingly thin; the small intestine contained yellow, bilious fluid fæces; in the last foot of the ileum the mucous membrane was grey, Peyer's patches were slightly raised, and in a few parts presented irregular ulceration; they had not, however, the raised swollen appearance common in enteric fever. The cæcum contained several small ulcers, and the whole mucous membrane was of an iron-grey colour; the edges of most of these ulcers were smooth and contracting; the mucous membrane was thickened.

In the transverse and descending colon and in the rectum the whole of the mucous membrane had a swollen, œdematous and almost villous appearance; this was most marked towards the rectum, Studding the swollen membrane with white patches of adherent lymph, in some parts merely constituting a thin, delicate, but adherent membrane, in others forming a large flocculent mass about three quarters of an inch in length, firmly adherent to the membrane; there were numerous small ulcers scattered over these portions of the intestine; some with smooth, others with irregular and congested margins; some contained a small portion of false membrane, like a slough; from others large masses of false membrane could be detached. On tearing off portions of this membrane, an injected granular surface or superficial ulceration was observed. The submucous cellular tissue was white, thickened, and œdematous; the muscular coat was contracted and distinct, and nearly one eighth of an inch in thickness; the mesenteric glands were enlarged. On carefully examining portions of the false membrane, it was found to consist of granular cells closely matted together with very little blastema; the cells were large and full of granules, some contained a faintly marked nucleus; but scarcely any columnar epithelium was observed. On examining the mucous membrane itself, small excavations were found to contain similar cells. (Plate III. fig. 3.) The liver and spleen were healthy.

This diseased condition of the colon had led to the effusion of a fibrin, and to the production of inflammatory cells, instead of the ordinary columnar epithelium; the follicles and solitary glands had become inflamed, and a subsequent continuation of this action produced superficial ulceration. The disease was of an inflammatory character, and not only the follicles and glands, but the whole surface of the mucous membrane was affected; the membrane thus formed appeared more cellular than is sometimes observed.

The symptoms closely resembled those of enteric fever or typhoid pneumonia. The irritation of the large intestine, as indicated by the diarrhœa, appeared to be checked by the Dover's powder which was given. The administration of alcoholic stimulants in a case of this kind is a question of great difficulty; the general symptoms—failing pulse, subsultus, &c.—appeared to require their free use. This case stongly favoured the idea of a constitutional origin of the disease, which resembled, if it were not identical with enteric fever.

III. Another class of cases are those in which chronic disease has slowly advanced for months or for years; acute

inflammation of the alimentary canal is then set up, which in a short time leads to a fatal termination. Cases of this kind are not of unfrequent occurrence, in which a patient is already broken down, as by incipient phthisis; there is already a disposition to the ulcerative disease of the small intestine, so common in phthisis, when, probably from fresh exciting cause, acute inflammatory disease is set up, and diarrhœa, which can scarcely be checked by any means, is rapidly fatal. This inflammation, and the effusion of false membrane, may be confined to the rectum or descending colon, or it may be found in the cæcum and ileum. Several cases of this kind have already been detailed in connection with strumous disease of the intestine.

*Catarrh of the Colon.**—The mucous membrane of the large intestine may be affected with catarrhal inflammation resembling that which we have already mentioned as occurring in the small intestine. It is seen both as an *acute* and as a *chronic* disease. In the acute disease the mucous membrane is congested, and sometimes the colon is deeply red; one part only of the bowel may be thus affected, the cæcum, or the sigmoid flexure or the rectum; the follicles of the intestine become enlarged; the mucous membrane is swollen, and the mucus altered in character; the fæces at first adhere to the membrane, for the secretion is diminished, afterwards the quantity of mucus is greatly increased, and it is recognised in post-mortem examination upon the mucous membrane, and during life is seen to coat the fæces, or to be passed in abundance without the ordinary alvine discharge, in gelatiniform masses, or in shreds. Ulceration may ensue in small patches, or in a deeper and more distinct form.

In *chronic catarrh*, the mucous membrane is found to be thickened, but sometimes it is atrophic and thin; the colour may be grey, and we often find that a deep-coloured grey zone may be found around the follicles; due to pigmental deposit the result of long-continued congestion. The mucus secretion varies according to the severity and the chronic character of the complaint. The discharge may be in small pieces, or it may constitute casts more or less complete of a

* See 'Remarks on Catarrhal Inflammation' in chapter on "Enteritis and Diarrhœa."

portion of the intestine. These casts may be several inches or even a foot in length, and consist of mucus cells in a tenacious albuminous basis, these casts and shreds especially in acute disease may have a fibrillated appearance when examined under the microscope ; the patient not unfrequently regards the mucous cast as the mucous membrane itself, or as an intestinal worm.

Symptoms.—In acute catarrh the symptoms are those of diarrhœa, sometimes with tenesmus, when the rectum is affected, and then even with the discharge of blood ; there may be febrile excitement, and uneasiness in the abdomen, but in many cases there is no fever, the tongue may be clean, the skin cool, and the pulse quiet ; if the excreta be irritating, there is often a good deal of smarting pain at the orifice, and the mucous membrane may be protruded. Flatulent distension of the abdomen and dyspnœa are also observed.

In chronic catarrh, diarrhœa is usually the prominent symptom; it may continue in varying degrees for months or even for years, and it often alternates with constipation ; if the strength fail, then the pulse becomes compressible, and the tongue dry and brown or glazed. When the rectum is affected, as it generally is, when mucous casts are passed, the pelvic viscera closely sympathise with the morbid action ; in men we find irritation of the bladder, in women disturbance of the uterus, vagina and ovaries, as well as of the bladder. This sympathy is observed in young children, acute catarrh of the rectum may be the cause of vaginitis, and lead to the supposition that the child has been mal-treated. We would, however, remark that the converse is also true, that stricture and disease of the bladder and prostate will in men set up excessive irritation even resembling dysentery; and in women, dysmenorrhœa, and ovarian congestion may be the cause as well as the result of inflammation in the rectum.

The patients who suffer from this chronic discharge of mucus are generally in a cachectic state, pale, and more or less emaciated ; the bowels are irregular, sometimes confined, at other times affected with diarrhœa ; and there are occasionally intervals of several weeks or months between these mucous discharges of flakes and casts. During their passage a sense of distress and faintness, and even actual syncope

may be produced, with severe colic; the pulse is compressible, the tongue may be clean or furred, and the appetite uncertain; the mind is generally irritable or dejected, and sometimes almost melancholic and hypochondriacal.

The neuralgia is often very severe, sometimes coming on two or three hours before the bowels act, at other times following the motion. The pain also is great, it may extend up the spine or pass to the pubes; sometimes it is compared to the cutting of an instrument, at other times the sense is that of painful burning. These painful sensations may be quite independent of any pressure at the anus, and may continue in a more severe form after the primary irritation in the bowels has subsided. The disease is often very obstinate, and it may last not only for months, but even years.

As to the *causes* of this disease, it seems in some instances to be produced by catarrh commencing in the small intestine, or it may be the sequence of acute or chronic dysentery. The irritation of a polypoid growth in the rectum or in the sigmoid flexure may induce it, or the mischief may be due to the irritation of hæmorrhoids. The portal congestion often associated with malarious fevers predisposes to this form of mucous congestion. Sometimes hard retained fæces may set up catarrhal irritation, so that mucus in considerable quantities may be passed, or thin fæces; in these cases there is a constant and painful effort to evacuate the bowels, and the malady is mistaken for diarrhœa or dysentery.

In those instances which do not proceed from disease of the rectum or of the sigmoid flexure, as hæmorrhoids, polypus, &c., nor are the sequence of acute dysentery, we have generally found, either that long-continued congestion of the vena portæ, or irritation of the urino-genital organs has produced or at least perpetuated the disorder. In young women, it may be induced by painful menstruation and ovarian disease; in men, by prostatic disease, calculus, &c.

The disease is a remedial one, and the prognosis may be favorable when the irritating causes can be removed, when a patient will submit to well-regulated dietetic regimen and careful habits of life, and when, for a sufficient time, he will persist in the use of proper medicinal measures.

Where disease of the rectum is present, and local and

general means are unavailing, the help of the surgeon may be required to remove an irritating growth or hæmorrhoid. If the latter be present, the bowels should be regularly acted upon by the confection of senna and of black pepper; the gall ointment may be locally applied or we may use an astringent wash; at the same time the diet must be carefully regulated and hepatic congestion avoided. It is, however, to the chronic form of mucous discharge that we here especially refer, and in this, careful attention to the diet and to the state of the skin is especially needed; a nourishing but unstimulating diet should be taken, and, if possible, stimulants altogether avoided. Although mercurial medicines, in aperient or in very small doses, sometimes afford considerable temporary relief, we have often found the distress greatly increased by them; and, we have seen greater benefit accrue from the use of nitro-hydrochloric acid with henbane and vegetable infusions, as of calumba or cascarilla. If the bowels be loose, krameria, with ipecacuanha and tincture of catechu, may be used, or quinine with Dover's powder. When aperients are necessary, a small dose of colocynth may be given with Dover's powder, or of castor oil with tincture of rhubarb, but aloes and the more powerful purgatives are injurious. The sulphur confection or the compound confection of senna may be used; but enema of oil with gruel, or decoction of poppies may be sufficient to act on the bowels. Astringent injections are sometimes of service, but are unavailing if portal congestion or pelvic irritation continue. In dysmenorrhœa and ovarian disease, absolute rest, at least for a time, is necessary, and the avoidance of tight corsets is indispensable. Dr. Clark* recommends astringents, as alum, the pernitrate and the sesquichloride of iron, &c., but it is often better to soothe the irritated mucous membrane by the injection of borax with poppies, or of nitrate of bismuth with morphia and gruel, or morphia suppositories with belladonna may be used. If hardened fæces be retained they must be got rid of by the use of gentle aperients, or by the injection of several ounces of oil followed by soap and water, but if necessary they must be removed mechanically.

* See some interesting remarks on this subject by Dr. Andrew Clark, 'Lancet,' December, 1847.

CHAPTER XIII.

ON TYPHOID DISEASE OF THE INTESTINE.

In enteric fever diseased action of a special kind takes place in the glands of the intestine. This state passes through very definite conditions, and has been described by Rokitansky as the typhoid process. Dr. Stewart, Sir W. Jenner and others have pointed out the essential difference in the signs of typhoid and typhus fever, and that it is only in the former disease that we find an abnormal condition of the intestine. The glands especially affected are those at the lower part of the ileum, namely, Peyer's or the aggregate glands; the solitary glands also become involved, and the lymphatic glands of the mesentery are enlarged, congested and swollen. The questions naturally arise, In what does this state consist? Is it a necessary sign of fever? What are the indications of the typhoid state of the glands, and what is the course which the disease pursues?

The intestinal disease consists in an abnormal and excessive growth in the glands just mentioned, and the product effused is composed of a blastema, which as it undergoes but little development quickly degenerates, and consists of an immense aggregation of granules, and of some large cells containing nuclei.

Soon after the commencement of the fever the glands are swollen and enlarged, and the mucous membrane becomes more vascular than usual. As the fever advances the glands are raised sometimes two or three lines above the surface of the membrane; about the fourteenth day of fever the product either becomes absorbed, or ulceration takes place, or the gland sloughs; a few days later the slough is found to have separated, and an irregular ulcer occupies its position; the muscular coat is exposed; and the margin of the ulcer is

ragged and congested. If the patient do well, this ulceration of greater or less extent, gradually heals, a cicatrix is formed, and the health is slowly restored; the convalescence extends over several weeks, and is interrupted, it may be, by relapses consequent on this condition of the intestine, or by a repetition of the process in hitherto unaffected glands. The glands nearest to the ileo-colic valve are those which are most severely affected; and sometimes the whole valve itself is converted into a slough, and the disease extends to the glands in the cæcum.

The mesenteric glands slowly assume their normal condition; but, in some instances, the hyperæmia thus induced tends to the excessive development of cellular structure, which may undergo caseous degeneration.

In the examination of the intestines after death from fever, we find the process of glandular disease in various stages in the same subject; the glands may be merely swollen and raised, or the sloughing process may have commenced in small points, or the whole of the glands may be converted into sloughs, which are partially detached, and stained by fæces; the glands nearest to the cæcum may be in this latter state, whilst others further removed from that part are, in earlier stages of the same process, either beginning to slough or merely swollen and raised. In some cases, when death has taken place several months after fever, we have found cicatrices, without ulceration; the disease had been cured. A very interesting case of this kind occurred at Guy's Hospital under the care of Sir Wm. Gull. A young man was admitted, having the ordinary symptoms of enteric fever, with the indications of ulceration of the intestine; he appeared to convalesce favourably, but about three months afterwards, he was seized with typhus, and died in a few days. On inspection, there was no injection of the mucous membrane of the ileum, but only cicatrices.

As a consequence of this diseased action the whole of the mucous membrane and even the deeper tissues become inflamed; the intestine, from its enfeebled muscular power, readily yields to any distending force; the peritoneum is sometimes injected, and we find in many cases a delicate, fibrinous exudation upon it; again, the mucous coat often

becomes ulcerated, so also the muscular, till at last only the semi-transparent peritoneum is left; this also in many instances sloughs, and a minute opening takes place in the peritoneum, leading to rapidly fatal peritonitis; and even when the peritoneum is not actually perforated, transudation is frequently found to take place, so as to produce acute disease of the serous membrane.

Tuberculosis, although not a necessary sequence, frequently follows this fever; changes such as those just referred to, may take place in the mesenteric glands; tubercles may be deposited in the substance of the mucous membrane, and ulceration follow; tubercular disease of the peritoneum may take place; and, lastly, phthisical disease of the lungs and other structures may supervene.

The symptoms which are especially associated in enteric fever with this condition of intestine, and which alone have to be considered in this work on abdominal diseases, are that the abdomen is full and rounded, and on pressure in the region of the cæcum a gurgling sound is produced, with more or less pain; diarrhœa is generally but not always present; for sometimes the bowels are confined, even when the ulceration is severe; the evacuations are of loose consistency and of an ochre colour, and they often contain blood and portions of sloughy membrane; the pulse is compressible, the tongue is red and injected, and it becomes dry or cracked; there is often also a circumscribed flush on one or other cheek; the brain, too, is more depressed than in other cases. If perforation takes place there is sudden severe pain in the abdomen with collapse, and death then generally ensues in five to ten hours.

The symptoms of typhoid fever are sometimes so slight, even with existing ulceration of the intestine, that the patient is able to walk, and does not appear much enfeebled. I well remember a case of this kind, attending, and continuing to attend, as an out-patient at Guy's Hospital for three weeks, under the care of one of my colleagues. About the twenty-third day, a short time after admission into the hospital, when I first saw him, perforation of the intestine had taken place into the peritoneal cavity, and death quickly followed; and in other cases, when the severity of the fever

has passed, and the patient has apparently begun to convalesce, having regained power and mental energy, after some indiscretion of diet, or an attempt to move from the bed, perforation takes place, and the bright, beaming hope of returning health is lost in the terrible foreshadowing of speedy death. These are painful cases, trying to the physician, who has encouraged the hopes of the patient and his friends, and still more so to those who are thus deprived of kindred. Perforation takes place from the third to the sixth week, and until this period is passed the greatest care should be used in allowing changes of food, or increased muscular movements; for among the fatal cases of enteric fever a large majority die from this perforation of the intestines.

The hæmorrhage from the intestine in fever may be exceedingly severe and generally results from sloughing at the affected part and from perforation of minute vessels; it is in my experience rarely fatal,* but it may lead to great exhaustion and may retard convalescence, sometimes hæmorrhage is followed by rapid subsidence of the febrile symptoms and by speedy recovery. Ulceration, however, is not the only cause of hæmorrhage, for we find that bleeding sometimes takes place from the stomach and from the kidneys, even in cases that terminate favourably.

The general symptoms and treatment of fever, and the question whether there be any essential difference between tyhpus and typhoid fever, are not within the sphere of this work; the able manner in which they are discussed by Drs. Stewart, Jenner, Wilks, Peacock, Murchison, &c., and earlier by Bretonneau, Louis, Broussais, Bouillard, Chomel, Christison, &c., render any mention of these points unnecessary.

Treatment.—The question may, and has been raised how far diarrhœa is beneficial; and whether we ought at once to check it? We may be assured that purgatives are injurious, especially those of an active or drastic character. The disease of the intestine has been often aggravated by the injudicious administration in the early stage, of jalap and scammony, of senna, and the like; so also mercurials tend not only to increase the subsequent depression, but to aggravate the ulcerative

* Murchison, however, states that of 60 cases of hæmorrhage 32 died, or 53·33 per cent.

action. It is often beneficial to act on the bowels and on the liver by a mild mercurial purge, as gr. iij of Hydrargyrum cum Cretâ followed by a rhubarb draught or by castor oil, when there is disorder of the abdominal viscera; but all irritation of a prolonged kind must be avoided. When the diarrhœa is continuous, it should be checked by enemata of starch, or by the administration of chalk with opium, or vegetable astringents; but, in reference to the use of opium, it is well to be on our guard, lest the cerebral oppression be increased and a state of coma be induced thereby. When hæmorrhage takes place, the acetate of lead is sometimes of service, or vegetable astringents, as kino, catechu, logwood, krameria or the glycerine of tannin.

We must strongly urge extreme caution in the return to solid and highly nutritious food; and equally important is it that, during the severity of the fever, and for many subsequent days, no muscular exertion should be attempted, but absolute rest in the recumbent position maintained. The attention to these means would have saved many valuable lives; and few diseased conditions require such constant watchfulness in the maintenance of rest, and the frequent adminstration of mild nutritious aliments.

Ammonia and serpentary may be given; and in some, quinine proves of service, especially where there is any sign of miasmatic influence; but in other cases quinine may reduce the temperature and promote convalescence. The judicious adminstration of wine in fever is one of the most difficult questions in practice; many are benefited by it, whilst others appear to do well without it; a failing circulation, especially in advanced life, as shown by a compressible character of the pulse and a feeble action of the heart, shew that its free use is required; other indications for the employment of stimulants are dryness of the tongue, prostration of strength, a dusky condition of the skin, the presence of petechiæ, &c. In many cases, if too long postponed, patients will sink, however freely wine may afterwards be given; and, on the contrary, I have witnessed in others that a reduction of quantity, or the entire cessation of the adminstration of wine and ardent spirits, has been followed by moisture of the tongue, and the abatement of all the febrile symptoms.

In some cases of enteric fever the pyrexia is reduced by the cautious use of cold water, either as a bath or by sponging; but where there is evidence of severe intestinal affection, great caution must be used lest perforation be induced or fatal collapse ensue.

Case CXL.—*Enteric Fever. Peritonitis.*—Henry H—, æt. 23, died on the twenty-third day of fever; and on the day before death he had symptoms of peritonitis; he had previously had syphilis, and was in a cachectic state.

On inspection, there was acute peritonitis; but no perforation could be found; there was very extensive ulceration of the ileum and cæcum, affecting both the solitary and Peyer's glands; in one or two places the muscular coat was also destroyed. The liver, spleen, and kidneys, were healthy.

In this instance, acute peritonitis was set up, although complete perforation had not taken place; in some parts, however, the serous membrane only was left entire; and there can be little doubt that transudation had resulted in the acute serous inflammation.

Case CXLI.—*Enteric Fever. Perforation of Intestine in the Seventh Week.*—Joseph C—, æt. 17, was admitted, August 18th, 1858, and died September 1st. He had been residing at Woolwich, and six weeks before admission had suffered from fever, with much diarrhœa. The day before he was brought to Guy's he was said to have had a discharge of blood from the bowels. On admission he was pale, emaciated, and almost pulseless; scarcely any complaint of pain was made, but he had an anxious and distressed countenance; the abdomen was moderately distended; he rallied slightly, but sank a week afterwards.

Inspection. Chest.—The pleura was healthy; the lungs were pale, and distended; the *heart* was healthy. *Abdomen.*—The intestines were distended; the peritoneum contained about two pints of offensive pus, which was collected in the depending parts; there was scarcely any adhesive lymph, and no adhesions; but the general peritoneal surface was slightly opaque. About eight inches from the cæcum there was a sloughing opening into the ileum, capable of admitting the tip of the little finger; and a second opening of rather smaller size was situated nearer to the cæcum. On the mucous surface of the ileum at its lower part, were the remains of ulcers; many of them cicatrizing, their edges were smooth and grey; the floor of the ulcers was formed in several instances by smooth submuscular areolar tissue on the peritoneal surface; these remains of ulcers, covered nearly the whole of this part of the intestine. There were also several ulcers in the cæcum; the rest of the intestine was healthy. The *liver* was discoloured on its surface, but it was otherwise healthy; the *spleen* was slightly enlarged; the *kidneys* were healthy.

The comparative absence of pain in this case was explained by the great prostration from which the patient suffered. The great care required after typhoid ulceration of the intestine is shown in this instance; for six weeks had elapsed, and many of the ulcers had healed before fatal rupture of the intestine and peritonitis took place. It is probable that injudicious diet or increased muscular exertion had led to the perforation of the ileum.

Case CXLII,—*Enteric Fever. Perforation of the Ileum.* John C—, æt. 28, was admitted in a dying state into Guy's Hospital. He stated that he was well till the previous evening, when he was seized with acute pain in the abdomen; and on admission he had the symptoms of peritonitis. He died in a few hours.

On inspection, the body was found to be well nourished. The abdomen was distended; the whole surface of the intestines was covered with fæcal matter, and the end of the ileum was perforated; the lower part of the ileum was ulcerated, as in typhoid fever, and one of these ulcers had given way; there was deposit in Peyer's glands, and the mesenteric glands were enlarged and softened. The liver was healthy, so also the kidneys. The spleen was large, soft, and of a dark colour.

The patient seemed to have been so far convalescent from a mild attack of fever as to consider himself well, when fatal perforation of the ileum took place. The appearance of the intestine was precisely that found in typhoid fever, and there was no indication that the ulceration was of a strumous character.

CHAPTER XIV.

ON COLIC.

By the term colic we mean a severe twisting pain in the abdomen, about the region of the umbilicus, without inflammatory action, generally with constipation, but sometimes with looseness of the bowels and vomiting. Internal strangulation of the intestine and intussusception are sometimes considered as more aggravated and severe forms of colic on account of the pain which is a prominent symptom in many cases; but the former may be in its early stages altogether free from pain, until distension and violent peristaltic action set up inflammation, which involves all the coats of the intestines; unless, therefore, we consider some forms of colic to be free from pain, in some of its stages, we cannot regard fatal obstruction, arising from displacement and internal strangulation, as a form of the disease.

Dr. Copland divides colic arising from functional disorder of the bowels into four classes:—

1. Flatulent, nervous, or spasmodic colic.
2. Colic from an injurious character of the food.
3. Colic from morbid secretion, or retained excretions.
4. Colic from lead.

This division appears to be a just and useful one; for each class indicates widely different conditions, which require different treatment.

In *flatulent* colic the intestines become distended with flatus; severe twisting pain comes on round the region of the umbilicus; if the pain be severe, the patient becomes cold, and a clammy sweat breaks out; the pain extends to the back, and the severity of the pain is relieved by a change in its position, but especially by eructation, or by the discharge of flatus from the rectum; during the severity

of the pain, the pulse becomes depressed, feeble and irregular.

In *nervous and spasmodic colic* there is less distension of the abdomen although it may be slightly tympanitic; the pain extends to each side and to the back, and is sometimes situated across the chest. The removal of pain from one part to another, and especially the discharge of flatus, as in the flatulent colic, afford relief. The abdomen is, however, tolerant of pressure, and pain is occasionally relieved by this means. There is, also, an anxious expression of countenance, with coldness and clamminess of the surface, and with depression of the pulse, if the pain be severe. The collapse has even been mistaken for ruptured intestine, so complete may be the prostration; in colic, however, the collapse entirely disappears in a few hours; in perforation, it soon terminates in death. The tongue is not generally affected, and it may be clean or furred; the evacuations from the bowels also may be as in health, but in most cases they will be found to deviate from their normal condition. In the nervous colic of hysteria, the urine is abundant and limpid. In the spasmodic colic of gout the urine contains an excess of lithic acid, and may be turbid and scanty.

Causes.—Flatulent colic is observed in nervous and hysterical subjects, and is produced by the rapid evolution of gases from the contents of the alimentary canal, whilst in some cases it appears to arise from change in the secretions of the mucous membrane itself. In the intemperate, and in gouty patients, the chylopoietic viscera are often in a congested, and morbidly excited state; and in these cases a very trifling cause will produce intense colic.

In patients reduced by exhausting diseases, by loss of blood, by the too long continuance of farinaceous and fluid aliments, as also by over lactation, we find that colic of this kind is readily induced.

The exciting causes are alarm and fright, exposure to cold and wet, especially of the lower extremities, food not in itself indigestible, but taken when the powers of digestion are diminished, either from an enfeebled condition, or from the state of the nervous system.

Diagnosis.—There are several conditions for which this

functional colic may be mistaken, and which are important to remember.

Perforation of intestine is generally known by the intensity of the collapse; it is exceedingly unusual for collapse at all approaching in severity to that produced by ruptured intestines to arise from functional colic, although it is sometimes the case. During the passage of a calculus from the gall-bladder or from the kidney, intense pain is produced; but the position of the pain, the character of the vomiting, and in the latter case, the pain and retraction of the testicle, and blood in the urine, enable us to distinguish these diseases from ordinary colic.

In disease of the spine, severe and sometimes intense pain is produced in the abdominal parietes, but this pain has generally less of the twisting pain of colic, and may be traced in the course of the spinal nerves; sometimes, however, it is more diffused in character, and the patient can scarcely be persuaded that the cause is not within the abdomen.

Aneurism of the abdominal vessels and abdominal tumours are sometimes the cause of intense suffering, but the character of the pain, and the presence of a tumour with other signs afford easy diagnostic marks of their true character.

In peritonitis there is exquisite tenderness of the abdomen, whilst in colic the pain rarely amounts to more than a diffused soreness, and pressure can often be borne.

In tubercular and chronic peritonitis flatulent distension of the abdomen is associated with soreness or tenderness, less severe than in ordinary peritonitis; and these conditions may, in the *early stages*, be mistaken for simple colic; this is important, because by an over active plan of treatment disease may be accelerated; afterwards, when the intestines are matted together, and attacks of peritonitis are set up, the pain and tenderness come on in severe paroxysms, when they are less likely to be mistaken for simple colic. It is only in the early conditions of this disease, and especially in young people of nervous and excitable temperament, that there is liability to such mistake.

The distinguishing marks between colic and hernia need not be dwelt upon; for the presence of an external tumour,

with constipation and stercoraceous vomiting, can only be mistaken for simple colic by great carelessness; and in every case of colic, even before severe vomiting has come on, it is well *always* to examine the patient for hernia. In intussusception also, intense recurrent pain in the abdomen of a twisting character is sometimes associated with diarrhœa, and I remember a case in which this malady was mistaken for colic produced by irritating substances; this idea was strengthened by the occurrence of the attacks of pain on the days when the patient was visited by his friends. Flatulent distension of the stomach is sometimes a severe and even *fatal* disease, but the distension and tympanitis are great, and the form of the abdomen is characteristic. The intense pain arising after poisons, as from mineral acids, &c., is associated with violent vomiting; but the suffering is especially experienced in the mouth and gullet, and has other symptoms which we need not now mention.

Our *prognosis* in flatulent and spasmodic colic is generally favorable, but it must be more guarded when we have had evidence of previously existing disease, or where the collapse is great in a patient who has been affected with gout.

Treatment.—The ordinary treatment in colic, often before the patient is seen by a practitioner, is to administer some hot brandy and water; and if the disease be of the simple kind, which we have described, the symptoms may be thereby relieved; but in peritonitis, in hernia, in perforated intestine, no treatment can be worse, for it takes from the patient the chance of recovery. Opium, gr. i—ij, and laudanum, are the most useful remedies in severe functional colic, and may be given either alone or with ether; chloroform in doses of ɱv with or without camphor, chloric ether also, and the salts of morphia, may be advantageously administered. Warmth should be applied to the abdomen by means of hot water, hot flannels, poppy fomentation, &c., and sometimes a mustard poultice or a hot flannel sprinkled with turpentine, or spongio-piline previously wrung out of hot water and sprinkled with chloroform and belladonna liniment, mixed in equal parts, may be employed to relieve severe pain.

When the bowels are inactive, and when no indications of acute disease, hernia, or internal obstruction exist, a warm

saline purge may be given, but some practitioners prefer a dose of calomel, with gr. j or ij of opium, or colocynth with henbane, or castor oil with the tinctures of rhubarb and opium. Again, enemata are sometimes of much service in emptying the colon, and thus may entirely relieve the disease; castor oil and oil of turpentine, colocynth and rue, may each be employed in this manner.

If the attacks be less severe, but repeated, and if the patient be exhausted and anæmic, steel and quinine may be combined with henbane and with mild aperients. At the same time many of the vegetable bitters—calumba, cascarilla, gentian—may be prescribed with the aromatic spirit of ammonia, with henbane, with the carbonated alkalies of soda, potash, or magnesia, &c. In hysterical subjects the compound assafœtida pill and aloes, musk, or myrrh may be used; and some practitioners employ valerian, castor, sumbul, and the essential oils, to relieve the painful and flatulent distension of the abdomen.

The diet should be of a form easily digestible, but sufficiently *varied*, and neither bulky nor entirely of a fluid kind.

When a gorged state of the portal system exists, from an excess of aliment and of stimulants, it is well to abstain from alcohol in every form; but this abstinence is the more difficult to attain, because the colic is itself often relieved by fresh doses of ardent spirits. So also in gout, an excess of animal food and of stimulants aggravates the disease, but the patient may be so enfeebled as to require the continuance of stimulants in a well-regulated manner; and in instances of colic with exhaustion, from over lactation, loss of blood, great mental alarm, &c., alcoholic stimulants are of great value.

2. Colic arising from the *injurious character of the food.* This disease has many symptoms in common with the colic just described; but its cause is different, and also its mode of relief.

Severe pain comes on in the region of the scrobiculus cordis and umbilicus, sometimes with flatulent distension, two or three hours after eating. Vomiting occasionally supervenes; and it may be, if the food is of an injurious character, either in itself or from the idiosyncracy of the patient, that diarrhœa is set up. The tongue is whitish and furred, or

enlarged, and red papillæ are observed through the fur, or it is injected at the tip and edges. The pain is followed by a soreness of the abdomen, which may persist for several hours or days. The pulse is compressible, and the respiration is less free than normal. This condition may pass into that of diarrhœa, or of enteritis; or, after vomiting, and the discharge of unhealthy evacuations from the bowels, the patient may be restored to health.

This form of colic is often associated with disturbance of the cerebral functions, and severe pain in the head, dimness of sight, irritability of temper come on; or it may set up disturbance of the skin, producing urticaria and roseola, and in children strophulus and other lichenous eruptions.

If the injurious diet be persisted in, the colic may cease, but other conditions consequent on general impaired nutrition may be set up.

The exciting causes are salads, cold drinks, acid and fermenting wines, raw fruit, especially stone fruit, mussels, and so-called shell-fish, the imperfect mastication of food, either from bad teeth or hurried meals; the latter cause is especially found in those who are actively engaged in business, or who from choice or necessity postpone the meal till the frame is almost exhausted. Severe colic of this kind is sometimes produced by mushrooms, especially where other forms than the edible agaricus are taken, and dangerous and alarming symptoms may follow.*

In other cases the diet may be of good quality, but improperly administered; thus the most severe colic may be produced by giving cold milk to young children. Sudden prostration of strength, pain, a sunken eye, vomiting, and afterwards diarrhœa are produced, and the motions indicate the undissolved state of the food taken.

In the *diagnosis* of these cases, equal care is necessary as in flatulent colic, for the same conditions may mislead in each; it is well also to remember that hernia, perforation of the intestine, peritonitis, intussusception, and enteritis may produce many of the symptoms of this form of colic. Ordinary care will in most cases enable us to detect external hernia; the pain of peritonitis and that from perforated

* Taylor on 'Poisons.' Christison on 'Poisons.'

intestine is more severe in kind, and different in character from that of ordinary colic. Enteritis and intussusception may follow as the consequence of intestinal irritation of the kind just described, but the symptoms of these are of greater duration than those of simple colic; and when due to the administration of irritating poisons, the examination of the vomited matter is an essential element in forming a correct opinion as to the nature of the case.

Treatment.—If vomiting have come on, and irritating matters have already been freely ejected, the symptoms of disease often subside spontaneously, if not soothing demulcents may be given; but if pain and nausea continue, an emetic is of service. Action from the bowels should be ensured by saline aperient medicines, as the carbonate of magnesia, the sulphate of potash, the tartrate of soda, or by a free mercurial purge; and demulcents, as arrowroot, milk, rice, mutton or veal broth, &c., should constitute the only diet; the administration of saline medicines, with antispasmodics, sedatives, and anodynes may be necessary for a short time, and opium may be required to check the irritated action which has been set up, but opium should not be given whilst irritating substances continue to disturb the intestine.

3. Colic from retained secretions and morbid excretions.

When severe pain comes on with diarrhœa and with dark bilious evacuations, a state of disease is produced which is closely allied to the bilious diarrhœa and English cholera, which we have previously noticed. The severe pain in the region of the umbilicus may be associated with violent vomiting and purging, without being caused by any impropriety of diet. The patient sometimes becomes prostrate, the motions fluid, the surface cold, the pulse compressible, and in a very short time he is brought to extreme collapse, resembling Asiatic cholera. This, in its most severe form, constitutes the English cholera that is found to prevail each autumn in our own country. But there are less degrees of this condition; the vomiting, pain, and purging may be more moderate, the tongue furred and injected, whilst the prostration is less. Again, in other instances, severe pain in the abdomen of the character of colic is present, without any purging or vomiting, but with a sallow complexion, with furred tongue, pain in

the head, oppression of the mind, and impaired physical energies.

In some cases the prostration is so severe that the patient succumbs; but more generally, I may say in most cases, the symptoms subside, and are followed by speedy recovery.

Causes.—In the autumnal season there is much greater liability to this disease, on account of the sudden variations in temperature to which persons are often exposed. The exhalations from decaying animal and vegetable produce, the effluvia from drains, also induce this form of colic. In miasmatic districts, and in damp localities, there is still more liability to this state, and so great may be the predisposition, that a very slight excitement is sufficient to set up the disease.

The most frequent cause, however, is disturbance in the function of the liver, whether from intemperance, indiscretion in diet, mental disquietude, &c.; and whatever leads to congestion of the portal system tends to induce colic upon slight exciting causes. Attacks of this kind are often designated "spasms."

In infants it is exceedingly common to have colic from retained and from morbid secretions; pain is produced, as shown by the drawing up of the lower extremities, the cry is almost incessant, there are green or watery evacuations, containing portions of coagulated milk or undigested food, the countenance is anxious and distressed, and the sleep is disturbed. If this condition continue, it extends so as to affect the mucous membrane of the stomach, and is then associated with violent vomiting, so as to constitute gastro-enteritis; rapid prostration may ensue, and death may quickly follow, or more slow muco-enteritis or intussusception may supervene; and in some older children a less serious, but a troublesome disease, prolapsus ani, is occasionally produced.

In the diagnosis, the remarks made in reference to the other descriptions of colic are equally applicable; and in the severer forms the disease approaches in character to cholera.

Our prognosis must be a guarded one, for although most cases recover, still in some, especially in infants, an untoward result follows, and the patient becomes perfectly prostrate and dies.

Treatment.—It must be remembered that the effect of the vomiting and purging in these cases is to remove the offending matters from the alimentary canal, so that many cases, if left to themselves, recover. In milder cases the pain, the vomiting, and purging are entirely removed by the administration of arrowroot, or by the injection into the rectum of thin starch. If offending substances and secretions are retained, castor oil with tincture of rhubarb, and with opium, afford great relief, repeated as need be; and it is in this condition, antecedent to the aggravated forms of Asiatic cholera, that we may expect to derive benefit from the plan of treatment recommended by Dr. Johnson. Some administer magnesia with good effect, calcined or carbonate, with a little conium or henbane; and grey powder, with Dover's powder, or calomel with opium, may be given so as to remove the abnormal contents of the intestine, and to check the pain of the colic. If, however, the pain and diarrhœa continue, it is well to give absorbent alkaline medicines, with astringents, as chalk with catechu and opium, or kino, krameria, logwood, tormentilla, &c., and to repeat the starch injections, or injections of oak bark.

In the subsequent prostration, mineral acids, the sulphuric, nitric, hydrochloric acids, with vegetable tonics, are of great service in restoring tone to the mucous membrane. The sulphuric acid has been much used in this form of diarrhœa, and we have already alluded to its use. The secretions from the mucous membrane of the small and large intestine are of an alkaline character, and when the membrane is irritated, these are poured out in greater quantity, forming an unusually thick covering to the membrane; in this state the mineral acids correct the secretions by their astringent effect on the capillaries, checking the further secretion of watery mucus, and they assist the removal of that already formed. The solution of potash, and the alkalies generally, have a soothing influence upon the mucous membrane of the alimentary canal, and I think are of greater service than acids in the early stage of this form of colic and diarrhœa. If there be persistent pain warm applications, as previously described, should be applied.

Food should be very sparingly administered, and only of

the most bland form, as arrowroot, rice, tapioca, veal or chicken broth; if the strength fail, we must add brandy, or some other ardent spirit.

4. *Lead colic.*—Till attention was drawn to the subject of lead poisoning, the colic arising in the wine and cider districts was attributed entirely to the character of the fluids drunk; this is still known to be in a great measure the case; but, since the observations of Sir George Baker, on the effects of poisoning by lead in its several forms, we are able easily to distinguish the effects of lead poisoning from other forms of colic.

The patient exposed to the influence of lead becomes of a sallow and anæmic aspect, his muscular development is diminished, and his mental capabilities are somewhat enfeebled; if colic came on, he experiences severe pain in the abdomen, at first moderate, but afterwards becoming intense, and of a twisting and grinding character about the umbilicus; the abdomen is contracted, and the patient experiences relief by firmly compressing the abdomen with his hands, or even across a chair; the bowels are obstinately constipated, the abdomen is neither tender nor hot, but hard and contracted; nor is there generally any vomiting, but the patient writhes with the severity of the pain; the tongue may be clean or furred, the pulse is feeble, but not increased in frequency, and the urine is pale. After some hours the severity of the pain subsides, but it may again return during the next night, or after taking food. The severe colic is sometimes accompanied by cerebral disturbance, but this is a rare occurrence, although severe cephalalgia or epilepsy may precede or follow colic, as another of the effects of lead poisoning; so also paralysis of the extensor muscles of the forearm may be produced. The colic may, also, be associated with severe cramps and pains in the extremities; the constipation sometimes gives place to diarrhœa, but still the pain continues, or rather severe soreness, occasionally aggravated into intense suffering. On examining the gums we find along the edge a deep blue dotted line composed of minute particles of sulphide of lead. This sulphide is formed by the sulphuretted hydrogen produced by decomposing food, lodged between the teeth, reacting on the lead circulating in the capillaries. The deposit takes place around the small capillary

vessels of the papillæ of the gum as shown by Dr. Fagge, but by abrasion it becomes exceedingly superficial. This line is a very distinctive sign of lead poisoning, even when the abdominal symptoms are insufficient to guide us to a correct diagnosis. It rarely occurs that colic produced by lead terminates fatally, unless associated with other diseases. In a case previously referred to lead colic was associated with chronic ulceration of the stomach, which led to perforation and a fatal result. We sometimes find that paralysis of the hands or wrists, and epilepsy are coincident with the colic; it is unusual to have paralysis of the ankles, but such a case I have seen.

The proximate cause of lead colic is not known, whether it arises from irregular peristaltic action of the muscular coat of the intestine or from paralysis of one part, and spasmodic contraction of another. In those cases which I have examined, and in others recorded, no abnormal appearance was found in the intestine. The manner in which the lead enters the system is, in some cases, very obscure, but generally it is sufficiently manifest. Drinking fluids from leaden vessels which are not covered with any protective carbonate, &c., and acid drinks as cider, &c., from leaden vessels, are the common modes of its introduction; but lead colic is most frequently observed in plumbers, painters, type-founders, &c., men who are constantly employed in handling lead, and who breathe an atmosphere contaminated with minute particles of it. It appears probable that in the mixture and using of paints containing lead there is still greater liability to its absorption, the oil contains minute particles of the metal, and its ready inhalation is effected. In many instances the want of proper cleanliness in washing the hands before taking food, and in changing the clothes, very much aggravates the liability to poisoning by lead. It is sometimes, however, difficult to ascertain how the metal has entered the system. Dr. Addison mentions a publican who was thus poisoned by drinking in the morning, as his first draught, the ale which had remained in the leaden pipe during the night. Several instances have been known where lead was found in the snuff which the patient had been in the habit of taking. It has sometimes been produced by

the medicinal use of acetate of lead; but Dr. Thompson has shown that there is less liability to this effect being produced when the lead is combined with opium, or given with dilute acetic acid.

The diagnosis of lead colic is sufficiently clear when ordinary caution is used, the lead line along the gums, with pain relieved by pressure, and the contracted abdomen, distinguish the disease; but, as before mentioned, it may be associated with chronic ulcer of the stomach, with hernia, &c., which obscure the diagnosis, and may lead to a fatal result.

In uncomplicated lead colic we may give, especially in the earlier attacks, a favorable prognosis.

Treatment.—The indications of treatment appear to be sufficiently plain in this disease—to relieve the pain, to act on the bowels, and to remove lead from the system. For the relief of the pain, opium and chloroform are the best remedies and may be administered freely; to act on the bowels, croton oil with opium, or calomel with opium, or castor oil and laudanum, or the sulphate of magnesia with compound infusion of roses and henbane may be used; or we may administer injections of castor oil or colocynth; warmth should be applied at the same time to the abdomen.

In relation to the subsequent treatment, we should not be content with the subsidence of the colic, as long as the patient retains his sallow and anæmic aspect, and has a lead line along the gums. Iodide of potassium has been used, and it has been found that the urine contained lead during its administration; this I have often attempted, but unsuccessfully, to verify. Considerable benefit has been found in dropped hands from rubbing iodine ointment into the paralysed parts,* and still more by the use of electricity and galvanism locally applied. An insulated water bath has been recommended, the patient in the bath being connected with one pole, the sides of the bath with the other. It is stated, that the lead is removed from the body of the patient, and deposited upon the walls of the bath; but I have not seen electricity applied in this manner; the only opportunity in which I have known galvanism used in colic, to excite the

* 'Medical Times and Gazette,' May, 1857.

bowels to action, was in the case associated with gastric ulcer; the existence of the gastric ulcer was not known, and fatal peritonitis followed. Warm baths, perfect cleanliness, bracing air, and preparations of steel, after the removal of the lead, are of great service; but a considerable time is required for the system to become completely free from the poison.

The prophylactic treatment is an exceedingly important consideration to those employed in the use of lead. The importance of perfect cleanliness, of changing the clothes, of not partaking of the meals in the workshop are now generally acknowledged, although they are not acted upon as their cogency demands.

A drink containing dilute sulphuric acid with lemon juice is a useful preventive against absorption of lead for those who are exposed to its influence.

CHAPTER XV.

ON CONSTIPATION.

Waste and repair are necessarily connected with the performance of every function of the human body; and the various excretory organs are the channels by which the waste materials are separated as substances no longer of any benefit, and the retention of which becomes increasingly detrimental to the whole economy.

The large intestine may be looked upon as an important excretory organ, as well as a channel for the separation of effete material; and the removal of its contents is as necessary for the continuance of human life, as the separation of carbonic acid from the lungs in ordinary respiration.

The colon is well adapted for the purpose of excretion, and by its arrangement serves as a reservoir, which by its distension permits of an occasional, rather than a continuous, discharge of its contents.

But in this periodical movement of the intestinal canal there is great difference in individuals; and the variation within the bounds of health is much greater than is usually supposed; with some, and perhaps by far the larger number, an action of the bowels takes place once every day, or it may be two or three times, although either condition may be consistent with health; on the contrary, with others, it may be that an action every second or third day is the normal condition; and the usual period may be even extended to every fourth or seventh day. This variation must be borne in mind, otherwise, in the attempt to produce what is considered beneficial, an abnormal condition may be set up, and comfort and health lost in striving to bind all to the same universal law.

Much, however, may be acquired by habit; regularity may

be attained; or inattention and want of care may induce a condition which will almost baffle any subsequent effort to remedy. Premising that the healthy action in one may be disease in another, we may define constipation to be a less frequent action of the bowels than is the healthy condition of each individual. Ordinary constipation arises from the insufficient contraction of the muscular coat of the intestine; the canal becomes more and more distended, and with each increase in the circumference of the tube greater power is required to force onward its contents. I have sometimes observed a colon so enlarged in obstinate constipation by distension and consequent loss of power, that it has measured as much as twelve to fifteen inches in circumference; the power which must have been necessary to propel the contents must have been enormous. And it appears probable that in this extreme distension, a state closely allied to paralysis of the muscular parieties is the result; sometimes, however, this gradual distension is the effect, rather than the cause of paralysis.

A second effect of constipation is that the lateral pouches of the colon formed by the circular and longitudinal bands of muscular fibre, become more and more distended, and being thus filled out, their contents are removed from the central current, and become impacted, while the bowels act with some degree of regularity; these impacted fæces may frequently be felt as tumours through the abdominal walls, alarming the patient, but disappearing under judicious treatment.

Pouches of the colon sometimes become of considerable size, and are generally surrounded by the circular fibres of the canal; but not unfrequently these fibres yield, and the mucous layer projects, covered only by the peritoneum, thus forming a mere elongated sac, filled with mucus, or more frequently with fæces. The orifices of these small sacs are surrounded by the hypertrophied circular and longitudinal fibres, and their contents remain almost shut off from the intestinal canal. These pouches are the result of constipation, the muscular fibres become hypertrophied, and their efforts to propel onward the contents of the canal lead to these hernial protrusions.

I have most frequently observed pouches in connexion with the sigmoid flexure; but they, probably, occur at any part where the longitudinal fibres form a triple band rather than an uniform layer. In one case they were situated about every half inch, forming a double row on each side of the colon. No muscular fibres could be detected in several of them, beyond the immediate vicinity of the mouth of the sac; they consist merely of mucous membrane, submucous tissue, with fat and peritoneum. They have latterly been observed in the smaller intestine where they usually occur at the mesenteric attachment of the bowel. These pouches do not appear to produce any symptom, nor do they lead to dangerous results. A remarkable case of this kind I observed in a patient, aged sixty-two, who died from cancerous disease of the liver and lungs, with bronchitis and emphysema. The sigmoid flexure and rectum were contracted, and presented numerous pouches, some of which were half an inch in length; they were arranged in two rows about one inch apart; these pouches consisted of mucous membrane and peritoneum; the circular muscular fibres were placed between them, and the longitudinal fibres on either side, and both of these fibres were hypertrophied. The pouches were filled with mucus and fæces. There was neither ulceration nor evidence of cicatrix, but it appeared that the constipated bowels, to which the patient had been subject, had led to unequal pressure and saccular distension, or herniæ of the mucous membrane. Appearances of this kind, though in less degree, are by no means uncommon in the colon, especially towards its termination.

Continued distension of the colon with solid contents alters its position; this is especially observed in the transverse colon, and in the sigmoid flexure; the convexity of the former becomes greatly increased, and the double curve of the latter is rendered more evident. The attachment of the great omentum, and the ready separability of its layers, appear to be especially designed to allow of free distension of the transverse colon, but a continued pressure increases the curve, till at last it may form a large sigmoid flexure, reaching nearly to the brim of the pelvis. Increased curvature of the transverse colon is of common occurrence, but

sometimes its malposition seems to be congenital; thus we have seen the descending colon passing downwards in close contact with the ascending, and then terminating in a transverse colon, which was situated at the brim of the pelvis, thus connecting the descending colon with the sigmoid flexure.

The most important result arising from continued constipation is the retention within the blood, or the reabsorption into it of materials which are essentially excrementitious. The excrementitious portion of the bile is not removed, and the functions of the liver are imperfectly performed; the blood of the whole portal system is rendered more or less impure; the complexion becomes changed, sallow and muddy; the brain does not act with its wonted energy, and there is a manifest diminution in the elasticity of both the mind and body.

The functions of other viscera become disordered, and the enlarged and distended colon interferes mechanically with the healthy action of adjoining viscera. The cæcum and ascending colon may press injuriously upon the ilio-hypogastric and genito-crural nerves, leading to severe neuralgic pain over the crest of the ilium or groin; and pain of this kind may be mistaken for rheumatism, lumbago, and sciatica, whilst it entirely disappears when mechanical pressure on the nerves has been removed. This pressure is, however, more frequently exerted on the left side by the sigmoid flexure than by the cæcum on the right; the veins of the lower extremity and the testicle or ovary may become pressed upon, and œdema of the feet and varicose veins result; by the distended transverse colon the stomach is interfered with, and its movements are to a certain extent crippled.

In reference to the *causes* of constipation, the *first* to be mentioned is original peculiarity of habit, or idiosyncrasy; that such peculiarity does exist cannot, I think, be doubted, although it must not be considered as disease in the same light as constipation arising from organic change.

A *second* cause is an abnormal condition of the abdominal walls. The contraction of the parietal muscles is an important aid in defecation, and their tonic contraction assists the peristaltic action of the intestines. The constipated condition

of the bowels in diseased and fractured spine may be explained in part by this cause, namely, paralysis of the parietal muscles. Diminution of contractile power also arises from degeneration of the muscles themselves, and from excessive development of fat; and sometimes the contraction of these muscles is checked by pain, either of a neuralgic character, or from local inflammation, as boils, fascial abscess, carbuncle, &c. Inactivity, or sedentary life, tends to produce constipation in the same manner. How different the condition, when many hours are spent day after day in nearly the same position, from that of active muscular exertion? Contrast the mechanic, where the whole frame is in constant movement, with the overworked sempstress; the clerk, sitting for hours over the desk, with one engaged in active out-door occupation; the professional or literary man, almost deprived of walking exercise, to another in the full enjoyment of it. The muscular exertion of walking, horse-riding, various athletic exercises, or other means by which the muscles of the abdominal walls are brought into play, are thus essentially necessary for maintaining good health.

A *third* cause of constipation arises from the alteration of the secretions poured into the large intestine. These secretions, or rather excretions, arise from the mucous membrane of the large intestine itself, from the small intestine, from the liver, and from the pancreas, and they undergo various changes; thus a congested condition of the liver and of the portal system of veins, induces modification of the whole chylopoietic viscera, for the vena portæ receives its branches from the large and small intestines, stomach, &c.; hence also a state of congestion of the liver not only checks the formation of bile, but it interferes with normal secretions from other parts, often diminishing them in quantity, and altering them in quality; in this manner we have constipation from hepatic disturbance, and from the intemperate use of alcoholic liquors; thus also in jaundice, constipation is generally the result, the motions become clayey, white and exceedingly offensive.

Diseases of the lungs and heart, which interfere with the free circulation of the blood, render the right side of the heart engorged; and as a necessary consequence of this dis-

tension, the liver and the whole portal system are congested, the secretion from the mucous membrane becomes scanty, and constipation is the result. This constipation increases the original disease of the heart; and the remark is often made by those who are the subjects of chronic disease of the lungs and heart, as chronic bronchitis, emphysema, asthma, and valvular disease of the heart, that as soon as the bowels become confined, they experience increased discomfort.

A state which may be called chronic catarrh of the mucous membrane is sometimes induced from this congestion of the portal system, and constipation very frequently follows; but another cause of this altered secretion arises almost from an opposite cause, namely, a diminished supply of blood to the mucous membrane. The secretion is scanty, but from a different reason; in the former case, secretion is checked by engorgement of the vessels with blood; in the latter, by a diminished supply.

The various excretory organs are closely connected the one with the other. The excretions from the lungs, the skin, the kidneys, the alimentary canal, are intimately associated. Their nicely adjusted balance continues during health, but if one becomes greatly in excess, the others consequently, and almost in that proportion, suffer; thus excessive secretion from the skin diminishes secretion from other parts. The box of rhubarb pills is often carried by the pedestrian—and why? The muscular exercise and action of the abdominal muscles should induce increased action; and such would in many cases happen if the exercise were moderate; but if persisted in so as to induce free perspiration, with rapid molecular changes in the muscles, blood is actually withdrawn from the alimentary canal to the skin and muscles; the internal secretions become diminished, and constipation results. A similar condition is observed when excessive action of the kidneys carries off the aqueous portion of the blood too freely. The kidneys act less when the skin energetically performs its function; and on the contrary, when the warm air of summer is suddenly changed to a cold, chilly temperature, the action of the skin is checked, and increased renal secretion is induced. We have already alluded to this in our remarks on diarrhœa and dysentery; for the sudden inter-

ference with the action of the skin often induces those diseases; hence autumnal diarrhœa, and the severe dysenteries of hot climates. Cerebral congestion, over-anxiety of mind, extreme mental occupation, act also in this manner, as well as more directly upon the nervous condition of the alimentary canal. There is increased circulation of blood in the brain, and less in the abdomen; for great excitement of the cerebrum is associated with diminished activity in the nerve of organic life.

Constipation is also induced by *general* anæmia, and loss of blood; and very frequently in spanæmia or poverty of blood, as in the chlorosis of young women. The condition of the blood is here the primary cause of other secondary changes. There is inactivity or irregular muscular exertion, and the secretions are imperfect both in their character and quantity.

A *fourth* cause of constipation is a diseased state of the coats of the intestine itself. I have already alluded to the secretion from the mucous membrane, and especially refer here to the condition of the muscular layer, and to the nervous supply of the alimentary canal.

The muscular layer, in a state of health, contracts from slight direct stimulus upon the contents of the canal, but this contractile power is liable to various modifications; sometimes it is excessive, leading to the immediate expulsion of the contents, but more frequently it is deficient, leading to constipation. This inactivity may arise from the muscular coat having been unwisely excited to action by improper means—as by the injudicious use of purgatives, either from their habitual continuance or from their powerful character; and the muscular coat is left in such a state that it will not contract from the normal stimulus, whilst the diminution of contractile power is increased by the constipation with which it is associated. The intestine becomes distended, the calibre increases, and the muscular fibre, which could easily propel the contents of a cylinder one to two inches in diameter, is unable to do so when the cylinder is increased to three or four inches in diameter, and the canal many times its normal size. A state of actual paralysis of the muscular fibre of the intestine may be thus induced; in the same manner as the urinary

bladder, when enormously distended, is unable to expel its contents. Repeated doses of blue pill and black draught, of violent purgative medicines, of mercurials, &c., render the whole coat of the intestine in a relaxed and enfeebled condition; the mucous membrane is debilitated, the muscular fibre is inactive, and partially paralysed. I do not mean for a moment, that such remedies are not frequently attended with marked relief to existing morbid conditions; but, the continued use of them leads to chronic disease, which is perpetuated, as well as induced by the remedy itself, although in some cases this is borne with apparent impunity.

Dr. Billing related to me an instance of a lady, who for thirty years took a grain of calomel every night; and a colleague of his own at the London Hospital for more than thirty years had taken the same quantity daily after dinner.

It is, I believe, universally acknowledged that the long continued habit of taking snuff irritates the fauces and epiglottis, producing cough, &c. Nor is dyspepsia the only further ill effect of this habit; the irritating particles extend along the whole length of the alimentary canal. Several inveterate snuff-takers have complained to me of the irritable state of the bowels; and it appeared that the mucous membrane was unnaturally stimulated and irritable. The oft-repeated stimulus leads to an enfeebled condition of the mucous membrane, to a loss of contractile power, as well as of healthy secretion and of nervous stimulus; as regards the stomach, dyspepsia is the result; in the intestine, it leads to diarrhœa or constipation; in some cases the rectum is principally affected, and either the fæces are retained so as to form an impacted mass, which the bowel is unable to propel; or, if the excreta be fluid, the same weakness allows the contents to pass rapidly to the sphincter, which is itself so enfeebled as to be unable to restrain an involuntary discharge. Snuff may actually be seen among these excreta.

Drinking excessively of cold water induces an enfeebled, relaxed condition of the mucous membrane of the alimentary canal.

Cicatrices of the mucous membrane after ulceration, as in dysentery, lead to contraction and diminution of the canal; they cause mechanical obstruction, and interfere with

regular peristaltic action. Tumours, or any growths pressing upon either small or large intestine, may induce constipation in a similar manner; but we defer entering into the causes of *insuperable* constipation, arising from cicatrices, till we speak of ileus. With these cases also we shall consider other more serious causes of constipation, namely, cancerous and fibroid growths, tumours connected with the intestine, or pressing upon it, and the various forms of internal strangulation and intussusception, &c.

In speaking of constipation arising from diminished secretion, we have alluded to cerebral disease, and cerebral congestion, from over anxiety and mental work. Various causes often co-operate in these instances; a sedentary life and diminished muscular exertion, are associated with changes in the secretions and with diminution of contractile power of the intestine. In many diseases of the brain, the abdomen becomes collapsed, as if the healthy tone of the parts was lost.

In diseases or injuries of the spinal cord, this relation between the nervous system and the alimentary canal is still more evident; the bowels are constipated, and action is often induced with difficulty; not only from paralysis of the parietal muscles, but from diminution of the contractile power of the intestinal muscular layer, as well as from change in the secretions of the mucous membrane. The paralysis is painfully shown in these cases by the want of control over the sphincter muscle; for the motions escape involuntarily.

In advanced life the feeble contraction of the parietes, the diminished excitability of the intestinal muscular coat, and the necessarily less active life, often produce constipation, which is increased by the nervous alarm of the patient at the non-action of the bowels.

Constipation is also a sign of inflammation of the peritoneal investment of the intestines; the muscular coat becomes involved, and ceases to contract with energy. This is a wise and beneficent provision, to which we have already referred.

Constipation also is induced when defæcation is painful, as in inflamed hæmorrhoids, in ulceration of the rectum, and in diseases of adjoining parts. So severe in the pain is some

cases, that action of the bowels is prevented by the sufferer, who is unwilling to undergo, or rather is desirous to postpone to the latest period, that which produces such intense suffering. It is a merciful provision that in health such necessary actions are free from pain.

It sometimes happens that a spasmodic constriction of the alimentary canal, especially the rectum, induces constipation; in most cases, however, it will be found that there is associated with this spasmodic contraction some direct cause of irritation at the part, as a minute fissure or ulceration of the mucous membrane, disease of the bladder or uterus, &c.

A *fifth* cause of constipation may be the state of the *contents* of the large intestine. The fæces having become hard and impacted, remain like a foreign body, and are only removed with considerable difficulty. The character of the food may have been such as to induce this impaction; for many cases are recorded of substances which have been taken habitually, as brown coarse bread, leaving the undigested parts to become agglutinated; so also with calcined magnesia, taken medicinally day after day; undigested meat, ligamentous tissues, arteries, fish bones, human hair, may form these concrete masses; and amongst lunatics stones and pebbles which have been swallowed may thus become impacted.

It is in the lower part of the large intestine that fæces generally become thus hardened; although it sometimes takes place to a less degree in the cæcum, and in the ascending and transverse colon.

Sixthly.—Mechanical obstructions have been cursorily alluded to in reference to tumours, as affecting the coats of the intestine; and it is of very common occurrence in pregnancy and ovarian growths, to find that direct pressure is exerted upon one or other part of the colon, so as to interfere with regular and free action of the bowels.

Symptoms.—Constipation manifests its effects on the brain by inducing torpor of the mind with diminished energy and activity; the sleep is disturbed, and not refreshing, the mind easily agitated, and often melancholic. There is also a general *malaise,* which renders the patient unwilling to undergo ordinary exertion and fatigue; pain in the head, sometimes at the forehead, at other times in the occipital

region, is often present; and when diseased arteries of the brain, or other predisposing causes of disturbed cerebral circulation exist, there is not unfrequently vertigo, with disturbed vision, haziness, sparks before the eyes, muscæ volitantes, ringing noise in the ears (tinnitus aurium); and occasionally there is momentary loss of consciousness.

When disease of the heart exists marked symptoms of disturbance in the circulatory organs are sometimes produced; the most frequent, perhaps is irregularity of the pulse, and uncomfortable palpitation of the heart; and the pulse is generally compressible. As to the respiratory organs, dyspnœa is not unfrequently induced by the impediment to free action of the diaphragm. Pain, especially across the sternum, is often ascribed to the chest, whilst it really arises from distended colon.

The abdomen is full, and sometimes masses of a round and hard character can be felt in the course of the colon, simulating morbid growths, which, when perceived, cause alarm to the patient; this state of partial impaction may exist, although there is daily action from the bowels, a central channel being left, or fluid fæces pass around the obstruction; the tongue is flaccid and indented by the teeth, shewing an atonic state of the muscular fibre.

Various neuralgic pains are often induced, from direct pressure upon the nerves, sometimes in the right hypochondriac regions; frequently over the crest of the ilium in the course of the ilio-hypogastric nerve, and in the course of the genito-crural, to the groin and the testicle.

Aching pain in the loins and in the lower extremities arises from interference with the free return of blood; and beside this symptom, a varicose condition of the veins is induced or aggravated; and consequent œdema is produced. A similar condition of the hæmorrhoidal veins is also the result of habitual constipation; and all the discomfort attendant on hæmorrhoids follows. Irritation of the adjoining pelvic organs is sometimes excited, as irritability of the bladder.

It has been stated, that a distended transverse colon may exert pressure on the duodenum, so as to lead to symptoms of dyspepsia; such an effect is exceedingly doubtful, but when adhesions have taken place between the first portion of

the duodenum and the colon, great distension of the latter then exerts pressure; generally, however, these symptoms are due to the imperfect separation of excreta, and to congestion of the portal system.

Diagnosis.—The diagnosis of constipation may be considered as generally sufficiently clear, but the various secondary symptoms may lead to serious misapprehensions. As to impacted fæces in the course of the colon, they have very often been mistaken for tumours; but their local character, mobility, and general symptoms serve to distinguish them. This discrimination is more easy in the ascending or transverse colon; but in the descending colon, and especially in the sigmoid flexure, the diagnosis is more difficult. Cancerous obstruction at the sigmoid flexure is very insidious, and gradual constipation is its principal symptom; but local pain, and a small, firm, hard tumour at that part are very diagnostic of an obstruction of this kind. Impacted fæces, however, in the rectum and sigmoid flexure, sometimes become so firm and immovable, that the symptoms may closely resemble organic disease; weeks may be passed without an evacuation, and gradually severe symptoms result, as vomiting, and occasionally extreme pain. A careful examination will, in most cases, render the diagnosis easy, and the patient perseverance in injections and mild aperient remedies will be effective: we do not find in simple impaction of fæces that the stomach becomes so irritable as in organic strangulation. A hardened mass in the rectum produces the repeated discharge of fluid fæces or of a clear mucus, which is often mistaken for diarrhœa; and whenever these symptoms occur, it is most important to make a digital examination.

A case is recorded by Mr. Staniland,* of a patient, æt. 73, who had habitual constipation, so that, during the last five years of her life the bowels were only acted upon once in every two months; after being confined for four months and eight days they were very freely acted upon; seven months then elapsed without any pain or evacuation. Some weeks before death she had a fall, which produced very severe pain in the region of the cæcum, and led to local inflammation, gangrene, and fæcal extravasation into the peritoneum. The

* 'Medical Gazette,' p. 246. 1832-1833.

intestines were found enormously distended with fæces, the transverse colon was nine inches in diameter, and the sigmoid flexure ten and a half; the rectum six inches. A remarkable instance of constipation of nearly four months' duration, after fever, is recorded by Mr. Gay, in the 'Pathological Transactions' of 1854. The patient, æt. 6, recovered.

The *treatment* of constipation is a subject of great interest, because it is one which so frequently tests the skill of the practitioner. A knowledge of the habits and diet is essential to us in divising means of cure; thus regular exercise, when the life has been sedentary, and especially walking or horse exercise, is of paramount importance. It is true that the beneficial effect of pure air may be otherwise obtained, but not all its good effects; for carriage exercise is not alone sufficient. The practice of riding in many of the crowded conveyances which hurry to the city day by day, becoming wearied by standing, or quietly sitting at the desk, and when exhausted returning home in a close omnibus, or railway carriage, is sufficient to induce discomforts of a hundred kinds, without the addition of the anxieties of life; and this mode of life in a greater or less degree is everywhere observed. An actual distaste for or aversion to walking may be easily acquired, and the beneficial effect of such exercise is forgotten.

It is very desirable to promote constant regularity in the action of the bowels; with many persons, an early movement before or after breakfast, removes discomfort for the rest of the day; with others, though less desirable, the time immediately before going to bed is chosen.

The character of the food is an important consideration; sometimes injury is done by taking more than the frame requires, and the stomach can digest; or by too great sameness in the diet, for variety is required; not that at each meal numerous forms of food should be taken and satiety induced by the niceties of the culinary art; but, an admixture of animal and vegetable food is necessary, and a change in them is requisite.

Vegetable food contains a large quantity of indigestible material and of alkaline salts which stimulate the alimentary canal, so that when there is a tendency to constipation, a free

use of this form of diet may be sufficient to remove it; thus, brown bread acts by the irritating character of the indigestible parts of the grain. Again, gentle palpation of the abdomen, kneading of the parietes with the palms of the hands, has sometimes induced action. The bracing tonic effect of a shower-bath, or in a less degree of cold sponging, when it is not contra-indicated, may obviate constipation. These means produce their effect by the increased action of the abdominal muscles; but another agent acts in a similar manner, namely, *electricity*. A galvanic current transmitted through the abdominal walls induces a very speedy action, or rather emptying of the colon; it has been sometimes recommended in the constipation of painter's colic. I have used it with manifest advantage in paralysis. A case of partial paraplegia, in which injections did not act satisfactorily, and drastic purgatives were undesirable, was treated by a galvanic current passed through the abdomen every morning; in a few hours a free evacuation was produced without any discomfort. This agent, which has been employed to excite contraction of the uterus, may be frequently used with benefit in constipation.

Medicines, directly purgative, may be divided into several classes:—those which are—

1. *Laxatives* — Manna, figs, prunes, raisins, fruits, brown bread, cold water.

2. *Aperients*—Castor oil, almond oil, cod-liver oil.

3. *Saline purgatives*, as magnesia, sulphate of soda, and of potash, saline waters, bitartrate of potash, &c.

4. *Mild purgatives*—Senna, rhubarb, aloes, mercurial medicines.

5. *Drastic purgatives*—Jalap, colocynth, gamboge, scammony, turpentine, croton oil, elaterium.

Inspissated bile has been used as an aperient, from the idea that the excrementitious portion of bile is naturally purgative in its action; but although ten or fifteen grains may act as an aperient, and assist in unloading the intestine, it is an offensive and less satisfactory remedy than others which we possess. These remedies act on different portions of the intestine and in various ways; thus mercurial purgatives stimulate all the secretions, both those of the liver* and of the mucous mem-

* The results obtained by the Committee of the British Medical Association

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brane; senna, and saline purgatives act on the small intestine, and render the evacuations more fluid; aloes, and the drastic purgatives act on the colon; rhubarb has an astringent as well as purgative effect, and sometimes irritates and offends the stomach. Some aperients stimulate the intestine to increased peristaltic action and excite griping pain. The action of the salines is partly due to exosmotic current from the capillaries of the intestine, thus leading to the effusion of fluid in a greater extent into the canal than is absorbed from it.

The rapidity of the action of aperients is also very diverse. The salines act quickly, especially if given with a considerable quantity of diluent fluid. Aloes is slow in its action, and requires several hours to produce any effect. Drastic purgatives are often followed by much trying irritation in the rectum, and by tenesmus.

Strychnia, or nux vomica, is a valuable remedy in constipation; it excites the muscular coat to contraction, at the same time that a tonic effect is produced on the mucous membrane. It is well to combine with it purgatives and sedatives, as aloes, and henbane, &c. Preparations of steel often act as purgatives in the same manner.

Podophyllin, from the *Podophyllum peltatum*, the May apple or mandrake, has been long used in the United States; in doses of gr. $\frac{1}{4}$—j, it acts as a mild purgative, producing an evacuation from the bowels slowly, but efficiently and often without pain. I have observed it act thus favorably in chronic ulcer of the stomach; in large doses it produces violent vomiting and purging; thus in an instance in which a nurse, contrary to directions, gave seven to ten grains, severe colic, vomiting and dysenteric diarrhœa followed, but subsided in a few days. The tincture of podophyllin, gr. j, with ʒj of rectified spirit, is a convenient mode of administering this purgative.

The use of glysters is too frequently neglected in ordinary constipation; but, their beneficial effect is now more generally acknowledged; some act simply by irritating and distending the intestine, thus exciting it to contract; as warm water and gruel; purgative substances may be added, as soap, castor-oil,

appear, however, to show that mercurial medicines do not increase the actual flow of bile in the lower animals.

colocynth, turpentine, and rue; the last two are especially used when constipation is associated with flatulent distension of the intestines. The excessive use of glysters even of the mildest kind, as water and gruel, and especially when they are administered in large quantities, induces distension of the rectum, and an unreadiness to act without the wonted stimulus.

I cannot leave the subject of the use of purgatives in ordinary constipation, without speaking of the injurious effect of their indiscriminate and injudicious use; to some the use of a dinner pill or an aperient at night, is constant, year after year; in others a slight discomfort leads to the use of the blue pill or black draught, or to still more active agents. Temporary relief is afforded by powerful purgatives, but the delicate mucous membrane of the intestinal tract is weakened, a state of chronic catarrh is induced, and the very condition sought to be removed is aggravated tenfold. In enfeebled persons, violent purgative medicine has in very many cases induced excessive prostration, and even fatal results; and, in them, it is easy to excite a state of irritation which it is almost impossible to subdue.

The administration of vegetable tonics, with mild purgative medicines, and with ammonia, is often of great utility; a valuable preparation of this kind is the compound gentian mixture of the London Pharm.; it contains senna, gentian, orange and lemon peel, ginger and tincture of cardamoms. The combination of aloes and myrrh is a preparation of a somewhat similar kind, the tonic effect of the myrrh is associated with the purgative of the aloes. Purgative medicines sometimes act more beneficially in combination; as slight mercurials, when the secretions of the liver are imperfect, with aloes, rhubarb and colocynth.

The addition of an anodyne or carminative, as hyoscyamus, Dover's powder, the essential oils, &c., with more active remedies, is beneficial in removing their irritating character, and in preventing the griping pain sometimes induced by them when given alone; thus the compound gamboge pill, and compound colocynth pill with henbane, act as efficient but tolerably mild purgatives, emptying the large intestine; or the purgative may be sheathed by mucilaginous and

oleaginous substances, as rhubarb with linseed oil. Belladonna will often act as a purgative when administered alone, as gr. $\frac{1}{4}$ of the extract; it appears to induce this action by lessening spasmodic irritation.

In infants, constipation is sometimes an exceedingly troublesome affection; the repetition of castor oil is trying, and even injurious; an old-fashioned remedy is that of exciting the intestine to contract by introducing a very small glyster pipe into the rectum, or a portion of soap cut into a conical shape; magnesia may be given in a tasteless form, the calcined, or citrate, &c., or sometimes a small quantity of gruel will excite the bowel to slight action; in any case, however, irritating medicine must be avoided. It is difficult to over-estimate the injurious effect in children of repeated doses of calomel, of jalap, &c.; muco-enteritis is induced, and sometimes fatal results follow; scammony with milk is a convenient remedy in some cases, but it must be used with caution.

In the *aged*, enfeebled either by a life of activity or by declining strength, the intestines lose their normal power of wonted contraction; to use drastic purgatives is out of the question, and a constant change of milder aperients is necessary. The mildest laxatives may suffice, as a draught of cold water, prunes, figs, roasted apples, brown bread, manna, the confection of senna, or the compound rhubarb pill, alone or with henbane, so the compound colocynth pill, and scammony pill with henbane and Dover's power, or a few grains of dried rhubarb with capsicum and soap, may be given with each principal meal; and to these, in some instances, very minute doses of strychnia are added, with considerable benefit. The ammoniated tincture of guaiacum is sometimes useful as a stimulant to the colon, or the powdered resin of guaiacum with the combined with the confection and syrup of senna, or may be confection of sulphur.

When the muscular coat of the rectum loses its contractile energy the contents sometimes become so impacted and hardened as subsequently to withstand the most powerful efforts at expulsion; purgatives, and even copious injections, are insufficient to soften the hard contents, and mechanical assistance has in not a few cases been required. Hard

masses may be retained in the colon and rectum even although there be repeated action of a fluid kind; for, laterally, fluid may pass, especially after purgative remedies, whilst scybala are still retained. In advanced life, in spinal disease, in constipation after powerful purgatives, this state is occasionally present, but it has in rare cases been witnessed in very early life. Warm copious injections, whilst enteric irritation is avoided, will suffice to relieve most of these impactions, but it is well to precede the soap or gruel injection with several ounces or even a pint of warm salad oil, if the obstruction be severe.

Concretions may form in the intestines from deposit upon extraneous substances, from impacted biliary calculi, but more frequently they consist of hardened fæces, or of the undigested portions of food and medicine, as from oatmeal, brown bread, &c. Dr. Harley, in an interesting communication on this subject to the Pathological Society, in 1859, records an instance of concretion consisting of starch, taken to relieve dysentery; another of benzoin, which had been taken to improve the voice, and had formed a concretion as large as a bean. Again, large quantities of magnesia have been found as a mass in the colon, and portions of string have become impacted in like manner.

Foreign bodies of considerable size sometimes pass through the whole intestinal canal without producing any injurious symptoms, as coins accidently swallowed, stones taken by maniacs; in other cases they are retained at the sphincter and require mechanical assistance in their removal, as fish-bones, &c., placed across the intestine.

In a remarkable instance in which a sailor swallowed clasp-knives, several were discharged from the bowels, and one was found fixed transversely in the rectum; the case is recorded by Dr Marcet, in the 'Medico-Chirurgical Transactions,' and the thickened stomach, with the fragments of the blades found on examination after death, are preserved in the Museum of Guys Hospital. The patient was an American sailor, aged 23, who, in June, 1799, swallowed four clasp-knives; three were discharged from the bowels. In March, 1805, he swallowed fourteen knives in two days; in December, 1805, he swallowed fifteen to twenty more; making thirty-five swallowed at dif-

ferent times. His health became impaired ; he vomited the handle of one, and passed portions of the blades of others ; and in March, 1809, he died in a state of extreme exhaustion. The œsophagus and stomach were dilated and thickened, and in the latter, there were numerous blades of knives partially dissolved. In the abdomen there was a general discoloration of the intestines ; one blade was found perforating the colon opposite the kidney, bnt without extravasation of fæces ; another blade was transversely fixed in the rectum.

CHAPTER XVI.

ORGANIC OBSTRUCTION.—INTERNAL STRANGULATION.—INTUSSUSCEPTION.—CARCINOMA OF INTESTINE.

Varied conditions, leading to insuperable constipation, have frequently been indiscriminately associated together, under the term ileus; and whilst we are willing to acknowledge, that very great difficulty is connected with the correct diagnosis of these cases, we believed that when a full history of the symptoms can be obtained, careful examination will enable us to divide them into several classes, and to make an approximate diagnosis, not only as to the character, but as to the position of the obstruction. Each minute circumstance is important in assisting the correct diagnosis of these cases, the accurate detail of previous symptoms, the mode of attack, the position of the pain, the vomiting, the relative severity and period of commencement of these symptoms, the state of the abdomen, the general appearance of the patient, the quantity of the urine, &c. Dr. Barlow has drawn attention to several of these conditions, and has shown the importance of ascertaining the period of the commencement of the vomiting* and the condition of the renal secretion.

Organic obstruction of the bowel may be conveniently divided into several classes.

1. Those cases in which the cause of the obstruction is *external to the bowel* comprising:

Bands of adhesion.
Diverticula.
Adherent appendix cæci.
Twists of the bowel or displacement.
External tumours and enlarged glands.

* 'Guy's Reports,' 1844. Clinical cases. Practice of Medicine.

Internal hernia :—

Diaphragmatic.
Meso-colic.
Omental.
Obturator.
Pelvic.

2. Those cases in which the cause of the obstruction is in the changed coats of the intestine.

Intussusception.
Polypoid growths.
Cancerous disease.
Cicatrices.
Contraction following inflammation or injury.
Peritonitis and enteritis.
Prolapsus ani.
Inflamed hæmorrhoids.

3. Those cases in which the obstruction is due to the contents of the bowel.

Concretions.
Foreign bodies, gall stones.
Impacted fæces.

In the consideration of the pathology of the first class of cases, those in which the *obstruction is external to the bowel*, we have first to notice the obstruction produced by *bands* of adhesion.

These bands are of various kinds, sometimes like a thin cord under which a coil of intestine may have passed or round which the intestine may have twisted ; at other times they are broad, and may be the cause of obstruction by having become perforated or by allowing the intestine to pass through them, but more frequently the obstruction is due to traction upon the band by distension of the part above. Thus, in an instance under my care, there was a broad band extending from nearly the whole of the ascending colon to the mesentery ; years had passed with only slight pain when the knee and thigh were strongly flexed, but when the cæcum became greatly distended after improper food, the traction upon the band led to complete and fatal obstruction. Bands are generally the result of inflammatory action, and may extend from one coil of the small intestine to another, from the small

to the large intestine, from the sigmoid flexure to the cæcum, from the small intestine to the pelvic viscera, as the uterus or ovary; again, a portion of adherent omentum may constitute the constricting band. The inflammation may have taken place during infantile or even during fœtal life, and it is always important to inquire minutely into the clinical history in these cases.

The part of the small intestine most frequently strangulated either by loops, bands, or adhesions, is the lower portion of the ileum; the colon is sometimes constricted by old inflammatory bands, but the sigmoid flexure is that part which we find most commonly diseased, and very frequently the disease there is of a cancerous character; sometimes the constriction is twofold, as in an instance under the care of Dr. Rees, in Guy's Hospital, in which a band constricted the upper part of the jejunum, and a second band the ileum.

The constricting medium may however arise from congenital malformation, and be produced by *diverticula*. During fœtal life the omphalo-mesenteric duct extends from the intestine to the umbilicus, and a portion of this duct may remain as a pouch passing from the ileum a few inches from its union with the cæcum. At the extremity of this pouch an adhesion of varying length may fix it either to the mesentery, to the umbilicus, or to a coil of intestine, and thus become a constricting band. Remains of this duct may be free from the ileum, but attached at the navel.

The *appendix cæci*, as we have before remarked, varies greatly in its position and in its length. It is sometimes several inches long and free, so that it may pass over a coil of intestine, and if inflammatory adhesion take place it may become a constricting band; we have known the lower part of the ileum completely bound down in this manner.

Twists of the bowel and *displacement* frequently become the cause of obstruction, and the intestine may be looped in a complicated manner. Rokitansky gives three forms of twisting of the intestine:—1, upon its own axis; 2, upon the mesentery; and 3, upon other coils of the intestine. The small intestine may easily become thus twisted, and the cæcum is sometimes so freely moveable that it may be twisted round into the left hypochondrium, as in a case recorded in this chapter. Again, the sigmoid flexure, especially in aged persons, where there

has been previous constipation, will bend upon itself, and fall over into the pelvis. The sigmoid flexure then forms an acute angle opposite to the brim of the pelvis, and the contents will not pass; the distension of the upper part of the bowel increases the obstruction.

The pressure of *enlarged glands* and of *abdominal tumours* is an occasional source of insuperable constipation. An ovarian tumour may exert considerable pressure on the bowel, but if a coil of intestine has becomefixed by inflammatory adhesion the obstruction may be rendered complete. It is more frequent to find that tumours which cause fatal obstruction are of a cancerous character; in a case under the care of one of my colleagues, numerous enlarged glands pressed upon the intestine and produced a double obstruction, one affecting the lower part of the intestine, and the other the duodenum, in which latter part the bowel passed between two enlarged glands which compressed it on either side.

By *internal hernia* we mean those forms of the disease in which the intestine does not protrude in the ordinary channels as through the umbilicus, the inguinal canal or the femoral ring, but in positions where it is either entirely hidden by the soft structures or concealed in the abdomen; thus hernia may take place through the diaphragm, but many of these cases are from direct violence and a fatal result at once ensues; the protrusion may be through the meso-colon, through the omentum or the mesentery; or again through the obturator foramen, the ischiatic notch, or through the recto-vaginal pouch, or lastly through the foramen of Winslow, or behind the peritoneum.

A *second division* is that in which there is change in the *coats of the intestine* itself. Such is the case in *intussusception;* and also in *cancerous disease* of the bowel whether of the large or small intestine; *Polypi* of varied form and size grow from the mucous membrane, especially in the rectum and sigmoid flexure; these growths sometimes induce intussusception, but they may themselves produce obstruction. The *cicatrices* which follow ulcerative action may cause occlusion, for not only is the bowel narrowed at that part, but spasmodic contraction may ensue and render the partial obstruction complete; in this way we have observed an ulcer in the small intestine

lead to fatal result. After dysentery the cicatrices are still more decided, and constipation even of an insuperable character may ensue; malignant deposit sometimes takes place at the seat of the cicatrix. The same kind of contraction may be induced by *previous inflammation* whether the result of injury or not.

In *peritonitis* and *enteritis*, the coats of the intestine are enfeebled by the inflammatory process; they are unable to contract and to propel onwards the contents, hence constipation that is *apparently* insuperable is the result; a greater mistake can scarcely be made than to administer purgatives in these cases, and to try and induce action from the bowels. In *procident conditions of the rectum, prolapsus ani*, and in *inflamed hæmorrhoids*, fatal constipation may sometimes result; the pain is so severe that the patient will not allow the bowels to act; and vomiting and extreme prostration may come on.

A *third* class includes those cases in which the obstruction arises from the *nature* of the contents of the bowel; we have already referred to concretions of various kinds, and to foreign bodies, stones, fish bones, portions of hair and string. It is not usual, however, for these substances to cause fatal obstruction, and, indeed, it is remarkable how foreign bodies will pass along the intestinal tract with comparatively little irritation, such as coins of varied sizes, nails, pins, even small spoons &c.

Gall stones of very large size occasionally obstruct the bowel, we remember fatal obstruction from a gall stone impacted in the commencement of the jejunum, and in another case which we have recorded, the gall stone was gradually working its way onward to the colon, it had reached the lower part of the ileum, when death took place from hæmorrhage. There are many instances on record of this kind of obstruction. *Fæcal accumulation* rarely if ever causes fatal obstruction, though death may arise from the violent remedies employed, as from strong purgatives or as when the injections of very large quantities of fluid have been followed by fatal collapse.

When the obstruction is complete, the intestine above the part becomes distended, and when the disease is chronic, the muscular coat becomes hypertrophied. In chronic obstruc-

tion, especially in the lower part of the colon the distension becomes very great, and the colon attains an enormous size. The coats of the intestine at the seat of the stricture become greatly congested; there is intense venous repletion; the mucous membrane becomes purplish in colour, enteritis supervenes and afterwards ulceration. The inflammatory action extends to the peritoneum, so that it is very rare to find a case of fatal obstruction without peritonitis; sometimes merely a dry and congested state of the serous membrane exists, in others lymph is effused, and in many there is perforation. The perforation of the intestine is often observed at the seat of the constriction, and is most marked at its upper limit; but in diseased rectum and sigmoid flexure, it will be frequently found that perforation has taken place, not only at the constriction, but at the cæcum. The ulceration of the mucous membrane in these instances is also peculiar; it is somewhat similar to that presented by the skin which has been overstretched, and affected with erythematous inflammation and superficial ulceration. It is, in instances where the obstruction is primarily from the mucous membrane, as in cancerous growth, that peritonitis is most slowly developed. Where all the coats of the intestine are involved, as in many cases of internal strangulation, the vessels of the mesentery become also obstructed, œdema is produced, and in a short time gangrene follows.

In the records of the Guy's post-mortem room during twenty-three years, there have been nearly 8000 examinations (7934), and twenty-five instances of fatal obstruction by bands are described.

In 10 a peritoneal band extended from the mesentery to some other part.

In 5 there was an omental band.

„ 2 a band from the vermiform appendix.

„ 5 diverticula ilei.

„ 3 various; in one there was an arch from the mesentery; in a 2nd, the pedicle of an ovarian tumour; and in the 3rd, the neck of an internal hernial pouch formed the constricting medium.

From the whole number of *post mortems* just mentioned there were 114 cases of intestinal obstruction, including

strictures of various kinds; there were intussusceptions 17 times. Twisting or volvulus 8 times. Obstruction by bands 25 times. Adhesions and contractions 20 times.

The latter class included various conditions, such as chronic tubercular peritonitis twisting upon old adhesions, one case of obstruction some time after recovery from intussusception, and two other cases were from a malposition or malformation.

As regards the *symptoms* produced in these several conditions we find, that the instances of internal strangulation and acute obstruction of the bowels, from twisting or compression, differ from those produced by intussusception and from the more gradual disease due to cancerous growth, and we may take these *three* as examples of the several varieties we have just enumerated.

Abercrombie* describes cases of ileus in which no cause of strangulation nor obstruction was detected after death, and he believed them to arise from distension, or "simple derangement of action" of the intestine; thus he states, "that distension appears to constitute a morbid condition which may be fatal without passing into any farther state of disease;" and again, that "ileus does not appear to be necessarily connected with obstruction in any part of the canal; for we have seen it fatal without obstruction, and we have seen everything like obstruction entirely removed without relieving the symptoms." He mentions other instances in which adhesions had formed without sensible diminution of the calibre of the intestine, and which were followed by the symptoms of insuperable obstruction; in the former we believe that either enteritis was present, or the bowel was twisted; in the latter that spasmodic contraction rendered a partial impediment complete; and the author just mentioned writes, "I admit, however, that there may be irregular contractions of portions of the intestine, analogous to that to which the term spasm is usually applied, and that these may form the first step in that chain of derangements of the harmonious action of the canal which leads to an attack of ileus."

Internal strangulation.—The general symptoms of this condition are pain, gradually increasing distension of the

* Abercrombie on 'Diseases of the Stomach and Intestine.' Third edition.

abdomen, constipation, generally of an insuperable character, vomiting at first bilious, afterwards stercoraceous; and after a longer or shorter period peritonitis, prostration, and death.

Pain.—In many cases of internal strangulation there is a sudden catch in the bowels, as of some displacement, and the patient can place the hand on the exact part, which generally indicates the seat of disease, although we may afterwards find that distension and other causes have led to considerable alteration of its original position. When a portion of intestine has slipped under a band of adhesion, or into a hole of omentum or mesentery, this character of pain is observed, but when there has been a twist of the intestine the pain is generally more gradual in its development, and for many days may be entirely absent. The most obscure cases are those of internal strangulation, in which there has been chronic partial constriction, when from indiscretions in diet, or other causes, slight enteric irritation has led to spasmodic constriction at the part; in these cases the pain closely resembles ordinary colic. Tenderness of the abdomen may be absent for many days; in some instances the peritonitis does not come on till nearly the close of life, when it is due to a state of continued and extreme distension of the intestine, and to ulceration of the mucous membrane extending to the serous coat; but where there has been sudden strangulation, the serous membrane is more quickly implicated, and the symptoms bear a closer resemblance to those of ordinary external strangulated hernia. If the strangulation be in the small intestine, either near the cæcum, or in the jejunum, the pain will generally be found to be in the region of the umbilicus; where the colon is involved the position of the pain is in the course of that part of the intestine, and often marks its precise seat; thus, in diseases of the sigmoid flexure, the pain will generally be found in the left iliac fossa or in the left groin.

Peristaltic movements.—Tympanitis.—Unless the obstruction be very high in the alimentary canal, as in the case recorded with disease of the duodenum and of obstruction twenty inches from the pylorus, the abdomen gradually becomes distended, and tympanitic on percussion. The enlarged coils of intestine may be observed through the stretched parietes, and the peristaltic movements are often

clearly perceptible, especially in obstruction of the colon. If the ileum, or the commencement of the ascending colon be constricted, the distension is central in its character, and is less evident; but if the descending colon, sigmoid flexure, or rectum, then the portions of the large intestine above the seat of disease become greatly distended; they may be observed in the peculiar outline of the abdomen, and the tympanitic resonance extends to the *loins;* where, however, the obstruction arises from portions of twisted large intestine, as of the cæcum or sigmoid flexure, we find that there is some deviation from the general character just mentioned; an enormously distended cæcum may be twisted over to the left hypochondrium, and constitute a prominence in that region. It is, however, not to be considered that a constant rule is laid down, for a greatly distended small intestine may occupy the position of the transverse colon.

Vomiting.—The character of the vomiting, and the period at which it has commenced, especially when irritating and powerful purgative medicines have not been administered, are important guides to our diagnosis. If the obstruction be sudden, and be situated in the small intestine, the vomiting comes on very quickly, in from half an hour to two or three hours; if it be high in the jejunum, the vomited matters are of a bilious character, but if near to the cæcum they may assume a fæcal odour, and be completely stercoraceous. In one instance, in which the obstruction arose from a band of adhesion high up in the jejunum, the vomiting was so sudden as to resemble that produced by cerebral disease; and this view of the case was favoured by the partial insensibility of the patient. In the case recorded of twisted cæcum, where the obstruction was near the termination of the ileum, so fully fæcal was the character of the vomited fluid that it was for a time supposed that a communication existed between the stomach and the transverse colon. When the large intestine is the seat of disease, as in cancer of the sigmoid flexure, and of the rectum, &c., several days sometimes elapse before vomiting supervenes; the time is, however, much accelerated if powerful drastics are given. In the latter state, also, the vomiting is more easily checked by the administration of remedies, as of ice and opium. As to the

immediate cause of stercoraceous vomiting, Dr. Brinton, in his valuable remarks in the 'Encyclopædia of Anatomy,' has suggested that the peristaltic action is not in itself reversed, but that the contents of the bowel are propelled onwards in their normal manner till the obstruction is reached, when the fluid assumes a central retrograde direction, thus producing a double current, a parietal or onward, and a central or reverse current; this retrograde movement continues till the vomited matters are of the same character as those found at the seat of stricture. It would, however, seem, from the character of the ejection, that the intestinal tract is emptied in the order of its anatomical arrangement, first the stomach, then the duodenum, jejunum, and lastly the ileum. During the latter stage of the disease if the patient become insensible, regurgitation of the stercoraceous vomit sometimes takes place into the trachea and bronchi.

Hiccough is also more severe and more speedily produced in the strangulation of the small than of the large intestine. It must be borne in mind, that the vomiting and hiccough are sometimes extreme in peritonitis, especially where the serous membrane of the stomach is involved.

Urine.—Dr. Barlow has drawn especial attention to the amount of urine excreted, as a sign of the seat of obstruction; that where the obstruction is high in the canal, as in the jejunum or ileum, absorption is partially checked, the renal blood supply is thereby considerably diminished, and a small quantity of urine is excreted; if, on the contrary, the rectum or sigmoid flexure be occluded, nearly the whole of the capillaries of the alimentary canal are free to absorb fluid, and thus the blood contains more watery constituents, and the urine is abundant. This is a symptom deserving our attention, but it is not a certain one; several cases among those illustrative of disease of the sigmoid flexure had scanty urine among their earlier signs, and we shall find that the amount of urine is in inverse proportion to the quantity of fluid vomited; that if in obstructed colon powerful drastics have been administered, and speedy vomiting induced, or peritonitis quickly set up, the urine will be found to be small in quantity; if peritonitis take place the condition of the abdominal sympathetic may lead to cessation of secretion from the

kidney as well as from other glands. The fluid character of the contents generally observed in the distended intestine above the seat of stricture is to be remarked, and is an indication that no remedies are needed in these cases to render the fæces more watery, but that the spasmodic state of the diseased bowel, in addition to the mechanical impediment, is the immediate cause of the obstruction and often prevents a drop of fluid or any gas from passing the stricture.

State of the rectum.—Dr. Barlow has here also brought his diagnostic acumen to bear on the elucidation of the symptoms presented. He has shown that in intestinal obstruction suddenly produced, the rectum retains its naural power of contraction, and will be found to be empty; if the disease be of gradual formation, that it is more patulous and readily yields to injections. To a certain extent this is the case, but the symptom is one upon which we cannot rely. The intestine below the obstruction is generally contracted, though sometimes after the occurrence of the strangulation or other occlusion, a fæcal evacuation may take place, or be removed after injection from below the seat of stricture, thus giving a delusive hope of recovery, or misleading in diagnosis. Mr. Charles H. Moore has proposed the injection of fluid into the colon, as a means of enabling us to detect the position of the obstruction, the extent of the dulness on percussion in the loins being carefully noticed; and that in this way fluid may be forced into the ascending colon, and indicate that the disease is above that part.

The discharge of blood, or of offensive mucus, has been mentioned by Mr. Gorham* as a very frequent sign of intussusception; and it may be here remarked that it is important in all cases of this kind to make a careful manual examination of the rectum, as well as of all the parts in which hernia may occur. By this simple means impacted fæces, inflamed hæmorrhoids, cancer of the rectum, prolapsus ani, suppuration in the pelvis, each of which may lead to symptoms of insuperable constipation, may be diagnosed.

In internal strangulation there may be no excitement of pulse, nor any febrile disturbance; the patient may be free

* 'Guy's Hospital Reports.'

from distress, except that the abdomen is distended, and the bowels do not act; the mind may be perfectly clear, but there is generally some anxiety of expression; day after day may pass in this way, till prostration, with hiccough and peritonitis supervene. We often find that the bowels act when sphacelus of the strangulated intestine takes place; the friends of the patient suppose that the urgent symptom, constipation, being relieved, all will be well; the bowels may act copiously, but on examination the patient may be cold and nearly pulseless; he is in a dying state, although the mind is clear and perfectly conscious. The period at which a fatal result ensues is liable to great variation. In sudden strangulation of the small intestine we sometimes find that death takes place in five to seven days; whilst in other cases, especially in obstruction of the colon, several weeks may elapse, and the patient may remain free from pain and distress till about forty-eight hours before death. Cases, however, recover when the patient has been apparently in a hopeless state; the bowels act, the tympanitis subsides, and the strength soon returns; sometimes, however, after the development of favorable symptoms, a relapse takes place, and the obstruction leads to a fatal result.

Intussusception is that condition in which one portion of the intestine passes into another, as the finger of a glove drawn within itself. In this state there need not necessarily be entire obstruction, unless congestion, effusion, and inflammation close the canal completely. The section presents us with three layers of intestine; two mucous and two serous surfaces being opposed to each other, and in the centre are placed the ordinary mucous surfaces. It is said that there is sometimes a second involution of the intestine from below, passing in an opposite direction; or that the only involution may be from below upwards. The occurrence of such a condition must be very rare, and obstruction from it still more so. The mesentery attached to the involuted portion is also drawn in, and by its traction the central portion of intestine becomes somewhat curved laterally, and the opening of the most depending part is observed to be linear. The vessels of the portion of intestine thus incarcerated become engorged, and may render the obstruction complete; the whole of the

folds involved become swollen and deeply congested, and blood is extravasated into the substance of the mucous membrane, as well as into the mesentery; in a short time both the serous and the mucous surfaces become inflamed, and an effusion of lymph takes place; the opposed serous surfaces become adherent, and so to a less degree the mucous surfaces; bloody serum and mucus are effused into the canal, and this discharged per rectum is a diagnostic sign of intussusception. If life be prolonged, and the intussusception continue, the serous surfaces at the opening or upper part are rendered adherent; the contained intestine becomes gangrenous, and is often detached as a slough. In this way many inches of intestine may be discharged per rectum; in one instance as much as forty-four inches of large intestine were evacuated; in another, which terminated favorably, and the specimen of which is in the museum at Guy's, the whole of the cæcum and ascending colon were thus passed. If the adhesions be disturbed or broken down after the slough has separated, fæcal abscess may be the result. In some instances the intussusception is restored; more frequently, more and more intestine is forced in, symptoms of internal strangulation supervene, and death results from perforation into the peritoneum, or from peritonitis set up by the direct extension of disease from the strangulated part. It must not, however, be supposed that the passage is always occluded; such is sometimes not the case, and even diarrhœa may be produced. It would seem that the intestine may be thus incarcerated within another fold, without being strangulated. The case recorded by Dr. Hughes, in the Guy's Reports, was of this kind; so also those of Mr. Phillips in the 'Medical Gazette;' and still more remarkably a specimen exhibited by Mr. Hutchinson at the Pathological Society, in which the symptoms extended over seven months.

The position of intussusception may be solely in the small intestine, but more frequently a portion of ileum passes into the cæcum at the valve, the valve being pushed onward and forming the most dependent part; and lastly, the intussusception may consist only of one portion of colon within another; the cæcum and ascending colon may become so involuted as even to reach the rectum. It would appear

that in intussusception in the colon, constipation is less constant as a sign of disease.

According to the following tables from Dr. Brinton's Croonian Lectures, recorded in the 'Lancet,' 1859, it would seem that ileo-cæcal intussusception is the most frequent variety; this may be the case, if we exclude the numerous instances of intussusception which take place during the time the patient is in articulo mortis.

Intestinal Obstructions (excluding Hernia).

Frequency, 1 in 280 deaths (from 12,000 promiscuous necropsies).

Intussusception	43
External (bands, &c.)	32
Parietal (strictures, &c.)	17
Torsions	8
	100

Varieties, relative frequency per cent. (from 600 necropsies of obstruction).

Intussusception, varieties of, per cent.—

Ileo-cæcal	56
Ileac	28
Jejunal	4
Colic	12
	100

In nearly 8000 post-mortem records at Guy's Hospital, there are 17 cases of fatal invagination. Ileo-cæcal 10, ileac 5, rectal 2, one of these due to villous growth.

The number of intussuscepted portions also varies much, being sometimes single, but in young persons, and especially infants, it is exceedingly common to find numerous parts so affected, from six to twelve, or even more. Some of these, however, are probably produced immediately before death; there is absence of all symptoms of strangulation, and in the intestine itself neither congestion, effusion, nor ulceration exist; they are most frequently observed in inflammatory disease of the brain, and hydrocephalus.

The *symptoms* of intussusception are those of colic with constipation; sudden local pain is produced in the bowels, followed by vomiting, constipation, prostration, haggard expression of countenance, failing pulse, distension of the abdomen, stercoraceous vomiting, peritonitis, and

death. It is exceedingly difficult to distinguish this condition from ileus arising from internal strangulation and local enteritis; but after a time there may be discharge of blood and mucus from the involuted portion, which materially assists in forming a correct diagnosis. In intussusception, a firm mass may often be felt at the seat of pain, which is not the case in ordinary internal strangulation. In in tussusception of the small intestine the tumour may be central, whilst in ileo-colic and colic involution the mass will be in the course and position of the colon. The sudden onset of the pain, its subsidence and paroxysmal aggravation are indications of this form of obstruction. It has been before mentioned that diarrhœa sometimes supervenes, especially where the large intestine is affected; and it is occasionally noticed where the disease is of a chronic character. In seeking to arrive at a correct diagnosis, it is well always to examine the rectum.

The *cause* of this abnormal involution appears to be sudden and spasmodic contraction of a portion of intestine, impelled onwards into a part which is less contracted or altogether flaccid. It occurs at all periods of life, but it is much more frequent in youth and infancy.

The *prognosis*, although very unfavorable when we have well-marked indications of the existence of intussusception, is not without hope, and we have seen almost hopeless cases recover. In some the intestine is restored to its normal state; in others, the strangulated bowel sloughs off, the canal becomes free, and the divided intestine unites.

Cancerous Disease of the Intestine.—Cancer of the stomach is a disease of frequent occurrence; but cancer is more rare in other portions of the alimentary canal. We have already described instances of it as affecting the duodenum and the cæcum, and other portions of the small intestine and of the colon are occasionally thus diseased; still the rectum and the sigmoid flexure of the colon are the parts of the intestine most frequently affected, and it is to the latter, that we direct especial attention as a seat of obstruction.

The termination of the sigmoid flexure appears to be particularly prone to this form of disease, and many of those cases which are described as cancer of the upper third of the rectum

are at this part, and have been pushed down into the pelvis by the obstruction produced. It is a peculiar form of disease that we find thus developed; not the extensive deposit with glandular infiltration, though this is sometimes the case, but a modification of scirrhus. There is a growth from the mucous membrane, the muscular fibre is infiltrated and contracted, and the calibre of the intestine is diminished. The glands are frequently not at all affected, and in this respect it closely resembles epithelial cancer. The constriction of and growth in the intestine are sometimes circular, sometimes one side is much more affected than the other. On examining the condensed part we find fibrous tissue, and some elongated nuclei; but the growth from the mucous membrane presents more of the elements of cancer. These, however, are not like the ordinary epithelial cancer elements, but many of the cells are large columnar epithelium, with a large nucleus, the growth being modified on account of its situation on a columnar epithelial surface, an instance of the differentiation of abnormal growth.

Medullary and colloid cancer sometimes affect this part, so also lymphoma and adenoma, but their course is different from that of scirrhous disease. In medullary cancer the ulcerative process extends through the coats of the intestine more rapidly, and instead of intestinal obstruction we have fæcal abscess, either in the iliac fossa, or within the abdominal cavity itself, or a communication may take place with the bladder. In the rectum similar forms of disease are presented, which occur in its several parts: and scirrhus of this part leads to contraction, thickening of the external tissues, and obstruction of the intestinal canal. Medullary cancer, on the contrary, causes ulceration and communication with the other pelvic viscera, with the vagina, bladder, or uterus, so that all the viscera become matted together into one mass. The rectum also frequently becomes involved, by the extension of disease from the uterus and vagina, leading to terrible manifestations of disease and suffering. Epithelial growths of a cancerous character arise from the mucous membrane of the rectum, as well as from the sigmoid flexure, and they lead slowly to obstruction or to exhausting diarrhœa.

Where the coats of the intestine are thus diseased, the in-

testine above the stricture becomes gradually distended, the mucous coat is thickened, and the muscular hypertrophied, so as to be in some cases a quarter of an inch in thickness. The extent of these changes varies much, and in chronic and slowly progressive disease they are more manifest. The distension of the intestine also produces inflammation and ulceration of the mucous membrane above the stricture, and it leads in many cases to perforation; this condition of ulcerative erosion is sometimes very extensive, at a considerable distance from the seat of obstruction; thus we find perforation of the cæcum taking place in obstruction of the sigmoid flexure.

Cancerous disease of the ascending or transverse colon takes place more rarely, and appears to be produced by some local exciting cause, as the cicatrix of an ulcer, or by a blow; still it is far from infrequent. In a case of colloid cancer of the stomach we observed a similar state of the ascending colon, but in a less advanced condition.

Mr. Birkett, in the 'Pathological Transactions,' has recorded a remarkable case of vascular villous growth from the colon near the liver; the growth was covered with epithelium, and its cancerous character was very doubtful. It was taken from a man, aged fifty-eight, who a year before his death had had pain in the abdomen and diarrhœa. Two months before admission into Guy's, he had had constipation and pain, and when brought to the hospital he had symptoms resembling strangulated hernia, with constipation of one week's duration; he had had a scrotal hernia, and the sac still remained. The cæcum could be seen distended, and so also the ascending colon, as far as the liver, where there was pain on pressure; the descending colon could not be felt. Mr. Birkett explored the hernial tumour, but no intestine was within it. The propriety of opening the ascending colon was discussed; but the patient died four days after admission. (See Prep. in Guy's Museum, 1854[65].) In another instance a blow on the hypochondrium was followed by a cancerous growth, which led to fæcal abscess and to perforation of the jejunum.

Carcinoma of the stomach sometimes extends to the transverse colon; such was the case in one of the instances we have recorded of disease of the stomach; but although there was fæcal eructation, no stercoraceous vomiting occurred.

Drs. Gairdner and Murchison have shown the important diagnostic indications of this symptom in communication between the stomach and intestine.* It is more common to find disease of the colon extending into the stomach than the reverse, namely, disease of the stomach into the colon.

The ileum and jejunum are very rarely affected with primary scirrhous and medullary cancer; they are sometimes involved in cancer of the mesenteric glands; but we have never observed insuperable obstruction thus produced.

During the last 16 years 45 cases of stricture of the intestine have occurred at Guy's, as shown by the post-mortem records :

General narrowing from disease of the peritoneum, extending into the coats of the bowel . .	2
Of the small intestine	1
„ cæcum and ascending colon . . .	2
„ hepatic flexure	3
„ transverse colon	2
„ splenic flexure	1
„ descending colon	4
„ sigmoid flexure	10
„ rectum	20
	45

Symptoms.—In scirrhous disease of the sigmoid flexure, if we possess a history of all the symptoms, the nature of the malady may often be correctly shown. There is slight pain, fixed in character, and remaining for a variable period, in the left iliac fossa, with constipation, or an irregular condition of the bowels: after one or two attacks of this kind, with several months or years between them, the constriction becomes narrowed to such an extent that a very slight increase renders it complete. The bowels again are confined, the patient feels uncomfortable from their loaded condition; the abdomen is gradually distended, vomiting comes on, and the symptoms of insuperable obstruction follow. The vomiting occurs much later than in obstruction of the small intestine, unless powerful drastic purgatives have been administered; the secretion of the urine continues free, and the patient may appear in comfortable health, except that the bowels have not acted. After ten or twelve days, however, if no evacuation ensue,

* 'Edinburgh Monthly Journal.'

the colon becomes much enlarged, its distended coils can be seen through the parietes, and there is tympanitis in both lumbar regions; the urgent peristaltic movements may be detected through the parietes; at last ulceration takes place above the seat of stricture, and leads to fatal peritonitis and extravasation, or peritonitis arises from the enormous distension, and the more general inflammation of the coats of the intestine. Sometimes, with judicious treatment, after symptoms of threatening peritonitis, the bowels are acted upon, and the patient is for a short time spared; even diarrhœa will occasionally supervene; the patient then continues much enfeebled, and after a few months sinks exhausted, or another attack of constipation terminates fatally.

The same symptoms of insuperable obstruction sometimes arise in medullary and colloid cancer; but, as before stated, they less frequently terminate in complete occlusion. The intestines become united together, ulceration extends through the coats, local peritonitis and fæcal abscess are the result, with severe pain and hectic fever; or the cancerous ulceration may extend into the iliac fossa and suppuration may burrow down beneath Poupart's ligament, as in disease of the cæcum, or the disease may form a communication with the bladder.

There is much less pain in cancerous disease of the sigmoid flexure than of the rectum, because the parts are more free, there is less pressure on the nerves, and the adjoining structures are less involved. If the *rectum* be affected, the constipation and difficulty of defecation is more constant; the pain produced is often intense, especially where the lower third is affected. The fæces become flattened; this may be the case when the sigmoid flexure is the part diseased, but it is less liable to occur, for the fæces can be retained for a sufficient period in the rectum to reassume their ordinary character. In the later stages of cancerous disease of the rectum, and in the fibro-cellular thickening and contraction of its coats, diarrhœa instead of constipation may occur; I have seen several such instances, and Nélaton refers to this liquid condition of fæces and their free separation as not unfrequent in syphilitic disease. Tactile examination may detect disease at the lower part of the rectum, but not at its upper third. The extension of disease to the bladder, vagina, and uterus,

leads to most distressing complications, and special symptoms are produced. In obstruction of the alimentary canal, as we have before said, the rectum should always be examined.

The symptoms of cancerous disease of the ascending or transverse colon are of the same kind as we have just described, but it is more easy to detect a hardness or tumour produced by the growth in the intestine. In many instances there is severe pain at the seat of the obstruction at an early stage, and this pain I have in several instances noticed as being produced as soon as fluids have been taken; diarrhœa is sometimes present, or it alternates with constipation. Again, we do not find that the transverse colon becomes distended and tympanitic across the abdomen; nor that there is the same resonance in the left lumbar region. These indications, however, must be used with great caution, because the distension of the small intestine may lead to the presence of enormous coils, which may easily be mistaken for an enlarged colon. The suggestion of Mr. Moore may be tried, namely, the injection of water into the colon and the examination of the amount of dulness produced. The intestine, however, in some cases, becomes so contracted below the seat of stricture, as not readily to yield to the injection of water, and we might be led to a very incorrect diagnosis if we trusted to this means alone.

In many patients who are affected with cancerous obstruction of the sigmoid flexure, there is but little emaciation or appearance of cancerous cachexia. They may be well nourished, and apparently in health; generally, however, there has been some indication of disease, as shown by troublesome constipation, an occasional fixed pain, and sometimes by a discharge of mucus from the rectum.

These forms of scirrhous cancerous disease rarely occur in early life; at that period it is more likely to be medullary or lymphadenomatous in character; but there are exceptional instances in this respect.

The position at which the sigmoid flexure becomes affected is at the brim of the pelvis, where it is more liable to temporary compression. It is also at that part where the triple longitudinal muscular band assumes a continuous character around the intestine.

Diagnosis.—In our remarks on internal strangulation, we have already pointed out the diagnostic value of many of the symptoms presented. The varied causes of obstruction must be also borne in mind; comprising not only the forms of internal strangulation, of intussusception, and of cancerous disease, but the presence of tumours, of enteritis or peritonitis, the impaction of fæces or of foreign bodies, tumours connected with the uterus or ovaries, and hæmorrhoidal tumours. In *intussusception* there is generally more pain resembling colic, there is the discharge of bloody mucus, and a tumour can frequently be felt at the affected part; and in not a few cases the involved bowel may be detected by examination per rectum. In *internal strangulation* the vomiting is more severe, the onset more sudden than in cancerous disease, and frequently something has been felt to have given way or slipped; there is a great resemblance to the symptoms of ordinary hernia; the small intestine is the part that is generally thus strangulated; and then, whilst the vomiting is more early and severe, the abdomen is less distended, and the course of the colon cannot be so easily traced. In *impacted fæces* alone, unless some foreign body be also present, the symptoms rarely, if ever, become so urgent, and are scarcely ever fatal. In speaking of constipation, we have quoted a case from the 'Medical Gazette,' where after seven months of fæcal obstruction, the patient had a fall, and peritonitis was produced; she had had attacks of constipation of two months' duration, for four years. In simple fæcal retention, after a whole month has elapsed, we may find very little discomfort, and the distension not extreme in degree. In *cancerous disease* of the sigmoid flexure, the gradual character of the obstruction, the seat of pain, the distension of the abdomen without tenderness, the abundance of urine, the late period at which vomiting occurs, are the principal signs; and many of these cases closely resemble simple fæcal impaction. In the one we shall probably find that injections per rectum will be effective, and after a time they will be followed by relief; in the other, the injection will in a short time be returned, only a small quantity can be thrown up, and no fæcal contents are evacuated.

The early tenderness of the abdomen distinguishes *enteritis,*

and *peritonitis* in most cases; and recto-vaginal examination serves to remove other sources of diagnostic difficulty.

Treatment.—If after the administration of mild aperient medicines, or even without their use, it has been ascertained with tolerable certainty, that constipation from one or other of the causes we have described exists, it is exceedingly unwise to employ active treatment. Purgatives of all kinds are better avoided, and the use of drastic measures will tend to aggravate the sufferings, to shorten life, and to remove the possible chances of recovery.

The administration of *opium* is now known to be attended with beneficial results, and frequently with partial, if not with permanent relief. By this means the peristaltic action is checked, spasmodic contraction diminished, and the opening which previously would not allow the passage of flatus, will suffer fluid fæces to escape. Solid opium may be given, as in the soap and opium pill. Some combine calomel with the opium, but we prefer opium alone, for the mercurial medicine increases depression; it probably hastens perforation, and extravasation is less likely to be limited by adhesion after its action.

Drastic purgatives, as colocynth, croton oil, scammony, mercurials, &c., stimulate and excite the intestine to greater contraction; vomiting of a stercoraceous character is set up more quickly or is increased, and ulceration or fatal peritonitis is speedily produced. Electricity, which is a valuable remedy in simple constipation, is here productive of injury to the patient.

If there be any indication of local peritonitis, leeches should be applied, and rest in the recumbent posture enjoined. The diet should be spare, and of a fluid, unirritating, and non-stimulating kind. If, however, we find great prostration, it is well to give brandy or wine, when they can be taken.

Enemata are of great value in removing fæcal concretions from the rectum, and below the seat of the stricture; and are sometimes followed by the discharge of flatus, affording great relief to the patient. In this way warm water, soap, castor oil, or turpentine injections may be used; and several ounces of simple olive or linseed oil thus thrown into the rectum sometimes afford considerable relief. Injections of this kind

are most effectually administered by means of an O'Beirne's long tube; care, however, must be used lest the extremity of the tube turn upon itself. The simple introduction of an enema tube, and its retention for a short time, may excite the lower bowel to contract, and cause the expulsion of flatus, thus relieving the painful distension. In some instances, it is well to use nutrient enemata, which may serve to prolong the exhausted powers of life for a short period. Great care is necessary in the use of the long tube; we have known perforation, abrasion of the intestine, and fatal peritonitis induced by it, and in one instance emphysema. The mucous membrane of the bowel is softened and the parts adherent; in the case in which emphysema was produced the patient passed the enema tube through an ulcer into the cellular tissue.

By the use of these means, when the patient is almost *in extremis*, an evacuation may be passed, and recovery take place. In some cases, after the continued use of opium, diarrhœa is produced, and may become so severe as to require remedial measures.

Change of position has in some instances appeared to produce benefit, and has been followed by recovery; but whilst this may sometimes occur, we have witnessed the injurious effect of moving the patient when the peritoneum is intensely congested, and perhaps inflamed from the great distension; death has in several instances quickly followed.

The application of cold water, of ice, or the exposure of the surface of the abdomen to the air, has been sometimes advantageously tried. In one of the cases which I have narrated, the patient said, whilst the abdomen was exposed, that he felt that something had slipped, and in a short time an abundant fæcal evacuation was passed, and recovery took place. In another case obstruction had gone on for many days, the mischief appeared to be in the small intestine, so that colotomy could not be performed, and a fatal result was anticipated, when the application of a bag of ice to the abdomen was followed by free action of the bowels. The patient, a woman of middle age, left the hospital comparatively well.

In the absence of relief by these means, the question of surgical interference becomes one of anxious consideration; after death from internal strangulation, the obstruction has

been found so simple in character, that with great facility it might have been divided, and perhaps the life saved. In several instances, Mr. Hilton attempted this mode of relief, with an amount of success which subsequent operators have confirmed; but it must be borne in mind, first, that the peritoneum is already inflamed, or in a state of intense congestion, and that general peritonitis is very likely to follow; secondly, that there is great difficulty in the diagnosis, and that some recover from apparently a dying condition. A very interesting communication on this subject was read at the Hunterian Society, by Mr. Hutchinson, to which we must refer, and to the papers of Mr. Hilton, in the Guy's Reports of 1852. The operation of opening the colon in the loin has in many cases prolonged life; it has been especially performed in cancerous disease of the rectum, to relieve either the obstruction or the severity of the pain, and in other cases, where we have indications of obstruction in the sigmoid flexure, it may be employed with much success. In the case recorded by Mr. Hilton, in the paper just referred to, the relief was exceedingly marked, and the life of the patient prolonged for several months; of late years numerous successful cases have been recorded by Curling, Bryant, Maunder, and others. In many instances I have witnessed the value of this operation; sometimes for the relief of ulceration of the colon extending into the bladder; in one, several years ago, the patient was reduced to extreme emaciation and distress from the presence of fæces in the bladder. Mr. Bryant opened the colon, the patient regained strength, and the opening in the loins is of only slight discomfort to him. In another case, cancerous disease of the bowel led to the same distressing complication, colotomy relieved the suffering and prolonged life for several months. Last year a patient, aged 54, consulted me for dyspeptic symptoms on January 24th; organic disease was suspected; he had become thinner, suffered from pain after food, and flatulence, sometimes from vomiting, the bowels were inactive. On March 4th the bowels had not acted for a fortnight, there was great distension; the coils of the intestine were visible, and peristaltic movement was distinct; there was vomiting, but no pain. Opium with belladonna was given,

and injections of oil, and afterwards of soap and water were used. Colotomy was recommended if the bowels did not act. He was brought to Guy's on March 13th, the bowels acted freely after admission, but still the abdomen remained distended. Remedies were used to relieve this flatulent distension, but the bowels again became confined, and it was evident that the danger was imminent; a fatal result was feared, when Mr. Davies Colley, on April 6th, performed colotomy. The urgent symptoms were relieved, and after a few days fæces were passed by the rectum, and the patient left the hospital comparatively well on May 5th. In a valuable paper by Mr. Cæsar Hawkins, in the 'Transactions of the Royal Medical and Chirurgical Society,' the result of the operation of colotomy in forty-four cases of stricture of the colon or rectum is recorded; in ten cases death took place within forty-eight hours, in twenty-one within five weeks, and thirteen recovered; of these six died in six months, and nine survived more than one year.

The colon in its ascending or descending part may be opened in many cases with facility, without dividing the peritoneum. Mr. Maunder has proposed opening the small intestine through the peritoneum, and has successfully performed such an operation. My colleague, Mr. Bryant, has also successfully performed similar operations; in one case the patient survived eighteen months. In many cases, however, these operations have been deferred so long, that peritonitis has already arisen from the extreme distension, and the skill of the surgeon is then placed under the most disadvantageous circumstances.

In the *treatment of intussusception,* every possible means should be employed to quiet the propulsive action of the intestine; but much good may be affected by local means. If the bowel be felt in the rectum, it may sometimes be returned by the introduction of a bougie, or of a candle; and in other cases gentle distension by the injectionof warm water, or inflation by air, has apparently produced a return of the bowel. Mr. Hutchinson has suggested operative interference in these cases, by opening the peritoneum and withdrawing the invaginated bowel ('Med.-Chir. Transactions,' vol. lvii); in other cases in which the operation

has been performed, even in recent cases, it has been found that the bowel could not be withdrawn; out of eight cases two have been successful, one under Mr. Hutchinson, and the other under Mr. Howse, six have proved fatal.

CASES OF INTERNAL STRANGULATION.

CASE CXLIII.—*Internal Strangulation af the Ileum. Band of Adhesion.*—Elizabeth B—, æt. 52, was admitted, March 10th, 1857, into Guy's Hospital. She was a married woman, thin, of sallow complexion, and had had a family. For twenty years she had had occasional pain in the left side, the bowels had generally been confined, but she had not had any attack like that for which she was admitted.

On March 5th, five days before admission, after breakfast, she experienced a sudden pain in the abdomen; it commenced about the navel, but soon extended over the whole abdomen; vomiting came on an hour afterwards; the bowels had been open slightly the same morning, but had been confined on the previous day. From that time no evacuation took place, the vomiting continued, the abdomen became tympanitic, and moderately distended, and there was slight tenderness. The pain in the abdomen came on in paroxysmal attacks, but was generally absent when she remained quiet; the vomited matters continued bilious, and the urine abundant.

On March 10th, the countenance was expressive of considerable distress, but was calm and resigned; the eyes were sunken; the abdomen was slightly prominent in the centre, but not laterally; it was tympanitic, but free from tenderness; the pulse was sharp, the respiration normal, and the urine was abundant. Purgatives had been given, and enemata administered, but she had vomited the former.

She was ordered calomel and opium of each gr. j every six hours, a soap injection to be administered, and a linseed poultice to be applied to the abdomen.

March 12th.—The countenance was more haggard, and the eyes more sunken; the vomited matters were thick, green, and offensive, but not stercoraceous; the pulse was more compressible; the abdomen was in the same state as far as external appearance, and it was still free from tenderness; there had been no relief from the bowels, and no flatus passed; the urine continued abundant; she had had a restless night, and suffered occasionally from hiccough.

14th.—There was no improvement. There was neither pain nor tenderness in the abdomen, nor was it more distended; she was not disturbed by vomiting, but was partially under the influence of opium, which had been continued without calomel; nutrient enemata were used.

17th.—She died, rather less than twelve days from the time of strangulation.

Inspection took place about twelve hours after death. On opening the abdomen, the small intestines were found moderately distended, but on the fingers being passed towards the pelvis the strangulated bowel gave way, and some fæcal extravasation took place; the peritoneum was inflamed; it was dry, and deep red lines existed at the points of contact of the intestine; the stomach and transverse colon were moderately distended; the small intestine was still more enlarged. In the pelvis several coils of small intestine were found almost black in colour; there was fæcal extravasation, but this probably only took place after death; at the site of the right internal abdominal ring, was a roughened and injected state of the peritoneum, as if adhesion had existed; and there was a similar condition also on the right side. On turning aside the small intestine, a firm band of adhesion, round and dense, was found to extend from the region of the cæcum to the margin of the pelvis, at the termination of the sigmoid flexure; through this loop several coils of ileum had passed, and had become strangulated. The band of adhesion passed from the mesentery of the ileum to the mesentery of the sigmoid flexure, and it appeared to be the free perforated margin of the latter mesentery; the band was thin, and contained vessels; and it was doubtful whether it was really a band of inflammatory adhesion, or a part of the sigmoid mesentery, which had become thinned and perforated, and so presented an abnormal and free edge. The strangulation was four feet from the cæcum, and nearly two feet in length. The mesentery of the strangulated part was infiltrated with blood; its peritoneum was almost black, and in several parts it was sloughing. The mucous membrane at the upper end of the strangulation presented an extensive slough, and the coats were destroyed; at the lower end the sloughing was rather less extensive and advanced. The coils of intestine contained within the adhesion were united by moderately firm lymph.

The appendix cæci was perfectly free; below the band the small intestine was contracted, so also was the sigmoid flexure, but the transverse colon was moderately distended with flatus. The stomach was not at all dissolved; but the whole of the mucous membrane was intensely congested with very minute arborescent vessels.

The liver, kidneys, and spleen, were healthy. In the lower lobe of the left lung there were several lobules, in a state of red and grey hepatization; and the whole of that lobe was in a state of early pneumonic consolidation; the other lung was healthy. The heart was normal; its right cavities were filled with blood.

In this case, it is probable that a portion of intestine had been encircled by the band for some time, for adhesions had evidently existed between that part of the ileum and the parietes near the inguinal canal, and occasional pain had been experienced in the abdomen; the distension of the incarcerated part and the intrusion of other coils led to strangulation.

It was diagnosed before death, that the obstruction was in the small intestine, from the moderate distension, the short time that elapsed before vomiting came on, and the character of the ejected matters. The quantity of urine did not assist us here; the vomiting was moderate, because purgatives and irritants were avoided; the distension also was rather in the central part of the abdomen, aud the transverse and descending colon could not be traced, as in obstructed sigmoid flexure. As to the treatment, I believe it was most judicious after admission into Guy's Hospital, and that life was by that means prolonged for several days, and the patient spared intense suffering. The opium quieted the peristaltic action and violent vomiting, and if the latter had continued perforation would probably have taken place at an early period.

In reference to opening the abdomen, if it had been attempted at a very early period, the band might perhaps have been divided, but during the latter days of life the intestine was in a semi-gangrenous state, and the operation would probably have been hastily terminated by the rupture of the strangulated bowel.

Case CXLIV.—*Internal Strangulation. A Loop of Small Intestine passed into a hole in the Great Omentum.*—J. D—, æt. 45, was apparently in the enjoyment of good health, till Monday morning, November 29th. On that day he alighted suddenly from a chaise; at the same moment he felt sudden pain in the abdomen, low down in the right iliac region; about noon he began to vomit, and the vomiting recurred frequently. He had never suffered from any irregular action of the bowels, and had previously had good health. He was bled, and calomel with purgatives administered, without any effect. Enemata were returned with fæcal odour. On the third day the abdomen was moderately distended, but free from tenderness; the pulse was 84; and the tongue was injected and fissured. There had been no action from the bowels, and the vomiting continued.

On the *fourth* day, there was no change in the symptoms; he was placed in a warm bath, and water injected into the rectum. Whilst in the bath he became much worse, collapse came on, and death followed in five hours.

Inspection.—The peritoneum contained thin fæcal fluid. The coils of the large intestine were lying in front of the omentum, which descended into the pelvis. The small intestine was adherent to the anterior abdominal parietes, and air was found to escape from a perforation in the small intestine. A loop of ileum, six inches from the cæcum, together with the mesentery, had passed through an opening in the great

omentum, and had led to the fatal strangulation and subsequent perforation. There was no ulceration in the whole of the canal.

In this case we had sudden occurrence of symptoms; the position of the pain indicated the seat of the disease, and the vomiting came on a few hours after pain, indicating an affection of the small rather than of the large intestine. The case showed that, although the abdomen was free from pain and tenderness, the movement required to place the patient in a warm bath, and the injection of warm water into the rectum, were not free from danger; they hastened fatal perforation and peritonitis; how much more easily would such an effect have followed from more sudden and violent exertion!

Case CXLV.—*Internal Strangulation of the last eighteen inches of the Small Intestine by means of a Diverticulum from the Ileum, fatal after thirty-eight hours.*—Henry W—, æt. 19, had been employed as a lead and colour manufacturer in Tooley Street; he had had colic a year previously, but at the time of admission into Guy's Hospital no trace of lead existed on the gums. He was of pale complexion, with light hair, and he enjoyed his usual health till Sunday, July 28th, at 7 p.m., when soon after drinking some beer he was seized with pain at the lower part of the abdomen, towards the right side. About an hour after this he had moderate action of the bowels. Sickness came on about 9 o'clock, and during the night he vomited whatever he took. An injection, administered before admission, came away with scarcely a tinge of feculent matter. He was brought to Guy's at 10 p.m., July 29th, and placed under Dr. Barlow's care, in an almost pulseless state; pulse 144, the face and extremities were cold, there was frequent eructation, the abdomen was rigid, tympanitic, and very tender on pressure; the tongue was flabby; no urine had passed; and his respiration was entirely thoracic.

At 9 a.m., on the day after admission, the abdomen was tense, slightly hollowed out in the right hypochondriac region, and tender on pressure. He was very restless, turning from side to side in bed, and his legs were occasionally drawn up. He had passed a disturbed night, with the same symptoms as on admission; his pulse could scarcely be felt. Shortly after this he was allowed by the nurse to rise up in bed, became faint, and died in about half an hour, thirty-eight hours after the commencement of the pain.

On examining the abdomen, several pints of bloody serum were found in the peritoneal sac. The whole of the small intestine was much distended; but several coils, corresponding to the last eighteen to twenty-four inches of the ileum, were in a state of approaching gangrene. The latter portion had become strangulated by a diverticulum from the small intestine, about one and a half inches in length, and by

a band passing from the mesentery to the cæcal end of this pouch. The large intestine was less contracted than is generally observed in such cases. There was evidence of general peritonitis, lymph being effused between the coils of the intestine. The mucous membrane was continued into the pouch, and much imperfectly masticated cocoa-nut, and the remains of gooseberries, which had been eaten on the morning of the attack, were found in the intestine. The remaining viscera were healthy.

This case is worthy of being recorded as presenting peculiar difficulties in diagnosis; for whilst the urgent vomiting, the state of the abdomen, and the mode of the attack, pointed it out as one of mechanical obstruction, the great depression and rapid termination seemed to refer it to rupture of the bowel. These latter peculiarities, however, probably arose from the extent and completeness of the strangulation leading to speedy gangrene. Although the pain was situated towards the right side, the symptoms were not those usually presented by cæcal mischief. The first indication of disease was pain resembling colic after taking some malt liquor, and it is probable that the indigestible substances which he had eaten tended to excite distension and irritation of the mucous membrane. A slight constriction of the canal may become so increased by irregular peristaltic action and over-distension as to become complete; thus a patient may for years suffer from slight attacks of pain and from irregularity of the bowels, till after some indiscretion in diet he has a recurrence of pain and vomiting with constipation; no tenderness of the abdomen may be present, but rigidity of the abdominal muscles; the vomiting may continue, no further action from the bowels take place, but hiccough, rapid prostration of strength, and death speedily follow. The diagnosis in such a case is beset with difficulty. Abercrombie records several instances of this kind, where there was adhesion without apparent narrowing of the canal, existing probably for years, till, from some unknown cause, complete and fatal obstruction took place; and cases repeatedly present themselves in which organic disease of great extent has existed for a considerable period, and symptoms of obstruction are manifested only a short time before death.

Case CXLVI.—*Internal Strangulation of a large part of the Small Intestine. Death on the fifth day.*—Edward J. T—, æt. 27, was admitted under the care of Dr. Rees into Guy's Hospital, October 11th, 1861, and

died on the 14th. He was a spare man, with a rather sallow and anxious expression, and his eyes were sunken. The skin was cool; he stated that he was quite well till Wednesday, the 9th, when, having returned to his work after dinner, sudden pain came on in the abdomen, close to the umbilicus; he sent for a dose of castor-oil, which at once produced vomiting; the vomiting continued till his admission on the Friday. The rejected matters had the appearance of fluid fæces, but the fæcal smell was not very manifest. The tongue was clean, the pulse compressible; there was no evidence of external hernia; the abdomen was rather small, and there was no distension of the colon; neither was there any tenderness, nor tumour, nor hiccough. Calomel and opium were given, and, after an injection, flatus was discharged; after a second injection flatus and some fæcal matter were passed; the pain ceased; during the twenty-four hours a pint of urine was passed. On the 14th collapse came on, and in a few hours death took place.

On inspection, the lungs were found in a healthy state; the heart was small, the right side was flaccid, the left was firmly contracted. On opening the abdomen a band of adhesion was at once seen constricting a large portion of the small intestine. The general peritoneum was clear, smooth, and shining; the constriction was formed by a hole near to the centre of the omentum, the edges of which were thickened; and the ends of the constricting fold were adherent to the brim of the pelvis. The stomach and about six feet of the jejunum were distended; the rest of the jejunum and the ileum nearly to the cæcum had passed through the opening. The constricted part was contracted; its peritoneum was partially inflamed, and in one part softened, but there was no perforation. The colon was small and empty. The kidneys and the liver were healthy.

The symptoms of strangulation in this case were suddenly developed; and it was evident that the small intestine was the affected part, from the early period at which vomiting came on, the absence of distension of the abdomen, and the small quantity of urine which was passed. I have usually regarded the passage of flatus as a hopeful symptom, but in this case it had not its usual favorable import; however, the strangulation was at that time either not complete, or the flatus merely came from below the incarcerated intestine. The early period at which death took place was probably due, in part, to the great extent of the strangulated bowel, which amounted to the whole of the ileum and part of the jejunum; but the cause of the sudden collapse, a few hours before the fatal termination, could not be ascertained, for no perforation existed, and the strangulated portion only had its peritoneal investment inflamed. The omentum had first become adhe-

rent, then atrophied and perforated, and on sudden movement or distension the bowel passed through the opening.

Case CXLVII.—*Internal Strangulation. Old Peritoneal Adhesions. Peritonitis. Suppuration.*—John D—, æt. 33, a labourer, was admitted under Dr. Wilks's care into Guy's Hospital, June 8th, 1860. Till the previous Sunday, June 3rd, he had felt in good health; and on the following day, at 1 a.m., he was seized with pain in the abdomen, and vomiting shortly came on. Aperient medicines were given, and the vomiting increased in severity; the ejecta became stercoraceous; but no action of the bowels took place. He had a sallow and anxious expression of countenance when he was brought to Guy's; the abdomen was moderately distended, and rather tense; there was slight pain; an injection on the previous day had brought away some fæcal matter, but he was not sure that any flatus had passed; the urine was scanty; the tongue was slightly injected and furred; the pulse was compressible. A grain of opium was ordered every four hours; and a warm poultice was applied. On the 9th the countenance was less anxious; but the eyes were sunken; the pulse quiet, the skin normal, the abdomen was not distended, and the muscles were hard and rigid, especially around the umbilicus, where he complained of pain; there had been no action from the bowels, nor had any flatus been passed; the urine was moderate in quantity; the vomiting of offensive matter continued. On the 11th, as there was no improvement, Dr. Wilks directed that he should be placed in a warm bath, and cold water poured upon the abdomen. On the 12th the patient was in greater distress, and in more severe pain; he had had no sleep, for as soon as he dozed he was at once awoke by sudden pain darting through him; the pulse was 100, hard; the tongue was rather dry, the vomiting more severe, and stercoraceous; the abdomen was not distended, and still rigid; the pain was especially situated in the umbilical region and about the cæcum. Opium gr. j was continued every four hours; and a long tube was passed and water injected into the bowel. On the 13th he was in still greater pain. Six pints of water had been thrown up three times; and the dulness consequent on the injection extended apparently as far as the cæcum; some scybala were brought away, and the vomiting became less.

On the 16th he had not vomited for three days; on the previous day a six-pint injection was again thrown up, and some scybala passed; flatus was discharged; the pulse was quiet, the skin cool; the urine was abundant; he had suffered during the morning from severe twisting pain in the region of the umbilicus, and the pain continued; but his general expression was much improved—more cheerful and less haggard; he was able also to take beef-tea. To continue the opium.

During the afternoon of June 16th, on the thirteenth day of obstruction, the bowels acted. On the 17th the bowels acted twice. On the 18th, he was cheerful, but suffered occasional pain in the abdomen. In a few days he was considered sufficiently well to leave the hospital.

On October 17th, 1869, he was admitted into St. George's Hospital,

under Dr. Fuller's care, and I am indebted to the kindness of Dr. Dickinson for the following report:—The abdominal pain had never entirely left him since he had been in Guy's Hospital. "When admitted (October 17th) he was much emaciated and sallow. The abdomen was somewhat tympanitic, and slightly painful, but not tender. The bowels were regular; the motions pale. He was weak and occasionally had cramp in the abdomen; his strength failed, the tongue became red and glazed, and the pulse rapid. On the 8th, he was more prostrate, and the pulse quick and irregular. Vomiting came on and continued all day, leaving him at last faint and sinking, in which condition he died, in full possession of his faculties."

"*The inspection* was made sixteen hours after death. The body was much emaciated; the abdomen very tympanitic. The brain was healthy. There were extensive old pleural adhesions on both sides. The lungs and heart were healthy. All the opposite surfaces of the peritoneum were closely united by old adhesions. In front the parietal peritoneum was thus united to the great omentum, which was of great density and much thickened by old inflammation. It was closely adherent below to the walls of the abdomen near the pelvis, so that on dissecting off the abdominal walls, nothing else was seen. On cutting through the omentum, a large collection of thin fetid pus was found bathing the intestine; there could not have been less than a quart of this fluid. The small intestines were much convoluted, and in some places greatly distended; they were vascular, and their surfaces smeared in many places with recent lymph. Besides these, there were old adhesions between neighbouring coils. The small intestines were carefully traced down from the stomach (which was itself collapsed, but healthy), but no trace of obstruction could be found either in it or in the large intestine. The coats of the bowel were in many places much thickened, so as to resemble tripe. No morbid condition of the mucous membrane was anywhere found. The mesenteric glands were healthy, and near the ileo-cæcal valve was a large chalky mass, which appeared to have originated in a diseased gland. The liver and kidneys were healthy."

When this patient was under the care of Dr. Wilks he was suffering from the symptoms of internal strangulation of the small intestine, as shown by colic, with constipation and stercoraceous vomiting, &c.; and from the subsequent inspection, which revealed the presence of old peritoneal adhesions, it would seem probable that the obstruction arose from this cause, namely, the pressure of adhesions, perhaps rendered complete by enteric inflammation. The thickening of several portions of intestine indicated the presence of chronic impediment in the transit of the fæcal contents. The cause of death appeared to be exhaustion from recurrent peritoneal

attacks, terminating in suppuration. The advantage of an opiate plan of treatment, with enemata, was shown in the subsidence of the severe symptoms of the first attack.

Case CXLVIII.—*Lead Colic. Internal Strangulation of the Intestine from old disease of a Mesenteric Gland, and subsequent Fibroid Contraction.* (Reported by Mr. George Eastes.)—Charles S—, æt. 29, was admitted into Guy's Hospital, under Dr. Rees' care, November 8th, and died on the 20th. He had been a painter by trade, but had left that occupation to become a chimney-sweep, seven or eight months before his last illness, on account of the attacks of colic from which he suffered; but even when a child he frequently suffered from pain in the abdomen. The first attack of this sort occurred three years previously, but that had been preceded by many threatenings; the next was twelve months later; in six months more, the colic came on a third time; and from that time he had repeated attacks, the interval of freedom from pain lessening in duration; so that during five months prior to admission, he was quite laid aside, on account of the abdominal pain and distress being almost constant. During the latter part of his illness he had been much annoyed by vomiting; this symptom had harassed him continually, and it had generally come on about two hours after food, of whatever kind it might be; the bowels were meantime costive, so as only to be opened by injection; the pain gave him no rest, by night nor by day, and it was accompanied by gurgling and spasm of the abdominal walls; the peristaltic movement of the intestine became visible. The patient described the passage and quantity of urine as free. He did not suffer from headache, nor from pain in the joints; but he had a well-marked lead line on his gums. His complexion was dark, and he had a large quantity of black hair; his countenance was anxious; the conjunctivæ were dingy; the tongue was red at the tip and edges; the pulse 68. The abdomen was not tender during the intervals of quiet; but as soon as the pain came on, the rectus muscle was drawn up into distinct knots, and then the abdomen became so tender that he could not bear even the bedclothes to rest upon him. He was not always sick, but generally vomited for a day or two at intervals of two or three months. The appetite was pretty good, but for four months he had taken only bread and arrowroot; meat was almost certain to produce vomiting, soon after taking it. His bowels were much constipated, acting only every three or four days; and the evacuations were hard and scybalous. There was slight difficulty in micturition, and the urine contained lithates.

The bowels acted slightly on two occasions during the next twelve days, but the pain and vomiting continued more severely, and he died November 20th, after a night of agonizing pain.

The inspection was made thirty-six hours after death. The thoracic viscera were healthy. *Abdomen*, there was general and acute peritonitis; nearly the whole of the ileum and jejunum were almost of a black colour, and greatly distended, and in several parts the peritoneal surface

had ulcerated, exposing the muscular coat, apparently from distension. The small intestine was drawn backward towards the spine from contraction of the mesentery; and on examining the ileum, near to the cæcum. a hard mesenteric gland projected into the intestine, and had led to fibroid thickening and contraction; at this part the muscular coat of the ileum was much hypertrophied, and projected, like a nodule, into the intestine; it closely resembled thickening of the pylorus from fibroid degeneration; the hypertrophy of the muscular coat extended some distance up the ileum, and contrasted remarkably with the thin muscular coat below the stricture; the mucous coat was also thickened, and slightly ulcerated; the peritoneal coat presented the ulceration before mentioned; the colon was contracted. The other viscera were healthy.

The constriction in this instance apparently originated in disease of one of the mesenteric glands during early life, fibroid thickening took place at that part of the mesentery, which led to partial and afterwards to fatal occlusion and peritonitis. The intense colic from which the patient suffered, was produced by the irregular peristaltic and spasmodic efforts to overcome this obstruction; attacks of colic appear to have come on in early life, before he had adopted the trade of a painter; afterwards, it is probable that the lead aggravated them. The circumstance of chronic poisoning by lead and the blue line along the gums tended to obscure correct diagnosis; the intensity of the colic, however, the intolerance of pressure, and the supervention of peritonitis, were all opposed to simple poisoning by the absorption of lead.

Case CXLIX.—*Mechanical Obstruction terminating favorably after seventy-eight hours.*—For many of the particulars of the following case I am indebted to my friend Sir William Gull.

J. S—, æt. 33, a coal porter on a wharf, rose on the morning of the 26th June, 1850, in his usual health, and before going to his work, went, as his habit was, to stool, and had a good evacuation from the bowels. About half an hour afterwards, whilst stooping to fill a sack, he was suddenly seized with a sharp pain across the abdomen in the hypogastric region, accompanied by a sense of constriction. He was obliged to leave his work and to go home; in a short time he began to vomit, and after the attack was unable to pass anything downwards. He was treated by Mr. Mitchell, of Deptford, but without effect, and on the evening of the following day, forty hours from the accession of the symptoms, he was sent to the hospital with a note, saying that no hernia could be found, but that an internal obstruction was suspected. The assistance of Mr. Cock was obtained, who examined all the outlets, but could detect no protrusion. On admission he had the usual sym-

ptoms of strangulated hernia, urgent vomiting, anxious countenance, pulse rather frequent; the temperature of the surface was depressed, the abdomen rigid, and rather tumid, and slightly tender on pressure, urine small in quantity, and high coloured. He was ordered a grain of opium every four hours, and to abstain from relieving his thirst. The report of the third day at noon was, that he had passed a restless night, vomiting continually. He was seen early in the morning, everything was interdicted, even to cold water, and he was then better, the paroxysms of pain in the abdomen being less urgent. As he was under the influence of opium the dose was diminished to half a grain, and a copious enema of salt and water was thrown by a long flexible tube into the rectum; it passed up readily, but without bringing away any feculent matter. In the evening he was restless, his countenance was anxious, the vomiting and other symptoms continuing as before.

Fourth day, eight o'clock a.m.—He vomited during the night in considerable quantity; the abdomen was tense, and coils of distended intestine could be partially traced, the peristaltic action rendering them prominent, with increase of pain in the abdomen, of which he complained bitterly. His countenance was still expressive of great anxiety, and the features were shrunk. He had passed about half a pint of urine, clear and well coloured; the pulse was accelerated, and diminished in power. He was ordered to go on with the opium. During the morning his abdomen was exposed for some time, whilst a sketch was made of its peculiar form, and the position and direction of the prominent convolutions, in order to determine more accurately the precise seat of obstruction; when suddenly, about noon, he expressed himself relieved, saying, that "something had given way within him," and this feeling was quickly followed by a copious flow of liquid fæces inundating the bed. From this time he steadily recovered, the vomiting and hiccough at once subsided, and the face acquired a cheerful expression.

Certainly no cases present a less promising prognosis than those of mechanical obstruction of the intestines, nor has the enterprise of modern surgery yet succeeded in diminishing their mortality. The case here recorded presented points of no common interest; that it was one of mechanical obstruction there can be but little doubt, and if so, we had an instance of its spontaneous removal, and it answers in the affirmative the question whether we can hope for a successful result in mechanical obstruction without surgical interference. From what we have seen in hospital practice, there is reason to believe that irregular peristaltic action following upon indigestible food, is not an uncommon cause of internal displacement; but in the case here recorded, it came on after a night's fast, and before any meal had been taken in the morning. The patient rose as well as usual; the bowels acted according to his daily

habit; he went to his work in good health, but whilst in a stooping position the pain came on. It need not be mentioned, that there was neither history nor trace of lead in the system, nor indeed were the symptoms such as arise from poisoning by that mineral. The only remedy trusted to in the treatment was opium, but the happy termination of the case whilst the abdomen was exposed to the cold air, renders it probable that moderation of temperature had somewhat to do with the result. The application of cold has been suggested in such cases, and has much in theory to recommend it, and it might be expected, in conjunction with opium, to effect all that mere treatment can effect. For, suppose a portion of intestine to have insinuated itself under any accidental band in the abdomen, by what means can we so well hope to liberate it, as by reducing its volume, and by allaying the vomiting? I would also suggest whether opium suppositories would not sometimes more efficiently promote the latter object than opium in the stomach. Of the opiate plan of treating intestinal obstruction too much cannot be said. It has both reason and experience on its side; and yet in the reports daily given of such cases, purgatives form generally the early part of the treatment; and they are persevered in until the stomach will bear them no longer, serving only to exhaust the patient and to increase the symptoms. This case also shows the importance of abstaining from food, which not only distends the bowel, but increases peristaltic movement and augments the pain.

Case CL.—*Internal Strangulation and Constipation. Subsidence of Symptoms. Death from Phthisis.*—(From the Museum Records.)—William H—, a man of middle age, was admitted into Guy's in 1829. There was obstinate constipation, vomiting of a stercoraceous character; but no hernia could be detected. The symptoms gradually subsided, but the patient died from phthisis several months afterwards.

On *inspection*, there were vomicæ in the lungs. The intestines were irregularly contracted. The appendix cæci was bound by adhesion to the brim of the pelvis, and several bridles of adhesions extended to portions of small intestine at this part; one of them was very long, and had apparently led to constriction, and to the previous symptoms of strangulation. No ulceration of the intestine existed.

Tumours sometimes become developed in the mesentery, and act as either the predisposing, or as the direct cause of

mechanical obstruction. Among the records of the inspections at Guy's, is that of a boy, aged seventeen, who, after a blow on the abdomen two years previously, had gradual distension of the abdomen, fluctuation, vomiting, and constipation. The jejunum was found to be enormously distended. One portion of the mesentery near the commencement of the ileum contained numerous tubercles, supposed to be cancerous, and the contraction around these had led to obstruction; other tubercles were situated in the pelvis.

Case CLI.—*Colic, Simulation of internal Strangulation. Recovery.*—A young man, æt. 22, badly nourished, who had resided in Rosemary Lane, was admitted August 21st, into Guy's Hospital. He was pale and desponding, and had been suffering severely during eight days. He appeared to earn a scanty livelihood as a porter, and on August 14th, after taking his breakfast in his usual health, he lifted about ¾ cwt. upon a cart, when he felt a sudden pain below the left hypochondriac region; he, however, went to his work, but was taken back, "doubled up," as he described it; after a few hours, vomiting came on, and both pain and vomiting continued till admission; he had not had any action from the bowels, although repeated doses of medicine had been taken, nor had there been any hiccough. He complained of severe pain across the umbilical region; the abdomen was neither hot, nor tender on pressure; there was some distension laterally, and in the position of the transverse colon, otherwise it was contracted. The tongue was clean and pale; the pulse eighty, and tolerably free in volume. He had passed but little urine, and neither blood nor mucus from the bowels. There was no hernia, but along the gums a dirty line which somewhat resembled lead.

For three months he had been a teetotaller, and he had had occasional pain in the abdomen, but no constipation.

A soap injection was administered, and calomel gr. v, with opium gr. iss, given as a pill. On the 22nd and 23rd there was no relief from the bowels, no medicine was administered. On the third day after admission the bowels acted slightly, castor oil was then given, and was followed by more active remedies. The bowels acted, and he left the hospital in a few days comparatively well.

This case was probably one of colic, in which the symptoms came on suddenly after exertion; it resembled internal strangulation, but the abdomen never became distended; the importance of not following too active a plan of treatment was also shown, the vomiting became much less after the purgative medicines had been left off; the calomel and opium with enemata were used once; and on the third day the bowels were acted upon.

CASES OF INTUSSUSCEPTION.

Case CLII.—*Colic. Lumbrici. Diarrhœa. Intussusception of the Ileum and Ascending Colon into the Descending Colon.*—This case is fully reported by Dr. Hughes in the 'Guy's Reports' of 1856.

Daniel D—, æt. 14, was admitted into Guy's, February 27, 1856, under Dr. Hughes' care. He had resided near the Tower, and had assisted his father as a tailor. His previous health had been very good till seven weeks before admission, when he was exposed to severe cold, and the following morning he was seized with acute pain in the abdomen, which continued for several hours; the pain returned on the following day, and similar paroxysms took place till admission, but at uncertain periods. The attacks generally came on towards evening, and sometimes twice in the day. He was free from pain from the 21st to the 25th, when he took some castor oil, and from that time he suffered from tenesmus, vomiting after meals, and loss of appetite. He described the pain as a twisting and tearing of his intestines principally about the umbilicus, and he detected "lumps" in the abdomen, which disappeared on the subsidence of the paroxysm, during which he lay with his legs curled up and his hands on the abdomen; the duration of the pain varied, and was frequently relieved by passing flatus. In the intervals he felt well. The appetite was capricious, and sometimes excessive. The bowels were open twice a day, the motions semi-fluid or scybalous. On admission he was much emaciated; the expression of countenance was one of distress; there was a white fur on the tongue, and the pulse was weak and compressible. Shortly after admission he voided an ascaris lumbricoides with some mucus. Calomel gr. v and opium gr. $\frac{1}{2}$ were given, and were followed by a senna draught. Poppy fomentations were applied, and milk diet ordered.

Repeated paroxysms of severe pain came on during the next fortnight; but in the intervals he was able to go about the ward. Calomel and opium, purgatives and enemata were ordered; diarrhœa then supervened with tenesmus. On March 15th he was suffering from severe pain, the tongue was coated with a white fur, and the pulse was quick and compressible. The abdomen was distended; coils of intestine were visible, and there was tenderness. He vomited a considerable quantity of green bilious fluid, and the alvine evacuations were of a dysenteric character, consisting of bloody mucus without fæcal matter. Notwithstanding treatment by sedatives and demulcents, no relief was obtained; the vomiting became more severe; another lumbricus was ejected; and on the 23rd the symptoms of peritonitis became suddenly aggravated, and he died on the following day, twenty-seven days after admission, and eleven weeks after the commencement of the attack.

Inspection.—The body was badly nourished. The lungs and heart were healthy. The abdomen was considerably distended. On opening the peritoneum the descending colon was found to be enormously

enlarged and full; so also the sigmoid flexure, which made a great curve nearly to the right side of the abdomen. The transverse colon could be traced in a similar state to the right side of the median line; it was thrown into transverse folds, and the ileum was found within it. The cæcum and ascending colon were entirely intruded. The rest of the ileum was much distended; a great part of the jejunum, however, was collapsed, and situated behind the transverse colon and stomach, in the position described, as the sac of the lesser omentum. It occupied this position either from the congenital looseness of the colon, or from its meso-colon having been drawn aside by the intussusception; the foramen of Winslow was normal. The general peritoneum was intensely injected, and was covered with lymph, and there was general acute peritonitis; the small intestine, however, which was situated behind the stomach, was not inflamed.

The stomach contained semi-feculent fluid; but the duodenum was normal. Several lumbrici were found in the jejunum; the ileum presented towards the commencement of the intussusception an ulcer about half an inch in diameter, much congested at its margin; the intestine was full of yellow fluid fæces. On tracing the intestine onwards the lower part of the ileum, the cæcum and ascending colon were found in the descending colon. It could be felt within the large bowel, and reached into the rectum, within a few inches of the anus. On opening the sigmoid flexure and rectum, the termination of the intussuscepted portion was observed, almost black, but surrounded by semi-fluid fæces; the apex of the invaginated portion was very tense, its opening, which would admit the little finger, was marked by a fissure towards one side on account of the contraction of the mesentery. Turning aside the bowel it was found to be convex and twisted from the dragging of the mesentery, and at the concave side was a large irregular ulcer at the most tense portion. (Plate IV, fig. III.) In the sigmoid flexure, which was considerably distended, was a small opening into the peritoneal cavity, which had set up general peritonitis; at the other extremity of the intussuscepted portion the finger could be easily passed round the bowel, although there was commencing adhesion for the effusion of lymph. The liver, spleen, kidneys, &c., were healthy.

This case was one of peculiar interest, on account of the obscurity of the disease; the colic appeared to be due to the lumbrici, but the severity of the symptoms, the intense pain, the purging of bloody mucus, the almost incessant vomiting, and the distended coils of intestine, indicated a more serious abdominal lesion. The disease lasted eleven weeks, and it is probable that the intussusception continued during that period, at first perhaps slight in extent, but gradually increasing to a greater degree. The canal did not become entirely occluded till near the fatal termination; and it is possible

that the intussusception may have become *partially* restored with the relief of the symptoms, and at each fresh paroxysm the intestine may have been pushed further onwards. The cause of death was peritonitis, consequent on rupture of the sigmoid flexure; and the exciting cause of the intussusception was probably the irregular peristaltic action consequent on the lumbrici associated with unusual and perhaps congenital freedom of the cæcal mesentery. As far as can be judged by a post-mortem consideration of treatment, opium was the most desirable remedy, with rest, bland nutriment, and the avoidance of any purgative medicines; but with such an extensive intrusion of intestine no remedy would probably have been effective; the injection of fluid at an early period might have been effectual in reducing the invaginated bowel, but the gangrenous condition of the enclosed bowel had a reparative tendency, which in like cases has often resulted in the recovery of comparative health.

I have observed instances in which symptoms very similar to those manifested in this case have gradually subsided, and the patient recovered; such a case occurred under my colleague, Dr. Fagge, in 1870, in which the patient subsequently died from a twist of the bowel at the point where an old intussusception had become adherent to the abdominal wall.*

Case CLIII.—*Intussusception. Recovery. Cæcum and the whole of the Ascending Colon passed per Rectum.* (See Prep. in Guy's, 1875.)—W. P—, æt. 6, a patient of Mr. C. King's, in 1852. The previous health of the child had been good, till he was attacked with œdema and discoloration of both legs; these symptoms soon subsided, but constant vomiting came on, with constipation and pain, and with tenderness of the abdomen, particularly in the right iliac region; these urgent symptoms remained for four days, when convulsions and insensibility ensued. He remained in this condition for twelve hours, apparently dying; on the two following days he was a little better, the vomiting ceased, but constipation continued; during the next four days there was no change. Eleven days after the seizure, and five days after the cessation of the vomiting, he had an evacuation from the bowels, and the cæcum with the vermiform process and the ascending colon were discharged; when passed, the cylinder of the intestinal slough was

* The seat of constriction was over the right sacro-iliac joint; here the enormously distended ileum went to the wall of the abdomen, and became lost for half an inch just before its junction with the cæcum. The two edges of bowel thus left, on opening the intestine, were found to be raised, red, and well defined, and a seam in the mesentery led to this point.

complete. In a few days the leg became gangrenous, and was removed by Mr. Hilton. The child did well, and completely recovered.

The symptoms of colic, in this as in the previous case, were very severe, and the recovery of the child very remarkable after the removal of the whole of the cæcum and ascending colon. It must also be noticed that constipation of an insuperable character was not one of the earlier symptoms; there was evident impairment of the general health of the child, as shown by the œdema and discoloration of the legs, followed by gangrene; and it was suggested that unwholesome food, as ergotized bread, might have produced the disease. In cerebral irritation, also, we find a disposition to irregular peristaltic action of the intestine, and frequently after death from hydrocephalus numerous portions of invaginated intestine are observed; here, however, the abdominal symptoms preceded the cerebral. The following cases present several points of great interest connected with this subject.

An emaciated man, æt. 28, under the care of Mr. Benjamin Phillips,* had been resident in a miasmatic district. He had suffered occasionally for weeks from an obscure affection of the digestive system; the abdomen was hard and tympanitic; there was frequent nausea, but vomiting rarely took place; the alvine evacuations were sometimes frequent and fluid, at other times they were natural; leeches were applied to the abdomen; the diarrhœa and nausea continued, the evacuations became greenish, and contained blood; and an elongated mass was found occupying the left iliac fossa. The patient had a constant disposition to sleep; and he died seven days after coming under Mr. Phillips's care.

On inspection there was found to be acute peritonitis, and an invagination of the cæcum and ileum into the transverse and descending colon. Several inches of the invaginated intestine were gangrenous, and the serous surfaces of the enclosed bowel were adherent; perforation had taken place.

In another case, reported by the same gentleman, the patient, æt. 31, had suffered for many months; the skin was sallow; he was emaciated, and had a tympanitic state of the abdomen, with tenderness in the course of the descending colon and sigmoid flexure. In the left iliac region a tumour

* 'Medical Gazette.'

could be felt, considered by some to be impacted fæces. On inspection there was general peritonitis, the cæcum and ascending colon were not visible, and a cylindrical tumour was found in the iliac fossa; "two inches of the small intestine had penetrated into the cæcum; this turned upon itself, and was then introduced into the ascending colon, which in turn had passed into the transverse colon, and all these parts thus disposed had reached the left iliac fossa." Several perforations had taken place.

In a case reported by Mr. Jon. Hutchinson, in the 'Pathological Transactions,' the symptoms of colic had existed for several months, and the patient, a young man, had sometimes swung himself on the steps of a ladder, as the only means of relieving the pain. The invaginated portion of intestine was found adherent, and the appearances evidently indicated that it had been so intruded for a considerable period.

Case CLIV.—*Constipation. Subsequent Perforation. Peritonitis. Intussusception Restored?* (From the Museum Records.)—M. S.—, æt. 60, ten or twelve days before application, had experienced sudden violent pain in the abdomen, with constipation; vomiting came on, but no hernia could be detected; by avoiding medicine the vomiting subsided. A dose of croton oil produced an evacuation, but without relief to the symptoms; the bowels were afterwards moved by castor oil; the symptoms of peritonitis returned, and the patient quickly died. On inspection a portion of small intestine was found, dusky and lurid, and patches of lymph were observed; on moving the intestines fæces escaped. The discoloured portion was from six to seven inches in length, and the mucous membrane was dark; the mesentery was also slightly discoloured, and greenish at that part. A defined line marked the diseased portion.

The appearances presented in this case were either those of an intussusception restored, which was the opinion of one who had had very great experience in pathology; or, 2ndly, of internal strangulation; or 3rdly, of local enteritis, as we have previously mentioned in speaking of that disease; or, 4thly, of a twist of the intestine on the mesentery, which had become partially restored. The last suggestion was, perhaps, the most probable. There was no evidence that either external or internal hernia had existed; and whilst it is very probable that cases of intussusception are restored,

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we scarcely feel warranted in asserting that invagination had taken place in this instance.

The following case is a remarkable one, as indicating one of the sequences of intussusception. It is from the 'Medical Gazette:'—A patient, æt. 65, had constipation, violent pain in the bowels, and vomiting; in four days the pain ceased. It had commenced on August the 26th; on the 31st there were several offensive dejections, and on September 5th forty-four inches of intestine were evacuated. The patient survived forty days.

On inspection the sigmoid flexure was wanting, and the cæcum and colon, seventeen inches in length, opened into a large fæcal abscess, into which the rectum passed.

Case CLV.—*Phthisis. Intussusception of the Ileum. Peritonitis.*—James H—, æt. 16, a pale boy, was admitted into Guy's Hospital, May 23rd, 1860. For a year he had suffered from cough and phthisical symptoms. Eight days before admission he complained of pain in the abdomen, which was accompanied with vomiting. The pain commenced in the region of the cæcum, but the tenderness was at first slight; this symptom afterwards increased, and became more general as the indications of peritonitis were developed. There was great restlessness, and persistent bilious vomiting. The bowels acted once after injection, but there was no discharge of blood. Death took place on June 1st.

On inspection, phthisical vomicæ were found at the apices of both lungs; and the lower lobe of the left lung was in a state of recent hepatization. In the abdomen, both small and *large* intestines were distended; there were some lines of injection at the margins of contact between the intestinal coils. A foot from the cæcum all the coats of the small intestine had sloughed through up to the mesentery; but extravasation had not taken place to any great extent, although no adhesions had formed. It was at once seen that the sloughing had arisen from intussusception of the ileum; and several inches of *separated* intestine were in a sloughy state. The sigmoid flexure and the parts below the intussusception were not collapsed, but were partially distended with flatus.

Case CLVI.—*Intussusception of Ileum. Perforation. Peritonitis.*—John S—, æt. 17, was admitted into Guy's Hospital, under Dr. Barlow's care, September 17th, 1857, in a moribund state, and died in an hour or two. It was stated that he had suffered from insuperable constipation for a fortnight, with increasing distension of the abdomen and vomiting. The first symptom had been inaction of the bowels two weeks previously; and after that time he had only the smallest evacuation after injections. On admission there was peritonitis and

fæcal vomiting. The body was that of a strong, muscular man; the abdomen was much distended and tympanitic.

On inspection, the thoracic viscera were found to be healthy. There was acute peritonitis, but only a small quantity of lymph had been effused. The small intestines were much distended, but the large were contracted. The obstruction was at once seen to be an intussusception at the lower part of the ileum; and upon raising this portion an opening was seen in the gut, and fæcal matter was escaping; a small quantity only of fæcal matter was at first seen, so that the perforation probably remained nearly closed by being in contact with an adjoining coil, although the whole calibre of the intestine was torn through. The intussusception was found to be at three feet from the cæcum, and consisted in four to five inches of the ileum which had passed into a lower portion. The contained part was in a state of slough, and was in shreds, as if it would soon have become detached. At the upper orifice some firm adhesions existed between the serous surfaces, but at the point of constriction these had separated. The opening of the lower part was almost closed, so that a probe could be scarcely introduced. The serous surfaces were closely adherent at the margin, where they passed the one into the other; and upon cutting through the included part the serous surfaces were seen in like manner to be connected by lymph; and, as a considerable space existed, the lymph uniting them was of some thickness; the interior mucous passage was almost closed, only just admitting a probe. All the small intestines, as well as the stomach, were filled with fluid fecal matter, which in general appearance could not be distinguished from that in the colon.

This patient was dying when admitted, and there were no symptoms to enable us to distinguish this case of intussusception from one of internal strangulation of the intestine. It is possible that, had rest been enjoined and proper treatment adopted from the first, the contained slough might have been discharged without the separation of those adhesions on which the safety of the patient depended.

Case CLVII.—*Intussusception of Sigmoid Flexure. External Protrusion. Symptoms of Strangulation. Peritonitis. Death.*—Catherine F—, æt. 25, was admitted into Guy's Hospital, June 18th, 1857, and died on the 28th. She was a single woman, and in the October before her death began to suffer from prolapse of the anus; the prolapse was returned, but again came down, and from mistaken modesty she had neglected her complaint. Three weeks before admission the bowel came down, and she was unable to return it, and at the same time constipation ensued. Still no advice was sought, and on admission she was found to suffer from strangulation; the bowels had not been moved for three weeks. The intussuscepted bowel lay for several

inches outside the anus, but could be easily replaced, although the strangulation was not thereby overcome.

She died on the 28th, ten days after entering the hospital. The body was spare; the abdomen was tympanitic, but not excessively distended. There was acute general peritonitis. All the intestines were slightly distended, and full of fluid fæces. Nothing abnormal was found till the pelvis was examined, where, low down behind the uterus, an intussusception was found, and at first it seemed so near to the anus as to be merely a prolapse; when, however, the intestine was removed it was found that the proximity to the anus arose from dragging down of the intestine, for when stretched out the invaginated part did not reach the anus by three inches; measuring from the line of constriction to the anus was nine inches, and the invaginated part measured half this length, making the commencement of the inverted bowel eighteen inches from the anus, and therefore in the sigmoid flexure. The invaginated part was sloughing, and, as usual, slightly curved on itself by the dragging of its attachment. The other viscera were healthy.

These instances of intussusception present us with symptoms of severe colic, with vomiting and constipation, and often with tumour; 2ndly, they show that the pain and other symptoms are often paroxysmal; 3rdly, that the constipation is not always constant, but, on the contrary, that diarrhœa is sometimes present; 4thly, that the discharge of blood and mucus occasionally takes place; 5thly, that the causes of death are perforation and acute peritonitis, or secondary fæcal abscess; and 6thly, that the disease is cured by restoration of the parts, and sometimes by sloughing and separation of the invaginated portion.

CASES OF CANCEROUS DISEASE.

Case CLVIII.—*Columnar Epithelioma of the Sigmoid Flexure, with Cancerous Infiltration of Glands near the Gall-bladder.*—Ralph G—, æt. 44, a stout, plethoric man, who had served for fifteen years in the police force, had been employed at the station house, so that his life was a sedentary one. He had had good health, with the exception of slight attacks of rheumatism, till one year before admission, when, after taking less than his usual exercise, his bowels became confined; he had, however, generally a motion every three days.

He was admitted into the hospital, under my care, July 3rd.

On June 20th he passed a solid stool, small in quantity, but without straining or pain; from that time nothing had been passed. He did not feel any uneasiness till the 23rd, when he felt pain and a sense of

weight in his abdomen, and he vomited slightly. These symptoms passed off, but afterwards returned. He had hiccough at night, and his sleep had been disturbed; the appetite had failed, his abdomen had swelled, and he had some dyspnœa. Before admission he took various aperients, and had an injection of turpentine, but without effect.

July 3rd. The abdomen was much swollen, measuring forty and a half inches in circumference; it was most prominent in the position of the transverse colon, and tympanitic. This tympanitic resonance could be traced in the course of the colon, nearly to the sigmoid flexure. At that part he had slight pain, and stated that some months before he had had a similar attack. He had not had any discharge of blood, mucus, nor of air, per rectum; there was no pain on manipulating the abdomen, nor any increase of temperature; the pulse was quick and sharp, 98; the respiration was accelerated, the skin was perspiring, the tongue had a white fur upon it. A turpentine enema was ordered at once, and the soap and opium pill, gr. v, three times a day.

4th.—Vomiting took place at 5 a.m., the pulse was strong, 86; the skin cool; he had had no vomiting since the morning. The pills were continued, and he was to have a rue injection.

5th.—He passed a considerable evacuation and felt much easier. He afterwards had some sleep, and was able to take some food; the pulse was feeble, 116; tongue more brown. 9 p.m.—Calomel gr. xij, were ordered to be taken, and the rue injection to be repeated.

6th. — Passed a small quantity of fæces. The prostration of strength and tympanitic distension increased; there was no further action of the bowels, although the long tube was used; the patient became restless, the pulse rapid, but he did not suffer from severe vomiting. Opium was continued. The urine was moderate in quantity and high coloured.

2 p.m.—Mr. Birkett could not detect anything on examination per rectum, and did not think the symptoms of insuperable obstruction sufficiently severe to warrant surgical interference.

9 p.m.—The patient appeared in the same condition as in the morning, he was prostrate and was covered with clammy perspiration. The patient gradually sank, and died 2.30 a.m. on the 8th, nineteen days after the commencement of the symptoms of obstruction.

Inspection twelve hours after death. The rigor mortis was well marked. The abdominal parietes contained a considerable layer of integumental fat. The abdomen measured round the umbilicus three and a half feet. On opening the peritoneal cavity it was found to contain about three pints of opaque serum mixed with shreds of lymph; the peritoneum was much injected, and was covered with spots of lymph. Both small and large intestines were enormously distended; this was especially marked in the cæcum and colon, as far as the sigmoid flexure, where was the seat of obstruction; the sigmoid flexure was distended and bound to the walls of the abdomen, the intestine then turned inwards towards the promontory of the sacrum, where

it became suddenly narrow at its union with the rectum. Externally the constricted mass felt hard, and after removal it was found that an ordinary probe would scarcely pass. The obstruction was nearly an inch in length; on placing it in water the surface was quite flocculent, resembling villous cancer. The intestine, both above and below, was healthy; above, was a large quantity of fluid fæces; below, small scybalous masses. Near the gall-bladder were several glands infiltrated with cancerous product. The other organs were healthy.

The microscopical examination of the diseased growth presented cells resembling columnar epithelium, but of greater size, and containing large nuclei. The whole of the flocculent surface was composed of cells of this kind, but no large cells, such as are usually found in epithelial cancer, were observed. They appeared rather to be modified columnar epithelium. The muscular coat of the intestine at that part was much contracted. The diagnosis in this case was from the first clear; the gradually increasing constipation, absence of pain, resonance, so far as the sigmoid flexure, with previous slight pain at that part, and the normal quantity of urine, all tended to show that the obstruction was at or about the sigmoid flexure. It was a matter of regret that, in a case so favorable for surgical assistance, such means were postponed till fatal peritonitis came on; but the apparent mildness of the symptoms, the absence of vomiting, on account of the non-administration of drastic purgatives, led some to the supposition that the disease arose rather from impacted fæces than from an insuperable obstruction. The development of glands infiltrated with cancer near the gall-bladder was an interesting fact with this form of disease, which appeared to be of the character of epithelial cancer, in which there is less tendency to glandular infiltration.

Case CLIX.—*Cancer of the Sigmoid Flexure. Perforation.*—Sarah O—, æt. 42, was admitted November 18th, 1856, and died the following day, at 8 a.m. In July she had received a fall, and on August 5th experienced pain in the region of the sigmoid flexure of the colon. The pain gradually extended over the whole abdomen; injections were administered which produced evacuations from the bowels, several days before admission.

When brought to Guy's Hospital she was too ill to give any definite statement in reference to herself. The countenance was anxious, the pulse was small and compressible. The abdomen was very much distended, and when exposed the position of the transverse colon was

more prominent than other parts, and was tympanitic. The pain and tenderness were general; vomiting was very distressing; an abundant quantity of urine was passed. Opium was given, and a warm poultice was applied; but she died the following morning.

Inspection was made about six hours after death. The thoracic viscera were quite healthy. The peritoneum was much injected, and the intestines appeared dry, from a delicate stratum of lymph upon them.

The colon was very much distended as far as the sigmoid flexure; the small intestines also were moderately distended. The stomach was healthy. Near the end of the ileum there was considerable congestion and several ulcers; these ulcers, however, were much more extensive in the cæcum. The cæcum was enormously enlarged, and there was very general transverse ulceration, exposing the circular muscular fibres, as if ulcerated from over-distension; in some parts the muscular coat also was destroyed, and slight perforation had taken place in one spot, but without extravasation of fæces; the gut was more than nine inches in circumference. The appendix was filled with mucus, which was very slightly acid; and it was adherent in the long axis of the colon. The descending colon was very much distended as far as the brim of the pelvis, where it became suddenly contracted; and this part was adherent to the uterus and to a coil of small intestine. On separation the intestine was found to be drawn in at that part, and hardened. On opening it, the little finger could be passed, and the canal above was filled with fluid fæces; at the constriction there were vascular prominent growths, corresponding almost to the position of the longitudinal bands; the section had a yellowish colour, and showed that both the muscular and mucous coat were involved. On careful microscopical examination the surface was found to present a few villous processes, and the mass consisted of abundant nuclei and many compound nucleated cells, resembling some forms of medullary cancer; above the constriction was a smooth round opening, extending through the coats of the intestine into the peritoneum, but adhesions had formed between the uterus and coils of small intestine, so as to prevent extravasation. The constriction was seventeen inches from the anus; below the stricture was some dry fæcal matter. The other abdominal viscera and glands were healthy.

Case CLX.—*Cancerous Disease of the Sigmoid Flexure. Ecchymosis of Stomach. Ulceration of the Ileum. Contracted Mitral Valve.*—Ellen H—, æt. 53, was admitted November 7th, 1855. She was a married woman, without family; she had been living at Shepherd's Bush, and was greatly emaciated.

Seven months before admission she had had severe pain at the lower part of the abdomen, and was compelled to desist from work; the pain came on four or five times a day; the bowels were confined, but had previously been regular. The motions were then very scanty, except after injections; she had sometimes had severe vomiting, and at times offensive matter was rejected; the urine had always been abundant.

The abdomen on admission was very large and tympanitic, but it was most prominent in the umbilical region; the tongue was clean; the pulse was small and very compressible. No abdominal tumour could be felt; and there was no tenderness. On admission enemata were administered, and purgatives, which latter aggravated the symptoms. November 24th, opium was given, gr. j every six hours. This was followed by marked improvement, the stomach became quiet, and she was able to retain food.

November 30th.—She was not so well, and complained of severe pain in the stomach; the tongue was small and contracted; the bowels were opened freely; enemata had been administered, and opium given.

December 19th.—She was much better; the abdomen was supple, not distended; and the bowels were open; she was free from pain, and had a good appetite; she took some porter and a chop, and wine. Opium gr. j was continued. The bowels afterwards again became constipated; the abomen became painful, and the strength failed. She sank on January 8th.

January 9th.—*Inspection*, 2.30 p.m., seventeen hours after death. The body was extremely emaciated; the eyes were sunken; the abdomen was greatly distended. The parietes of the abdomen were thin. On opening the peritoneal cavity, an enormously distended transverse colon was found to occupy the whole anterior region of the abdomen; from the liver it passed down to the brim of the pelvis, then ascended nearly to the scrobiculus cordis, before it formed a second smaller curve, and became the descending colon. The large intestine was distended as far as the termination of the sigmoid flexure. Along the margins of the distended coils of intestine were lines of injection, and between some of the coils were delicate flakes of lymph. At the commencement of the rectum the intestine was contracted; and a drawing in of the coats of the intestine gave the part an irregularly puckered appearance; although thus contracted, the intestine at that part was readily movable. The whole of the colon was distended with fluid bilious fæces; at the constricted part the intestine would only admit an ordinary quill; the constriction was one inch in breadth, raised, nodular, and deeply injected; the superficial portion was soft, and of a greyish colour; this rested on firm iron grey structure, and minute masses of yellowish fat; the muscular coat was drawn in and lost at this part; but in the colon, both above and below the stricture, it was distinct.

On careful examination of this part (Plate III, fig. 5) the surface was smooth, and presented columnar epithelium, nucleated cells, and elongated nuclei (*a*); beneath the mucous membrane, which was itself dense, changed in character and fibrous, was a considerable quantity of firm, fibrous tissue, arranged at right angles with the intestine (*b*), and leaving interspaces filled with nuclei, but without nucleoli (*c*); still deeper, muscular fibre could be detected. There was no structure of an ordinary carcinomatous character. The nuclei were different from ordinary nuclei, not having well-defined cell-wall or nucleoli. They

appeared like a coagulated blastema, in course of development into a fibrous structure.

In the termination of the ileum was an ulcer affecting nearly the whole of one of Peyer's patches, and the mucous membrane was entirely destroyed, but the disease was of a different character from that in the colon; the rest of the small intestine was healthy. The stomach contained some black mucus adherent to the membrane. At the cardiac extremity was a raised, black patch, covered with white substance, but merely affecting the mucous membrane, probably from thrombosis. The follicles were evident, and slightly blackened from the blood which they contained; but at the upper part of the membrane, where the capillaries were more numerous, there was an almost uniform black colour; it appeared that before death ecchymosis had taken place from the capillaries, and that after death the blood had become changed by the action of the gastric juice. At the lesser curvature was another black patch, but without the white substance on the surface; there, too, the follicles were beautifully distinct, some being marked out by being filled with changed blood; and that which had exuded from the superficial capillaries was blackened. The white substance consisted of cells and crystals. There was contraction of the mitral valve; but the liver, kidneys, and other viscera and glands were healthy.

In this case the obstruction was diagnosed to be at the sigmoid flexure, but the general emaciation led to the belief that there was more general infiltration of the glands. This was not the case, but the distension had produced ulceration of the ileum; nutrition was much impaired, and the diseased condition of the mitral interfered with the healthy action of the heart. The opium acted well, and its use was followed by marked improvement, and by action from the bowels; the administration of purgatives increased the vomiting and prostration.

Case CLXI.—*Cancer of the Liver, of the Lumbar Glands, and of the Sigmoid Flexure.*—Robert W—, æt. 32, was admitted September 19th, and died October 16th. He was a patten maker, and had lived in the Borough. Four months previously he had begun to feel pain; there were symptoms of indigestion, and afterwards severe pain in the right side. He became emaciated, but the abdomen was enlarged; the liver could be felt very distinctly on the right side, and nearly reached to the crest of the ilium. The pain in the right side and across the abdomen became more severe, and he gradually sank. There was no indication of disease of the sigmoid flexure observed during life.

Inspection was made twenty-seven hours after death.—The body was spare, and slightly jaundiced. The chest was healthy, with the exception of the base of the right lung, where was a large patch about three inches in diameter, white in colour, situated on the surface of the

pleura, and about one eighth of an inch in thickness; this consisted of cancer, extending through the diaphragm from the liver; there were a few tubercles in the neighbourhood; and one of the glands of the neck was infiltrated with cancer. The lungs, bronchial glands and heart were healthy.

Abdomen.—The peritoneum contained about three pints of serum and pus; the liver was 9½ lbs. in weight, and towards the diaphragm had the appearance of a large abscess; the surface was irregularly contracted from the development of masses of cancer. On section, nearly the whole gland was found to be involved, with scarcely any intervening gland structure; and these cancerous masses presented nearly every stage of degeneration; some had a soft, yellow centre, others a dark green slough, and in some the centre was semi-fluid. The lumbar glands were infiltrated; and at the termination of the sigmoid flexure was a small fæcal abscess; the walls of the intestine were ulcerated, broken down, and infiltrated with cancer, and some of the contents had become extravasated among the cancerous exudation.

Here there was *no marked* constipation; the cancer was medullary rather than scirrhous or epithelial; there had been some pain in the part, but no obstruction. The patient was evidently wasting from organic disease; the liver was known to be affected, and so slight were the symptoms of disease at the sigmoid flexure, that they were scarcely noticed, although it is probable that the disease commenced at that part.

Case CLXII.—*Cancerous Ulceration of the Sigmoid Flexure of the Colon. Constipation.*—For the particulars of the following case I am indebted to my friend Sir W. Gull. The preparation is in the Museum at Guy's (1854[35]).

Mrs. H—, æt. 60, in May, 1854, had an attack of diarrhœa, and a similar attack had occurred some months previously; from that time she had been troubled with flatulence and pain in the abdomen. The diarrhœa was relieved, but the pain continued. On July the 22nd she had constipation, which was not removed by the use of castor oil, rhubarb, &c. There was no vomiting, the pulse was quiet and the tongue clean. Vomiting came on, on the 24th. The examination of the rectum discovered a hard mass high up in the recto-vaginal space. Opium and ice removed the symptoms. After five days the bowels were relieved, and she then went on very well till September 20th, when the bowels again became obstructed; enemata were used, and opium was administered; croton oil was rubbed into the abdomen. Purgatives were occasionally given, but in vain; after five weeks of complete constipation, symptoms of peritonitis came on, and she died. The operation of opening the descending colon was proposed, but the patient would not consent.

In this case diarrhœa alternated with constipation, a condition which is not unfrequent in disease of the sigmoid flexure.

Case CLXIII.—*Cancer of the Sigmoid Flexure. Obstruction. Relieved. Gradual Exhaustion.*—Richard C—, æt. 32, was admitted under Sir W. Gull's care, July 2nd, 1854, and died September 3rd. He had been troubled with symptoms of obstruction for five months, his abdomen often becoming distended, and again diminishing after escape of flatus. Various remedies were given, and with considerable success (quinine and opium). The bowels became freely acted upon, but the patient became gradually wasted, and at last sank.

Inspection, twenty hours after death. The heart and lungs were healthy. The *abdomen* was enormously distended on account of the size of the large intestine; the omentum was drawn upwards. The small intestine was much enlarged; but the cæcum and colon were enormously so. Just within the hollow of the sacrum was the constriction, which could be felt as a hard lump about the size of a hen's egg. The disease occupied four inches of the canal, and consisted of epithelial cancer. The walls were much thickened, and in the cellular tissue around was hard tissue of a scirrhous character. The interior of the gut was ulcerated, and upon it were a few vascular fringes. The mesentery contained a few hardened glands. The walls of the intestine were considerably hypertrophied. The remaining viscera were healthy.

This case was an exceedingly interesting one, showing the beneficial and marked effect produced by judicious treatment. On admission there appeared but little probability that the obstruction would be overcome; the opium which was administered with quinine, so far allayed the intestinal action and spasmodic contraction, that fæces slowly passed the stricture, and for a time there appeared probability of recovery.

Case CLXIV.—*Colloid Cancer of the Sigmoid Flexure. Artificial Anus in the Groin. Pleuro-pneumonia.*—Thomas C—, æt. 56, had had severe pain in the course of the ureter, and it was supposed that he had renal calculus. On admission it was evident that there was an abscess forming in the iliac region; this reached slowly below Poupart's ligament, and was allowed to open itself. The patient became more and more prostrate, and a few days before death troublesome diarrhœa came on.

The inspection was made seven hours after death.—The body was rigid and much emaciated; on the left side, below Poupart's ligament, and at the crest of the ilium, were two openings about a quarter of an inch in diameter, the surrounding skin being thin and red; a probe passed for several inches along the course of the crest of the ilium, and a discharge of feculent pus proceeded from the wound. There was

pneumonia at the base of the left lung. The heart only weighed seven ounces, the valves were athromatous, and the muscle fatty.

Abdomen.—The parietes were rigid; the intestines were collapsed; two bands of omentum were adherent at the sigmoid flexure. The stomach was low down, and much distended; its mucous membrane was mammillated; the secreting cells were granular; the pylorus was healthy. The mucous membrane of the cæcum and colon were of a grey colour. The colon was contracted; at the commencement of the sigmoid flexure was a hard mass resembling scybala; on opening this the calibre of the intestine was almost obliterated by an irregular growth from the mucous membrane, which involved the whole circumference of the gut, and would only admit the little finger at the upper margin; it was rounded, foliated, and extended in one part an inch up the descending colon; the lower margin was of the same kind, but more intensely congested. The breadth of this diseased portion was from one to three inches; the intermediate part was ulcerated, and a communication passed at the posterior part into an irregular sinus, behind the fascia covering the quadratus lumborum; this sinus was filled with feculent pus, and burrowed downwards along the crest of the ilium to the openings in the skin. On making a section of the growth, it was found to be soft, of a yellowish-white colour, and had a striated appearance, and fluid could be compressed from it; several parts presented transparent gelatinous masses of colloid cancer. The whole of the mucous and muscular coats were involved and destroyed; and the muscular tissue of the quadratus lumborum was filled with round isolated masses of colloid growth, separated by bands of muscular fibre. The surface of the growth presented (Plate III, fig. 4) columnar epithelium, some cells of normal size, others much enlarged (*a b*) and containing single or double nuclei; some of these cells were oblong; the principal portion, however, of the growth was composed of large nuclei, about 1000th to 1500th of an inch in diameter, with distinct nucleoli, and closely packed together with very little intervening blastema (*c*); there were some large cells containing several nuclei (*d*). On the field were numerous masses resembling inflammatory granule cells (*e*). The intervening tissue consisted of delicate fibres, arranged so as to form cells (*e*); and in some parts presenting elongated cells (*f*). There was no doubt as to its cancerous character; and there were a few small infiltrated glands in the neighbourhood of the cancerous growth. On the surface of the liver, both on the right and left lobes, the peritoneum was thickened from attrition; the liver was fatty and coarse. The spleen was soft, its corpuscles were visible. The kidneys were atrophied, and contained a few cysts; they were 8½ oz. in weight.

In this case, the examination of the fæces or the discharge might have detected cancer, but no tumour could be felt; there was no marked constipation, but pain in the course of the ureter was the principal symptom.

Case CLXV.—*Cancerous Disease of the Sigmoid Flexure. Diarrhœa. Perforation. Fæcal Abscess.*—Elizabeth S—, æt. 55, was admitted into Guy's Hospital, March 29th, 1854. She was a married woman, but had had no children. She was much emaciated, and for three years had ceased to menstruate. On admission she had a hot and dry skin; the abdomen was tender; the pulse was sharp and frequent. She had had pain in the hypogastric region, with vomiting and purging, and the stools had contained blood. The diarrhœa became more severe, and there was increased tenderness and pain at the lower part of the abdomen; the evacuations contained inflammatory product. She died on May 16th, severe purging having continued.

On *inspection* the lungs and heart were found healthy. A cancerous growth was situated above the sigmoid flexure; and there was ulceration of the new growth. The calibre of the intestine was contracted, and there was thickening of the mucous and muscular coats of the descending colon. The omentum was adherent to the large intestine at that part, where a large fæcal abscess had formed, from the giving way of the descending colon above the seat of stricture. The liver was small and fatty. The kidneys were small and atrophied.

This case is one of much interest, as showing an occasional mode of fatal termination of cancerous disease of the intestine; and that after ulceration has taken place at the seat of stricture diarrhœa may come on. Here, however, the intestine had also given way, and had led to peritonitis, and the formation of fæcal abscess.

Case CLXVI.—*Cancerous Disease of the Rectum. Old Hernia.*—In the 'Guy's Reports' for 1850, Mr. Birkett has recorded a case of insuperable constipation, arising from stricture at the upper third of the rectum, and associated with scrotal hernia. The patient was forty-nine years of age, and for fourteen years he had had hernia. The bowels had been rather constipated. On June 13th he could not reduce the hernia, and applied at one of the London hospitals. On the 18th he was admitted into Guy's. There were slight symptoms of strangulation, but the hernia was reduced, and he felt greatly relieved. On the 21st he came to the hospital, suffering very severe pain in the abdomen, with tympanitis; the voice was weak, and the countenance was expressive of great anxiety; the pulse was small and frequent, and the extremities cold. There was a swelling in the left side of the scrotum, and although the patient did not complain of pain, there was much dragging, with sense of tightness across the abdomen; it was decided to make an exploratory operation. No intestine was found in the sac, and the internal ring was perfectly free. He died on the 26th, nine days after the last alvine evacuation. On inspection, there was a general peritonitis, and at the commencement of the rectum there was a vascular growth from the mucous membrane, with thickening

of the submucous tissues, which had led to complete occlusion of the canal. The hernial sac was perfectly free.

Great obscurity existed in this case; examination per rectum could not have reached the stricture, and the whole attention of the patient was to the hernia. The symptoms, however, were more gradual in the onset than ordinary strangulated hernia.

Case CLXVII.—*Cancerous Disease of the Transverse Colon. Fæcal Abscess.*—Mary N—, æt. 40, living at Whitechapel, was admitted September 19th, 1856. Two years previously she had been pushed by her husband from the top of the stairs, and violently struck her abdomen across the banister. She felt great pain in her loins when she recovered herself, and was unable to assume the erect posture, but felt more easy in the semi-upright position. The abdomen became distended, and a large hard swelling was felt in the left hypochondriac and iliac regions. This tumour gave her great pain on stooping, and she was unable to bear any pressure upon it. She had vomiting and diarrhœa. The tumour continued in the same state for about a year; but at that time it became enlarged, and there was great pain across the loins; she frequently vomited and had diarrhœa. The urine occasionally became scanty, and she had headache, vertigo, and loss of appetite. She was a woman of dark complexion, and was much emaciated, cachectic, and slightly jaundiced; a tumour was felt in the left iliac and hypochondriac regions: it was tender on pressure, and appeared to be felt in the loins; the bowels were relaxed, the urine dark coloured, but it did not contain any pus. The diarrhœa continued with occasional vomiting till death, on the 18th October.

Inspection was made on the 20th. The body was slightly jaundiced. The thoracic viscera were healthy, but colored with bile.

On opening the abdomen, the peritoneum was healthy, except towards the left side, where the tumour was observed, which had been felt during life in front of the kidney. There wered adhesions firmly uniting several coils of intestine together. On separating them, which could be done without tearing the intestine, a feculent cavity was found, bounded above, by the transverse colon, where it joins the descending colon, and by the greater curvature of the stomach; behind, by the pancreas; below, by several coils of jejunum.

The transverse colon presented an irregular opening about three inches in circumference, the edges of the opening were thickened, stained by adherent fæces, infiltrated with cancerous product, and in some parts were half an inch in thickness. The pancreas at its lesser extremity, and some of the adjoining glands were infiltrated with cancer; the stomach, though adherent, was not affected. At the lower part of the abscess two coils of the jejunum were firmly adherent, and were perforated; one, by a transverse opening extending about half

across the intestine, the edges of which were everted and much ejected; the other, by a smaller opening. The mucous membrane of the jejunum generally was injected, and covered with mucus. The stomach and remaining parts of the intestine were healthy, so also were the liver and kidneys. The uterus, ovaries, and glands, were healthy.

The disease was here of a strictly local character. The examination of the growth showed that it consisted of nuclei resembling those found in cancerous disease, and the general appearance was very strikingly that of cancer; still no other part was affected. The blow which she had received at this part set up inflammatory disease, and it is probable that a cancerous action subsequently ensued; ulceration then took place, and a fæcal abscess formed.

The diagnosis was difficult; the position of the tumour was that usually found in disease of the glands about the kidney, but no abnormal condition of the urine existed. The vomiting was less persistent, and the diarrhœa more severe than is usually observed in cancerous disease of the stomach; but although the colon was thus extensively diseased, constipation did not occur.

Case CLXVIII.—*Carcinoma of the Rectum, of the Ovaries, and of the Peritoneum. Acute Peritonitis. Scirrhus.*—Ann S—, æt. 26, admitted March 26th, was a married woman, living at Dockhead, and her youngest child was two and a half years old. For one year she had had difficulty in the passage of the alvine discharges, She was exceedingly ill on admission, and no connected history could be obtained; the lowest part of the rectum was sacculated, and about two inches upwards a stricture was found, through which a catheter could be passed. She suffered considerable pain, but no vomiting; she gradually sank, and died April 13th.

Inspection seventeen hours after death.—The body was very much emaciated. At the apices of the lungs there was slight pneumonic consolidation, with a little chalky deposit. The heart was small, and without fat.

Abdomen.—The intestines were distended. The peritoneum was intensely injected, and the coils of the small intestine were matted together. The mesentery was shortened. The great omentum was contracted into a firm mass, and was nodulated; nearly the whole of the peritoneum was minutely studded with small white tubercles; these were very numerous upon the peritoneal surface of the stomach. The sigmoid flexure and the upper part of the rectum were very much distended.

On taking out the large intestine, a growth was found about three

inches from the anus, having a semi-cartilaginous hardness. On its inferior surface the infiltrated mucous membrane had a double lip-like appearance, and was considerably raised. In the centre of the growth, all the coats of the intestine were destroyed, and were infiltrated with heterologous deposit. The mucous membrane had a yellowish-white appearance on section; beneath it was a firm, white fibrous product, mixed with iron-grey pigment; still lower, fat with firm tissue. The whole of the external cellular membrane was semi-cartilaginous. On microscopical examination, the mucous membrane was found to consist of a delicate cellular tissue of nucleated fibres, interlacing and leaving spaces filled by elongated and reniform nuclei; a few cells were observed, but their cell walls were very imperfect; the submucous tissue was very beautifully composed of a series of bands of fibre tissue, with intervening columns of nuclei; at the upper part these bands of fibres formed series of arches. The muscular coat of the intestine above the stricture was much hypertrophied. In the sigmoid flexure above the stricture were one or two superficial ulcers or abrasions. The descending colon was filled with solid bilious fæces, but was otherwise healthy. The cæcum and small intestine were also healthy as to their mucous membrane. The whole of the cellular tissue about the ovaries was thickened, white and infiltrated; both ovaries also were infiltrated with cancer, and one mass was of a yellowish colour, as if degenerating. The uterus, vagina, and bladder, were healthy. The liver was fatty. The stomach and spleen were healthy. There was no infiltration of the lumbar nor of the mesenteric glands. The kidneys and supra-renal capsules were healthy.

The disease in this case began apparently in the rectum, and extended from it, by continuity of structure. It was of a scirrhous character rather than epithelial, and although the obstruction was so great as only to allow a goose-quill to pass, no vomiting was produced by the constipation; the reverse would have been the case if violent drastics had been administered. The character of the pain in this instance was more severe than we find in disease of the sigmoid flexure; there was direct pressure on the nerves of sensation, and the disease extended to the adjoining structures. The growth could be felt on rectal examination, so that there was no difficulty in the diagnosis.

Case CLXIX.—*Epithelioma of Rectum. Contraction and Obstruction. Artificial Anus in the Loins. Diseased Appendix Cæci. Fæcal Abscess.*—Mary P—, æt. 48, was admitted into Guy's Hospital, October 7th, 1859. She had suffered from constipation for three weeks, accompanied with vomiting, and great abdominal distension. She was a thin person, having an aged, haggard expression; and when brought to Guy's she

was in such a condition that life was despaired of for many hours. The abdomen was much distended, but free from pain, and there was resonance and distension in the loins. On October 8th, Mr. Bryant made an incision into the left loin, and opened the descending colon; thin fæces were abundantly discharged; the operation was performed without unusual difficulty, but the patient gradually sank, and died on October 19th, at midnight.

The *inspection* was made fifteen hours after death. The body was very thin, and the abdomen collapsed; the peritoneum in some parts had lost its shining surface, but there was no evidence of general peritonitis. The peritoneum covering the iliac fascia on the left side was thin and green, and nearly perforated. The rectum passed directly up to the cæcum, then turned to the left along the brim of the pelvis; at the angle was a small fæcal abscess, bounded by the rectum, cæcum, and by a portion of small intestine; it contained the appendix, which was obliquely truncated near the cæcum by ulceration; there was a contracted portion of rectum about the centre of the concavity of the sacrum, having the appearance externally as if girt with a portion of string. On opening the bowel it was found to be nearly occluded; it was ulcerated on its inferior aspect; and above, it had a raised, slightly vascular fringe; there was no enlargement of glands. The opening into the descending colon was well situated; it was about one inch in length, the mucous membrane had united to the muscle immediately beneath; but beyond that, near the skin, the tissues were in a state of slough, and fæces had burrowed down under the fascia, so as to occupy the whole of the iliac fossa; this fæcal abscess nearly perforated the peritoneum, and extended into the labium on the left side, where was a small opening. The bladder was distended. The liver was pressed down; a white thickened patch existed on its surface.

This patient was too prostrate to allow of reparative changes after the operation had been performed, so that fæcal extravasation took place in the loin; the disease in the rectum was of a local kind, and the operation was skilfully performed; still, not only was surgical help deferred too long, for when first admitted she was almost dying, but the fæcal abscess arising from a perforated appendix cæci, would in itself have led to a fatal termination.

CASE CLXX.—*Cancer of the Jejunum, and of the Mesenteric Glands. Softening of the Spinal Cord. Paraplegia.*—Samuel S—, æt. 15, was admitted into Guy's Hospital under Dr. Rees' care, December 17th, and died on the 31st. After a fatiguing march, in a rifle corps, five weeks previous to the commencement of his illness, he began to suffer from "pins and needles" in his legs, followed by weakness and complete paraplegia. The respiratory muscles became involved before death. A tumour was felt in the lower part of the abdomen, near the anterior

and superior spinous process of the ilium on the right side; but neither history of abdominal pain nor any distressing abdominal symptom was made out during life. The bowels acted without purgative medicine; the motions, however, were discharged involuntarily.

On *inspection*, the spinal membranes were found to be clear, but rather more adherent than usual; the vessels also appeared very full of blood; and at the upper part of the dorsal region the cord had a diffused eechymosed appearance, several points of extravasated blood were also found. In the lumbar and lower part of the dorsal region the cord was hard, but at the upper part it became soft, and in some parts semi-diffluent; one or two spots were more prominent than others in this softened portion.

Abdomen.—The peritoneum was healthy; the omentum was spread down to the pelvis, and was adherent near the right iliac region to a hard mass, about three inches in circumference, consisting of an enlarged and infiltrated mesenteric gland; a distended coil of jejunum was adherent at the part to the omentum. The cæcum was free and empty, and was situated behind and a little to the right of the growth just mentioned. On removing the intestine and opening the distended portion opposite to its mesenteric attachment, it was found to consist of about six inches of jejunum dilated into a large sac; at the entrance into this sac the mucous membrane was infiltrated with cancerous product, so that the valvulæ conniventes were hard and prominent; a similar state also existed at the outlet of this sac; in some portions of this distended bowel the coats were very much thinned, as if about to perforate into the peritoneum. The mucous membrane of the jejunum, however, was entire. A mesenteric gland in the centre of this coil of jejunum was infiltrated with medullary cancer; it was very soft and pale in colour; other glands were infiltrated in a less degree; and one or two near the pancreas were also enlarged. The growth in the jejunum consisted of yellow cancerous matter infiltrating the coats of the intestine. In another portion of the jejunum there was a white, hard mass, opposite to the mesenteric attachment, about one inch in length, and one eighth of an inch in thickness, consisting of cancerous infiltration into the submucous cellular tissue, but the mucous membrane was entire. The colon, stomach, duodenum, and pylorus, were healthy. The liver and spleen were fissured, but free from disease; there were several cancerous the kidney, and the epididymis was enlarged. The lumbar tubercles in glands were normal. The left lung was solidified at its base.

The spinal mischief led to a fatal termination, but the case is remarkable not only in the form and situation of the cancerous disease, but in the comparative absence of symptoms of abdominal mischief. No obstruction took place in the intestinal tract, and the peritoneum was not involved. If, however, life had been prolonged for a short time, the more

extensive affection of the mesenteric glands and the implication of the peritoneum would soon have led to well-marked indications of abdominal disease.

Case CLXXI.—*Cancerous Ulcer of the Colon opening into the Duodenum. Diarrhœa. Vomiting.*—Ann S—, æt. 47, a greengrocer, who had worked hard, and drank freely; her father died from phthisis, but with the exception of an attack of acute rheumatism, and of erysipelas ten years before her last illness, she had enjoyed good health. Five and a half years before admission she had free access to a fruit garden, and partook of fruit to excess; severe diarrhœa and depression followed. Eighteen months afterwards the skin became slightly jaundiced, and her medical attendant found a tumour about the size of a hen's egg immediately above the superior spinous process of the left ilium. She had also suffered from hæmorrhoids, and from tapeworm. When she applied for admission at Guy's Hospital, November 15th, 1859, she was pale and had a careworn appearance; there was brown discoloration of the abdomen, neck, thighs, and elbows, the gums were pale, and the tongue was clean. The resonance of the chest was good, and the respiration was healthy. The pulse was 90, and compressible. The abdomen was supple and resonant, excepting in the region of the cæcum, where a rounded, uneven and hard tumour could be felt, about the size of a turkey's egg. There was slight dulness at that part, but no pain except when pressure was made, or when a deep inspiration was taken, or after swallowing fluids; pain extended also in the course of the ilio-hypogastric nerve, reaching as far as the trochanter, and also back to the spine; on pressure, also, the pain was produced in the inguinal region of the opposite side. The bowels were relaxed, and mucus was passed in the motions; the urine was of light colour, of sp. gr. 1015, and free from albumen and sugar. There was good appetite; nausea was present, but no vomiting. Eight leeches were applied, and a poultice; the spermaceti mixture given, and Dover's powder with grey powder every night. The pain was relieved by the leeches, but on the 24th it again became very severe, and the bowels were relaxed. The leeches were repeated, and calomel and opium, of each gr. j, given every night. 25th.—The pain was less, but there was tenesmus and diarrhœa; an enema of starch with tincture of opium was administered. On the 30th, leeches were repeated to relieve the pain, and opium was given.

On December 4th, there was diarrhœa, and the swelling had increased, extending upwards; vomiting came on. Logwood mixture (G.P.) was given. On the 7th, sickness was relieved by brandy and soda-water. The symptoms partially subsided, and she left the hospital on January 31st.

She was readmitted on March 13th, 1860. Fifteen days before, at 3 p.m., she had an inclination to go to stool, but before she could reach the closet she felt something give way in the abdomen, and a profuse discharge of very fetid pus took place from the bowels. The tumour

diminished in size; the bowels continued relaxed, and for one week there was blood in the evacuations; she seemed low and weak; there was no appetite, but considerable thirst; there was pain in the tumour before and after the discharge, emaciation was manifest, the mouth became sore and aphthous, and the urine contained lithic acid. When admitted, she was emaciated, and her countenance was anxious and distressed; there was a deep flush on the cheeks; the eyes were sunken and hollow, the tongue was morbidly red, glazed and cracked, and there was aphthous ulceration at the tip; the skin was hot and dry. The abdomen was soft. There was undue prominence over the right ilium; and pain with tenderness was present at the epigastrium, as well as in the right hypochondriac and iliac regions; the tumour which had been felt so long was resonant on percussion. The hepatic dulness extended two inches below the sternum; the appetite was bad, and she complained of thirst and nausea; the bowels were moved ten to twelve times, and the motions consisted of very fetid brown fluid, containing scarcely any solid matter, and no blood. The urine was scanty. The compound decoction of krameria was given every six hours, with brandy, milk, arrowroot, &c.

March 25h.—For two days obstinate vomiting tried the patient; it increased in severity, and came on after any exertion, and after taking food; rapid prostration followed, and death.

On *inspection*, the thoracic viscera were found to be healthy. In the abdomen, the ascending colon was firmly fixed in the right loin, and it was adherent to the surface of the liver; but the liver and kidneys could be removed without interfering with the diseased part. On opening the colon there was found in the ascending part, just above the cæcum, a large carcinomatous ulcer, as large as the palm of the hand; it was circumscribed and surrounded by raised edges of morbid structure. In some parts of the diseased tissue the edges were undermined, so that bridles of tissue passed across. At the bottom of the ulcer was a large hole, through which the middle finger could easily be passed, and entered at once into the duodenum. On opening the duodenum the perforation was seen within it; the hole was as large as that in the colon, but its edges were merely fringed by the new growth. The duodenal opening was near the pylorus, and opposite to the common bile duct, so that the bile might have at once passed into the colon. The contents of the intestine, both small and large, were of a pale slate colour, showing the absence of bile. The liver was very fatty, and it was lighter than water. The kidneys were healthy. The omentum was adherent to the right ovary, and the Fallopian tube was adherent to the ovary.

In this case there was evidence of chronic disease of the cæcum or of the colon, as shown by the gradually increasing tumour; the pain increasing at once on drinking fluids was very manifest. The enteric irritation was propagated to other

parts of the intestine, and diarrhœa was produced; this in connection with pain was, for a long time, a very troublesome symptom. About a month before her death, at the time that something was felt to have given way in the abdomen, the opening into the duodenum was probably suddenly made, and from that time vomiting was a more constant symptom; there was no evidence, however, by stercoraceous vomiting, that fæcal matter passed from the colon into the duodenum. As to the cause of the disease of the colon, it is possible that the primary irritation of the intestine after partaking of a large quantity of fruit, might have determined the seat of the disease; this, however, is very doubtful. From the first, the treatment was in a great measure palliative rather than strictly remedial; but much may be done in these cases to diminish the sufferings of the patient and to prevent the rapid extension of the disease.

Case CLXXII.—*Ulceration of the Colon. Intestinal Obstruction from Contraction of the Transverse Colon. Cancer? Dysentery. Constipation. Diarrhœa.* (For the following case I am indebted to my friend Dr. Wilks).—David B—, æt. 72, was a rather spare man, of middle stature, and with a yellowish complexion, but he had never been abroad; his habits had been rather intemperate. He stated that his general health had been tolerably good, until within the last few years, during which he had suffered at frequent intervals from diarrhœa, with colic in the abdomen, and often from painful defecation. His bowels were at times so irritable that, after swallowing only a cup of tea they acted immediately and almost before he could reach the closet; these symptoms became increasingly severe. Nine years previously, also, he had received a blow in the left groin, which produced a femoral hernia; it was reducible, and, with a truss, did not give him much inconvenience.

On August 11th, 1855, he complained of diarrhœa, stating that his bowels were relaxed several times during the day, and that he suffered at times from severe pain in the abdomen; the pulse was full, 75; the tongue was clean; the appetite was good; and, excepting the symptoms just mentioned, he seemed to be in good health. He was ordered chalk mixture with aromatic confection three times a day.

On the 14th, the bowels were less relaxed, but the pain in the abdomen was augmented; and sulphuric ether, with tincture of opium, was given in pimento water every four hours.

On the 16th, the abdominal pain had greatly increased, it was nearly constant, but at intervals became more severe; there was no tenderness on pressure at any particular part, but the greatest amount of pain was felt about the umbilical region; the bowels had not been open for

two days. The constipation was relieved by purgatives, but there was return of severe colic, and vomiting and tympanitis came on. He gradually became prostrate, and diarrhœa supervened before death on the 29th.

Inspection. August 30th.—The body was spare, but not much wasted. The abdomen only was examined. There was recent acute peritonitis. The intestines were distended, injected and covered with a slight exudation of lymph. The seat of stricture was at once seen to be the middle portion of the transverse colon, exactly in the median line of the body; the omentum was found abnormally adherent to this portion of the intestine, and a dark-coloured, hard-looking substance was recognized; this formed the constricted portion of the intestine, and both above and below it there was considerable dilatation. On removing this portion of the intestine, the disease was felt as a hard tumour situate in the substance of the organ, and producing the constriction. Although the exterior continuity of the bowel exhibited a considerable falling in at this part, its lessened calibre was not so manifest from the exterior as from the interior. When the intestine was opened, its channel was found to be so reduced in size that it would only admit a goose quill. On laying the whole of it open, the diminished passage was found to be owing, not only to the external peritoneal puckering, but to the hypertrophy of the subserous cellular tissue, and of the muscular coat, and to a raised spongy condition of the mucous membrane. When spread out, the diseased surface occupied a space not much larger than that of a five-shilling piece. The mucous membrane was red, highly vascular, and completely separated from the healthy surrounding structures, not only by its colour, but by its highly raised margin, which was considerably above the level of the adjacent mucous membrane. It had a soft, spongy appearance, and the muscular coat beneath was much hypertrophied. The microscope showed the surface of the structure to be composed of highly vascular branching villi. The surface was covered over with an abundance of columnar epithelium. More deeply seated was found a delicate fibre tissue, with a number of small nucleated cells, of a shape resembling ordinary or abortive epithelium. The cæcum and ascending colon, as well as the lower part of the descending colon and the rectum, contained numerous ulcers in various stages of healing; most of them were quite healed, and presented only cicatrices. There were large irregular shaped portions of mucous membrane, of a dark blue or slate colour, which seemed to have been ulcerated, and caused a considerable puckering of the surface. In the cæcum and rectum the general calibre of the intestine was much altered in shape by the contraction, and also by the hypertrophy of the muscular coat, which was very considerable in the cæcum. The liver contained no cancerous disease, nor did any of the abdominal glands.

Simple acute disease of a dysenteric character took place in this patient, ulceration followed, and, at the seat of one of

these ulcers a villous growth was developed, which led subsequently to constriction; the coats of the intestine at that part were hypertrophied, showing that the obstruction had existed for some time. As to the nature of the growth, although no strictly cancerous product was found, and although no glandular disease was present, its villous character and cellular substratum showed that it belonged to the class of growths designated as cancerous. The first symptoms were those of dysentery, as shown by the diarrhœa and the discharge of mucus; but as the disease extended to the deeper structures, and spasmodic contraction took place at the seat of the villous growth, the obstruction became complete, till vomiting even of a stercoraceous kind was set up; and it was only as the strength of the patient failed that the constriction yielded and the bowels acted; diarrhœa then came on, and continued till death. In the treatment of the patient, the increase of the symptoms after purgative medicines, and their relief after the administration of opium, were well marked.

These instances show, that with care the several forms of internal strangulation may be generally distinguished, when we have the whole of the symptoms before us; that whilst over-active and injudicious treatment increases discomfort and hastens a fatal termination, much may be done for the relief of the patient, and valuable lives may thereby be prolonged. These are not the cases for do-nothing practice; the proper use of enemata, of such diet only as can be borne without injury, opium, rest, and other means to which we have referred, will mitigate suffering even where cure is impossible.

CHAPTER XVII.

SUPPURATION IN THE ABDOMINAL PARIETES. PERFORATION OF THE INTESTINE FROM WITHOUT. ABSCESS IN THE ABDOMINAL PARIETES EXTENDING INTO THE INTESTINE. FÆCAL ABSCESS.

Perforation of the coats of the small intestine ranks in the order of frequency next to perforation of the stomach; the colon is, however, perforated more frequently than is generally supposed. These perforations of the intestinal tract divide themselves into two great classes: 1st. Those which arise from disease commencing in the intestine itself, and to which we have referred in numerous instances, as perforation of the ileum in typhoid fever and in phthisis; of the cæcum and its appendix; of the colon in dysentery, in cancerous disease, and in several forms of insuperable constipation. 2nd. Those in which the perforation is from without, or from the extension of disease from adjoining structures. These latter cases constitute an important and an exceedingly interesting class of diseases; and the following causes of external perforation may be enumerated:

1. From the peritoneum, as in strumous peritonitis and localized peritoneal abscess.
2. From disease of the stomach, as ulceration and cancer, extending into the transverse colon.
3. From hydatids and abscess of the liver, thus forming a means of escape into the small or large intestine.
4. From calculi in the gall-bladder, setting up ulceration of the duodenum or of the colon.
5. From abscess in the spleen.
6. From abscess in the kidney.

7. From abscess in the abdominal parietes and loins opening into the intestine.

8. From diseased ovary communicating with the cæcum, colon, or rectum.

9. From cancer of any of the abdominal organs extending into the intestine.

10. From extra-uterine fœtation.

11. From one portion of intestine opening into another, as the appendix into the rectum.

12. From blows, and external injury.

In many of these forms of disease last enumerated, various and characteristic symptoms precede the perforation of the peritoneum and of the intestine; thus, the signs of cancerous disease of the stomach arise some time before fæcal eructation or vomiting indicate extension into the colon. In hydatid disease of the liver a rounded tumour, of slow formation, is detected, having often a peculiar vibratory thrill, and without general disturbance, before the occurrence of local peritonitis takes place, and the hydatids are discharged either by the mouth or with the evacuations per rectum.

In gall-stone very severe pain arises in the region of the gall-bladder with vomiting and often with jaundice, before ulceration takes place, and perforation be made into the duodenum or into the colon. Peritoneal adhesions generally prevent severe inflammation of the serous membrane.

In abscess of the spleen the symptoms are more obscure, and constitute part of a general constitutional disturbance, till perhaps the discharge of pus by stool indicates that a communication has been formed with the transverse or descending colon.

In abscess of the kidney, and pyelitis, there is purulent urine; but when there is suppuration external to the tunic of the gland the symptoms are more obscure.

In ovarian and cancerous tumours tactile examination will detect them. Some of these forms of disease are more obscure than others, but when fæcal abscess is the result there is considerable uniformity in their character; severe local pain and tenderness come on, with hectic fever, and steadily increasing prostration; and when the abscess is not limited by adhesion, a rapidly fatal result occurs.

Suppuration in the *parietes* of the abdomen is frequently observed, and simulates deeply-seated mischief; and for a short time considerable obscurity may attend it. The symptoms are generally of an acute character; considerable pain and febrile excitement precede inflammatory œdema of the skin, and while the effused products are bound down by firm fascial investments the symptoms closely resemble cæcal disease, and local peritonitis; in fact every part of the abdominal parietes presents us with disease on the surface, resembling deeper injury, and the structures beneath sympathise with the external disease. Thus jaundice may come on with abscess in the right hypochondrium, constipation and distended bowel may be found in cases of inflammation behind the ascending or descending colon. Movement of the bowel induces pain and delay in the passage of the contents. In the hypochondriac regions suppuration connected with the costal cartilages and ribs simulates abscess of the liver, empyema, hydatids, diseased gall-bladder, or corresponding disease of the spleen; in the right and left iliac regions abscess in the parietes may be mistaken for affections of the cæcum and sigmoid flexure of the colon; in the lumbar regions, for renal and spinal disease; in the umbilical, for strumous and cancerous disease; and, lastly, in the hypogastric region, pelvic cellulitis, for ovarian and uterine disease.

Simple suppuration in the parietes generally tends to the surface, and the abscess is opened or it is discharged spontaneously, and in many cases recovery takes place, unless the disease be associated with pyæmia, or occur in cachectic subjects; sometimes the suppuration spreads extensively among the muscles; it extends also in depth, and gradually produces local peritonitis, or discharges itself into some of the viscera. Thus abscess about the kidney opens into the colon, that in the iliac regions into the sigmoid flexure, or cæcum.

The most fertile sources of these forms of parietal suppuration are blows and falls. I have observed them from blows, from pressure on the abdomen, and from falls on the back, &c. In pyæmia and in cachectic subjects very trifling causes appear to be sufficient to lead to this disease. A rupture of the muscular fibre is followed by extravasation of blood, and suppuration may supervene.

Diagnosis.—The pain will generally be found to be very superficial; but in many instances, at an early stage, before any inflammatory œdema has been produced on the skin, and whilst the disease is confined beneath the fascia of the abdomen, there is much obscurity in the diagnosis; and after pus is discharged, it must be remembered that a fæcal *odour* does not necessarily imply communication with the intestine; for transfusion of the gaseous contents of the intestine, when there is tolerably close contact, may cause the contents of an abscess to have a fæcal smell. In the diagnosis, it is important to bear in mind the remark we have just made as to the sympathy of adjoining viscera. We refer to the production of jaundice in disease in the right hypochondrium. Abscess below the diaphragm often leads to congestion and inflammation of the pleura and lung which may be mistaken for the primary disease.

In reference to the *treatment* this early obscurity is of no great moment, for at that period, rest, warm cataplasms, local depletion, and counter-irritation, are equally applicable to local peritonitis as to parietal inflammation. When suppuration has actually taken place, the sooner the pus is evacuated the less likely is it to burrow among the flat muscles and fascia of the abdomen; and even in abscesses, fæcal or otherwise, extending secondarily to the parietes, unnecessary delay is sometimes made in discharging their contents. The rule is, I believe, a correct one, to open these abscesses very early.

Case CLXXIII.—*Suppuration external to the Sigmoid Flexure of the Colon, opening on the Anterior Abdominal Parietes, and communicating with the Intestine.*—Elizabeth R—, æt. 39, a widow, who had supported herself by dressmaking, was admitted into Guy's Hospital, under my care, in March, 1855. Till a fortnight before admission she had enjoyed good health, when she felt pain in the back, which extended to the shoulders and knees. The greatest pain, however, was in the course of the ilio-hypogastric nerve. These symptoms were accompanied with considerable febrile excitement. In a few days the pain, which had simulated rheumatism, ceased, and she gained strength.

On March 26th, three weeks after admission, she complained of pain in the left iliac fossa, and a firm tumour about the size of a hen's egg could be felt deeply in that part. There was no tenderness in the spine, no numbness in the legs, nor other symptoms of disease of the spine, nor was there any evidence of disease of the ovary. The bowels were easily acted on, but this action did not affect the size of the

tumour nor alleviate the symptoms. The urine was normal, and there was no indication of renal disease.

May 10th.—The pain had returned with much severity, and hectic came on. The tumour increased in size; it could be felt extending to the quadratus lumborum; and it also reached to the anterior abdominal parietes, which, at the left iliac fossa, were red, œdematous and exceedingly tender.

19th.—The bowels were acted upon three times freely, and a considerable quantity of purulent mucus was discharged. The examination of this discharge could detect no cancer cells. The pain and the hectic continued; the patient became pale and exhausted; the left thigh and leg, and afterwards the right, became swollen and tender; and there was excessive pain in the course of the femoral veins. Nourishment and stimulants were administered as the patient could take them. Quinine and opium, or morphia were given.

On June 8th, the inflammatory œdema of the anterior abdominal parietes had increased. My colleague, Mr. Callaway, made an incision at this part; and more than a pint of exceedingly offensive pus was evacuated. Every means were used to sustain the patient; but the discharge continued abundant, and it had a feculent odour; the appetite completely failed, and at length her strength gave way. Bed sores formed on the sacrum; and a few days before her death cough came on, which aggravated her distress. She gradually sank and died June 24th.

Inspection was made twenty-four hours after death. The body was blanched, and the lower extremities were œdematous; the posterior lobes of the lungs were in a state of red hepatization. *Abdomen.*—The peritoneum was healthy, except in the left iliac region, where the omentum and several coils of intestine were adherent. In this region was an abscess, situated behind the peritoneum and fascia, and containing offensive, feculent pus; it extended to the anterior abdominal parietes in front, above to the diaphragm and kidney, and posteriorly nearly to the spine. Very careful examination could detect no disease of the ilium, nor vertebræ, nor of the pelvic cellular tissue. The abscess communicated with the sigmoid flexure by three small openings, in close contact the one with the other; their edges were not thickened, but valvular. The small and large intestines were otherwise healthy, and the opening into the intestine was evidently secondary. The uterus, ovaries, and kidneys were normal. The stomach was of normal size; its mucous membrane was pale, and it had undergone degeneration. The liver was more than 5 lbs. in weight, and extremely fatty. The lower portions of the vena cava, and of the common iliac and external iliac veins, were filled with very firm, white, adherent fibrin; and the coats of the veins were much thickened.

The review of this case showed that the pain in the course of the ilio-hypogastric nerve arose from direct pressure upon that nerve by inflammatory effusion; that the tumour felt in

the iliac fossa consisted of this effusion pushing forward the peritoneum and sigmoid flexure; that the subsequent symptoms arose from suppuration, and its extension in various directions; inwards into the colon, leading to some extravasation of fæces into the abscess and of pus into the alimentary canal; forwards, so as to reach the anterior parietes, where it was opened; upwards, to the diaphragm; and inwards, to the cava and iliac vessels, which became involved and obstructed by fibrinous material. That it did not arise from diseased bone was proved by careful examination; and it is probable that some accidental blow had led to this suppuration, with its fatal results; or, that irritation in the intestine had led to inflammation external to it, and subsequently to suppuration.

After the tumour had been felt, evidence of suppuration soon arose; and the discharge of purulent mucous showed that it had formed a communication with the intestine, or that there was ulceration of the coats of the intestine itself. Renal, ovarian, spinal, or parietal suppuration, or cancerous disease of the sigmoid flexure, might give rise to many of these symptoms. The absence of all indication of diseased kidney was shown in the condition of the urine. Disease of the spine was exceedingly donbtful, from the absence of tenderness and numbness, and from the course of the suppuration. The position which the tumour assumed and vaginal examination showed that the ovary was not involved. The tumour appeared to arise from disease near to the sigmoid flexure, either commencing in that viscus and extending outwards, or beginning in the parietes and making its way into the intestine. It was in deciding as to which of these might be correct that the principal difficulty consisted. The discharge of purulent mucus from the intestine, and the feculent character of the pus, indicated a connexion between the abscess and the intestine. Before death, I was led to believe that the disease commenced in the sigmoid flexure, and that the suppuration external to the intestine was secondary; the inspection after death showed that the reverse was the case. This instance resembled cases of suppuration external to the rectum, but so deeply was the mischief situated, that any exploratory incision would have been unjustifiable till there

was more certain evidence of suppuration than was presented at the commencement of the disease.

Case CLXXIV.—*Abscess in the Loins. Feculent-smelling Discharge. Pleuro-pneumonia with Feculent-smelling Sputum. Recovery.*—T. H—, æt. 34, was admitted into the Clinical Ward, under my care, June, 1855. He was a man of steady and industrious habits. His health had been good till an attack of rheumatic fever two years before; and at Christmas, 1854, six months before admission, he had a very severe injury whilst at work; he fell upon his head, and it was believed that the skull was fractnred. He remained for some time in the hospital, under the care of Mr. Birkett, but left well, and continued so till three weeks before admission, when, in the middle of the night, he awoke with great difficulty of breathing, the respiration being accompanied with considerable distress and pain. These symptoms increased greatly in severity, and presented the signs of pleuro-pneumonia on the right side.

On admission he was exceedingly ill; his countenance was pale; his eyes were glistening; the lips and nostrils were contracted; the teeth were covered with sordes; the tongue was brown at the base and edges; and the skin was hot and clammy. In the chest there was found to be increased roundness of the right side at the base, with imperfect mobility, increased dulness on percussion, and loss of tactile vibration; and in front, below the nipple, there was a pleuritic rub. On the left side the respiration was peurile; and at the apices the expiratory murmur was prolonged and coarse. The position of the heart was normal; its sounds were healthy, but the precordial dulness was somewhat increased; the respiration was 26 per minute; the pulse 95, feeble and compressible; the urine was high-coloured, acid, sp. gr. 1025. He reclined on his back towards the right side, with his knees drawn up, and the head thrown forward.

The prostration increased till June 14th, when deep-seated fluctuation below the ribs on the right side could be detected beneath the lumbar fascia about the quadratus lumborum muscle. An exploring needle was passed, and afterwards a director, and the wound enlarged; about a pint of pus, having a strong fæcal odour, was discharged, and the abscess continued to discharge freely. After the opening of the abscess the respiration became more free, and he coughed up a considerable quantity of frothy mucus, having the same odour as the pus. His strength was sustained by nourishing food and stimulants; by quinine and opium; diarrhœa was occasionally troublesome, and the offensive expectoration became exceedingly distressing.

On July 2nd, he had so much improved as to be carried out into the open air for half an hour. The offensive character of the breath and respiration gradually subsided; healthy respiration became audible nearly to the base of the lung, and he continued to gain flesh.

In October he returned to his work, and then appeared a stout hale

man; but a fistulous opening remained up to that time, which occasionally discharged freely. The sinus healed in about six months, and he then appeared in good health, May, 1857.

In this case deep-seated suppuration took place near the quadratus lumborum muscle; acute pleuro-pneumonia on the right side, and the most severe constitutional symptoms followed. The pus, which was evacuated, and the mucus expectorated, were of a most offensive and feculent odour; but microscopical examination of the pus could not detect decided fæcal elements. Diarrhœa came on; the feculent character of the discharges slowly subsided, but the offensive character of the expectorated matter tried the patient much. Several facts render it probable, that the abscess was in close contact with the ascending colon; mere contact with the intestine would be sufficient to explain the fæcal odour; and it may be, that the contents of the abscess were partially discharged into the colon.

In the investigation of the case, several modes of explanation were suggested:—1, an abscess, the result of the blow; 2, caries of the vertebræ or their processes; 3, abscess of the liver; 4, empyema; 5, suppuration external to the kidney, from disease of that organ. Although there was evidence of acute disease of the chest, the abscess was evidently below the diaphragm, and probably in contact with it. The character of the pus, and the absence of the elements of bile, indicated freedom from hepatic disease. It is probable that disease of a vertebra or of one of its processes had been set up by the blow.

The treatment in both the cases just detailed appears sufficiently clear; namely, as soon as a tolerably certain evidence of suppuration is obtained, to make a free outlet for the pus, and to support the patient by every means in our power.

To defer the opening of the abscess, tends to increase fæcal extravasation where there is communication with the colon; and in other cases the pus readily extends among the cellular tissue which connects the layers of fascia and muscle.

Case CLXXV.—*Abscess in the Loins. Pleuro-pneumonia. Recovery.*—A Greek sailor was admitted into Guy's Hospital under my care in 1877, with pain in the left loin, between the ribs and the crest of the ilium. The severity of the febrile disturbance led to some doubt whether the patient was suffering from enteric fever or

from tuberculosis; still the especial complaint was of tenderness in the loin. One of my surgical colleagues kindly examined him, but at first did not think that the symptoms warranted an exploratory operation. After a few days, when the pain was still more decided, and accompanied with tenderness, pleuro-pneumonia on that side came on. The operation was again delayed, but soon the symptoms of local disease became more evident. Mr. Jacobson opened the abscess, and the patient slowly recovered; the pneumonia soon subsided. There was no proof of communication between the abscess and the lung, but the close proximity of the disease below the diaphragm led apparently to the thoracic mischief.

CASE CLXXVI.—*Miscarriage. Pyæmia. Abscess between the Uterus and Bladder. Abscess in the Loins, opening into the Ascending Colon, and into the Iliac Vein.*—For the following case I am indebted to my friend Dr. Hardwicke, of Leeds.

Ann D—, æt. 37, was admitted into the Leeds Infirmary, December 12th. She was a married woman, the mother of four children, the youngest being two years old; she had enjoyed tolerable health; but had suffered severely from rheumatism four years previously, and from scarlet fever in her childhood. She had not menstruated since her last confinement.

When admitted, the uterus was enlarged nearly to the umbilicus. Her present illness had commenced three weeks before admission. She had not been suffering previously from any pain, nor from disorder of the bowels. During the day of the attack she had been working hard, and awoke in the night with violent pain in the lower part of the abdomen, of a bearing down character. She thought that relief would be obtained by an action of the bowels, but found that she could not pass anything, and that the sensation of forcing and pain continued. On the following day she got up, but fainted, and had a severe rigor; on the third day, she noticed that her abdomen was enlarged, chiefly on the right side; this was the seat of all the pain, and became so tender that she could not bear the weight of the clothes upon the part. Her left side had been free from pain throughout. The bowels remained confined for four or five days after the commencement of her illness, and were only moved by a second dose of purgative medicine. The constipation continued till the time of admission. Miscarriage then took place.

On December 17th, she appeared anxious, and had a slightly yellow tinge of skin. There were a few bronchial râles in the chest. The heart's action was irregular and intermittent, but unattended with any bruit. Her abdomen was large, the superficial veins being distended. On the right side above the ilium there was an elastic tender swelling, with apparent fluctuation in it; in front it was ill defined, but above was separated from the liver by a resonant space. There were no symptoms to connect it with the kidney, and it did not extend into the right groin. The tongue was furred and white. The bowels

were purged by medicine. The urine contained no albumen, but at times the colouring matter of bile was in abundance. The pulse was irregular, and generally intermitted every fifth beat.

December 30th. The tumour had been gradually disappearing, and for the last two days could not be detected; there was also resonance at the part; she complained much of "rheumatic" pain in both her shoulders and elbows, but less of pain in her side; the bowels had been regular till this day, when she passed three or four large evacuations, consisting chiefly of dark coagulated blood. This continued till the following day, when she sank.

Inspection was made seven hours after death. The body was slightly wasted. The lungs were healthy in structure; on the right side there were firm adhesions at the base. The pericardium contained about ℥iij of serum. The heart was a little enlarged, but there was no valvular change. There was redness with effused lymph over the peritoneum on the right side; and the cæcum was pushed a little upward and glued by recent adhesion to the posterior wall of the abdomen, and to the transverse colon. The liver was large and fatty; the gall-bladder contained two calculi, each about the size of a marble. The spleen was rather enlarged. The kidneys were large, soft, and of loose texture, and showed but little distinction between the cortical and medullary structures. Numerous small cysts were found in their substance; and the capsule separated readily. On detaching the ascending colon from its adhesions, which was done very easily, a quantity of dark clotted blood escaped, and the bowel was found to form the anterior wall of a large cavity, filled with coagulated blood. It occupied the position of a psoas abscess, and extended behind the psoas muscle, and even for a short distance below Poupart's ligament. The blood was confined by the fascia, and occupied the whole of the right iliac fossa. There was a small portion of fibrin in it, but no pus could be detected; several nerves were found passing from the spinal column through the middle of the cavity; and the iliac vessels lay on the inner side and slightly in front of it. The artery was healthy throughout; the vein was roughened posteriorly, and formed a portion of the boundary of the cavity described. At the termination of the common iliac vein on the right side was a large irregular opening posteriorly, forming a communication between the vein and the cavity in the muscle. Above this point the vessel was healthy; below, and throughout the external and internal iliac veins, the coats appeared thickened, and the vessels were closed by firm adherent clot. Around the opening on the inner side there were small excrescences of lymph, almost similar to those sometimes found on the valves of the heart. The lumbar portion of the spine was removed, and carefully examined, but no caries nor other disease could be found. The sacro-iliac synchondrosis was sound, and no diseased bone could be detected at any part. The small intestine was slightly injected at one or two points. The large intestines were healthy, except the ascending colon; there was some vascularity, and an injected appearance in small isolated spaces. On its posterior wall were four

or five large ragged openings, varying from the size of a sixpence to a shilling. There was a brown discoloration of the bowel for some distance around the openings, and their edges were thin, having the mucous membrane entire as far as the border of the opening. The peritoneal covering was roughened and uneven, being generally wanting round the edges of the openings, so as to give them a bevelled appearance on their outer aspect. The colon contained a small quantity of blood. There was thickening of the cellular tissue about the uterus on the right side; and a circumscribed abscess, the size of a small orange, was found between it and the bladder; but this was entirely distinct from the cavity in the psoas. The ovaries were small and flabby, and did not present any corpus luteum. The uterus was contracted to the size of an orange and felt soft; the os was dark and discoloured. The uterus was covered internally by a thin layer of dark clot, and to its posterior wall was firmly attached a fibrous mass of the same colour and appearance. The structure of the walls was healthy.

Many of the earlier symptoms in this case arose from threatening miscarriage after a day of hard work; and it appeared probable that a state of pyæmia was afterwards produced, and would have probably terminated fatally, if the hæmorrhage from the divided cava had not led to comparatively sudden death. The cause of the abscess behind the colon, which extended into the cava, and afterwards into the large intestine, was not apparent; it arose either from some laceration of muscular fibre of the psoas and subsequent suppuration; or it occurred as one of the secondary deposits in pyæmia. It is exceedingly improbable that the vein was primarily lacerated; we are rather disposed to believe that ulceration perforated its coats. The extension into the colon was evidently from without, the larger size of the ulcer on the external aspect, and the sudden discharge of blood by stool, showed this to have been the case.

Case CLXXVII.—*Abscess in the Hypogastric region of the Abdominal Parietes, simulating Ovarian Disease. Recovery.*—Emma N—, aged about 25, a cook, was admitted under my care into Guy's Hospital, October 13th, 1856. She was a single woman, and had enjoyed good health till twelve months previously, when she had violent pain in the left side, which was said to arise from inflammation of the uterus, and she was leeched, poulticed, and blistered. Three weeks before admission a swelling was perceived in the left iliac region, which was exceedingly tender on pressure.

On admission, at the lower part of the abdomen, between the hypogastric and left iliac regions, a hard, unyielding tumour was detected,

which was slightly tender and painful on pressure; it extended obliquely towards the median line of the abdomen, and appeared to be beneath the muscles; there was no redness of the skin, and the pain was only manifested on pressure. It appeared closely to resemble an ovarian tumour. There was no febrile disturbance and the skin was moist; rest was enjoined, and the infusion of roses with magnesia was prescribed.

Ten days after admission the tumour became more painful, and on the 27th the skin slightly inflamed; leeches were applied, and cataplasms, &c.

November 2nd. The character of the tumour was now manifest, fluctuation was distinct, the pain superficial, but severe. On the 4th, the abscess was opened by my colleague, Mr. Forster, and a pint of pus was evacuated. The abscess slowly healed, and, on the 23rd, she left the hospital convalescent.

Case CLXXVIII.—*Suppuration external to the Right Kidney. Fibroid Thickening of the Tunic of the Kidney. Chronic Pyelitis. Obliteration of the Vena Cava. Adhesion, thinning, and doubtful Perforation of the Ascending Colon.*—Hugh M—, æt. 36, was admitted September 12th, 1855. Six months previously he had received a blow on his back, and suffered directly afterwards from hæmaturia; this discharge of blood continued for three weeks, and severe pain in the back came on. The pain continued, and gradually a swelling formed in the loins to the right of the spine. After the blow he had several rigors, and some febrile excitement. The abscess in the loins was opened on November 26th, and from that date continued to discharge freely. He was a man of middle stature, with long thin hair, and had a haggard and cachetic appearance. The urine contained much mucus. Stimulants and steel were prescribed.

November 22nd. He had gradually emaciated, but enjoyed his food; his bowels were regular, his tongue very clean; he had had swelling and pain in his right leg for two weeks. On December 19th, the abdomen and lower extremities were much swelled; the vessels on the surface were prominent, and the larger capillaries of the skin intensely injected, as if new vessels had been formed; the skin was shining, white, and tense. He was in considerable distress, and very prostrate, though not in severe pain. He had a rather troublesome cough. His strength gradually failed, and he sank.

On *inspection*, January 7th, the abdomen only was examined. The œdema of the lower extremities, and the congestion of the vessels had disappeared. The peritoneum contained about four quarts of clear serum; it was smooth and shining, except on the peritoneal surface of the bladder, and in the right iliac fossa, where it was opaque and covered by numerous granules, from about the size of a pin's head to a pea.

The stomach and ileum were healthy; but the lower part of the latter

was of a grey colour. The whole of the cæcum and ascending colon were of a deep iron-grey, and contained much irregular pigment in the substance of the mucous membrane. The cæcum and ascending colon were so firmly adherent, and their walls so thinned posteriorly, that they gave way on removing them, even if they were not already in communication with the abscess behind them, which was probably the case. The whole of the peritoneum and sub-peritoneal tissue around the right kidney to the aorta was much thickened, semi-cartilaginous, and formed the boundaries of a sinus filled with pus; this communicated with the opening made in the loins, and extended down as low as the pelvis. The aorta was normal; the vena cava, about two inches from the liver, was completely occluded by the thickening, and by the fibrinous external deposit; its walls were irregular, puckered, and it contained a firm clot. The right renal vein was obliterated, but the artery was normal. The left kidney was hypertrophied, the right kidney and the ureter contained opaque concrete pus, distending the calyces; the secreting structure was destroyed, and surrounded by a dense fibrous envelope. The bladder was small, thickened, and its mucous membrane irregularly granular. The dense tissue about the right kidney involved the right semilunar ganglion; it could with difficulty be dissected; the cells contained a considerable quantity of pigment, and their nuclei were indistinct.

The blow on the loins produced in this instance hæmaturia; and led to abscess, and to chronic disease of the kidney. The new tissue had become fibrous, and exceedingly dense; the ascending colon was adherent, and apparently perforated, so as to communicate with the abscess; but no fæcal discharge took place from the back, nor was there any evidence of purulent evacuation from the bowels. The superficial abdominal veins were intensely congested, evidently from obstruction of the cava.

Case CLXXIX.—*Fæcal Abscess in the Pelvis, communicating with the Ovary and Bladder, opening twice into the Rectum, and in the Groin.*—Sarah Y—, æt. 24, residing in Lambeth Road, was admitted August 22nd. Till nine weeks before admission she enjoyed good health, and at that time, on going to breakfast, was seized with sickness, and with great pain in the abdomen; after a few days she had rigors for three or four hours, and the pain, vomiting and purging continued for seven or eight days more; she then became more comfortable, and improved in health; one week before admission she was again attacked with vomiting, pain and purging; and these symptoms continued for three or four days. On admission her countenance was flushed, there was great pain in the abdomen, and intolerance of pressure; the countenance was anxious, and there was general tremor. The pain continued very severe till her death, and the diarrhœa was persistent; for some days the

motions appeared to be of a purulent character. A few days before death a feculent abscess opened in the right groin below Poupart's ligament.

On *inspection*, the thoracic viscera were healthy; there were some pleuritic adhesions, but no tubercle.

Abdomen.—The general cavity of the peritoneum, except in the pelvis, appeared healthy; the viscera were collapsed; the small intestine was adherent to the brim of the pelvis, and to the cæcum.

The stomach was pale, but on microscopical examination it was found to be healthy. The small intestines were healthy; the colon, as far as the sigmoid flexure, was much contracted, and contained small scybalous grains, firmly attached to the mucous membrane of the intestine. The viscera of the pelvis were found to be firmly united by adhesions. On taking out the uterus some superficial ulceration was found at the os uteri; the left ovary and tube were normal; but on the right side, at the position of the Fallopian tube and ovary, was a sac capable of holding about ℥ij of fluid, filled with purulent and feculent secretions; the abscess communicated by an irregular opening with the first part of the rectum, and extended into an irregular abscess, containing fæces, situated between the ovary and rectum. This abscess passed downwards towards the bottom of the pelvis, and opened again into the rectum by a small circular opening about three inches above the anus; its boundaries were exceedingly irregular, burrowing beneath the pelvic fascia; it extended to the bladder, and had perforated its fundus by a circular opening; it also passed upwards to the psoas muscle, and reached the crest of the ilium; below it passed beneath Poupart's ligament, and at Scarpa's triangle formed a large ulcerated opening, about two inches in diameter. The mucous membrane of the rectum was congested and grey; its calibre at the part between the two openings was diminished. The bladder was small, and its mucous membrane was red, but the cavity did not contain any fæces, nor did it appear that any had passed by the urethra. The kidneys and spleen were healthy; the liver was fatty, moderate in size; its weight 2 lbs. 7 oz.

In this case, inflammation appeared to have commenced in the right ovary; suppuration and local peritonitis followed; communication then took place with the rectum; fæcal abscess was the result; this burrowed beneath the pelvic fascia, and formed a second opening into the rectum, one into the bladder, and along the psoas muscle it reached the skin upon the thigh.

The diarrhœa proved to be tenesmus with purulent discharge, and is an indication of one of the fallacies in the diagnosis of dysentery. There was some ulceration at the os uteri. The severe pain arose partly, I doubt not, from pressure on the nerves in the psoas muscle, namely, the ilio-

hypogastric, ilio lumbar, and last dorsal nerve, and from the attacks of local peritonitis.

CASE CLXXX.—*Abscess external to the Rectum leading to Perforation. Considerable Fibrous Thickening, and Simulation of Cancerous Disease.*—Ann C—, æt. 55, a needlewoman, living in Bermondsey, was admitted into Guy's Hospital, March, 1857. She had been married eighteen years, and had had one child. Till ten years before admission she had enjoyed good health, when she fell and struck the sacrum; she suffered much, and was confined to her bed: from that time there had been a constant discharge from the rectum, with pain in defecation, and she had been unable to stand or walk on account of the pain. Three years later she was supposed to have inflammation of the uterus; but the catamenia had continued regularly till thirteen months before admission. For three or four months the left leg had been swollen, and for two months the abdomen had been tense and painful. She was a small delicate woman; the abdomen was tense and tympanitic. The chest was normal, and the heart feeble. There was a constant discharge of mucus and slimy secretion from the rectum; and its calibre was much contracted. The urine was albuminous. Her strength gradually became exhausted, and she died in a few weeks.

The walls of the rectum were exceedingly rigid, dense, and fibrous, and communicated with an abscess, or rather sinus, on the concavity of the sacrum. This chronic inflammatory action had extended to the neighbouring parts, and led to stricture.

During life this was supposed to have been a case of cancerous disease, but the post-mortem inspection did not confirm this supposition; it showed that inflammation commenced after the fall in the cellular tissue external to the bowel, and led to the dense fibrous constriction. This condition of rectum leads to abundant discharge of mucus, simulating diarrhœa or dysentery. A similar state of rectum was observed in a case under my own care, associated with albuminuria; there, however, limited to the walls of the rectum, and not as here produced by external inflammation. This case is another evidence of the severity of pain when the inferior portion of the rectum is diseased, as compared with the immunity from it, in disease of the sigmoid flexure. The nerves are more easily compressed, and the outlet is also freely supplied with nerves of sensation. In this instance colotomy might have been attended with considerable benefit.

CASE CLXXXI.—*Multilocular Ovarian Tumour. Perforation of the Cæcum. Fæcal Abscess. Pneumonia. Pus in the Ovarian Veins.*—

Martha L—, æt. 33, was admitted into Guy's Hospital, December 12th, 1855. She was a married woman, who had resided at Poplar. She had had five children, and the youngest was fourteen months old at the period of her admission; but before the birth of her child, she had had pain occasionally, of a severe character, in the left iliac region. After parturition, swelling of the abdomen increased, but with scarcely any pain for a time, till the exertion of walking produced it severely; she stated that the tumour fell from side to side. Four months before admission great pain came on in the left iliac region, extending to the hypochondrium of the same side. The abdomen afterwards increased much in size, and the catamenia ceased. She had also suffered from diarrhœa.

On admission, she was pale, her countenance was expressive of anxiety; the mind was active. The abdomen was swollen and tense, and the skin about the umbilicus was red and inflamed; there was dulness on percussion in each iliac region, but especially on the left side, and on that side a tumour could be felt extending towards the loins. The abdomen was tympanitic at the umbilicus, and for a short distance on either side. The urine was high coloured, and contained lithates. The bowels were relaxed; there was nausea with loss of appetite. She was ordered Dover's powder three times a day, a blister to be applied to the abdomen, and milk diet. The diarrhœa became persistent, and was with difficulty checked. On December 20th, paroxysmal pain in the back came on, and the abscess at the umbilicus had broken and discharged feculent pus, with relief to the patient; opium and chloroform were given. The fæcal discharge through the parietes continued till death, which was preceded by an aphthous condition of the mouth, by violent retching and vomiting, and by aggravation of pain in the abdomen. She lingered till February 5th.

On *inspection*, acute pleuro-pneumonia was found at the base of the right lung. In the abdomen, the stomach and transverse colon were found moderately distended; and reaching from the umbilicus to the pelvis was a tumour, composed of ovarian cysts; it was connected with the left ovary, and filled the left iliac fossa in front of the sigmoid flexure. On cutting down the median line, an abscess was opened extending to the right, into the cæcum, the anterior surface of which was destroyed. The abscess was formed in front by the anterior abdominal parietes, which had become perforated; to the left by the ovarian tumour; to the right by the cæcum and kidney; below, by the fundus of the uterus, and by the rectum. The walls of the abscess were covered with lymph, and the cavity contained fæces. The ovarian growth was six to eight inches in diameter, composed of cysts, some capable of holding several ounces of fluid, others almost microscopic; the fluid was tenacious and gelatinous; and the walls of the cyst were vascular; near the cæcum one of these cysts appeared to be connected with the abscess. The large ovarian veins extending into the tumour were filled with thin pus. The right ovary was small and atrophied. The uterus was healthy. The mucous membrane of the cæcum and

ileum were much congested. The stomach was pale, and presented gastric solution at its greater curvature. The liver, kidneys, spleen, and mesenteric glands were healthy.

The ovarian disease was the commencement of the fatal affection; one of its cysts had become adherent to the cæcum, and had led to perforation; local peritonitis and fæcal abscess followed. As to the ovarian disease, it was of the ordinary multilocular character. The diagnosis of ovarian disease was not certain; movable carcinomatous tumours become developed in the omentum; and the position of the growth was at first that presented by diseased glands about the kidney; it extended less into the loins, however, than is usual in the latter disease. The local peritonitis and perforation of the intestine were evident; and the treatment most likely to afford partial relief was that adopted, namely, the administration of opiates and of nourishment to sustain the patient.

Case CLXXXII.—*Ovarian Tumour filled with Fæces and opening into the Ileum. Pneumonic Phthisis.*—Catherine S—, æt. 47, was admitted into Guy's Hospital, December 14th, 1853, and died March 23rd, 1854. She had been a washerwoman, and had resided at Clapham. For sixteen years the abdomen had gradually enlarged, but she had followed her occupation till five months before her death, when, during menstruation, she took cold, and suffered from pain in the abdomen. On admission there was severe pain in the whole of the abdomen, with loss of appetite, thirst, and want of sleep. The countenance was pale and anxious; the tongue was brown; the skin was hot and dry. Ovarian disease could not be detected by vaginal examination. Symptoms of pneumonic phthisis and pleurisy came on, and she died about three months after admission.

On *inspection*, the left pleura was found full of pus; the right lung contained a vomica, and presented indurated lung tissue around it. Peyer's glands were ulcerated. In the cæcum was a small ulcer, and another was found in the appendix, which contained fæces. The right ovary was diseased, and constituted a cyst, five inches in diameter, with thickened walls. The cyst was firmly adherent to the lower part of the ileum, and communicated with the intestine. It was filled with fæces, and was adherent to the uterus at the lower part. The left ovary was atrophied; the cervix of the uterus was enlarged and thickened; the kidneys were pale; and the liver was fatty.

The commencement of the affection strongly indicated ovarian disease; suppuration took place around the ovary, and led to symptoms resembling peritonitis; pus was probably

discharged by the bowel. Inflammatory disease was afterwards developed in the lung, and led to a fatal termination.

Case CLXXXIII.—The following is one of a very unusual character, and the preparation is in the Guy's Museum, Nos. 2516 and 2517.

Extra-Uterine Fœtation opening into the Sigmoid Flexure.—Elizabeth H—, aged about 20, had led an irregular life, and had had a child eighteen months previous to admission; she was not aware that she was pregnant; she had been ill for six months, but had only been confined to her bed for three or four weeks. She was in a state of extreme prostration, and had obstinate diarrhœa; the evacuations consisted of blood and pus; there was slight tenderness of the abdomen, some fulness, but no defined tumour. She died in sixteen days.

Inspection.—Abdomen.—In the pubic region there were firm adhesions, and there was a cavity bounded by the ascending colon, and by the lower part of the sigmoid flexure; posteriorly, by the rectum and sacrum; anteriorly, by the parietes, by the pubes and bladder; and laterally by the pelvis. This cavity was filled with pus, and contained a decomposing fœtus about three months old. There were traces of placenta; and extending into the sigmoid flexure was an opening two to three inches in length and one in breadth. The uterus was small, and no decidua was present in it.

In the 'Guy's Reports' of 1838, Dr. Bright records a remarkable case of abscess of the spleen, which perforated the colon; the diagnosis was exceedingly obscure.

The patient was a young woman, aged twenty-five, much emaciated, of peculiarly sallow complexion and anxious countenance; she had great uneasines sand pain in the abdomen, particularly at the scrobiculus cordis and right hypochondrium; food increased the pain; the vomiting was constant, sometimes directly after food had been taken; there was also occasional bilious vomiting; the tongue was dry and glossy, and she gradually sank. On inspection, the lungs and heart were found to be healthy; the liver was hard and granular; the lower part of the spleen was occupied by an abscess, which was firmly adherent to the transverse colon, and had opened into it. There was also an abscess in the left ovary.

CHAPTER XVIII.

INTESTINAL WORMS.

The observations of late years have brought to light many facts connected with intestinal worms, especially as to their developmental changes. Since the translation of Küchenmeister's work by Dr. Lankester for the Sydenham Society, and of Von Siebold's treatise by Professor Huxley, the knowledge of entozoa has been advanced by various observers, but especially by the elaborate treatise of Dr. Cobbold in 1864; and to this latter work and to the excellent contribution of Heller in Ziemssen's 'Encyclopædia,' I must refer for the full description of the several forms of intestinal worms. These entozoa are of different kinds, but those which, from their resemblance to portions of white tape, have been designated tapeworms are the most numerous. The order Cestoda comprises numerous varieties of tapeworm or tænia, and several of them have only been found in the human subject.

Tænia solium.
Tænia medio-canellata (T. saginata).
Tænia nana.
Tænia flavo-punctata.
Tænia elliptica (T. cucumerina).
Bothriocephalus latus.
Bothriocephalus cordatus.

Each *tapeworm* is a chain of living segments forming, as they have been designated, a colony of animals; they do not possess any mouth or true vascular system, but the nutrition is by imbibition. The head of the animal, scolex, is small, and it has two to four suckers, in most varieties with a coronet of hooklets, and connected with it are the segments of the body (strobiles), of a tape-like form, which gradually attain their full sexual development. The head is small,

about half the size of a pin's head ; this is joined to the rest of the body by a neck, which soon becomes divided into segments, which vary in size, at first small, one eighth of an inch in breadth and a quarter to half an inch in length, but they gradually increase in breadth as they pass downwards till they become about a quarter of an inch in length and nearly half an inch in breadth. The lower border of each segment is larger than the upper, and in this way the segments are applied, the lower one fitting against, and, as it were, into the upper, thus forming an irregularly jointed band. Each fully developed segment contains both male and female sexual organs, the genital opening being a slightly raised projection at the side or upon the central surface of the animal. These strucures are seen as branching vessels in the segments. The development takes place by the budding of these segments, the number of segments increase, and each has independent germs of new life. The ova are very numerous, and globular or elliptical in form. The embryos have three pairs of hooklets, but do not at once form the tænia, but having entered into the stomach of another animal with the food, they begin to develope, passing into the blood or into the vessels and attaining a cystiform state, are known as hydatids. The hydatid reaches its further state of complete development only after subsequent admission into a different animal. Thus, the ova of the tænia cœnurus in a dog become in sheep the hydatid known as cœnurus cerebralis, whilst these hydatids, if eaten again by a dog, become the tænia cœnurus. The hydatids, or ecchinococci, that are so frequently seen in human subjects, are not from the tænia solium, the common tapeworm, but the imperfect developmental stage of the tænia ecchinococcus which is found in dogs, and has been found in those animals as a small tænia with four joints, and about a quarter of an inch in size. The tænia solium has its early stage in the cysticercus of the pig—measly pork—the cysticercus of the cow becomes the tænia medio-canellata. The larval or hydatid stage presents a head, as in the adult form, but is a mere cyst, and the head may be retracted into it. The head presents a projection or rostellum with four suckers, and with a coronet of hooklets in the sexually mature tænia.

The *Tænia solium* is the most common form of tapeworm in England; it is found in the small intestine, and is generally single and attains to seven or even ten feet in length. The head can easily be recognised on careful examination, and is about the size of an ordinary small pin's head; about six inches from the head the segments become distinct, and soon attain their full development. The head has four circular suckers, and placed on a projection or rostellum is a double circle of hooklets. The segments, proglottides, are, as we have before said, hermaphrodite; there are openings of the sexual organs on alternate sides, the oviducts forming the greater part of the animal. The ova are produced in immense numbers, they are globular in form, and are about $\frac{1}{700}$th of an inch in diameter. It is these ova which become the cysticercus cellulosa in the pig. Küchenmeister produced in man the tænia solium directly from the cysticercus cellulosa of a pig; he administered the embryos to a man three days before his execution, and afterwards found several tæniæ in the intestine. Ziemssen, quoting Leuckart, mentions a case in which a young man swallowed of his own accord four embryos of cysticercus cellulosa, and four months afterwards passed segments of the tapeworm, and after medicine had been given two perfect specimens of the tænia solium. This tapeworm occasionally presents irregularities in form from the union of segments or of two worms.

The *Tænia medio-canellata* or *saginata* is a larger worm, and less transparent than the tænia solium; the segments are also broader; the head has no rostellum nor hooklets, but in the centre of the head are four suckers which are firmer and of a deeper colour than in the tænia solium. The uterus is more finely divided; there are from fifteen to twenty dichotomous branches. The ova are oval, and rather larger than those of the tænia solium, and the embryos possess three pairs of hooklets. The ova cannot be distinguished from those of the tænia solium; in the cysticercus state they have been found in the cow and in the giraffe, and also in the sheep, goat, and calf, when segments of the worm have been given with their food.*

* Heller in 'Ziemssen's Encyclopædia of the Practice of Med.,' Eng. tr., vol. vii, p. 717.

This form of tænia is most common in Africa, but is also found in Northern and Southern Germany.

The *Tænia nana* is a small worm, about one inch in length, and one fiftieth in breadth; the head is round, and it has four discs and a single row of small hooklets. The segments are about 150 in number, and the lateral openings are all on the same side. The author just quoted states, that this worm was found by Bilharz in Egypt in great numbers in the intestine of a boy who died from meningitis.

The *Tænia elliptica* has a more chain-like appearance, and the head possesses three or four rows of hooklets. It has been found in man, but especially in children, and also in dogs and cats.

The *Tænia flavo-punctata* has never been fully described, and is of rare occurrence.

The *Bothriocephalus latus* is the largest worm which is known to infest human beings, and it attains the length of fifteen to twenty-five feet, sometimes even, it is said, as much as sixty feet. The head of this entozoon is very different from those previously described, as it does not posses any hooklets, but the head, which is club-shaped, is deeply grooved on each side. The segments are broader than they are long, and when fully developed are nearly square. The genital pores resemble a small rosette and are situated about the centre of the segment, and they are all placed on the same side of the worm. The eggs are brown in colour and oval in form, and are provided with a lid which separates from the rest of the egg. The eggs are at first ciliated and enable the young to float in water; they are in this state also possessed of six hooklets. The worm is generally single, but there may be several of the same kind, and other forms of tænia are said to have been present with it. The bothriocephalus latus has been found in Sweden, in North-western Russia and Eastern Prussia, in Switzerland, and in Belgium and Holland.

The *Bothriocephalus cordatus* differ sfrom the last described worm in the form of its head, which is broad, short, and the grooves are on the flat surfaces rather than on its margins. The body commences directly from the head, and the segments rapidly increase in breadth. It has been found in Greenland.

The *symptoms* that are produced by the presence of tænia may be divided into those which are directly connected with disturbance of the functions of the alimentary canal, and those which are reflex in their character; the patient is generally pale; the appetite is found to be unnatural, being variable in character, and sometimes craving. The condition of the bowels is also irregular; there may be diarrhœa or constipation; pain resembling colic is often complained of, with a sense of exhaustion at the stomach, and often with nausea and a sense of malaise, but the only pathognomonic symptom is the recognition of segments of the tænia, which are present in the evacuations. These segments may be single, or pieces several inches in length may be passed; but we have no security that the patient is really freed from his tenant unless the head of the animal is discharged. Other symptoms are due to reflex action, as itching of the nose and anus, headache, disturbance of sight, the sensation as of ringing noises in the ear, sometimes convulsion, or epilepsy; at other times pain in the limbs and in the region of the heart may be produced, so also palpitation of the heart.

The manner in which human beings become infested with these pests is by the introduction of the ova with the food. If meat be imperfectly cooked the ova are not destroyed; thus, imperfectly cooked meat, pork, or sausages, raw meat, or salads, may be the agents by which the ova are introduced.

The treatment of tapeworm is in most instances one that leads to a satisfactory result in the expulsion of the worm; but, unless the head of the animal be detected, we can have no certainty that the pest is removed. Numerous remedies have been used, but the *Male fern* is, I believe, the best; the observations made many years ago by Sir William Gull testified to the efficacy of this remedy. The powder of the rhizome of the *Filix mas* may be given in doses of one to three drachms, but a better preparation is the liquid extract or the oil of male fern, in doses of ℥j mixed with mucilage mixture and an aromatic water. The remedy should be given after the patient has been fasting for five or six hours, and should be followed by a dose of castor oil. Kousso is another of these remedies; it is the dried blossom of the *Brayera anthelmintica*, and it should be administered when

the patient is fasting. An infusion should be made, a quarter of an ounce in four ounces of boiling water, and when cool the whole quantity should be swallowed. The remedy is an effective one, but very nauseous, on account of its smell.

The oil of turpentine in ℥j or ij doses is also very efficacious. It also should be given on an empty stomach, and at bedtime, for the turpentine often produces temporary headache and giddiness. Kamæla or Kameela is also recommended,* in doses of ʒj or ij, mixed with mucilage and followed by a purgative. The bark of the pomegranate root (*Granati radicis cortex*) is given in the form of decoction, and often proves efficacious; it also should be given several hours after food and be followed by a purgative. Other remedies have been used, but those we have mentioned are the most important. Questions sometimes arise in the treatment of tapeworm as to the propriety of postponing our remedies; thus the entozoon is sometimes found during an attack of enteric fever, or during pregnancy, and the question arises whether injury will accrue from the remedies used. In an instance of a patient recovering from enteric fever in Guy's, under the care of the late Dr. Babington, full doses of oil of turpentine were given without producing any injurious effect, and the patient was freed from the tænia; again, in pregnancy with excessive irritability of stomach it is better to make the attempt of cure than to allow the patient to go on unrelieved. Sometimes one remedy after another is tried without success, but the fault will generally be found to be in the mode of administration.

The *Round* worms—the *Nematoda*—are more highly organised, and there are several species which infest the intestinal canal. One of the best known is the *Ascaris lumbricoides*, the round worm, as it is termed, varying in size from four to six inches in the male to ten or fifteen inches in the female; it is cylindrical in form, and has three lips surrounding the mouth of the animal. The male is much smaller than the female, and the spermatic duct opens at the same opening as the intestine, and two curved spicula are seen projecting from the part. The female contains two long coils of ovary and oviduct, which open into a vagina.

* Dr. Gordon, 'Report on Diseases of the Stomach and Bowels in India.'

The ova are oval, and are produced in immense numbers, and are expelled with the fæces. They are about $\frac{1}{340}$ to $\frac{1}{440}$ of an inch in diameter. It is not ascertained in what way they obtain entrance into man, but they locate themselves in the small intestine, and often are very numerous in the same individual; sometimes clusters of them, two or three, may exist together in different portions of the whole canal, in the duodenum, jejunum, ileum, and stomach; I have seen them in the œsophagus, and cases have been described where they have produced fatal results by getting into the larynx; they are found also in the colon. It has been stated that they are able to destroy the coats of the intestine and thus reach the peritoneal cavity; but it is now generally believed that ulceration and perforation had taken place, and the lumbricus had used the opening thus made; the irritation they produce may, however, aggravate ulceration in a marked degree; still, some instances appear to confirm the idea that lumbrici may themselves induce ulceration and consequent perforation; such, for instance, is one recorded in the 'British Medical Journal' of 1861, by Dr. Sandwith, in which a small perforation in the middle of the duodenum led to fatal perforation. Dr. Young, in a paper in the 'Medical Gazette,' records several cases where lumbrici were evacuated through the abdominal parietes; one instance was in a child, aged seven; several worms had been discharged from the bowels, an abscess afterwards formed in the right lumbar region, and living lumbrici were evacuated; after two years the abscess healed.

In another case, a child aged fifteen had severe pain in the abdomen, and lumbrici were found in the stools; an abscess formed on the right side of the abdomen, and lumbrici were passed through it: on inspection it was found that a fæcal abscess had been formed at the commencement of the colon, into which also the jejunum opened. It is probable that in both these cases either cæcal or strumous disease or direct injury had led to abscess, through which some of the lumbrici were discharged. The same paper mentions a recorded case of an infant, in whom a lumbricus was discharged from the navel; and another of a woman, in whom an artificial anus existed in the right groin, through which a

lumbricus was passed. A worm crawled from the mouth of a young patient of mine during the night, who had passed numerous lumbrici, after the administration of santonine; the worm was observed on the child's pillow. It is, however, probable, that the passage into the trachea and bronchi only takes place after the death of the patient. The symptoms found with this worm are a tumid, full, and doughy state of the abdomen, indicating that the secretions and muscular coat are not in their normal condition; the body is often feebly nourished; the cheerfulness is lost; the appetite is variable, somtimes craving, but uncertain; there is frequently severe colic; the breath is offensive, and there is irritation of the nose and anus. Other signs are frequently found, but they are in many instances sympathetic from the irritation of the intestine, especially when the subject is strumous, and predisposed to disease in other viscera; thus the brain often sympathises, so that the patient may be seized with convulsions, or have attacks of chorea, or epileptic fits, conditions which are entirely removed by the evacuation of the entozoa.

These worms occur more frequently in young children, but are not limited to them, for we observe them in young adults of both sexes, but especially in delicate and in strumous subjects.

The best remedy by which to get rid of the round worm is santonine, in doses of 3 to 5 grains given every or every other night on an empty stomach. The santonine is obtained from an undetermined species of *Artemisia*. The general health should be improved by proper diet and by tonics, and the bowels acted upon by gentle aperients. Stronger purgatives are often given, as jalap and scammony; but, although they remove a large quantity of mucus, they do not generally effect a cure.

The *Oxyuris vermicularis* is well known as the threadworm, and in its appearance it closely resembles a minute portion of ordinary thread. The male is smaller than the female, and is about one sixth of an inch in length. The female is about one third to half an inch. The animal has a mouth closed by three lips, from which extends the œsophagus and intestinal canal. The eggs are oval and about $\frac{1}{500}$th to $\frac{1}{100}$th of an inch in size. They pass all the stages of development in the intestinal tract.

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The threadworm is found in both small and large intestine; the mature females are said to be especially found in the cæcum. The threadworms are present in the rectum, and pass from it to the perineum and even reach the vagina; but it is erroneous to state that they only exist in the rectum. The eggs are swallowed with the food, and development begins in the stomach when the egg is acted upon by the gastric juice. As long as the threadworm exists only in the small or in the upper part of the large intestine no symptom is produced, but in the rectum its presence causes intolerable itching. Itching of the nose, impairment of appetite, general restlessness, and distress, may be produced by threadworms; we have seen urticaria present in children thus affected, but whether as the effect of threadworms is doubtful. They are more common in young children, but are also observed in adults.

In the *treatment* they may be destroyed and washed away from the rectum by means of enemata; the best is composed of one third or half a pint of lukewarm infusion of quassia, or of salt and water; decoction of oak bark, dilute solution of alum, may be also used; at the same time gentle aperients should be given, but such as will thoroughly empty the bowel, as rhubarb and magnesia, if sufficiently active; jalap with rhubarb, syrup of senna, confection of sulphur, or a few grains of grey powder; afterwards mild chalybeate medicines may be administered. The oil of male fern and santonine have less effect upon the threadworm, than in the cases in which we have recommended them. It is important to be very careful both as to the food taken, and as to the perfect cleanliness that should be observed in every respect.

The *Tricocephalus dispar*, the whipworm, is a small worm about two inches in length, with a thread-like head, the smallest part of the animal constituting about two thirds of its length; it is generally found in the cæcum. On the abdominal surface is a longitudinal band, and the intestinal tract passes throughout the length of the animal from the œsophagus and the stomach. The male is rather smaller than the female, and the male genital organ presents a spiculum which projects from the cloacal opening; it is set with numerous sharp points, and is surrounded by a sheath. The

eggs are oval, they are very numerous, and have, at either extremity, a minute projection.

We are not acquainted with any symptom produced by the presence of these worms; they have generally only been recognised after the death of the patient on post-mortem examination. I have in this way found them, whilst I had the charge of the post-mortem examinations at Guy's Hospital.

The *Dochmius*, or *Strongylus duodenalis*, or the *Anchylostomum duodenale*, was discovered by Dubini in 1838 in the North of Italy. It is a small cylindrical worm, the male nearly half an inch and the female three quarters of an inch in length. At the bell-shaped mouth are several strong hooks; the male terminates in a lobate enlargement, but the female is pointed. The animal fixes itself in the duodenum and jejunum; it is very common in Egypt, according to Bilharz. Its presence produces anæmia, and its attendant symptoms of weakness, palpitation, disturbance of the senses; there is craving or depraved appetite and dyspnœa. These symptoms arise from the loss of blood.

No medicine is known directly to dislodge the animal, but the treatment must be carried out on general principles to remove the worm and to relieve the bloodless condition by chalybeates. Turpentine, followed by chalybeates, would be apparently the best plan of treatment. These cases are not seen in England, and I am dependent on the description and statement of other observers.

Several minute kinds of Trematoid worms have been recognised. The Distomum crassum was found by Busk in the duodenum of a Lascar, and the Distoma heterophyes has been discovered by Dr. Bilharz in Egypt in the intestine of a boy. The Bilharzia hæmatobia, also prevalent in Egypt, has been the cause of diarrhœa and hæmaturia; but for many particulars of these and other varieties which have been noted by observers we must refer to the treatises already mentioned.

CHAPTER XIX.

ON PERITONITIS.

Reference has frequently been made in the preceding chapters to disease of the serous investment of the intestines, the peritoneum; and we propose now to review the general forms of peritonitis, to notice the pathological appearances they present, the symptoms by which they are indicated, the causes which produce them, and then the treatment best calculated for their removal.

Peritonitis is presented under the form of acute or plastic inflammation, chronic inflammation, purulent inflammation, septic inflammation.

Acute peritonitis. The earliest pathological appearance which the peritoneum presents, when acutely inflamed, is congestion of the capillary vessels, with a loss of the smooth and shining appearance of the serous membrane; dryness then takes place, from the diminished secretion, and slight opacity follows. This congestion is especially manifest at the angles of contact of the coils of the intestine, thus producing vascular lines, which pass along the long axis of bowel; in very acute disease, however, the whole surface is reddened. The inflammatory œdema which gives opacity to the serous membrane is an indication that the sub-peritoneal coat is involved; it arises from interstitial cell-growth. The muscular coat next participates in the disease; its contractile power is diminished, and the intestine distends, producing the tympanitis of which we shall have to speak; the coats of the intestine may be readily separated from each other; effusion of lymph then takes place, and it is often found to cover over the intestine in large flakes, mixed with serum in the more dependant situations; if the disease be at a very early stage, or slight in

degree, this lymph is represented by a mere stickiness and very slight adhesion between the intestines. The serum is sometimes present in considerable quantities, and in chronic peritonitis fills and distends the serous sac; but the conditions of the fluid effusion vary according to the character and the intensity of the disease; sometimes it consists of clear serum containing portions of semi-coagulated fibrin; at other times the serum may be almost of the character of pus, and between these extremes every gradation is observed. In proportion as the effusion is less organised it is corpuscular in character, and approaches proportionately to the appearance of pus. As the peritonitis subsides, these effusions may gradually become absorbed; but more generally they leave traces of their presence, the lymph becomes organized, fibres are produced, and vessels become developed in them; adhesions between portions of intestine are thus formed, either uniting them closely together, or constituting bands, which may be the cause of subsequent internal strangulation;* the lymph which covers the viscera, as the liver and spleen, often forms a thick investment, which gradually becomes firm, fibrous and cartilaginous in density, and calcareous particles are occasionally developed in it, especially in the splenic adhesions; at an early stage these investments may be stripped off from the proper tunic of the viscus, but afterwards they become inseparably united. Again, sometimes the lymph is spread generally upon the viscera, or it forms rounded patches, or it has a cribriform appearance, as if rounded portions had been removed or absorbed. Lymph deposited upon and between the layers of the mesentery and omentum leads to gradual contraction, to shortening and fibroid thickening. In some cases the serous membrane has a granular appearance; these granules must not be mistaken for an appearance sometimes found several days after death, when the serous membrane appears sprinkled with grains of sand; these possess the crystalline character of triple phosphate, and are probably formed after death. Lastly, acute peritonitis may lead to a general thickening of the serous membrane without adhesions; the membrane becomes dense,

* Bands leading to strangulation do not always have an inflammatory origin. See an interesting pamphlet on this subject, by Mr. Gay.

whitish, thickened and fibrous, and this arises from the fibrinous effusion taking place in the substance of the membrane rather than on its surface. In *chronic* peritonitis the same general changes are produced; lymph may be effused, become organized, and form adhesions or produce thickening of the serous membrane; or effusion of serum takes place, so as to distend the serous membrane, even without previous acute symptoms. The thickening of portions of peritoneum covering the liver which is frequently found after the pressure from stays and belts, consists in part of a fibroid degeneration of the serous membrane itself.

Peritonitis is either general or local; the former is often rapidly fatal; the latter is in many instances conservative in its action; and in perforation of the intestine from numerous causes, it limits or prevents extravasation. If extravasation have occurred, it may be so localised by peritoneal adhesions, that life is prolonged for weeks, or even for many months. When acute inflammation in the abdominal glands or viscera takes place, local disease of the peritoneum in the neighbourhood is set up; thus the peritoneum covering the liver becomes involved in hepatic disease, and that in the pelvis in acute disease of the ovary.

Tubercular peritonitis has already been described.

Cancerous disease of the peritoneum frequently leads to inflammatory change of an acute or chronic form, but these changes will be subsequently referred to; it occurs either as a primary disease of a scirrhous, medullary, or colloid form, or as a secondary one, from the extension of the disease to the peritoneum from the intestine. Thus, in cancerous disease of the stomach, or of the cæcum and colon, tubercles with inflammatory lymph are often found upon the peritoneum; so also with cancerous disease of the ovaries and of the mesenteric and lumbar glands; but in advanced life especially, primary cancerous disease of the peritoneum is not unfrequent; an immense number of tubercles, some semi-transparent, others red and congested, from the size of grains of sand to split peas, are found everywhere studding the serous surface, mixed more or less with ordinary fibrin and lymph; sometimes the deposition of pigment in these tubercles gives them a black colour, and a form of mela-

nosis is produced; this appearance, however, is to be distinguished from the blackness arising from effused blood. This form of cancerous disease is generally associated with considerable serous effusion, and it is more common in women than in men. Again, sometimes cancerous disease especially involves the omentum or the mesentery; and it is generally, when so situated, either of a medullary character, constituting large masses, composed of nuclei and nucleated cells, or of a scirrhoid character, when the affected parts become thickened by a fibro-cancerous growth; sometimes the disease consists of colloid growth. The omentum, in these cases, often forms a dense, hard mass, extending across the abdomen at the umbilical region; it is then several lines in breadth, and semi-cartilaginous, but still more or less transparent; and serous or fibrinous effusions may have taken place in considerable quantity into the serous sac. In some cases, both of minute cancerous tubercles on the peritoneum, and of the more general thickening to which we have just referred, it is very difficult to draw an exact line of demarcation between the simple products of ordinary inflammation and those of true cancerous disease. If a large quantity of pigment be deposited in the cells of the growth, as we sometimes find in medullary cancer of the omentum, &c., the term melanotic cancer is applied. Colloid cancer affects the peritoneum, either in part, as when the omentum only is affected, or generally, when it envelopes almost the whole of the abdominal viscera; it presents the semi-gelatinous appearance of colloid with intersecting bands, constituting alveoli, which contain large nucleated cells and colloid matter. This colloid disease of the peritoneum is either primary or it follows from colloid affection of the stomach, the cæcum, &c.

The *symptoms* of acute peritonitis are generally very characteristic, as when, for instance, the stomach and appendix cæci are perforated by ulceration, sudden intense pain comes on, the patient is "doubled up," unable to move, and lies with the legs flexed; the countenance expresses the intensity of the suffering, as well as the serious nature of the disease; the distress and pain are evident in the features, the eyes are sunken, the face is pallid, the abdomen very shortly becomes

distended, tender and tympanitic; no pressure can be borne, and even the weight of the bedclothes becomes insufferable; the pulse is small, compressible; and, if reaction take place from the first sudden collapse, it becomes more hard, frequent and wiry; the bowels are generally confined, especially at the early stage of the acute disease, but sometimes towards the close of the malady diarrhœa may supervene. The urine is scanty, and if the vesical peritoneum be involved, retention often takes place. If the peritoneal surface of the stomach be implicated, vomiting is a frequent and distressing symptom, and green bilious fluid is ejected. The mind may be conscious and strong throughout, even when the powers of life are fast failing, and the pulse is scarcely perceptible at the wrist.

In many cases of perforation the patient scarcely rallies from the first sudden collapse, and death takes place in five to ten hours after the onset of the disease; in other instances, however, the signs of febrile excitement, which are never well marked in acute peritonitis, are more evident, as shown by heat of skin, especially of the abdomen, by thirst, and by a frequent and hard pulse. If the disease tend to an unfavorable termination, the prostration increases, the patient is restless, the tongue dry and brown, the pulse compressible, failing and irregular; the extremities become cold, a clammy sweat breaks out, hiccough comes on, and then death follows, the patient often remaining sensible till the close, and the subsidence of pain, as life is ceasing, occasionally gives to the superficial observer a false hope of recovery. On the contrary, when the vomiting subsides, the pain and distension lessen, the countenance becomes less haggard and dejected, the pulse soft and less frequent, but tolerably firm, and especially, when the patient has refreshing sleep, we may regard the immediate danger as less imminent. Gradually all the symptoms may disappear, and the patient completely recover, with perhaps some peritoneal adhesions and thickening. It may be that effusions take place, which are more gradually absorbed, or become very persistent; again, if fæcal extravasation have occurred, repeated attacks of local peritonitis, with hectic fever, follow, or renewed general inflammation destroys the life of the patient.

It must be remembered, however, that pain is not an invariable symptom of peritonitis; sometimes the patient presents an exhausted appearance, the tongue is dry and brown, the pulse is very compressible, the abdomen is distended, but no complaint is made, and the patient dies from asthenia or exhaustion, and on the post-mortem table the coils of intestine are found to be covered with lymph, and the whole serous membrane acutely inflamed. Such cases we have often seen after paracentesis in chronic disease of the liver. Again, in cases of pyæmia, and of septic poisoning, acute inflammation, leading to purulent effusion into the serous cavity, takes place without any pain in many instances. Other symptoms are present, distension of the abdomen, tympanitis, sometimes but not invariably, constipation, and dryness of the tongue. There may be vomiting and hiccough, and failing pulse; the mind may be clear, or there may be delirium and unconsciousness before fatal a termination ensues.

Chronic Peritonitis may commence with the symptoms of acute disease, and subsequently produce recurrent pain, distension and effusion. This recurrence of symptoms is more especially the case in the course of tubercular and cancerous disease. In these instances the symptoms are less severe, although of the same general character; pain, with distension and tympanitis, and with a peculiar haggard expression, which is very characteristic of abdominal affection; the abdomen is at the same time hot, and tender on pressure. In *strumous* peritonitis, the pain is paroxysmal, and often resembles severe colic; the bowels are irregular, the stomach sometimes irritable, the tongue red and injected, the patient fretful, and as the intestines become mattted together by adhesions, the viscera move *en masse*, and a doughy sensation is communicated on manipulation; or these strumous and inflammatory adhesions may be local, simulating abdominal tumours. The indications of disease are also associated with general strumous cachexia, and are often complicated with pulmonary disease. Too frequently hectic supervenes, and this is especially the case when fæcal abscess has been produced, and the hope of ultimate recovery is then almost taken away. In strumous peritonitis also the pain may be very slight, whilst effusion gradually takes place to a considerable extent, as we some-

times find in children after measles, &c., or excessive tympanitis may be produced without any acute pain.

In *cancerous* peritonitis there is the same expression of distress on the countenance, with pain and heat of the abdomen, with gradual distension, and often with serous effusion ; if the disease consist in cancerous growth in the omentum and mesentery, a tumour may generally be felt ; if it extend to the peritoneum from the stomach, liver, intestine, ovary, &c., the earlier symptoms will be indicative of the primary malady. It must, however, be remembered, that in both strumous and cancerous disease the symptoms of acute peritonitis may be suddenly developed in the course of the chronic disease, from perforation of the intestine or otherwise, and lead to a speedily fatal termination. This acute mischief is sometimes set up by perforation from degeneration of cancerous deposit, or by paracentesis, the persistent irritation and congestion of the serous membrane passing very readily into general and acute inflammation. In colloid disease of the peritoneum, the symptoms are often obscure, they are pain, with heat and more or less distension of the abdomen, and sometimes diarrhœa ; but if the intestine become involved, other diagnostic symptoms arise.

Diagnosis.—The pain of peritonitis may not only be absent, on account of some peculiarity in the character of the disease, but the patient may be rendered unconscious of it from cerebral oppression, or from the dyspnœa and distress of pulmonary and cardiac disease fully engrossing the sensibilities of the sufferer.

Still there are painful conditions of the abdomen for which peritonitis may be mistaken. 1st. Flatulent colic. The pain and distension are in this disease sometimes very severe, the countenance may be haggard and distressed, and collapse sometimes results ; but there is not the tenderness of peritoneal inflammation, the symptoms are less persistent, the pulse less affected, the collapse rarely so profound. 2nd. In hysterical affections of the abdomen, the pain is very superficial, and firm pressure can frequently be borne, notwithstanding that the patient almost shrieks before the hand has reached the surface ; the countenance does not express the distress of serious organic disease, the pulse may be almost unaffected ; still, in this disease, we have seen a patient bled from the arm to syncope,

with the idea that acute disease existed. 3rd. The vomiting and sudden pain of perforated intestine are sometimes mistaken for gall-stone; but the latter disease is free from the acute tenderness and distension of peritonitis. 4th. Neuralgic pain from disease of the spine, of a functional or organic character, often simulates peritonitis; but here, also, there is an absence of tenderness on pressure of the abdomen, of distension and tympanitis, as well as of the general expression of peritoneal disease; the pain is situated in the course of the spinal nerves, and often extends over the crest of the ilium in the course of the last dorsal nerve, or into the groin and testicle in the course of the genito-crural nerve; there are also, generally, some indications of spinal disease in local pain of the vertebræ, with modified motion and sensibility of the lower extremities, and loss of power of the sphincter muscles. 5th. Suppuration of the abdominal parietes is at an early stage very difficult to distinguish from peritonitis. 6th. The pain from the distension consequent on the enlargement of abdominal tumours and effusions may easily be mistaken for peritonitis, as, for instance, in aneurism, in ovarian and cancerous tumours, and in dropsies; but in these cases, as we have before said, peritoneal disease is often set up in the progress of the malady. 7th. During the course of peritonitis, the muscular fibres of the bladder sometimes fail to contract, apparently from loss of power, and the urine is retained, thus closely simulating simple retention of urine; on the contrary, we have also witnessed distension of the urinary bladder from enlarged prostate or other cause, producing pain which resembled peritonitis, and which had been sent to the hospital as a case of abdominal tumour.

In reference to the *prognosis* of peritonitis, instances of intestinal perforation are generally quickly fatal, in from five to ten hours; but in some cases this issue might be prevented if perfect rest were maintained, stimulants and purgatives avoided, and opium given; for by movements of the body extravasation is increased, and we have seen castor oil floating in the peritoneum after perforation had taken place. In other cases, we must be guided in the prognosis by the cause of the peritonitis, whether it be of a remedial character or not. As to those symptoms which *immediately*

indicate a favorable or unfavorable termination, we have already alluded to them in describing the general characteristics of the disease.

Causes.—Although peritonitis is spoken of and treated as an idiopathic disease, we do not find that it is so; it is excited by injury to the serous membrane, or by the direct propagation of disease; and to elucidate this part of our subject we have referred to the inspections made at Guy's Hospital during a period of twenty-five years; out of 3752 inspections 501 were instances of peritonitis; but we cannot find a single case thoroughly recorded in which disease could be correctly regarded as existing solely in the serous membrane.

In relation to its causes, cases of peritonitis may be divided into three classes. 1. Peritonitis produced by the extension of disease from adjoining viscera, or excited by direct injury, including cases of perforation of viscera, extravasation, violence, &c. 2. Peritonitis connected with blood changes, as when inflammation of the serous membrane occurs in the course of albuminuria, pyæmia, puerperal fever, erysipelas, &c. 3. Peritonitis caused by general nutritive changes of the system, which have been followed by acute or chronic disease of the peritoneum, such as struma, cancer, &c.; and comprising also those cases in which the circulation of the peritoneum has been so altered by continued hyperæmia (modifying its state of growth), that very slight exciting causes suffice to induce acute mischief, as occurs in peritonitis with cirrhosis, disease of the heart, &c. In reference to the instances found amongst the large number of inspections just referred to, we find—

1. Peritonitis from direct extension . .	261
2. Peritonitis connected with blood changes	94
3. Peritonitis connected with general or local perverted nutrition	146
	501

It will be evident that the first class might be regarded as disease of a local kind, and the second and third as of a general character. The *first* division includes 261 instances of peritonitis, and of these 102 were produced by hernia,

internal and external, intussusception, bands of adhesion, and cancerous obstruction. In 19 cases the obstruction was of an internal kind, and in not a few of these death followed from rupture of the intestinal coats; 35 cases were caused by injuries or operations directly affecting the serous membrane. In some instances of severe abdominal injury, death resulted before any sign of inflammation had taken place, the injury being of such a character that no treatment could be more than palliative in the most trifling degree, as when the jejunum was completely divided by a vehicle passing over the body.

Among the operations referred to, one was for the removal of an ovarian cyst; one a case of gastrotomy; fourteen were cases of paracentesis abdominis, which was performed in five patients to relieve ascites accompanying cirrhosis, in two for ascites with heart disease, and in seven to empty large ovarian cysts. In instances of ascites from heart disease, chronic bronchitis, and cirrhosis, the whole of the peritoneal capillaries are in a state of continued hyperæmia; the serous membrane becomes opaque and thickened, and a very slight fresh exciting cause is sufficient to produce acute disease. If a larger number of instances of paracentesis abdominis had been taken, it would have been found that in ovarian disease, especially of persons advanced in life, paracentesis is much less frequently followed by a severe and fatal result than in ascites following cirrhosis.

Perforation of the intestine into the peritoneal sac constitutes a most important cause of peritonitis, and we shall briefly notice the several varieties. Out of the 501 cases of peritonitis perforation occurred 56 times, namely:

10 from hernia;
9 from disease of the stomach;
15 from ulceration of the ileum in enteric fever;
4 from tubercular disease;
11 from disease of the cæcum and appendix;
1 from cancer of the vagina;
4 from cancer of the colon;
2 from ovarian adhesions.

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This lesion, so often fatal in enteric fever, generally supervenes about the twenty-first or twenty-second day, and many instances are no doubt accelerated by muscular movements; the period, however, of perforation, is subject to considerable variation, occurring sometimes as early as the tenth day; in others, being postponed till the fifth or sixth week, when the patient may seem convalescent. We have before referred to the fact, that in fever, peritonitis is set up by ulceration, although the peritoneum may be entire, transudation having taken place in a sufficient degree to produce acute mischief.

In tubercular disease the sudden and intense peritonitis from perforation is generally prevented by adhesions; occasionally, however, these limitations of the mischief are incomplete; in the ulceration of phthisis, as well as in tubercular disease of the peritoneum, this sudden termination is found to occur.

Diseases of the cæcum and of the appendix are still more frequent causes of peritonitis, and in these affections perforation often takes place unexpectedly. In perforations, however, of every kind, the extravasation may be circumscribed, and local peritonitis and fæcal abscess be the result; numerous instances of this kind are detailed in preceding chapters.

Another frequent source of peritonitis consists in the extension of disease from the bladder uterus and other pelvic viscera; and in less severe degrees local peritonitis is often observed from ovarian irritation. The enumeration of the pelvic origin of forty-two cases from amongst the numbers we have before referred to will best illustrate the nature of this cause:

6 from ovarian disease;
1 from ulcerated vagina and uterus;
1 from strumous disease of the testicle and castration;
1 from diseased prostate;
1 from strumous pyelitis;
1 from fistula in ano;
1 from cancerous disease of the bladder;
1 from polypus in the bladder;
14 from cystitis, calculus in the bladder, stricture, &c.
1 from extravasation of urine;

2 from sloughing perineum;
1 from sloughing of the nates;
10 from lithotomy;
1 from diseased hip and pelvis.

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This number does not include peritonitis from stricture and chronic ulceration of the rectum; diseases which not unfrequently extend to the serous membrane. The introduction of bougies, and the incautious digital examination of the bowel, may sometimes lead to acute peritonitis.

Peritonitis is also caused by diseases of the liver and gall-bladder, and some of these are instances of extreme interest; thus, abscess in the liver, hydatid disease, gall-stone, primary disease of the gall-bladder may each induce disease of the general serous membrane. In many cases of chronic congestion and enlargement of the liver, and in cirrhosis, especially of an acute kind, the peritoneum becomes implicated; and the serous membrane is found, when a fatal issue has taken place, to be thickened and chronically inflamed; acute peritonitis is in these conditions very easily induced; but we have included these chronic forms of hepatic disease amongst the third class of causes of peritonitis.

Peritonitis is sometimes the result of acute disease of the mucous membrane of the intestine, extending to the deeper coats, and to the peritoneum itself, leading to inflammation, or to perforation and fæcal abscess. Ulceration of the colon was the cause of fæcal abscess in three of the instances we have previously mentioned, and a case of simple perforation was from this cause. In three other instances, acute dysentery, with sloughing of the coats of the intestine, also produced peritonitis.

In reference to the etiology of peritonitis, the following table shows not only the large proportion of cases due to simple extension of disease to the serous membrane, but the forms of disease by which peritonitis is induced; 261 instances from 501 are thus referable to direct extension:

From hernia, of which 19 were cases of internal obstruction	. . . .	102
„ injuries or operations	. . .	35
„ perforations of the stomach, ileum, cæcum and appendix, colon, &c. (other 13 mentioned with hernia or with cæcal disease)	.	43
„ perforation leading to fæcal abscess (2 cases mentioned elsewhere)	. . .	17
„ typhoid ulceration without perforation	.	5
„ disease or operations on the bladder and pelvic viscera, &c.	. . . .	42
„ disease of liver and gall-bladder, &c.	.	11
„ acute disease of the colon (3 others enumerated with perforations)	. . .	3
„ diseases of cæcum or appendix (9 others previously mentioned)	. . .	3
		261

We now turn to the *second* division, namely peritonitis connected with a changed condition of blood, such as exists in albuminuria, in pyæmia, in puerperal peritonitis, and in erysipelas, &c.

In *albuminuria*, where the renal disease is of an acute kind, lymph may be effused, and the symptoms of peritonitis are often well marked; but in some cases, in which there is small granular kidney, with contracted liver, the peritoneum is thickened, and more chronic disease is found to exist. Albuminuria is a frequent cause of serous inflammation affecting the pleura, the pericardium, the arachnoid, sometimes the joints, and, as these cases show, the peritoneum also. It rarely, however, happens that the peritoneum only is affected, although such is sometimes the case. The symptoms also are often masked by the distress arising from the general anasarca, and the dyspnœa from œdematous lungs.

Puerperal peritonitis is often associated with suppuration, either in the uterine veins, or in the pelvic cellular tissue, or in the broad ligaments. But there are sometimes instances in which the peritonitis arises from a general cause, and these may perhaps be considered as pyæmic or even of a rheumatic character, or connected as we have before said, with renal disease. Thus, peritonitis is found with pericarditis and with pleurisy; with pneumonia and dysentery, or with these conditions renal disease may be also combined. The two following cases are worthy of record in their causative relation.

Case CLXXXIV.—*Hypertrophy of the Heart. Adherent Pericardium. Acute Pericarditis. Pleurisy and Peritonitis.*—James M—, æt. 9, was a delicate boy, who had suffered from cough, but there was no history of rheumatism; he had been in the hospital for disease of the bones of the foot, and left nearly well; in one week he returned very ill, and was found to be suffering from pericarditis; there was slight pain in the shoulder, but no swelling of the joints generally. He died in three days. There was a cicatrix on the foot, showing the part from which the fourth metatarsal bone had been removed; but there was no suppuration. There was general pleurisy on both sides, recent lymph in small quantities being found; the lungs were congested, and the bronchi full of tenacious mucus. There was acute and chronic pericarditis, as shown by adhesions of recent lymph, and in some parts by very firm fibrinous bands. Minute depositions were found on the cardiac valves. In the abdomen, although the serous membrane had not lost its transparency, there were some flakes of recent lymph and a small quantity of serum.

Was this general disease of the character of rheumatism? We must regard it as arising from some general cause, and in that respect very different from so called idiopathic peritonitis.

Case CLXXXV.—*Acute Peritonitis. Pericarditis. Pleuro-pneumonia. Small Granular Kidneys.*—William B—, æt. 42, was admitted into Guy's Hospital, June 13th, 1855; he had been a labourer, and had resided in the Borough. A year previously he had had jaundice, and three days before admission had had rigors, but on the following day, although feeling ill, he went to his employment; the next day he gave up work. On admission, he was very ill, presenting the signs of pneumonia of the right lung; the dulness rapidly increased, with bronchophony; much blood was expectorated, and he became delirious, but whilst sensible did not complain of pain. The urine was not albuminous. He died on the 20th. There was recent consolidation of the whole of the right lung; the pericardium was covered with a layer of fresh lymph; there was also acute peritonitis, the intestines being adherent by recent lymph. There was a hydatid cyst in the liver, surrounded by a dense white envelope, one eighth of an inch in thickness, and containing disintegrated membrane with opaque fluid; the gland itself was fatty.

The kidneys were granular and coarse, the tunic adherent, the secreting tubes filled with inflammatory products.

The *third* and last class comprises peritonitis of a general character, arising from *tubercles* and *cancer*, in which the peritoneal disease is often very insidious. We include in this division those cases in which, after a prolonged state of

hyperæmia, the serous membrane becomes thickened, and a very slight cause suffices to produce acute disease.

The only remaining causes are those in connection with chronic disease of the liver and the thoracic viscera, producing prolonged hyperæmia of the peritoneal vessels and ascites, and readily terminating in acute peritonitis; hence the danger of tapping in these instances; but acute peritonitis often occurs in cirrhosis from other very slight exciting causes.

In *cirrhosis* the peritoneal covering of the liver is very generally thickened. We do not, however, refer to this merely partial affection, but to those in which the whole serous membrane is affected.

In the second and third divisions of cases of peritonitis, the causes were as follows:

From Bright's disease . .	63
„ pyæmia, 13; erysipelas, 5; puerperal fever, 10; with pneumonia, 3 . . .	31
„ tubercular disease . .	70
„ cancerous disease . .	40
„ hepatic disease . .	27
„ heart disease . . .	9
	240 out of 501 instances.

Treatment.—The consideration of the origin of peritonitis, either in its local or general source, is the best guide to proper treatment, whether it arise—1st, from extension of disease from adjoining viscera, or from perforation and injuries; 2nd, from blood changes, such as occur in albuminuria, pyæmia, and erysipelas, &c.; 3rd, from almost imperceptible changes or deficiencies in general nutrition modifying the state of the general health, as in struma, cancer, and climacteric changes; or from the hyperæmia of the peritoneum, consequent on cirrhosis and chronic disease of the heart and lungs, when upon very slight exciting causes, acute mischief follows. In the first form, if perforation have taken place, perfect rest is exceedingly important, in diminishing extravasation, and in localising the peritoneal mischief; purgative medicines of all kinds should be avoided, and also stimulants,

which are often unfortunately given at once, before a medical practitioner sees the patient. This injudicious attempt to relieve pain by purgatives, carminatives, and stimulants, may deprive the patient of the hope of recovery; for, as we have before said, we have seen castor oil floating in the peritoneal cavity. Food, also, should be abstained from, or only a few spoonfuls administered to relieve thirst; in more chronic forms, not arising from perforation, food of a fluid and bland kind only is admissible; and even when the more active symptoms have subsided, the return to solid forms of aliment must be very cautiously made. When there are symptoms of failing power, stimulants in small quantities may be given, but they are best combined with demulcent food, as brandy with arrow-root, &c.

As regards medicinal treatment, we believe the plan recommended by Dr. Stokes and Dr. Graves to be of the greatest value, not only in cases of perforation of the intestine, but where the peritoneum is acutely inflamed from the direct extension of disease. It consists in the administration of opium in full and repeated doses; and its beneficial result arises from its favouring rest of the intestines and the localisation of the mischief, from the mitigation of suffering which it affords, whilst at the same time it alleviates nervous prostration and collapse, and facilitates reparative action. The opiate plan may be combined with the external application of anodyne remedies, such as chloroform liniment with belladonna liniment, warm linseed poultices, cotton wool sprinkled with laudanum. Turpentine may be also applied on a flannel wrung out of hot water. Local peritonitis is also greatly relieved by the same remedies and external applications, as when produced by ovarian and cæcal disease; but blisters are of value in more chronic cases, and especially in those instances in which repeated attacks of peritonitis occur. Mercury, either in the form of grey powder, calomel, blue pill, or as mercurial inunction, is, we believe, injurious in all these cases of acute direct peritonitis. It tends to prevent adhesion, it excites peristaltic action, it promotes ulceration, it increases the depression consequent on the disease, which is often the immediate cause of death, and lastly, it renders the intestinal contents more fluid, thereby increasing extravasation. We

are well aware that many instances of acute peritonitis from diseased cæcum, from enteritis, and from ovarian disease, recover after mercury has been given; but as far as the causes we have enumerated can be any guide, and from extensive experience in these cases, we strongly deprecate its use.

Effervescent medicines generally increase the painful distension of the abdomen, but diaphoretics and salines are sometimes of value when combined with opium.

In the subsequent treatment we must not be too desirous of inducing action from the bowels, and, when necessary, gentle enemata are better than purgatives administered by the mouth; many days may elapse without any action, and aperients frequently produce a renewal of pain.

When the more active symptoms have subsided, opium may be continued with vegetable tonics or with quinine. If fluid effusions have formed, iodide of potassium and diuretics may be advisable, and the abdominal glands may then be beneficially stimulated by an occasional dose of grey powder or calomel. Preparations of iron are not generally well borne in the convalescence from acute peritonitis. It will often be found that as the health becomes established the fluid effusion rapidly disappears; in other cases the repeated application of counter irritants may be required, and sometimes it is well to remove the serum by paracentesis.

In the peritonitis of *albuminuria* the best treatment consists in the relief of the general disease by diaphoretic medicines, counter irritation and cupping on the loins, also by free evacuation of the bowels; but mercurial preparations very readily affect the system, producing severe salivation, without corresponding benefit. When effusion becomes extreme, it is better to attempt its removal by puncturing the thighs and by purgatives rather than by directly emptying the serous cavity. I have sometimes used with benefit the minute drainage-tubes recommended by Dr. Southey. Hot-air baths are sometimes of great service.

In the treatment of the peritonitis of pyæmia and erysipelas the local disease is to be less regarded than the general one, nor should we attempt to cure the peritonitis of this kind by depletion and mercurial preparations. Opium and salines, with the free use of stimulants, are apparently the best reme-

dial agents we can employ. Typhoid symptoms too frequently come on, and precede a fatal result.

In *puerperal* peritonitis the same plan of treatment may be adopted. In some cases the blood becomes affected by the absorption of septic material; or pelvic phlebitis and cellulitis are followed by the peritoneal disease; and, from the benecial effect following the internal adminstration of tincture of the sesquichloride of iron in erysipelas and diphtheritic disease of the throat, Dr. Heslop has recommended the same remedy in puerperal peritonitis, as being a disease closely allied in character. Those cases which we have seen recover have apparently been benefited by thoroughly washing away uterine discharges, by the free use of opium, and by stimulants; but we are qnite prepared to hear further reports of the good results of the tincture of the sesquichloride. In puerperal peritonitis the use of turpentine internally has been recommended, and has been followed sometimes by a beneficial result.

In the treatment of acute peritonitis in *struma*, the same rules ought to be borne in mind as in the treatment of strumous pneumonia. Opium is of value not only in relieving the pain and the great nervous prostration so constant in disease of the abdomen, but it also facilitates the recovery of the injured structure. Warmth and anodyne applications may be used; purgatives should be avoided, and rest strictly maintained; but mercurial preparations, given so as to affect the mouth, are as injurious in this form of strumous complication as in any other, and it is not necessary to recur to mercury for an aperient remedy, nor to prevent the opiates from checking secretion.

In the more chronic forms the means best calculated to remove the local malady are those suited for the removal of that general state of the system which has predisposed to the complaint; such as nourishment as far as it can be borne, cod-liver oil, steel as in the form of iodide steel wine, the iodide of potassium, alkalies, &c. Occasional counter irritants may be used, and moderate pressure on the abdomen employed to promote the absorption of serous effusions; an elastic bandage, strips of plaster, as the adhesive or the belladonna plaster, may be thus applied; in some instances in which I have used the ammoniacum plaster with

mercury, the intolerable itching which was produced compelled the removal of the application. Residence at the seaside greatly facilitates recovery in these cases. In slow strumous effusion, especially in young persons, after peritonitis, it is often extremely difficult to produce absorption, and paracentesis is sometimes advisable.

Peritonitis with *cancerous* disease is always associated with enfeebled power and diminished functional activity. Remedies such as diuretics have very little effect in promoting the absorption of fluid, and any measures which still further diminish strength appear to increase dropsical effusion. To sustain the powers of life by every available means is the best preventive against this result. If acute symptoms supervene, the opiate plan of treatment must be followed, with rest and bland nutritious diet. If paracentesis be performed, temporary relief may be obtained; but more frequently the patient very rapidly declines, and we then find that the whole of the diseased peritoneal surface has increased in vascularity, and lymph is poured out.

Peritonitis with cirrhosis is generally found in persons who have been of intemperate habits; the arteries are often diseased, and the kidneys may be granular and atrophied. At an early stage of the disease, when the diet can be regulated, and the excretory functions of the liver, the kidneys and the skin stimulated to increased action, the symptoms may, in a great degree, be alleviated; and when acute peritonitis is set up with cirrhosis, no class of cases are more benefited by the judicious use of the ordinary remedies for peritonitis, namely, local depletion, and mercurials with opium, on account of the stimulant effect which mercurials have on the excretory glands; but all the good effect of mercury may be attained without that remedy being used so as to produce salivation.

If the peritonitis be of a chronic form, and associated with advanced cirrhosis, our measures will, at best, be only palliative. Some have recommended mild mercurial salivation before tapping, to prevent the supervention of acute symptoms; but we have no experience of such a treatment, and we believe that if tapping be really necessary mercurial salivation would be detrimental, and would increase the exhaustion which often follows the operation, or that the

mercurial cachexia would lead to the speedy reaccumulation of the fluid. Mercurial frictions are less objectionable when used with moderation; and minute doses of blue pill, with tonics, as quinine, or with aperients, are, in many instances of chronic peritonitis from hepatic disease, of great service. Other remedies may also be tried, as diuretics, iodide of potassium, nitro-hydrochloric acid, &c., but the persistent congestion of the vena portæ interferes with their absorption and with their beneficial action. Nearly the same remarks apply to the treatment of peritonitis coming on in the course of chronic disease of the heart and of the lungs. In these cases I never recommend paracentesis, unless compelled by the urgent distress from enormous distension.

We believe that the benefit generally ascribed to mercury in the treatment of acute peritonitis is not an established fact, and the good results which apparently follow its use, may perhaps, be more correctly attributed to the opium with which it is usually combined.

M. Beau has employed large doses of quinine in the treatment of acute peritonitis, but we have no experience of this mode of treatment.

Numerous instances might be adduced to illustrate the symptoms, the pathological appearances, and the treatment of acute as well as chronic peritonitis; the fearful suddenness, and oftentimes fatal result of the former, and the insidious character of the latter, might be abundantly demonstrated; each chapter has contained some illustrations of peritoneal disease, but a few cases in which some peculiarities were observed, are all that we shall mention.

Case CLXXXVI.—*Peritonitis. Local Suppuration. Perforation of the Diaphragm.*—Robert P—, æt. 26, was admitted into Guy's Hospital, January 6th, 1858; he had been a labouring man, residing in Bermondsey; and stated that he had been well till seven weeks previously, when one night he was suddenly seized with violent pain in the abdomen, accompanied by vomiting and purging; he was, however, able to walk to an apothecary's house the next day, but the symptoms remained, and afterwards increased in severity. When admitted he was exceedingly ill, and there was much obscurity as to the precise character of the disease; he had the appearance of a patient in the later stage of typhoid fever; the diagnosis was peritoneal disease. He died on the 9th.

The body was wasted, the abdomen tumid. The brain was not

examined. The left lung was pushed up, and its base was adherent to the diaphragm; when the lung was removed its lower surface was found to form part of an abscess situated in the abdomen, and which had perforated the diaphragm. The abscess was in the left hypochondriac region; and the surface of the spleen, the left lobe of the liver, and the diaphragm formed its walls; the surface of the lung opposed to the opening of the diaphragm was also involved. The fluid in the abscess was well-formed pus, without odour. The neighbouring organs were carefully examined, to see if any disease in them had produced the abscess, but nothing could be satisfactorily found. The stomach and its mucous membrane were healthy. The duodenum and colon were firmly united, and gave way on attempting to separate them. All the intestines were more or less united, but there was no ulceration. The kidneys were coarse; the heart and bronchial glands were healthy."

We believe that the local peritoneal disease in this instance arose from some blow which the patient had received, for there was no evidence of perforation of any of the viscera.

Case CLXXXVII.—*Chronic Painless Peritonitis. Tubercle. Great Tympanitis.*—William F—, æt. 46, was admitted into Guy's, February 13th, 1857, and died March 26th, 1857.

He had been for several years a policeman in the Borough, and was of temperate, steady habits. He had not received any blow on the abdomen, nor was he aware of any exciting cause of the disease; he had had diarrhœa, however, some months previously. Two weeks before admission the abdomen became enlarged and tense, but without any pain; this increase of size went on till admission, when the abdomen was distended and tympanitic, but still free from pain.

He was a tall man, spare, and emaciated, the eyes glazy and sunken, the pupils contracted, and the conjunctiva injected, the pulse very small, quick, and compressible, the tongue clean, the bowels open regularly, the urine scanty. In the abdomen slight fulness could be detected in the region of the liver; fluctuation was indistinct. The abdomen was neither hot nor tender on pressure. He was prostrate and sunken in the bed; but he could take food well, and was quite sensible. At the apices of the chest the respiration was very coarse, almost bronchial; the heart sounds were normal. The tympanitis in great measure subsided about a fortnight before death, but he became gradually more prostrate; still, he did not suffer from any pain. Three days before death his mind wandered considerably. Only eight or ten weeks intervened between the commencement of the symptoms and the fatal issue.

Inspection about twelve hours after death. *Abdomen.*—The intestines were moderately distended; the peritoneum contained about two quarts of bloody serum; the intestines were everywhere covered over with lymph in grains somewhat resembling tubercles; there were

some tolerably strong bands of adhesion, and the small intestines were united together, but not firmly. The investment of the spleen was more than a quarter of an inch in thickness, and of a whitish colour from lymph, and contained yellow opaque grains or cheesy masses from degenerating tissue. The appendix was coiled like the letter S, on the right side of the cæcum, and was adherent. The liver was fatty; the spleen semi-diffluent; the kidneys somewhat granular and atrophied. The mesenteric glands were healthy. The stomach was contracted and small, and presented scarcely any post-mortem solution. In the ileum were several small passive ulcers, extending through the mucous membrane, but without any injection around them. The cæcum and colon were healthy. The appendix contained fæces surrounded by thickened mucus. *Chest.*—The pleura was adherent at both apices, but especially on the left side; the left apex was puckered, and was of an iron-grey colour, consolidated, and it contained some calcareous masses; some small granular masses resembling tubercles were observed. At the base of the right lobe were several lobules consolidated, and some were in a state of softening, or grey hepatization; they were situated beneath the pleura as in pyæmia. The heart was healthy, except slight atheroma of the valves. The tubercles in the peritoneum consisted of elongated fibre-cells, with a nucleus rendered very distinct by acetic acid; in some parts more rounded nucleated cells were closely aggregated, in others fibres were formed; some portions showed degenerating tissue. The structure was more highly organized than in struma, but it could not be considered cancerous.

Many facts of great interest were presented in this case. 1st. The insidious character of the peritonitis, unaccompanied by pain, but marked by tympanitis, with gradually increasing prostration. 2nd. The blood effused into the serous membrane, which apparently arose from the rupture of newly-formed capillaries. 3rd. The apparent tendency to struma, as shown by the condition of the lungs, which presented a retrocedent state of chronic pneumonia. 4th. The condition of the blood, as indicated by the pyæmic lobular pneumonia, the diffluent state of the spleen, and the effusion of blood into the peritoneum. As to the exciting or predisposing causes of disease, nothing could be found; it was not a case apparently of enteric fever; he had not been more exposed than policemen generally are to cold or wet; he had been a man of temperate habits, and there was no disease of the liver beyond fatty degeneration. The probable predisposing cause was the strumous diathesis. We have already referred to this case as one which might easily have been mistaken at an early stage for one of func-

tional dyspepsia; and other cases of a similar kind have come under our notice.

Case CLXXXVIII.—*Ulceration of the Intestine. Strumous Peritonitis. Fæcal Abscess. Umbilical Discharge.*—Mary Ann E—, æt. 38, by occupation a servant, was admitted, under Dr. Hughes care, into Guy's Hospital, July 18th, 1857, and died on August 4th. She had resided at Brixton, and till two months previous was quite well, when she began to suffer from pain in the abdomen; this gradually increased with vomiting and distension; and at last several tumours appeared. On admission she was very ill, with symptoms of general peritonitis, tenderness, distension, &c. Three or more defined tumours could be felt; one at the umbilicus, a second in the right hypochondrium, and a third on the left side. They could be reduced by pressure, and fluctuation was believed to be felt. On July 30th the tumour near the umbilicus burst at that part, and pus having a fæcal odour was discharged. She died on August 4th. The body was wasted. The thoracic viscera were healthy. There was a large fæcal abscess below the umbilicus circumscribed by the liver and the colon, and extending into the transverse colon; upon attempting to separate the intestine, further openings were made. Numerous ulcers were found in the ileum, cæcum, and colon; and most of these ulcers had perforated the coats of the intestine; extravasation had, however, been prevented by adhesions. Between the coils of intestine close to the mesentery were several loose earthy bodies, and similar ones were found in the mesenteric glands. The liver was fatty.

Although there was no evidence of tubercular disease in the lungs of this patient, we regarded the case as one of strumous disease of the abdomen, from the condition of the mesenteric glands, and the general character of the disease. It is probable that ulceration of the mucous membrane of the ileum first took place, possibly from enteric fever, and afterwards chronic peritonitis supervened; the latter was marked by severe attacks of pain and vomiting; adhesions between the coils of the intestine then formed, and limited the extravasation which subsequently took place from the perforated intestine.

In strumous peritonitis suppuration sometimes arises from the degeneration of the low organized peritoneal product, and the pus forms an opening into the intestine, namely, from the peritoneal to the mucous surfaces. In other cases, the perforation is from within; the extensive ulceration of the small and large intestine in this case rendered it probable that the latter was the course of the disease. The external opening at the

umbilicus is a rare event in these cases, and if a fæcal abscess thus opening had been the only one, great relief to the pain and distress might have followed; but these collections of fæcal matter were numerous. The calcareous condition of some of the mesenteric glands, and loose calcareous bodies of similar kind in their neighbourhood, are interesting facts connected with the explanation of loose bodies sometimes found in the serous sac.

Case CLXXXIX.—*Ascites. Cancer of the Ovaries and Peritoneum. Paracentesis. Peritonitis.*—Ann H—, æt. 45, was admitted under my care, September 20th, 1858. She was a single woman, and had ceased to menstruate in December, 1857. Since that time the abdomen had begun to swell, and ascites came on; she was tapped, and dark coloured fluid was drawn off; vomiting with severe pain in the abdomen supervened, and continued till her admission. There was then great emaciation, and irritability of the stomach was still very troublesome. The abdomen became very large, and fluctuation very distinct. Severe pain, with tympanitis, subsequently came on, and she gradually sank.

On inspection, the peritoneum was found studded with cancerous tubercles; the omentum was contracted, and contained much deposit; the stomach was irregularly contracted into two pouches; the pylorus was healthy; but an inch from the pylorus its coats were invaded by cancerous disease; the mucous membrane in several parts was intensely congested. The intestines were distended with flatus, and there were indications of peritonitis at the lines of contact of the coils of the intestine; some serous effusion was observed. The deposit on the peritoneum consisted of abundant nuclei. There was a medullary tubercle in the kidney; the glands were otherwise healthy, but there were no tubercles in the liver. The pleura presented numerous tubercles; and there was a considerable quantity of serous effusion in both serous cavities. The heart was normal. The spleen was enlarged. Both ovaries with the uterus were united into one mass by deposit of a fibro-medullary character; and numerous cysts were observed containing secondary cysts. The os uteri was healthy.

The acute peritoneal mischief was set up by the paracentesis; constant pain, and almost daily vomiting, with gradually increasing exhaustion followed, till death ensued. The onset of the disease was insidious, and probably arose in the ovaries; cancerous tubercles were then developed on the peritoneum, and effusion took place. This effusion may be without pain, excepting that arising from distension; at length the large size of the abdomen, the painful distension,

the inability to take food from the pressure on the stomach, the impeded respiration, the sleepless nights, and the general distress, cause the patient to long for relief; but there is always the danger of more acute inflammatory disease being set up, as was the case in this patient before she applied for admission into Guy's Hospital.

Case CXC.—*Carcinoma of the Peritoneum, with Effusion. Paracentesis.*—Mary T—, æt. 57, admitted into Guy's Hospital, April 25th, 1857, and died on August 28th.

She stated that about two months before admission the abdomen began to swell, and gradually increased. On June 13th, paracentesis abdominis was performed, and again on July 9th; at each operation more than five gallons of fluid being drawn off. No signs of peritonitis followed, but she gradually sank.

On inspection, the lungs and pleura were found to be healthy; there was recent lymph effused on the anterior aspect of the pericardium, upon the ventricles; and a small quantity posteriorly. In the abdomen there were several pints of fluid; numerous white cancerous nodules were scattered over the serous membrane, especially on the intestines. The membrane also was thickened by chronic action, in a more marked degree on the anterior parietes. The peritoneum covering the liver was opaque, and in some places tubercular. The omentum was drawn up and formed a solid mass (cancerous). The lymphatic glands were only slightly affected, but there were some large masses between the diaphragm and the liver. The surface of the diaphragm itself was affected; the tunic of the spleen was opaque; the liver, spleen, suprarenal capsules and kidney were healthy. The right ovary consisted of a mass of new growths and cysts, about the size of the fist; the former were made up of a spongy-looking fungus, composed of fibro-cellular structure, and the latter were filled with fluid. There were some smooth cavities containing a soft sebaceous matter, and amongst this were numerous hairs.

In this case the disease also probably commenced in the ovaries; there was absence of pain but gradual effusion; the ascites was, however, greatly relieved by paracentesis, no acute peritonitis followed, but as too frequently happens, the fluid soon re-collected, and again required to be drawn off; but at each time the patient was less able to rally from the effect of the operation.

Case CXCI.—*Chronic Peritonitis. Renal Disease. Spurious Cysts in the Peritoneum.*—Elizabeth S—, æt. 44, a stout married woman, was admitted December 7, 1859, under Dr. Barlow's care, and died February 11, 1860. She had been confined eight months before admission; and

swelling of the legs was followed by effusion into the abdomen. There was general anasarca, and the urine was albuminous. The abdomen became distended; there was distressing cough; prostration supervened, and she gradually sank.

Inspection.—There was effusion into the left pleura, and the bronchial tubes were much congested. *Heart.*—The muscular fibre was pale; the right and left ventricles were both much dilated. *Abdomen.*—The intestines were distended: on opening the serous membrane an appearance very closely resembling ovarian dropsy presented itself. The supposed cyst on the right side consisted of peritoneal effusion, shut off by fibrinous adhesions. This serous collection extended from the right iliac region as high as the liver, and between the liver and diaphragm; the fibrous cyst could in great measure be separated from the peritoneum, and contained many pints of slightly milky serum. Another cyst was found between the colon and the stomach. The mesentery was slightly contracted, and all the intestines were matted together. The kidneys contained cysts and some inflammatory deposit. The liver was soft and congested. The ovaries were atrophied.

Effusion into the peritoneum with serous inflammation is of frequent occurrence in renal disease, and such was the cause of the ascites in this case. It is, however, especially recorded, on account of the very peculiar appearance that was presented on opening the abdomen; there was the precise resemblance of a patient affected with ovarian dropsy, for the lymph effused upon the peritoneum had formed a cyst, and shut off the serous exudation. The lymph with its contained serum could be separated from the liver and intestine, but the ovaries themselves were healthy.

Case CXCII.—*Colloid Cancer of the Peritoneum and Ascending Colon.*—Harriet K—, æt. 32, a hawker residing in Kent Street, was admitted into Guy's Hospital March 27th, 1861, under the care of Dr. Rees. Her general health was good, and her habits of life temperate; but she had an anæmic appearance. Her employment exposed her to wet, cold, and fatigue, and she had evidently suffered from causes of depression, having had improper food, and the care of a family of five children. There was no history of hereditary disease.

Six months previous to her admission she was seized with a sharp pain at the lower part of the abdomen, and the pain was increased on pressure. From that time the bowels became relaxed, but the diarrhœa had been more severe for three months, ten to twelve motions being passed; the motions were of a dark colour, and sometimes were of a white glairy matter, like white of egg. Small masses of indurated fæces were also sometimes passed. She complained of a sense as of great weight at the lower part of the abdomen when standing. For a

short time she suffered from dyspnœa, but the cough was slight; the expectoration was greenish and tenacious. There had been no catamenial discharge for eighteen months. She suffered from vomiting; the pulse, 120, was small and soft; the tongue was dry in the centre, but the tip and edges were clean and moist. The diarrhœa continued to the close, but it was partially checked by treatment; she sank a week after admission.

Inspection was made twenty-four hours after death. The thoracic viscera were natural. The whole of the peritoneum was covered with colloid cancer, which extended from the diaphragm to the pelvis; no viscera, however, were involved except the ascending colon, and it was doubtful whether this was primary or secondary disease. On opening the abdomen the omentum was seen spread over the surface of the intestine, and reached nearly to the pubes. The mesentery was converted into a solid mass of colloid, an inch in thickness, and of considerable density. It formed a tolerably uniform mass, except at the edges, where the disease existed in the form of distinct nodules; the omentum was slightly adherent. On raising the omentum adhesions existed with the ascending colon, and on opening this portion of the intestine the walls were found to be involved, and in part destroyed by the disease. The cæcum itself was free, but above it the walls of the colon were converted into a solid tumour for about five inches. In other parts the disease was confined to the peritoneum, but in the ascending colon it had penetrated the coats and had partially destroyed them; thus, on section, the muscular coat could be seen traversing the centre of the colloid growth. The mesentery and its glands and the lumbar glands were free from disease; but the whole of the diaphragmatic peritoneum was covered, so also the peritoneal surface of the bladder, liver, and spleen. The substance of the liver and spleen were healthy, so also the kidneys, uterus, and ovaries. The left iliac vein was distended with an ante-mortem clot. The microscope showed colloid structure in the peritoneal growth.

This was a well-marked instance of colloid disease of the peritoneum originating in similar disease of the colon. A glairy discharge from the bowels was present, but I have not observed this symptom in other instances of colloid disease which have come under my notice. Pain in the region of the colon was the first indication of disease, and was followed by diarrhœa of a very persistent character, by vomiting, and gradual prostration. There was nothing, however, during the course of the complaint to enable us to diagnose its precise character. The patient was only thirty-two years of age, but she had had five children.

Loose Bodies are occasionally found in the peritoneal cavity, oval in form, and in size varying from that of a bean to that

of a pigeon's egg. They do not appear to produce any symptom, but they have been known to pass into hernial sacs. They are variously constituted. 1st. Some arise from growths connected with the intestine, and, whilst some may be quite free, others are found pendant by long thread-like bands. 2nd. The separation of appendices epiploicæ apparently constitutes others, as in a case recorded by Mr. Shaw, and as shown by the arrangement of its layers. 3rd. The separation of calcareous and degenerate glands may also give rise to these loose bodies. This mode of formation appeared probable in Case CLXXXVIII. 4th. The coagulation of fibrinous masses or of blood may lead to their formation; but this source is of very doubtful occurrence, although in spurious melanosis dark portions of effused blood may seem to be in an almost separated condition. 5th. Other occasional but rare conditions are proliferous cysts, simple and dermoid cysts.

CHAPTER XX.

ASCITES. DROPSY.

The term dropsy is often limited in its application to the effusion of fluid into the peritoneal cavity; this, however, is more correctly designated ascites, or peritoneal dropsy. The peritoneum is the lining membrane of the cavity in which the intestines and numerous other viscera are placed, it is a serous membrane like the pleura, and covered over by a cellular investment, formerly regarded as epithelial; modern histologists have shown that this is not strictly true, for the peritoneal cells are part of the connective tissue, and therefore endothelial. The serous membrane is richly supplied with vessels, and it is from these when in a state of active or passive congestion that the effusion takes place; these vessels participate in the more acute changes of peritonitis, in which lymph and fibro-albuminous products, and the various manifestations of cellular growth are found. The membrane has also abundant lymphatic vessels. It is, however, especially with fluid effusions into the serous membrane that we have now to do. These fluids are variously composed, according to the nature of the process which has led to them; the quantity of albumen varies, and sometimes leucocytes and cells are found answering to true pus cells; blood is sometimes present, and if the fibrinous material be abundant it may be recognised after death in a coagulated form; sometimes urea is present, and generally some saline constituents. The quantity of the fluid is equally variable; it may be only a few ounces which gravitate into the pelvis, or it may amount to several gallons. The fluid is usually transparent, of a greenish-yellow colour, and slightly alkaline in reaction. If there be disease of the lymphatic vessels, the fluid becomes milky and

opalescent, so also it is turbid, if inflammatory action have taken place, and proportionately so, as the fluid is more or less purulent. We have already referred to the occasional presence of blood; this may arise from a transudation of hæmatine in consequence of a changed character of the blood, as in purpura, or it may be due to rupture of congested vessels, as in heart disease, or even to the rupture of newly formed capillaries. Sometimes the fluid is more thick and viscid. For the convenience of description, as well as of diagnosis and of treatment, it may be well to divide ascites into several varieties.

1. From weakness, *asthenic dropsy*, such as we find in old age and in states of exhaustion.

2. From congestion of a passive character, *mechanical or secondary dropsy*, such as we have in chronic bronchitis, in emphysema, in heart disease, in pressure on the vena cava, and to some extent in chronic disease of the liver, cirrhosis. In all these states the vena portæ and its tributary branches are over-distended.

3. From peritoneal inflammation and congestion of an active kind, *inflammatory dropsy*.

4. From disease of the liver, the kidneys, the spleen, and the lymphatic glands, *glandular dropsy*.

5. From strumous or tubercular disease.

6. From cancerous disease of the peritoneum in its several forms, whether primary or secondary.

7. *Ovarian dropsy*. This, however, is not ascites, although ascites may be associated with it. The disease is limited to the ovaries, and the effusion is cystiform.

The first symptom of the presence of fluid in the peritoneum is the increase in size of the abdomen; the quantity generally, however, attains to a considerable proportion before it is noticed by the patient. Then, unless the patient is stout, and there is a large quantity of fat in the parietes or in the omentum, the fluid may be detected by the sense of fluctuation which is communicated when one hand is placed on one side of the abdomen and a gentle tap is given on the opposite side; or if the fluid is small in quantity and the loin is bulging, one hand may be placed towards the back, and a gentle blow given on the same side in front; the readiness with

which fluctuation can be felt is greater if the parietes of the abdomen be thin. The fluid in the abdomen, unless it be limited by adhesion, will flow from side to side and gravitate according to the position of the patient. It will fill the pelvis, and if the patient lie upon the back it will pass into the loins; the form of the abdomen is altered, therefore, by the bulging of the loins and the apparent flaccid condition of those parts. If, however, there be irritation of the peritoneum, as from inflammatory action, or from the presence of cancerous tubera upon the serous membrane, there is greater tension of the muscular walls of the abdomen and less projection of the loins. The quantity of fluid may be estimated by the extent of the dulness when a patient is in a standing position as compared with that on lying down; where fluid is present immediately beneath the parietes there is dulness, and where there is intestine there is resonance on percussion; hence we find in ordinary cases, if the effusion be moderate in quantity, that the intestines float on the fluid, and the abdomen is resonant in front, whilst there is dulness on the side, from the gravitation towards the loins; if, however, the patient turn on one or other side, the line of dulness is altered, for the fluid passes from one side to the other. If the fluid is in very large quantity and the abdomen is so distended, that the intestine being held back by the mesentery cannot reach its anterior wall, the dulness is general. Again, in some cases of chronic inflammation, the mesentery becomes thickened and contracted and the same restraining effect is produced, because the intestines are tied down; still further, adhesions may limit the fluid, so that it cannot gravitate to the dependent parts.

Other symptoms are produced by ascitic distension; the skin becomes stretched, the corium gives way, and transverse markings are produced, they may be of a reddish colour, but frequently when the distension is lessened they assume a white appearance, as seen after pregnancy; in very great distension, the umbilicus sometimes yields, it bulges out in a globular form; the skin is thin, and the vessels are evident; sometimes rupture takes place, and the fluid escapes, a result to be avoided if possible, as it often

leads to acute peritoneal inflammation and the exhaustion of the patient. If the inguinal canal is open, fluid may pass into the scrotum; but the distension of the tunica vaginalis must not be mistaken for swelling of the scrotum produced by œdema or by pressure on the veins. When the ascites is great, there is also pressure on the large vein of the abdomen, the vena cava; then the blood is prevented from returning from the lower extremities and œdema is the result; and therefore, in ordinary ascites, the enlargement of the abdomen always precedes the swelling of the feet and legs. The interference with the venous circulation also alters the state of the kidneys; the renal veins are distended, the glands act feebly from the passive congestion, urine is often scanty and is not increased by diuretic medicines; but as soon as the pressure is removed by paracentesis then the kidneys act freely. The fluid also presses upon the upper part of the abdomen and the diaphragm; the liver is pushed up on the right side, and the spleen on the left; and the fluid may pass over the edge of the liver, between it and the parietes. Digestion is also interfered with, for the stomach is compressed; sometimes severe vomiting is induced or there is loss of appetite, pain after food, and sense of great distension. It is very remarkable how these gastric symptoms may suddenly cease when the pressure is taken off. We have already referred to the fluid passing into the pelvis, the bladder and rectum may both be compressed, and in women the fluid may be felt in the recto-vesical pouch. The general symptoms as to the pulse, the tongue, the temperature and the respiration, vary according to the state of the patient. The fluid in the peritoneum may, however, be associated with a solid tumour, whether in the ovary, in the glands or in other parts; again a hydatid cyst in any of the abdominal viscera may complicate the diagnosis. A large ovarian cyst may be present and be recognised by its fixed position, the non-gravitation of the fluid &c., but it may be associated with ascites; there may be fluid outside the cyst in the peritoneum; lastly, pregnancy may be present with ascites. Pregnancy is sometimes attempted to be hidden under the name of dropsy, and a medical man ought never to be thrown off his guard in this respect.

1. Ascites from weakness, asthenia or exhaustion is some-

times observed after loss of blood, or in chronic disease, as in the later stages of phthisis; and we may in advanced life, when the circulation has become very feeble, observe the same condition. The fluid in these cases slowly collects, there is neither pain nor inflammatory action; the ankles, and even the whole leg, become œdematous. The effusion is of a passive character, and is due to the feeble condition of the circulation, and it may be, to obstruction of the vessels from thrombosis; there is no febrile disturbance and the patient is often unconscious of the ascitic enlargement. In these instances the ascites is purely symptomatic of a state of general exhaustion; no treatment is required, beyond what is necessary to sustain the feeble circulation; to attempt to remove the fluid by purgatives and diuretics would lead to increased weakness and would also augment the ascites.

2. Ascites produced by congestion of the portal circulation. This is also of a passive character and is *secondary* to other disease, and may be regarded as mechanical as to the manner in which it is produced. The hepatic dropsy to which we have presently to refer, is, in many instances, of the same secondary character. The minute branches of the portal vein are distributed everywhere upon the abdominal viscera, the stomach, the small and large intestine as well as upon the peritoneum; congestion of these vessels, which is often of an extreme character, leads to the discharge of serous fluid into the general cavity of the peritoneum. It commences in the abdomen if the liver only is affected, but in the cases to which we now refer, the obstruction extends to the cava and the legs, and the legs and feet also become œdematous. These cases are especially those of obstructive disease of the valves of the heart, and obstruction in the lungs, as we find in chronic bronchitis and emphysema. In the former class of maladies, cardiac affection, we may instance stenosis or contraction of the mitral valve; the blood is unable to pass onwards freely; the left auricle is first overstretched, next the pulmonary veins, and thus the whole lungs necessarily become surcharged; hence also the chronic congestion of the lungs, the attacks of pulmonary apoplexy and of pleuritic effusion. Since, however, the blood is retarded in the lungs, the right side of the heart is next distended, and the power of the

right ventricle is overtaxed to propel the blood onward; the muscle becomes hypertrophied and the cavity dilated; next the right auricle is similarly distended, and the blood is retarded in the superior cava, and also in the inferior cava; the large hepatic veins opening into the cava immediately before it passes the diaphragm, to reach the auricle of the heart, necessarily become distended, hence the congestion of the liver, its increase in size, and the nutmeg appearance it presents. Not only are the veins of the liver overstretched, but also those which form the inferior cava, the renal veins and the iliac veins from the pelvis and lower extremities; it is in this way that œdema of the feet is produced as well as ascites, the latter being due to the state of the portal circulation. The congestion of the liver interferes with its secretions, and distension of the portal ramifications in the stomach and intestine induces disturbance of their functional integrity; sallowness or even jaundice is produced and the severe gastric symptoms, which we have previously described. These symptoms are often regarded as the primary disease, and the dropsy of the abdomen is diagnosed as primary instead of being secondary in character. The enlargement of the liver, the jaundice, the severe flatulence, disordered appetite, the furred tongue, pain at the stomach, all tend to confirm the opinion that the abdomen is the primary source of the disease. As a rule in every case of ascites the heart and lungs should be carefully examined. The same remark may be made in reference to the kidney; the chronic congestion leads to an albuminous condition of the urine, and this may be regarded as the primary malady. Care will, however, prevent this mistake. The urine is generally scanty, of a deep colour and of a high specific gravity. It is well, to remember that chronic congestion may give rise not only to inflammation of the surface of the liver, and perihepatitis, but also to a state of general subacute peritonitis.

The treatment of these cases is often attended with marked relief; it is important to try and remove the cause as far as possible, whether it be due to disease of the heart or lungs, and thus to lessen, if possible, the secondary affection and remove the ascites. The relief of the latter is often attended with marked diminution in the

symptoms of the primary disease; if the congestion of the portal system is lessened, that of the liver is also lessened and so also the distension of the right side of the heart. Having lessened the cardiac oppression, the lungs are also relieved, the heart's action becomes more regular; the breathing is more free, and the patient's distress proportionately relieved. The treatment of the secondary affection is often more important than that of the primary disease; thus it may be well to use expectorants to lessen the bronchitis, and stimulants such as ether, ammonia and ardent spirits, to help the action of the heart, so also digitalis may be of the greatest service; but if we act upon the abdominal glands so as to increase their activity we shall more effectually lessen the primary, whilst we remove the secondary trouble.

Purgatives and diuretics should be used; I prefer a combination of blue pill, or calomel, or the black suboxide of mercury, with squill and digitalis. At the same time other diuretics should be given, as the acetate, nitrate, citrate, or iodide, or acid tartrate of potassium, with nitric ether, broom, &c. If the bowels are confined a mercurial purgative or jalap, or scammony, should be prescribed; podophyllin or elaterium may also be used, or the saline purgatives, as magnesia or aperient mineral waters. If the bowels act freely, and the patient is enabled to pass three or four pints of urine, the ascites is lessened, and the chest affection is relieved. The grey suboxide of mercury is often a good remedy in these cases in one-grain doses, so also the copaiba resin in ten or fifteen grains dissolved in spirit, and given in mucilage mixture. The gum resins and turpentine are also sometimes of service. In this form of dropsy tapping is less necessary than in hepatic ascites; relief is afforded by the means we have mentioned, or if absolutely necessary the legs may be punctured, and serum allowed to drain from them. There is a greater disposition to the supervention of peritonitis if tapping be performed.

The *third* form of ascites is that which follows inflammation of the peritoneum, *inflammatory or peritoneal ascites.* In strumous subjects, and in tubercular disease, serous effusion takes place, but we are now referring to those cases in which there is no such cachexia. The serous membrane

becomes inflamed, and pain and other symptoms of peritoneal disease, with serous effusion follow. The abdomen is rounded and tense, and there may be general uneasiness.

The diagnosis of these cases is difficult, for the disease may be confounded with strumous peritonitis, and also with that form of peritoneal mischief in which the serous membrane is studded with cancerous tubera. It is rather by negative reasoning than by direct symptoms that we are led to the diagnosis; the occurrence of an acute attack, with the absence of other exciting causes of disease, either in the thoracic viscera or in disease of glands, as the liver or kidney. In the treatment, diuretics may be used, but purgatives only with caution. The abdomen is sometimes with advantage strapped over with the "Emplastrum Ammoniaci cum Hydrargyro," which tends to promote absorption; the disadvantage of this application is the intolerable itching of the skin that it often induces. It is very important in these cases to improve the general health.

The *fourth* variety of ascites is that which is due to disease of the *glands*, the liver, the kidneys, the spleen, or the lymphatic glands. We have already referred to that form of ascites which is due to secondary congestion of the liver, and it is not our intention to describe all the symptoms of hepatic disease. Many forms of hepatic disorder of an organic kind exist without any dropsy or chronic enlargement, enlargement from fatty degeneration, from chronic obstruction of the bile ducts, from cancerous disease, hydatids, &c., but it is in those forms of disease in which the portal circulation is obstructed that effusion takes place. We have mentioned chronic disease of the heart, chronic bronchitis and emphysema; the same kind of obstruction may be due to thrombus or to the pressure of a cancerous growth, but the disease may be primarily one of the liver. In chronic inflammation of the liver, cirrhosis, the fibroid tissue of Glisson's capsule becomes thickened; the liver is enlarged and congested, the congestion at first affecting the margin of the lobules, the portal circulation, rather than the centre of the lobule, the hepatic venous circulation, as in secondary congestion. As the effused inflammatory product contracts, the circulation through the vena portæ becomes more obstructed, clusters of lobules are cut off from

other parts and give the gland a granular appearance; if the contraction be seen on the surface of the liver the organ has an irregular aspect, and when the contractions are more decided the surface has been compared to one studded with hob-nails, hence the term hob-nail liver. When contraction thus takes place the venous circulation is more interfered with than the arterial, and as the result of that congestion ascites is produced, and the abdomen swells. As the obstruction increases the veins communicating with the general venous circulation become enlarged, and the superficial epigastric vein of the abdomen returns some of the blood from the lower part of the abdomen to the mammary and intercostal veins, and in this way the blood reaches the vena azygos and the right side of the heart. The hæmorrhoidal veins also communicate with the branches of the iliac, and thus relieve the vena portæ. These enlarged veins in cirrhosis are seen on the surface of the abdomen; and from the congestion of the hæmorrhoidal veins just referred to there is a tendency to hæmorrhage from the rectum. As the liver contracts there is diminished dulness, which may not reach the margin of the ribs; and with this condition the symptoms gradually increase in severity; bilious attacks, irritability of stomach, disordered appetite, irregular bowels, flatulence, and gradual diminution of strength are produced; the body wastes, but the abdomen is enlarged; the legs are thin, the face haggard, the capillary veins of the face are distinct, the tongue may be at first but little furred, but afterwards it becomes injected; the pulse is weak and irritable; the skin is sallow or semi-jaundiced; the patient complains of weakness, and the nights are often disturbed; the blood becomes changed in character, it coagulates feebly, and there is a tendency to hæmorrhage; the urine is high coloured, and loaded with phosphates. If the surface of the liver be also inflamed (perihepatitis) there is pain in the right side, and often still more decided contraction; it becomes rounded at its margin, and is often peculiarly shrunken as wasting increases. This form of ascites is recognised not only by the presence of the symptoms just described, but by the absence of other indications of disease; there is no evidence of pulmonary nor of cardiac disease, no sign of renal disease, nor of tumour

pressing upon the vena portæ, nor of enlargement of the spleen or lymphatic glands. The swelling begins in the abdomen, there is no general anasarca as in acute renal disease, nor do the legs swell as in cardiac and thoracic disease.

In hepatic dropsy there is a tendency to hæmorrhage, and we find that bleeding takes place from the nose, sometimes from the bowels; coffee-ground vomit from the stomach indicates slight oozing of blood into the stomach from distended capillaries; sometimes bleeding takes place from the gums; and it is always advisable to avoid any surgical operation if possible, for even the puncture of paracentesis may lead to troublesome hæmorrhage; the clinical history enables us to distinguish the disease from purpura hæmorrhagica. If renal disease be also present there is more general anasarca, and the urine gives some decided evidence of the presence of albumen. It is sometimes difficult to distinguish hepatic dropsy from carcinomatous disease of the peritoneum; the pain may be mistaken for peri-hepatitis; there is absence of cardiac, pulmonary, and renal disease, the abdomen is the only part affected, and the cancerous cachexia may be imperfectly developed; the history of the case, however, indicates more acute disease, the abdomen is more tense, there is less bulging in the loins, and there is less evidence of venous obstruction.

In the treatment of hepatic dropsy, we must remember that we have to do with disease in an advanced stage; for the period for treatment of chronic inflammatory disease of Glisson's capsule is before the development of dropsy; when, however, ascites has taken place, we may endeavour to produce absoption by the use of diuretics, as the acetate, nitrate, or iodide of potassium, with broom, nitric ether, squill, and mercurials in alterative doses; purgatives may be given, and iodine applied externally; in every case the diet should be carefully regulated, and stimulants, if possible avoided; but it will be found that diuretics have often very little effect, for they are not absorbed on account of the distension of the portal veins; copaiba resin I have seen of service in increasing the quantity of urine; and some of the saline purgative mineral waters are also of great value. If purgatives are administered freely when the strength is exhausted the effusion will

often be found to increase; jalap, cream of tartar, and scammony, may be used; the podophyllin resin may be administered in doses of one third of a grain to a grain, or as a tincture, one grain being dissolved in ʒj of rectified spirit, and ɱxv to lx given diluted with water or added to the tincture of jalap; it is a good plan to combine a laxative with a tonic, as the taraxacum with bark, or the infusion of senna with that of gentian, or the sulphate of magnesia in small doses with quinine. If, however, these remedies have failed, and the patient has become prostrate, the tongue red, the pulse failing, the stomach irritable, the urine scanty, and the mind distressed, it is often very desirable to resort to paracentesis. If there are complications of renal or splenic disease, and if the peritoneum has become inflamed, as shown by the pain of perihepatitis, there is greater danger of peritonitis; but these complications need not necessarily preclude the operation. In those instances in which peritonitis follows paracentesis abdominis, we must not expect that the pain of peritonitis will always be present; the patient may merely seem to be prostrate, his tongue dry and brown, the pulse failing, and death may take place apparently from exhaustion, whilst on examination we may find the whole of the serous membrane covered with lymph and acutely inflamed. Where the umbilicus has become distended, and at length yields, the sudden discharge of the ascites is generally followed by peritonitis.

In ascites connected with *renal* disease, the serous membrane is often changed in structure, so that it becomes pale, and there is subacute peritonitis; the countenance is pallid, the urine is albuminous; there is general anasarca, and an absence of symptoms of hepatic, cardiac, and pulmonary disease. The liver and the spleen may also be affected, as in lardaceous disease; there is no difficulty in the recognition of such cases, but greater difficulty is found in the diagnosis of chronic cardiac and pulmonary disease in which the kidney has become affected by secondary congestion; the urine in such cases of thoracic disease is scanty, it is high coloured, of high specific gravity, and when the congestion of the right side of the heart is relieved, the albumen disappears. It would be foreign to our purpose to enter upon a description of all the forms of renal disease and their

treatment; it will suffice to remark that the ascites rarely requires separate treatment; sometimes, however, the distension of the peritoneum is so great, and there is so much pressure upon the stomach, that there is excessive vomiting, and scarcely any food can be taken. There may be violent vomiting simply from renal disease, but it is more trying when the stomach is compressed by ascitic fluid. In the treatment of renal ascites, if the malady be acute, benefit is derived from diaphoretics, as acetate of ammonia, with antimony; from hydragogue cathartics, as compound jalap powder and elaterium; from Turkish and hot-air baths, &c., but when the disease is chronic, these remedies too much exhaust the patient, and saline medicines, with iron or quinine, are more beneficial. If the legs are very œdematous, it is better to puncture them, and in this way to relieve the ascites rather than to perform paracentesis abdominis. Care is required lest erysipelatous or gangrenous inflammation supervene.

Disease of the spleen, with enlargement, may be found in connection with disease of the liver and the kidney, as in lardaceous disease, but in the enlargement with ague the latter glands are unaffected, and there may be no ascites; in leukæmia or leucocythemia, the spleen especially is enlarged and the blood is altered in character, there being an excess of white corpuscles or leucocytes. In the later stages of this disease ascites comes on, as much, however, from the altered condition of the blood as from any primary affection of the serous membrane; the patient is anæmic and the strength gradually fails; the heart becomes irritable, and there is disturbance of digestion; sometimes the bowels become disordered and diarrhœa supervenes, or hæmorrhage, as epistaxis, may come on; these later symptoms increase the exhaustion, and may be the immediate precursor of a fatal termination. The cerebral condition is altered, the brain is irritable, and convulsions may follow. The spleen in this disease attains enormous proportions, and as it increases in size passes downwards and extends towards the median line; it becomes tilted forward as it enlarges; the notch at the anterior border becomes very distinct, and is one means whereby we may recognise the enlarged gland. This anterior notch may, however, be simulated by a mass of enlarged

glands, and great enlargement of the supra-renal capsule may also be mistaken for enlargement of the spleen. Since attention was drawn to this form of disease by Dr. Hughes Bennett and Professor Virchow, numerous instances have been recorded, and the pathological changes have been noted, but the treatment has not been attended with any satisfactory result; the malady has, in most cases, steadily progressed, and has terminated fatally. Iodide and bromide of potassium have been used, and by some strongly recommended; but the steady use of quinine and of steel, with good nourishment, has been attended with a better result, although the benefit has only been temporary. Several instances have been recorded* in which phosphorus has been used by Wilson Fox, Broadbent, and others, but without results which warrant us in advocating its use. The anæmia has not been checked by its administration, nor is life prolonged. Neither has the heroic treatment of removing the gland given encouragement to repeat the operation. Mr. Bryant has twice removed an enormous spleen in cases at Guy's Hospital, but each patient sank in a few hours.

In general enlargement of the lymphatic glands, as in Hodgkin's disease, there is less affection of the spleen, in fact it is often unaffected, whilst the glands in the neck and in the axilla, in the groin and in the abdomen, become enormously hypertrophied; there is less tendency to ascites, but in some cases of enlargement of the abdominal lymphatic glands there is an effusion of serum which, from the chylous vessels becoming implicated, and from obstruction of the mesenteric lymphatics, becomes of a milky white colour. These instances are rare, and sometimes the milky character of the serous effusion may be regarded as an accidental condition from obstruction of some of the mesenteric vessels, the disease being only of a partial character; in other instances there is general disease of the mesenteric glands, the lymphatics are observed as whitish cords in the mesentery and on the coats of the intestine. Disease of the receptaculum chyli, or pressure upon it by morbid growths, may induce the same condition of chylous dropsy.

The next form of ascites that we have to notice is that

* Clinical Society's Trans.

which is found in connection with *tubercular* disease of the peritoneum, and with strumous disease. This disease has already been described, and we need not fully remark upon it. It will be sufficient to state that the malady is not always attended by the same symptoms; in some instances the deposition of tubercle is associated with considerable inflammatory effusion, the intestines become adherent and matted together; ulceration, perforation, and fæcal abscess may be produced, the abdomen becoming large, not so much from serous effusion, as from distension of the intestine. In other cases the serous effusion is the prominent sign, and we have true ascites. In a third class of cases the abdomen becomes very large, but not from serous effusion, nor from inflammatory disease, as in the first class, but without pain or febrile excitement, the intestine becomes weak, its muscular wall yields, the mesenteric glands may be enlarged, and we have the appearance of ascites, but without the reality; the abdomen is resonant everywhere. It is therefore only in the second class that dropsy of the peritoneum really exists. The symptoms of the first class we have already described; in strumous ascites, the symptoms are very insidious; there is the history of tubercular disease; there is impairment of general health, it may be with some disease of the apices of the lungs; the abdomen gradually enlarges without pain; the digestion is interfered with, and the bowels are inactive. When this condition comes on in young women, it may be mistaken for ovarian dropsy. As to the treatment of these cases it is well to improve the general health, to act freely on the bowels, and to use iodine, internally, in the form of iodide of potassium or iodide of iron, externally, as the tincture or the solution of iodine. Cod-liver oil should be given. In an instance of this kind that came under my notice in a delicate young lady, gentle means were of little avail, but the effusion disappeared under the violent but dangerous use of drastic purgatives by an unqualified practitioner.

Cancerous disease of the peritoneum is another cause of ascites; we do not, however, refer to those cases of cancerous disease in which malignant tumours variously located interfere with the venous circulation, and thus cause dropsy. This is sometimes the case in cancerous disease of the liver

and of the glands at the portal fissure, the growth may invade and obstruct the vena cava and thus check the return of blood. There is an interesting class of cases in which the peritoneum is especially diseased; the serous membrane is studded with tubercles varying in size from a millet seed to that of a pigeon's egg; the tubera are soft, sometimes very vascular and composed of cancerous cells; the mesenteric glands may also be involved, and sometimes the omentum is infiltrated with inflammatory and cancerous product, so that it is thickened, contracted, and forms a dense horizontal band immediately beneath the stomach and transverse colon. The amount of inflammatory product varies exceedingly, sometimes a layer of lymph is observed on the serous membrane; there is, however, in nearly all cases a large amount of serous effusion constituting ascites, and it is often discoloured by admixture with blood. The disease probably originates in the subserous lymphatic vessels, and extends till the whole serous membrane is involved, but it is also spread, it is believed, by direct contact of one part with another, or by the dislodgement of cells, which become attached and increase at the point of their fresh adhesion. Sometimes there is considerable amount of dark coloured pigment in the deposit, and the growth is regarded as melanotic in character; this, however, is uncommon.

We refer in this description to those instances in which the peritoneum is especially diseased, for in many cases of disease of the uterus and ovaries the serous membrane is secondarily involved, so also in disease of the stomach. Dr. Fagge in a paper in the 'Guy's Hospital Reports' for 1875 gives the following statistics. In 45 cases of disease of the peritoneum the viscera were only free 6 times; in 19 cases the ovaries were affected, and in 17 the stomach. Of these 17 cases 7 were without disease of the ovary, but in 10 disease of the ovaries also existed. In 3 the disease appeared to commence in the uterus, 3 in the pancreas, and 2 in the rectum. In the 45 only 11 were males.

The malady is one affecting persons in middle and advanced life, and the subjects of it are generally beyond fifty years of age; it is not limited to women, although more common amongst them, as we have just remarked. The general health

of the patient fails, there is weakness, emaciation, a cachectic appearance, and the abdomen becomes enlarged; the rapidity of the effusion varies, generally it is slow, but I have known the attainment of a considerable size in three or four weeks; the severity of pain differs considerably, sometimes it is slight, at other times very distressing. The form of the disease is unlike that of slow and passive ascites; there is irritation of the serous membrane, the recti become consequently rigid, and there is less flaccidity of the abdomen; the loins are less distended, and the abdomen is more prominent anteriorly; the abdominal walls are thin, and if there be venous obstruction, the veins are enlarged. As prostration increases the pulse becomes more compressible, the tongue red and glazy, and diarrhœa may supervene; these patients sink from exhaustion, or by the occurrence of more severe inflammation.

The disease is sometimes mistaken for cirrhosis in consequence of the absence of disease of the chest, and of œdema of the legs, the urine also being free from albumen. The instances most difficult of diagnosis are those in which the cancerous disease is acute, and the pain in the right hepatic region resembles perihepatitis. In a case of this kind under my care in the clinical wards of Guy's Hospital, in a man between fifty and sixty years of age, the disease was acute, the pain in the right side pointed to hepatic disease, the fluid had collected in about three weeks, and he sank within a month after admission; the cachectic pallor and general distress were different from cirrhosis, and there was no history of intemperate habits. In women the disease may be mistaken for ovarian disease, or for those cases where ascites is a complication of the ovarian malady.

The treatment of these cases is unsatisfactory, and it is of little avail to try and promote the absorption of the fluid by diuretics or by purgative medicines. More will be effected by soothing any irritable condition by mild doses of morphia, by the use of tonics, as quinine, or by iodide of potassium. If the fluid is sufficient greatly to distend the abdomen and to press on the stomach, it may be well to draw it off, but there is great fear that exhaustion may rapidly supervene, or that a low form of peritonitis may be induced.

Ovarian dropsy is the last form that we have to notice, and we do so partly because ascites is sometimes associated with it, and because it is often mistaken for peritoneal dropsy. It would be foreign to our purpose to enter into the pathology of ovarian disease, we would only remark that the disease may be a single cyst or it may be multilocular with varying degrees of solid deposit in the walls; sometimes the tumour is dense and fibrous, and non-malignant, at other times it has all the characteristics of cancerous disease; it may be free from adhesions, or the cyst may be firmly fixed to adjoining structures. The ovarian tumour begins from below, and is generally felt in one or other iliac region; it is dull, and if full of fluid, the fluid does not gravitate as in ascites. There is dulness in front, and the sides are resonant, the reverse being the case in ordinary ascites; portions of the solid walls of the cyst may be felt in some cases immediately below the liver or the spleen, but the hardness can be more easily moved than if those viscera were involved, and the tumour is not affected by respiratory movements. It is in cases in which, with the ovarian cyst, we have ascitic fluid, extending to the loins, that diagnosis sometimes becomes difficult. The fluid in the cyst may be serous, or sero-sanguinolent; the albumen contained in the fluid is different from that found in peritoneal effusion, in that after being coagulated by heat, it is redissolved by acetic acid when boiled again. The admirable lectures recently given by Mr. Spencer Wells at the Royal College of Surgeons, and published in the 'British Medical Journal,' refer to the variety of cell structures found in these ovarian fluids; he speaks of "the ovarian granule-cell" described by Dr. Hughes Bennett, and by Dr. Drysdale, in Dr. Atlee's work, as being rather larger than the red blood-corpuscle, and he refers to others, which show the more or less malignant character of the disease.

We have already referred to the close sympathy which exists between the stomach and the ovary, and the severity of the vomiting and other gastric symptoms which sometimes occur at the commencement of ovarian disease. In the treatment of ovarian dropsy it is useless to attempt to secure the absorption of the fluid by diuretics or by the use of iodine or

of mercurials; if there be inflammation or ascites, much may be done to relieve these conditions, but the ovarian disease will not be lessened. Small doses of morphia will sometimes lessen nervous irritability and may retard the progress of the case, but if the disease be slight it is better not to distress the patient by treatment which will do more harm than good. If the cyst become very large paracentesis may be performed, but it is only a palliative measure. The fluid will re-collect, and the only really effectual measure is to remove the cyst. Although a most formidable operation it is one which by the skill of modern surgery is attended with a large amount of success.

In the remarks that we have made upon the several forms of ascites we have adverted to many points connected with *diagnosis*, and it is not necessary again to dwell upon them. So also as to *prognosis;* the ascites is so generally a symptom of some other disease, that the result depends in great measure upon the original malady.

The *treatment* must also be according to the cause of the effusion. Diuretics are of greater service in the ascites from chest disease, than in that from cirrhosis of the liver; but in the latter disease, it is well to try them, for in some cases they are certainly beneficial; the acetate and nitrate of potash are the most effective, the iodide may be used, and may be given with broom juice. The copaiba resin in doses of ten to fifteen grains rubbed down with a little rectified spirit, and given in a mucilaginous mixture, is a valuable diuretic, and is often taken by patients without dislike. The moderate use of mercurials is sometimes beneficial in the early stage of dropsy from cirrhosis, and still more in those instances of obstructed hepatic circulation from disease of the heart and chronic disease of the chest, chronic bronchitis, and emphysema. Purgatives are of value, and sometimes suffice to remove the fluid from the serous cavity; these may be given in the form of saline aperients, as sulphate of magnesia, or, the more irritating medicines jalap and scammony, and sometimes the aperient mineral waters. If there be peritoneal irritation and inflammation these remedies are unsuitable. Blisters, and the application of iodine, may serve a

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double purpose, not only may they relieve severe pain, but they may promote the absorption of the fluid.

It will, however, be frequently found that when the patient is exhausted from chronic disease of the liver, as cirrhosis, that diuretics and purgatives are of no avail, but greater benefit is derived from the use of tonics with gentle aperients, as taraxacum with bark, or quinine with sulphate of magnesia. A time will, however, come when the question of drawing off the fluid must be entertained, and the operation is frequently followed by the greatest amount of relief. Sometimes the fluid only re-collects very slowly; after the pressure on the abdominal viscera has been removed the kidneys will frequently act freely, and that without any diuretic. The operation of paracentesis should, however, be postponed if there be evidence of peritonitis or of inflammation on the surface of the liver, perihepatitis; in these cases there is greater danger of peritonitis. When the operation is decided upon it is well to act gently on the bowels and to ascertain that the bladder is empty, the fluid may then be drawn off by trochar and cannula, the patient being raised up, and a flannel bandage placed round the abdomen to give support as the pressure from the fluid is lessened. After the operation the patient should be perfectly quiet, solid food should be avoided, and, if necessary, an opiate given to ensure repose.

CHAPTER XXI.

ABDOMINAL TUMOURS.

Before proceeding to the consideration of true abdominal tumours, it may be well to notice those which are of a delusive character, and have been called by Dr. Addison and Sir Wm. Gull "phantom tumours." It is a common thing for patients to suppose that there is something seriously wrong because one portion of the abdominal walls projects more prominently than another; sometimes the left hypochondrium is found to be enlarged from a flatulent stomach, or the cæcum or sigmoid flexure from similar gaseous distension, or the abdominal wall yields so as to form a direct protrusion; these conditions are easily recognised, the part is found to be flatulent on percussion, and manipulation fails to detect any solid growth; but in the "phantom tumour," a solid mass is felt, but it is in the parietes, and it is due to muscular contraction; the part is hard and dense, and may be readily mistaken; it is, however, fairly resonant on percussion, and by gentle and continued manipulation the muscle relaxes; if the hand be gently placed on the hard mass, and the attention of the patient diverted by conversation of an absorbing character, at the same time that the fingers are gently moved about the mass, the hardness disappears. This contraction of the muscular walls may be found at any part, sometimes it is on the right side, and the patient seems to have enlargement of the liver; frequently it is one of the transverse muscular bands of the rectus, sometimes it is the quadratus lumborum, or the transversalis muscle of the abdomen.

It is scarcely correct to speak of a loose kidney as a "phantom tumour," it is a movable one, but it does not

entirely disappear by pressure, although it may pass beyond the reach of the hand.

It is important in the study of abdominal tumours to have a definite acquaintance with the exact position of the abdominal viscera. For the convenience of description, the abdomen is divided into several regions marked out by lines from fixed points. A line drawn round the upper part of the abdomen at the most prominent part of the costal cartilages, and a second at the crest of the ilium, divide the surface into three zones, and these again by two perpendicular lines are subdivided each into three other spaces, the lines passing downwards from the cartilage of the eighth rib to the middle of Poupart's ligament. In the upper zones we have the right and left hypochondriac regions, on either side of the epigastric space or scrobiculus cordis; in the central zone, the right and left lumbar regions are on either side of the umbilical, and below, in the third zone, the right and left iliac are situated on either side of the hypogastric region. During health these regions are occupied by their respective viscera, and it is useless to try and ascertain abnormal states, unless there be a thorough knowledge of that which is normal. We would further add, that in every case of abdominal tumour it is important to enquire, 1st, into the general history of the symptoms of the patient, 2nd to ascertain the exact position of the tumour, and the physical signs, and 3rd, to learn whether there is any functional disturbance of the abdominal organs. It is not likely that any viscus is involved in a morbid growth, if it perform its functions in a healthy manner.

It may be well to consider these regions as regards their normal and abnormal contents. The *right hypochondrium* contains especially the liver and gall-bladder, but the gland passes into the epigastric region, and reaches the left hypochondrium; when enlarged it extends into the umbilical and right lumbar regions. The liver is attached to the diaphragm, and to a certain extent moves with it. It reaches upwards as high as the fifth rib, where the dulness commences and is partial, at the sixth rib the dulness is complete; when the patient is recumbent the liver is behind the ribs, unless, as is generally the case in women, it has been pushed down by

compression, but in the erect and sitting postures the liver may be felt an inch below the ribs. Beside the liver and gall-bladder the right hypochondrium contains the angle of the ascending colon, part of the duodenum, the right supra-renal capsule, and the upper part of the right kidney. It must be remembered in reference to enlargement of the liver that the gland may be *pushed* down by *pleuritic effusion*. In large effusions into the right pleura the liver is always displaced.

2nd. The liver may be pushed down by effusion between the upper lobe and the diaphragm, the effusion being either serous or purulent; in these cases the symptoms may closely resemble pleuritic effusion. Many years ago a woman was admitted under my care into Guy's Hospital with severe peritoneal symptoms after a fall from a cart upon the abdomen. The pain was great, and the strength gradually gave way. On examination of the lower part of the right lung before death, dulness on percussion, with bronchial breathing and modified voice sound, was heard, and some who had not known the previous history believed the disease to be above the diaphragm. On the post-mortem table a trochar was introduced between the ribs posteriorly and pus exuded, apparently confirming the idea that empyema existed, but on fuller examination it was found that the pus was situated between the liver and the diaphragm; there had been peritonitis, and the pus was circumscribed by adhesions.

3rd. The liver may be pushed down by the development of tumours, or by a hydatid cyst in the right lobe of the liver. This cyst or tumour may be so situated behind the ribs as to be quite beyond the reach of the hand. A woman in middle life was admitted under my care into Guy's with the liver extending into the umbilical region, the surface was smooth, the gland passed lower into the abdomen, and the strength of the patient at length gave way and she sank. On examination, when the abdomen was opened, the liver seemed to fill the greater part of the abdomen on the right side; the surface was smooth, and it was only when the gland was drawn down from the diaphragm that the true nature of the enlargement was recognised. An enormous hydatid cyst occupied the right lobe and pressed in every direction, but did not reach the free surface of the

liver. In the examination of an enlarged liver the patient should be placed on the back, the knees drawn up, and the head comfortably supported, and the patient's attention should be absorbed by conversation, if possible. Sudden pressure will often detect an enlarged gland, which could not be recognised by gradual pressure; if the fingers be passed upwards from below, the edge may be caught, and they should then be gently passed over the gland to ascertain whether there are any irregularities; the surface is dull on percussion; at the upper part where the liver is overlapped by lung there is partial resonance, and we sometimes find that the lower edge may be covered by the colon, and resonance is thus produced.

4. Enlargement of the gall-bladder is found generally opposite the tenth rib, it is pyriform and when filled with bile will yield somewhat to pressure. Sometimes I have found it filled with a great number of gall-stones, so that it resembled a solid mass; a very different condition was found some years ago in a case under the late Dr. Babington, the specimen of which is in Guy's Museum; the gall-bladder communicated with the intestine and was filled with gas, so that there was resonance on percussion.

5. Enlargement of the liver, if general, arises from congestion, from inflammation, from fatty deposit, from lardaceous disease, from obstruction of the bile-ducts; if *local*, from hydatid tumour, from syphilitic deposit, from cancerous growths, from abscess in the liver, or from suppuration in connection with the bile-ducts.

6. An enlargement of the right kidney can sometimes be felt immediately below the right lobe of the liver; it will be found to extend into the loin.

7. Malignant disease of the right supra-renal capsule may also reach the lower part of the liver. I have found a tumour of the left supra-renal capsule simulating enlargement of the spleen.

8. Malignant disease of the pancreas and first part of the duodenum are recognised by their clinical history; the hardness may be felt closely in contact with the liver.

9. Cancerous disease of the angle of the ascending colon is also felt in this region; in this disease pain comes on

several hours after food, and there is likely to be discharge of blood or of mucus from the bowels.

In the *epigastric* region we find the stomach and its lesser curvature, and the left lobe of the liver; the gall-bladder and the pyloric extremity of the stomach are situated at its union with the right hypochondriac region; posteriorly we have the pancreas, the aorta, the vena cava, the cœliac axis and the commencement of its large branches; at the lower part of this region we have the transverse colon, varying, however, in position according to the distension of the stomach. We would remark that yielding of the parietes, with flatulent distension of the stomach, often gives rise to the idea of tumour.

2. Abscess sometimes forms in the parietes in this part, not only in the muscular parietes, but in the loose cellular tissue about the end of the sternum. In a case of that kind in the clinical ward of Guy's some years ago there was a projection at the scrobiculus cordis, which was afterwards found to be an abscess which extended to the under surface of the diaphragm.

3. Abnormal pulsation is often felt at the epigastric region; this may arise from an aneurismal tumour in connection with the aorta or with the cœliac axis; in aneurism of the aorta close to the diaphragm it is, however, very difficult to feel the aneurismal tumour, unless it be of large size. In the majority of cases a pulsating tumour at the scrobiculus cordis is found to arise from disease of the left lobe of the liver pressing upon the abdominal aorta; in other cases the pulsating mass may consist of a vascular and pulsating medullary growth in the stomach.

4. Tumours of different kinds in the left lobe of the liver are found in this region.

5. Disease at the lesser curvature of the stomach may not only be felt in this region, but may have pulsation communicated to it from the aorta.

6. Chronic ulcer with thickened walls may constitute the tumour felt at the epigastric region; but

7. A hard mass felt in the epigastrium is more frequently found to be malignant disease.

On a level with the umbilical line and situated posteriorly we have the *pancreas*, but so deeply is the gland placed that

it is difficult to recognise enlargement by digital examination.

Malignant disease of the pancreas where there is much enlargement may be sometimes recognised, but in such cases we principally depend upon the clinical history and the general symptoms, in forming a correct diagnosis. In a case of inflammation of the cellular tissue about the pancreas which I saw in consultation some years ago, there was a hard swelling felt at the upper part of this region; there was severe pain, with febrile excitement, and I supposed the case was one of gastric disease; post-mortem examination shewed that the stomach was healthy, but that the swelling was an abscess connected with the pancreas.

In chronic disease of the omentum, often of a malignant character, the serous membrane is puckered and drawn upwards, so that it forms a firm band passing across the abdomen, at the lower part of the epigastric or at the upper part of the umbilical region. It may be associated with malignant disease of the peritoneum, as we have mentioned.

In the *left hypochondrium* we have the cardiac extremity of the stomach, the spleen, the left supra-renal capsule, and a portion of the kidney. The left angle of the colon may also extend to this space. The most common tumour found in this region is the spleen, which as it increases in size not only passes upward and raises the level of dulness on that side, but it passes downwards and is also directed forwards. This forward direction may be due to the band of peritoneum immediately beneath the gland, but there is no doubt of the fact that the spleen, as it increases, and it attains sometimes an enormous size, passes not only into the lumbar but also into the umbilical region. The fissure at the anterior edge assists us in the recognition of the spleen, but this is not a certain sign, for the fissure between two enormously enlarged lymphatic glands may communicate to the touch the same impression. The spleen enlarges after a full meal; it may increase from temporary portal congestion; it is felt below its normal position in enteric and other fevers, but these conditions would not be designated as tumours. It is in the enlargement after ague, in leucocythemia, in lardaceous disease, that we find the spleen to attain to very large proportions, and in these cases

the increase is general. In abscess, in hydatids, and in malignant disease, the enlargement is partial.

2. Another tumour in the left hypochondrium arises from enlargement of the left kidney or from hydatid at that part, but in this case the growth extends more into the loin, and there is more likelihood of distension of the lower ribs on that side.

3. Malignant disease of the supra-renal capsule on the left side sometimes presses forward to the anterior part, and is felt immediately below the spleen. I have known it mistaken for an enlargement of the spleen itself, for the growth was large, and it appeared to pass from beneath the ribs.

4. Aneurismal disease at the commencement of the descending aorta sometimes pushes forward the spleen, and the diagnosis is difficult. In the case to which I refer, the lower ribs were prominent, but pulsation was very indistinct. The patient died from rupture of the aneurismal sac behind the peritoneum.

5. The solid walls of an ovarian cyst sometimes reach into the left hypochondrium, form a tumour, and simulate disease of the spleen. The tapping of the cyst would be one means of diagnosis of a case of this kind, for the solid portion of the cyst would then pass towards the pelvis.

6. It is scarcely necessary to mention the manner in which the spleen may be pushed down by effusions both into the pleura and into the pericardium.

7. Local suppuration may occur in this region and produce a swelling resembling a tumour.

The next zone of the abdomen is divided into the central, the *umbilical*, and into the *right* and *left lumbar* spaces. In the *lumbar* regions the kidneys and the ascending and descending colon may be causes of tumours. The kidneys extend to the loin, and as they pass forward can be felt anteriorly to the inner side of the colon. The condition of the urine, in the discharge of blood, of pus, or of cancerous cells, affords to us an important guide in diagnosis. A tumour from distended pelvis of the kidney is most uncertain as to its size. Sometimes a calculus may block up the ureter, and the pelvis of the kidney gradually attains large dimensions, till at length the ureter is distended beyond the size of

the obstructing calculus, and a sudden discharge of several pints of urine at once diminishes the size of the tumour. The same may be the case in suppuration of the kidney. In a patient under my care in Guy's, a large tumour extended from the right lumbar into the iliac region, and would suddenly subside on the discharge of several pints of urine. This condition came on when the patient was about sixteen; he was a shoemaker, and although he had several severe attacks, he continued his work till he was nearly sixty-four years of age, when he died in Guy's Hospital from a large cancerous growth which affected the kidney on the same side. After death it was found that a calculus was the cause of the obstruction of the ureter.

2. The glands in connection with the kidney, the lumbar glands, sometimes form a large tumour in this region; the urine is then unaffected, the growth is more irregular, and there are generally other indications of malignant disease. In hydatid disease of the kidney the tumour is rounded and elastic.

3. Accumulations in the ascending or descending colon form masses in these regions, but the clinical history, the absence of severe symptoms, and the relief by purgative medicine, characterise these cases.

4. In intussusception a doughy, elongated mass may be felt in the ascending or even in the descending colon. The severe and spasmodic pain, the vomiting which is often present, the obstruction of the bowels, and the discharge of blood and of mucus, indicate the character of the affection.

5. In diseases of the spine leading to suppuration there is a bulging in the loin, and it may be a projection anteriorly, which can be felt on digital examination.

6. Abscess in the loin and in the quadratus lumborum muscle may lead to enlargement, and may extend into the bowel. Thus, we have known an abscess pass into the cæcum, and have seen suppuration primarily connected with the bowel reach the loin.

7. Ovarian tumours may pass from the iliac fossa into the loin, but more frequently they extend into the umbilical region.

In the *umbilical* region we have the transverse colon and the omentum attached to it, the small intestine, with the

mesentery and mesenteric glands, and posteriorly the aorta and vena cava. On either side are the right and left renal vessels. The position of the transverse colon varies greatly; sometimes its curve is greatly increased, and it may reach nearly to the hypogastric region. The curve may be increased as the consequence of distension, or by the dragging of an omental hernia. Tumour in the walls of the intestine also changes its position.

2. Intussusception of the small intestine is often found in the umbilical region.

3. Tumours in the omentum and in the mesentery. In the former, the mass is movable, and there is no functional disturbance of the intestine.

4. In strumous disease of the intestine the bowels are often matted together by inflammatory adhesion, and the mass resembles a tumour. Sometimes there is suppuration or fæcal abscess, or it may be the discharge takes place from the umbilicus.

5. Ovarian tumours are often found to extend into the umbilical region.

6. Aneurismal disease of the aorta and the branches of the abdominal aorta may be felt in this space, but frequently enlarged glands, pressing upon the aorta or upon the renal arteries, simulate true aneurismal disease. Sometimes we can remove the gland from the pulsating vessel beneath, by manipulation or by changing the position of the patient, but this is not invariably the case.

In studying enlargement in the loins it is important to remember that both the ascending and descending colon closely sympathise with diseased structures before or behind them, the intestine becomes inactive, the passage of the contents impeded, and the fulness may resemble primary tumour of the bowel.

The remaining regions are the *hypogastric* and the right and left iliac.

In the *hypogastric* region whenever a tumour is felt we must always render ourselves sure that the bladder is not distended. Urine may pass constantly, in fact, there may be a constant dribbling from over-distension of the bladder, and thus the disease be unsuspected. In this way I have

known the bladder reach above the umbilicus and contain many pints of urine.

2. Enlargements of the uterus, whether from pregnancy or tumour, extend into the hypogastric region.

3. Fibroid tumours of the uterus and of the ovaries, and cystiform disease of the ovaries, extend into right or left iliac region, and also into the central space.

4. Hydatid disease of the cellular tissue in connection with the bladder forms a rounded tumour in this space, in touch very closely resembling a distended bladder.

5. Aneurismal disease of the iliac vessels must also be borne in mind as a cause of tumour in the lateral portions of the hypogastric region.

In the *right iliac* region we have the cæcum and its appendix, and diseases of these structures constitute many of the morbid enlargements at this part. The mischief may, however, be external to the cæcum, peri-typhlitis; in these diseases we have local pain and tenderness, febrile excitement, generally a disordered condition of the bowels, constipation, sickness, and it may be peritonitis. In tumour from enlarged glands, there is less interference with the action of the bowels. In pelvic abscess the bowel is free, the mischief is found to extend from above, and it passes onwards in the direction of the psoas and iliacus muscles. A tumour from renal disease may reach the iliac fossa, but it can be traced upwards, and the urine will be found to be diseased in most cases, if carefully examined, except in instances in which one kidney does the entire work and the other is completely shut off.

An aneurismal tumour from disease of the iliac vessels is recognised by its pulsatile and expansive character, and by the condition of the circulation of the limb.

Ovarian tumours reach to the right or left loin; sometimes they become adherent to the bowel, and I have known an ovarian cyst become adherent to the cæcum, and having discharged its contents into the bowel, the cyst has become filled with fæcal matter. Acute disease of the right ovary sometimes closely resembles typhlitis, but the pain is lower, it extends into the pelvis; the tenderness, the constipation, the febrile excitement, may be equally marked in the acute disease of the ovary, as in cæcal disease.

In the left iliac region many morbid growths correspond to those on the right side, but here the sigmoid flexure takes the place of the cæcum. The curvature of this part of the bowel varies greatly; sometimes the sigmoid flexure extends to the right side, and there may be adhesion to the cæcum. In other cases of distension it bends upon itself, it falls into the pelvis, and the acute bending at a right angle leads to obstruction. The termination of the sigmoid flexure in the rectum at the brim of the pelvis is the part often affected by disease, and a tumour can in most cases be made out by careful manipulation. Sometimes there is a rounded growth in connection with the mucous membrane of the bowel, at other times all the coats are thickened and contracted, as if a piece of string had been tied round the bowel; all these states lead to gradually increasing obstruction, which may become complete.

Inflammatory adhesion sometimes takes place between the sigmoid flexure and the bladder; an external tumour is felt on deep but gentle manipulation. The diagnosis and the prognosis of these cases are often very obscure, and in several we have known direct communication take place with the bladder, and fæcal discharge with the urine supervene. Colotomy is of the greatest service in these cases.

We have thus briefly sketched the site and the character of abdominal tumours; each case has a clinical history of its own, and it is by the careful study of that history, in connection with the position of the tumour and the disturbances of the functional activity that are associated with it, that we can make out the true nature of the disease. Many most interesting cases of abdominal tumour might have been added to this chapter; the difficulties in the diagnosis might thereby have been more fully indicated, and the various modes of relief discussed; but, we have refrained on account of the length to which this work has already extended, and we have only given the general facts which these instances of disease have brought out.

We have sought to show the leading characteristics of diseased conditions as manifested in the various portions of the alimentary canal; and to do this have recorded the cases themselves, as facts upon which each one may form

his own opinion, rather than depend entirely upon the deductions we have drawn from them. Such general conclusions in most chapters have preceded the cases upon which they are founded; and we leave them before our readers with the hope that they will serve further to elucidate the general symptoms, pathology, and treatment of diseases of the alimentary canal.

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ILLUSTRATIVE CASES.

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I.—Diffused Inflammation of the Throat.

II.—Diffused Inflammation of the Throat. Ulceration of the Pharynx.

III.—Carcinoma of the Throat. Tubercular Pneumonia.

IV.—Diseased Cartilages of the Trachea. Ulceration of the Œsophagus.

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ERRATUM.

Page 227, 2nd line, *for* ulcer, *read* cancer.

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