pain and support the failing powers as far as possible. Opium in large doses becomes absolutely necessary; and by its judicious use, as already shown, much ease may be given for a time. Bleeding is to be checked by the application of powdered mastic leaf, or of a saturated solution of perchloride of iron, or of ice. Fluid nourishment—milk, cream, raw eggs, and essence of beef must be freely allowed, after the patient finds it impossible to masticate and swallow solid food.

As a curative measure, removal of the diseased parts or of the entire tongue is generally useless. But excision can, justifiably be resorted to, in some exceptional cases, for palliating the symptoms; as where suffocation is threatened from the swelling, when the pain is very intense, when the flow of saliva is so profuse as to keep the patient wet and miserable, or when there are repeated attacks of hemorrhage. That great relief often follows the operation cannot be doubted; and patients (even medical men, fully aware of the inevitable termination of the disease) will sometimes beg for a second operation, in the hope of gaining an extension of case. Whether the diseased structure should be removed by the knife, écrasur, or ligature must depend upon the part of the tongue involved and the extent of the morbid action. Unless the whole organ has to be removed the knife is probably to be preferred to the écrasur. The ligature has now been discarded by almost common consent. Several cases have occurred in which the entire tongue has been removed, and the operation recovered from; the patients having subsequently been able to masticate solid food, swallow fluids, and enter freely into conversation without causing any suspicion of the loss they had incurred.

To diminish the sensibility of the tongue, and to check the secretion of saliva, Mr. Moore, of the Middlesex Hospital, has recently (1861) repeated the operation of dividing the gustatory branch of the fifth nerve, as first suggested by Mr. Hilton. By section of this nerve between the disease and the brain, relief is immediately afforded; the pains and tenderness, the salivation, and the reflected irritation of the fifth nerve all disappearing. In some five cases, the relief was permanent so far as the gustatory nerve was concerned: though when the disease invaded the area of the glossopharyngeal nerve, new pain arose. To effect division, Mr. Moore cuts through all the soft tissues off the inside of the ramus of the jaw by an incision immediately behind the last molar tooth, extending three quarters of an inch in a direction from the angle of the jaw. The structures divided by such an incision are the mucous membrane and a part of the mylo-hyoid muscle, with the gustatory nerve descending forward between them, about half an inch from the tooth and nearly at a right angle with the direction of the incision. It is advisable to operate with a curved knife, as the alveolar ridge might shield the nerve from the edge of a straight one; while it is also necessary to cut outwards quite to
the boze. Section of the nerve may, however, be accomplished from the inside of the mouth. In one instance Mr. Moore combined ligature of the corresponding lingual artery with this operation; so as to diminish the supply of blood to the affected part.

4. CRACKED TONGUE, TUMOURS, &c.

Cracked tongue is sometimes a troublesome and inveterate affection, rendering eating and speaking very painful. Where there is no specific condition of the system, or no derangement of the alimentary organs to account for it, I have found a lotion of borax and glycerine (F. 268) act very advantageously; as does also one of bismuth, glycerine, and rose water. Iodide of potassium with steel or sarsaparilla (F. 31, 32) can likewise be administered, if local remedies fail to effect a cure. Chlorate of potash (F. 61) frequently succeeds. The efts or fissures may be a couple of lines in depth, and so numerous that they form an irregular series of grooves.

The surface of the tongue occasionally presents patches of baldness—that is to say, we find one or more smooth, oval, glossy patches. There is no ulceration or fissure, and the remainder of the surface of the organ looks healthy. This appearance is combined in many cases with psoriasis palmare; and is probably very often indicative of a syphilitic taint, when it will require a prolonged course of the perchloride or periodide of mercury (F. 27) for its cure.

Warts and condylomata are not uncommon diseases of the mucous membrane of the tongue; the former merely requiring excision, while the latter demand the ordinary anti-syphilitic medicines.

Papillary patches are sometimes met with; or, in other words, we find large spots of the mucous and submucous tissue thickened, tough, brawny, coarsely papillary, and perhaps fissured. This condition of the tongue has been described by Mr. Hulke, Sir James Paget, and Mr. Fairlie Clarke under the name of ichthyosis lingue; it has also been called psoriasis of the tongue, and consists of an hypertrophy of the papillary layer of the mucous membrane and epithelium. The patches produce an unpleasant feeling, with thickness of speech; they must not be mistaken for cancer, but they may run on into epithelium. They are in many cases attributable to smoking, and they may generally be cured by the administration of the iodide of potassium, with alkaline spray as a local application. When much induration is present, conium, in large doses, appears to be an efficacious remedy in producing softening.

Hypertrophy of the tongue is a rare affection. It is usually congenital. The enlargement generally becomes so great that the mouth is found too small to contain the organ; and a large portion is therefore constantly protruded. In a few instances the
FOLLICULAR STOMATITIS.

prolapsed part has reached below the chin. Removal will have to be accomplished by the knife, ligature, or écraseur. As the operation is not without danger, attempts have been fruitlessly made to effect a cure by continued pressure.

When the frenum linguae extends to the very tip of the tongue, the individual is said to be langue-tied. This condition is by no means so common in infants as the public imagine. Where it really interferes with the movements of the organ, the frenum should be divided at the point of the scissors being directed downwards, to avoid wounding the ranine arteries.

Encysted or fatty tumours form in the tongue or beneath it, and may require extirpation. Firm tumours, made up of fibrous and areolar tissue, have been found in a few rare instances growing from the tongue. When pediculated they had better be snipped off. There is no fear of haemorrhage, unless an artery can be felt in the stalk; in which case the écraseur should be used. Abscesses are very seldom met with in the tissue of the tongue. When they occur, a free incision must be made to evacuate the pus.

Necros of the tongue is most times congenital. Even though half the organ be involved surgical interference is seldom necessary. Some years since I saw a youth the whole of whose tongue seemed to be covered with small tortuous veins, which have contracted with time. In the event of repeated attacks of haemorrhage extirpation by ligature may possibly be needed.

And lastly, Ranula [Rana - a frog; because the voice is said to be croaking, like a frog's] is a semi-transparent fluctuating swelling, perhaps as large as a walnut, situated under the tongue. It consists of a dilatation of the duct (Wharton's) of the submaxillary gland. A seton should be passed through the cyst, or a portion of the anterior wall can be excised.

II. INFLAMMATION OF THE MOUTH.

Stomatitis [Στόμα - a mouth; terminal -itis], or inflammation of the mouth, is a common disease in young children. It may occur in three forms—i.e., according as the principal seat of the morbid action is situated in the mucous follicles of the mouth, the substance of the gum, or in the tissues of the cheek.

1. FOLLICULAR STOMATITIS.

Inflammation of the mucous follicles of the mouth—the aphthous stomatitis of some authors—is the mildest form of stomatitis. It may be idiopathic, or it may occur as a sequela of some of the eruptive fevers—as measles, &c. The attention is first directed to the child's mouth by observing that difficulty
seems to be experienced in sucking, that there is a more free secretion of saliva than usual, and that the submaxillary glands are tumid and tender. The patient is also restless and feverish, has but little appetite, seems to experience pain in deglutition, and frequently suffers from diarrhoea with very offensive evacuations. On examination, numerous small vesicles are found about the inside of the mouth, on the tongue, and on the fauces; which vesicles by bursting form little ulcerations covered with a dirty white or yellowish slough. These ulcerations sometimes remain separate, though more commonly they coalesce, forming a sore of considerable extent. In either case, as they heal, fresh vesicles appear, which again degenerate; and so the morbid action may continue for some weeks. When follicular stomatitis occurs as a concomitant or sequela of measles, it may become associated with diphtheria and produces an alarming malady.

For the greater number of cases very simple treatment, such as that presently to be recommended for thrush, suffices to effect a cure.

2. ULCERATIVE STOMATITIS, OR NOMA.

This disease attacks the gums; the ulceration sometimes progressing to such an extent as to destroy these parts and denude the teeth.

Noma [νόμα - to corrode], or water-canker, produces heat of the mouth, an increased flow of saliva, offensive breath, swelling of the upper lip, and enlargement with tenderness of the submaxillary glands. On looking into the mouth we shall see that the gums are swollen, red or violet-coloured, readily bleeding to the touch, and covered with a layer of pulpy greyish matter. If the disease be allowed to creep on unchecked, the gums will get destroyed by the ulceration; the teeth becoming exposed and loosened until they fall out. The morbid action also spreads to the mucous lining of the cheeks, which become covered with irregular sloughing ulcerations; while the tongue assumes a swollen and sodden appearance. Ulcerative stomatitis is not uncommon among the poor. It occurs for the most part in weakly children (between one and eight years of age) who have been badly nourished, and exposed to cold and damp.

The treatment of this disease is not difficult; inasmuch as we possess in the chloride of potash a remedy which may almost be deemed a specific. Five grains of this salt ought to be given every four or six hours to an infant one year old, in a little sugar and water. Pure milk and good broths will also be required. When the ulcerations have healed, bark or quinine should be administered.

3. GANGRENOUS STOMATITIS.

Gangrenous stomatitis, or cancrum oris, or sloughing phage-dæna of the mouth, is a much more formidable affection than
either of the foregoing. It is met with in children of debilitated habits, between the ages of two years and five or six.

The symptoms are generally these:—The child is out of health, and evidently weak. There is loss of appetite, wasting, and restlessness. The child dribbles at the mouth; the gums are swollen and covered with specks of ulceration; while there quickly forms, on one cheek, a hard indolent swelling. On examining the cavity of the mouth, a whitish or ash-coloured eschar is seen in the centre of the cheek; which gradually increases until the slough has spread over the whole of the interior of the cheek, lips, and gums. The saliva is copious, and horribly fetid. Supposing the destructive action to continue, either perforation will occur or the entire cheek may become gangrenous. The alveolar processes are very likely to get involved, and ultimately to exfoliate. Of course with all this there must be great constitutional disturbance. Now and then a low form of inflammation attacks the peritoneum and mesentric glands. Pulmonary complications are very apt to arise. The exhaustion rapidly becomes extreme, and the disease frequently ends fatally. The severe morbid action has often been unjustly attributed by the child’s parents and ignorant nurses to the action of mercury; but it may occur when not a particle of this medicine has been given.

The treatment had better consist in the application of the nitrate of silver—in some instances, of the strong nitric acid—to the slough; in frequently syringing the mouth with solutions of chloride of zinc (F. 79), or of chlorinated soda (F. 254), or of the permanganate of potash (F. 78); and in the free administration of strong beef tea, pure milk, raw eggs or cod liver oil, wine or brandy, and the chlorate of potash in decoction of bark.

The effect of mercury upon the gums and teeth varies according to the age and constitution of the recipient. Young children are certainly less susceptible to the injurious influence of this metal than adults; but cases are occasionally met with where great mischief has been produced, even in infants, by a mercurial course. Grey powder is unfortunately believed by the public to be the panacea for all infantile disorders, and hence it is administered on many occasions with great impropriety. Teething powders are largely sold, even amongst the intelligent portion of society; much illness resulting from their use in young children who would cut their teeth safely and almost painlessly, if parents could but be persuaded to cease their mischievous interference with a simple natural process. I have seen such severe inflammation of the gums (gingivitis) thus set up by the administration of some mercurial preparation, that the child could not venture to take the nipple into its mouth; while it has been rapidly wasting for want of food. Sometimes the gums and buccal mucous membrane become the seat of a widespread ulceration, with all the symptoms of cancer of the mouth. Where such violent action does not ensue, great
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mischief may yet be done to the teeth about to be cut; so that as they are shed they become dark-coloured, brittle, and very liable to rapid decay. The mischief, however, does not cease with the temporary teeth, the permanent ones being also affected, though perhaps in a less degree. It has seemed to me doubtful whether the iodide of potassium is of any use in these cases. Not unfrequently, when the child is first seen by a competent practitioner, there is so much exhaustion that all his endeavours have to be directed to maintaining life; and therefore recourse is had to small doses of brandy, to the restorative soup (F. 2), and to milk or cream, leaving the elimination of the mercurial poison to time.

4. APHTHE OF THE MOUTH.

Aphthe [from "Aπχ = to fasten upon] consist of small, round, white, elevated specks or patches, scattered over the tongue and lining membrane of the mouth. Every now and then these patches extend down the oesophagus into the stomach. They form a special disorder in infancy—the thrush: in adult age they are apt to arise in the course of other affections, when they are often the harbingers of death. In at least some forms of this disease, microscopical parasitic plants (the Leptothrix buccalis and the Odium albicans) become developed in large quantity in and between the epithelial cells of the mucous membrane; the filaments and spores of these fungi rendering the epithelium friable, loose, and swollen. They are readily transferred from the infant’s mouth to the mother’s nipple. When the aphthous spots are abundant they will frequently coalesce, producing a dirty diptherial-looking membrane. The chief general symptoms are restlessness, depression, difficulty in swallowing, cough, diarrhoea, and vomiting with feverishness and wasting.

The treatment of the thrush consists in the use of mild astringents and tonics, and the application of borax and glycerine (F. 250), or carbolic acid and glycerine, to the aphthous parts. A gargle of infusion of catechu, with or without a little borax, often answers capitally. The diet must be regulated, such nourishing food as is compatible with the age being freely allowed. Sir William Jenner states that in cases attended with the formation of parasitic plants, the application of a solution of sulphite of soda (sixty grains to one fluid ounce of water), suffices to remove the disease from the mucous membrane of the mouth in twenty-four hours. The secretions of the mouth being acid, the salt becomes decomposed, and sulphurous acid is set free, which at once destroys the parasite.
5. STOMATORRHAGIA.

Discharges of blood from the mouth and throat [stomatorrhagia, from ὅμα = a mouth + ῥήγαμ = to break out] seldom give rise to any trouble, except when they occur during the last stages of scurvy or purpura, or after the excessive abuse of mercury. In some few instances, the small veins about the inside of the cheek and pharynx have become varicose; and when their walls have ruptured, severe or fatal bleeding has resulted. Ulcers about the tongue and fauces rarely bleed much; but once or twice glossitis terminating in gangrene has produced haemorrhage which has only ceased with death.

Dr. Condie of Philadelphia has recorded a case where the blood flowed from the mouth in a stream, and on the gums being wiped with a sponge, it "was seen to start up at every pore from the whole surface." Now this would by many be regarded as an example of haemorrhage by exhalation; just as the occurrence of cutaneous bleeding, where the blood is said to appear like a dew upon the skin, has been explained. Remembering the observations of Cohnheim, it is necessary to criticise these views very cautiously. Still I cannot but think, that in such instances as have just been mentioned there is probably no haemorrhage, strictly speaking. The discharge is simply an exudation of serum, which is coloured by the red matters of the dissolved or ruptured blood corpuscles.

It is worthy of note that prisoners, malingerers, hysterical females, and others, often feign haemoptysis by pricking their gums, sucking out the blood, and mingling it with saliva and phlegm. This imposition will be readily detected on examining the mouth, as well as by noting the absence of all signs of either thoracic or abdominal disease.

The treatment of stomorrhagia has to be conducted on the general principles already laid down. Medicines need not be administered unless the use of a cold astringent wash, or of tannic acid lozenges, or of ice, fails to stop the bleeding.

III. INFLAMMATION OF THE TONSILS.

Cynanche tonsillaris, or tonsillitis, or quinsy, or common inflammatory sore throat, manifests itself by fever and pain and considerable swelling of the tonsils.

The disease is often ushered in by chilliness or a rigor, which is followed by smart fever. On examination there will be seen considerable redness and swelling of the fauces and tonsils; these parts being at first shiny-looking, and then covered with mucus. The tongue is thickly coated; while there is an annoying discharge of viscid saliva. Complaint is made of the return of liquids through
the nostrils on attempting to swallow, and of the difficulty of deglutition; together with (in severe cases) pain shooting from the throat to the ear, along the course of the Eustachian tube. Dyspnoea is but rarely present. The nights are sleepless. Under ordinary circumstances, the inflammation runs an even course, and terminates by resolution in a few days; merely leaving the tonsils temporarily swollen, or permanently enlarged. When violent and prolonged, however, the morbid action frequently leads to suppuration in one or both of the glands. Rigors generally announce the suppuration; the pain proving very severe until the abscess bursts, or is opened artificially.

The principal exciting cause of quinsy is cold. The liability to it is increased, during the youthful period of life, by repetitions of the attacks. It is doubtful whether it be contagious or not; but most practitioners assert that it is not.

The treatment required is usually very simple. The patient had better remain in bed, and breathe warm air not too dry. Milk and good broths are to be allowed. A few doses of some cooling saline purgative, and the application of hot fomentations or linseed poultices to the throat, will almost be all that is necessary. The steam of poppy water directed to the fauces gives great relief; and I have frequently found benefit from opiate gargles (F. 253). The inhalation of spray medicated with belladonna, or conium, or opium (F. 262), can also be recommended. Patients vary in opinion as to the ease afforded by sucking ice, in place of the hot applications. Blistering the outside of the throat, or the application of stimulating embrocations—as the compound camphor liniment, has seldom done any good in my hands; and I much prefer using freely the extract of belladonna, and applying a large poultice over it. Guaiacum in large doses has been recommended as a specific in quinsy, but I have never found it of much service; guaiacum lozenges, however, appear frequently to arrest incipient attacks. Ammonia and bark (F. 371), or quinine and some mineral acid (F. 379), have appeared to me of far greater value.

When the inflammation has gone on to suppuration, it is generally thought necessary to open the abscess. My own opinion, however, is that in nine cases out of ten it will be much better to let the abscess burst. If interference be determined on, care must be taken to puncture the tonsil with a sharp-pointed curved bistoury, the cutting edge of which is to be directed towards the mesial line of the body; for it has on several occasions happened that an awkward and unskilful operator has, by attention to this rule, wounded the internal carotid artery. Should such an accident happen, the official strong solution of the perchloride of iron must be quickly and freely applied to the wound; this excellent styptic having arrested the haemorrhage in a case where, had it failed, a ligature would have been placed on the trunk of the common carotid artery.
Permanent enlargement and induration of the tonsils may result from acute inflammation; or this state can come on slowly in strumous orrickety children, as well as in weakly youths and young women. The enlargement is often so great, that the fauces appear to be almost blocked up; while it produces thickness of speech, more or less deafness, an uncomfortable sense of obstruction, and some difficulty in swallowing. Occasionally the swollen glands seem to prevent full and deep inspirations. Portions of the hypertrophied organs had then better be excised, if the application of iodine or nitrate of silver or tannic acid or friction externally with red iodide of mercury ointment fail to effect a cure. Mr. W. J. Smith has attempted to revive the method of canterization by potassa fusa; but the proceeding must be much more dilatory and uncertain than excision with the knife and vulsellum forceps, or the guillotine invented for the purpose, while it possesses no countervailing advantages.* As regards constitutional remedies, steel and quinine, or iodide of iron, can be tricil. Cod liver oil is often very useful, particularly if taken perseveringly at the sea-side for many weeks.

Cancer of the tonsil is very seldom seen. The only case which has been brought under my own observation occurred in the practice of Dr. Burnett, of Biggleswade. The patient was a poor woman sixty-eight years of age, whose pharynx was much obstructed by a firm medullary cancer of the left tonsil. The diseased mass was completely excised by Dr. Burnett, but I believe with only very temporary relief.

IV. DISEASES OF THE PHARYNX AND OESOPHAGUS.

The coats of neither the pharynx nor the oesophagus are as subject to disease, as the position and office of the musculo-membranous tube which they form might lead us to expect. Occasionally, however, this canal, becomes the seat of cancer, or of

* Richard Wiseman, Sergeant-Chirurgeon to King Charles the Second, recommended the treatment of enlarged tonsils “by Extirpation: and that either by Ablowation, at once cutting them off: or by actual or potential Cautery. . . . . The first Chirurgeon in my memory that attempted the Extirpating them was the late deceased Mr. Ed. Mol. an excellent operator. He attempted it upon a Person of Honour by actual Cautery through a Curculina well contriv'd for that purpose. I afterwards saw him burn several. He passed the Cautery through the body of them, and by repeating of it twice or thrice he burnt a hole through them, and accordingly crimped them up. . . . The way by potential Cautery is, by working with a Caustick-stone and other Escaroticks fixt in such an instrument as may serve to cut into them, without offending the neighbouring sound parts. To which purpose I make my way into the body of the gland, consuming it within; and at last the shell (or exterior parts) falls in pieces, and is so eradicated.”—Several Chirurgical Treatises &c. Second Edition, pp. 329, 330. London, 1692.
inflammation leading to stricture. A narrowing of the passage may also result from simple spasmotic contraction, but then it is only temporary; or from the pressure of aneurismal or intrathoracic tumours; as well as from destruction of the mucous membrane and the effusion of a fibrinous material into the submucous arcolar tissue, the consequence of swallowing the strong mineral acids or caustic alkalies. I have seen only one instance in which inflammation and ulceration occurred, followed by stricture, without any appreciable cause.

Disease of the pharynx and oesophagus is attended by one prominent symptom—dysphagia \( \Delta v \sigma = \text{difficulty} + \phi \epsilon \gamma \omega = \text{to eat} \). Difficulty in swallowing will likewise arise from tonsillitis, diphtheria, and croup; from that very uncommon affection polypus of the pharynx; from erysipelas or other inflammation of the arcolar tissue of the neck or from retro-pharyngeal abscess; from paralysis of the muscles of deglutition; from malignant, syphilitic, and tubercular ulcerations about the epiglottis; from spasm of the pharynx and oesophagus, as in hydrophobia; from inflammation, ulceration, or oedema of the larynx; and rarely from disease of the laryngeal cartilages.

1. DISEASES OF THE PHARYNX, &c.

Every now and then, especially among the inmates of hospitals and workhouses, the walls of the pharynx become affected with a diffused erysipelas inflammation. There is generally low fever, with rapidly increasing prostration. A muttering dreamy wandering of the mind is common; the occurrence of violent delirium being exceptional. Ammonia and bark (F. 371), wine or brandy, and good fluid nourishment must be allowed very freely. A dose of opium sometimes does good. The morbid action will perhaps run on to sloughing, or the patient may die from exhaustion without great care.

Follicular disease of the pharynx in which the follicular glands are greatly hypertrophied projecting on the mucous membrane, and giving it an irregular appearance, is one cause of chronic relaxed sore throat. It is not attended with much pain, but there is disagreeable muco-purulent secretion from the enlarged follicles which accumulates during sleep, and causes hawking and spitting in the morning on rising; it often also gives rise to a degree of hoarseness. The treatment required is the application of iodine or astringents in the form of spray together with the administration of tonics.

Follicular ulceration in the pharynx affecting the mucous membrane on the posterior pillars of the fauces may give rise to an apparently disproportionate amount of pain in the act of deglutition. The solid nitrate of silver, or a strong solution on a bent camel hair pencil, should be applied to the minute ulcerations.
Extensive syphilitic ulceration of the velum and fauces has in a few instances, after healing, produced narrowing and contraction of the upper part of the throat to such a degree as to impede deglutition and to obstruct respiration. It might perhaps happen in some particular case that incising the edges of the contracted opening would afford sufficient relief; but most frequently real and permanent benefit will only result from tracheotomy. In one case the tracheal tube was worn with great comfort for eight years. Deglutition had to be slowly and cautiously performed, great care being required to masticate solids very finely.

Partial or complete adhesion of the velum to the posterior wall of the pharynx, with destruction of the uvula, are more common than the foregoing; but they give rise to little or no difficulty in breathing or swallowing, though they cause discomfort; and when complete so as to cut off the communication between the pharynx and posterior nares, the sense of taste will be considerably impaired, all appreciation of flavours as of different meats, wines, &c., being lost, since these are really odours which reach the olfactory region by the posterior nares.

Elongation of the uvula may be the result of chronic inflammation, or of a generally relaxed state of the fauces. By irritating the pharynx and epiglottis the hypertrophied uvula produces an inclination to vomit at times, with a troublesome tickling cough, especially liable to come on when the patient lies down at night. If astringent gargles and ferruginous tonics fail to reduce the size of this organ, about two-thirds of it should be snipped off.

In some cases of stammering I have found a congenital malformation of the uvula present; but this state has probably exerted no influence on the impediment in the speech. As a rule it will be unwise to interfere surgically with such a structure.

2. RETRO-PHARYNGEAL ABSCESS.

This is a disease which only comes under observation once in a way. It is more frequently met with in children than adults. To Dr. Fleming is due the credit of first clearly describing this form of obscure suppuration, and of showing that it sometimes occurs during infantile life.*

Pathology.—The abscess is the result of acute or chronic inflammation of the loose connective tissue, situated between the posterior surface of the pharynx and the muscles on the anterior part of the spine. It may result from direct injury, or it will be the consequence of some general or specific constitutional derangement. Chronic abscesses in this situation are often connected with the strumous diathesis, and are of the same nature as the suppurations which take place in the cervical glands. Perhaps

also, the mischief is more or less closely connected with a slight syphilitic taint. The inflammatory action often commences in a lymphatic gland at the back of the pharynx. In weakly subjects there is a fear that the inflammation will extend and produce œdema of the glottis.

**Symptoms.**—The characteristic symptoms are preceded by general disturbance and fever, varying in intensity according to the constitution of the child. In almost all cases there is derangement of the cerebral and respiratory and circulating systems. At the commencement we find some amount of nausea, and soreness of the throat. Indications of difficulty in swallowing and breathing then manifest themselves; the latter soon becoming so severe, particularly when the child is placed in the recumbent posture, that suffocation may even appear imminent. There is also a fixed and retracted state of the head, with rigidity of the muscles at the back of the neck; a more or less locked state of the jaws; and a remarkable articulation—in children old enough to speak, the words being drawled out with pain and difficulty. The painful deglutition increases, until it is found that solids are refused and liquids regurgitated through the nose; frequent spasmodic attempts are made to swallow, as if there were something in the mouth; and there will possibly be convulsions, or stupor sometimes amounting to complete coma. Death has occurred from the abscess pressing the pharynx forwards on the epiglottis and rima glottidis, and causing suffocation. On examining the fauces, a firm and projecting round tumour is felt just beyond the base of the tongue, occupying either the median line, or inclined to one or other side. The abscess sometimes occurs as a sequela of fever; but usually it is idiopathie.

**Diagnosis.**—Without caution the symptoms are likely to be attributed to some cerebral affection, or to disease of the cervical vertebrae, or to inflammation of one of the respiratory organs. Attention to the phenomena just described, noting the cessation or diminution of the difficult breathing when the patient is raised from a recumbent to a sitting posture, with a careful examination of the throat, will remove all doubt as to the true nature of the case.

**Treatment.**—Surgical interference gives immediate relief, and soon effects a cure. The abscess must be opened with a bistoury, shielded to near its point by lint or plaster. The head ought to be steadied during the operation by an assistant; who is to press it well forwards directly the puncture is made sufficiently free, so as to facilitate the escape by the mouth of the pus which gushes out. A spontaneous opening but rarely occurs. And could we trust to its taking place there would be a fear that the abscess bursting suddenly, air and pus might be inspired into the trachea producing suffocation.
3. DISEASES OF THE OESOPHAGUS.

Simple ulceration of the oesophagus is a peculiar disease, the pathology of which is obscure. The chief symptoms are difficulty in swallowing, sometimes so great that deglutition is impossible and at last starvation occurs; pain at the epigastrium, or at the top of the sternum, or between the shoulders; with a frequent sense of nausea, emaciation and debility, more or less hunger, and considerable mental distress. Not unfrequently the ulceration extends into the trachea; while it has also been known to progress until it has made a communication between the oesophagus and one of the bronchi—especially the left, or between the oesophagus and either the pleura, pericardium, or aorta.

The treatment which is chiefly useful in these cases of ulceration consists of local applications of a solution of crystals of nitrate of silver (twenty grains to the ounce), or painting the part night and morning with equal parts of turpentine and glycerine; or the employment of spray inhalations, medicated with tannic acid or borax or iodine (F. 262). Ice should be freely and frequently sucked. Amongst the constitutional remedies most deserving of trial are, bark and quinine and steel, iodide of potassium, cod liver oil, a very nourishing diet, and sea air. I have little doubt that life might have been saved in some of the recorded cases where death was due to slow starvation, by the formation of a gastric fistula in the manner presently to be described.

Cancer of the oesophagus takes place at any one part of the tube, or through its whole length and circumference. The disease will be of the scirrhous, or medullary, or epithelial variety; the latter probably being more common than either of the other forms. When it occurs as a primary disorder, distant organs are but rarely implicated in the cancerous affection, possibly because of the rapidity with which it destroys life. Most cases are fatal considerably within a year from the commencement of the symptoms. Sometimes the disease has spread from the larynx to the oesophagus. Thus, a patient with cancer of the larynx will perhaps have to submit to tracheotomy to avoid asphyxia from obstruction of the glottis. Living for several months with a tube in the windpipe, the malignant ulceration may extend to the pharynx or oesophagus. Death will possibly be due to haemorrhage, or to apnoea caused by food passing through the false opening into the bronchi.

The symptoms of oesophageal cancer at the onset are obscure. Complaint is at first made, somewhat suddenly, of sore throat and difficulty in swallowing. In one case under my observation the patient was much annoyed by a curious cutting pain in the ears,
which symptom preceded the dysphagia.* The disease soon gives rise to decided obstruction, so that after a time not a particle of nourishment can be naturally passed into the stomach; while just above the constriction there is often formed a pouch where food accumulates until it is rejected. There is also considerable pain in the canal, or in the back, or in the shoulders; nausea and retching may be most troublesome; and irritating cough and hiccup are not uncommon. The patient wastes rapidly and to a wonderful extent; while the cancerous cachexia becomes plainly established. Death has occurred from haemorrhage, one of the intercostal arteries having been laid open by the extension of the disease; or fatal loss of blood has taken place from the spreading of the ulceration through the coats of enlarged veins. In other instances the patient has sunk from sheer starvation—inanition; or from the ulceration involving important parts; or from destructive inflammation of the lung, owing to the implication of one of the pneumogastric nerves. We can only hope to give temporary relief by the use of opium and nutrient enemata; or by very cautiously passing a large gum-elastic catheter (No. 14 is a convenient size) through the contracted oesophagus, keeping the instrument there as long as it can be tolerated, and injecting food, &c. through it.

*Simple stricture of the oesophagus is generally an after-consequence of the attempt to swallow some corrosive poison. Dr. Basham has recorded† a very interesting example, which well shows the course of events in these cases:—A young woman, twenty-two years of age, accidentally swallowed a very small quantity of soap-licks (a caustic solution of impure carbonate of soda). When admitted into the Westminster Hospital, five days subsequently, she was suffering principally from vomiting: this was relieved by calomel and opium, saline laxatives and demulcents, milk and farinaceous diet, and by a blister to the

† In another instance (seen during the summer of 1864, in consultation with Mr. Jenkins, of Philpot-lane, Fenchurch-street), the only symptoms through the progress of the disease were constant sickness and increasing emaciation. The former was so urgent and incessant, that a teaspoonful of iced water, merely taken into the mouth, at once brought on retching. And it was remarkable that this sickness commenced suddenly one afternoon at dinner, when the gentleman was apparently in sound health; while it did not cease for a single day until death took place, some four months afterwards. There was no cancerous cachexia; neither dyspnoea nor cough; and no pain anywhere, not even tenderness on making firm pressure over the neck or under the diaphragm. For many weeks the patient merely sucked a piece of linen dipped in water to check his thirst; all medicine and nourishment being administered by the rectum. At the autopsy, a slight mass of malignant disease was found occupying part of the oesophagus, but in no degree obstructing it, just above the termination of this tube in the cardiac orifice of the stomach. The irritation of the pneumogastric nerves would appear to have been the cause of the great irritability of the stomach.
throat and upper part of the sternum. An oesophagus tube passed easily. Ten days after her admission she was discharged apparently well. At the end of eleven months she was again admitted, suffering from urgent dysphagia. She appeared half-starved, and stated that for many weeks no solid food had been taken; and that lately the difficulty of swallowing had become so great that she could hardly get down liquid nourishment. A small gum elastic catheter, No. 8, was introduced with a little difficulty; and beef tea was injected into the stomach, to the great relief of the patient. This plan of treatment was continued, a larger tube being gradually used; while in a little more than twenty days so much improvement had taken place that she was able to swallow freely, and was therefore made an outpatient. She neglected to attend, however, and consequently eighteen days afterwards was re-admitted with her former symptoms aggravated. The same treatment was again successfully resorted to, and she was kept under longer observation by employing her as a hospital nurse. She was afterwards lost sight of for a time; but in about eight months—or twenty-six from the accident—she again, for the fourth time, applied, and was admitted. Only the smallest bougies could now be passed; nutritious enemata were employed; but in a few days she died, literally of starvation.

In the management of these cases we should rely on the repeated use of bougies, to prevent the stricture from closing. It will not do to trust to the chance of the progress of the contraction being spontaneously arrested while there is yet room for pul-taceous nourishment to pass through the canal. The consequences of neglect are too serious to justify recourse to expectant treatment. The stricture must be gradually dilated; and then prevented from re-contracting if possible, by the employment of a large-sized bougie every ten or fourteen days for many months. One lady under my care derived relief from constantly wearing a gum-elastic catheter of a large size; through which she injected her food and medicines. As she had lost her upper incisor teeth, the instrument was allowed to project just in front, of the lips, where it caused little or no inconvenience. While passing any instrument great caution ought to be exercised; for in one instance it is said that an eminent surgeon forced a tube through the stricture into the thoracic cavity, and then injected half a pint of beef tea into the pleura. Moreover, if it be necessary to employ force the superior laryngeal branch of the pneumogastric may be injured, severe pneumonia being set up from reflex irritation. In one or two instances at least, death has resulted from the severity of the inflammation thus originated.

With regard to almost hopeless examples, two or three suggestions can be made. Thus, it may very properly be a question whether the constriction might not be overcome by the judicious use
of potassa fusâ, as employed by Mr. Wade for curing stricture of the urethra. This proceeding not appearing feasible, it would have to be determined whether the oesophagus itself could not be opened below the contraction by a cautious dissection (oesophagotomy or pharyngotomy) at the side of the neck. Such an operation has been resorted to successfully for the removal of foreign bodies—coins, fragments of bone, plates of false teeth, &c. The only reported case with which I am acquainted where the gullet has been opened for the relief of stricture so as to allow of the introduction of food into the stomach was in a man with obstruction from tuberculous deposit. The operation was performed by Dr. John Watson, surgeon to the New York Hospital, on the 12th February, 1844, and the patient lived in comparative comfort until the 14th May.*

But there are cases where the stricture is situated too low down to be reached by incisions at the side of the neck. Often the contraction is at that part of the oesophagus where the tube passes through the diaphragm. It will then become a question whether an incision ought to be made into the stomach, large enough to enable us to introduce food? A reply in the affirmative has been returned more than once. In one instance of malignant stricture of the oesophagus gastrotomy has been actually performed, the patient dying forty-five hours afterwards. I think there has also been a second unfavourable instance. Considering the immediate risk of opening the stomach, and the certainty of only at the best being able to postpone for a short time a painful death, I should feel averse to sanctioning such an operation in a case of cancer. It would, however, be a different matter in an instance of incurable simple stricture; for the well-known case of Alexis St. Martin (not to mention some five or six others where the stomach has been opened to remove knives which have been swallowed accidentally or purposely) seems to show that such treatment might be successful. I am inclined to recommend, however, that instead of making a communication between the stomach and external surface with the knife, a strong caustic—e.g., potassa fusâ—should be employed; through the agency of which we could gradually excite inflammation, adhesion, and ulceration. The feasibility of such a proceeding seems to be proved by a case recorded by Dr. Murchison.† In this instance, a woman produced a large opening through the abdominal parietes and gastric walls by means of long-continued pressure with a penny-piece. The ulcerative process was completed, so that food escaped from the stomach, on the 2nd March, 1854; yet the patient was in tolerable health, with the fistula large enough to admit three fingers, in June, 1858.

The oesophagus may, like the urethra and bronchial tubes,

suffer from *spasmodic stricture.* Young hysterical women are often affected with it; the principal symptoms consisting of difficulty in swallowing, an occasional sense of fulness and choking, languor, anæmia, &c. Spasmodic cannot be confounded with organic or permanent stricture, because the dysphagia is only temporary, a bougie passes with very little or no difficulty, and the symptoms are aggravated when the patient's attention is directed to them. Moreover, it may generally be readily relieved by antispasmodics (F. 86, 89); or by some tonic like the valerianate of quinine (F. 93); or by the phosphate of zinc (F. 414). The daily use of the cold shower bath is serviceable. Any general or uterine disorder which may be present, ought also to be cured.

A curious nervous condition termed *esophagism* is closely allied to the foregoing. It arises thus:—A woman puts some five or six pins into her mouth, has her attention drawn off for a moment, and then erroneously believes that she has swallowed one. Or a nervous individual, perhaps while eating fish, is suddenly spoken to. He is startled, makes a gulp, and fancies he has swallowed a small bone which is sticking in the gullet. As the irritation increases, he seeks advice. But the medical man may be misled by trusting to the patient's symptoms; or feeling, with the fingers in the throat, the upper edge of the corn of the os hyoides, he is apt to mistake it for a foreign body. A careful investigation with the finger or the laryngoscopic mirror, or the cautious passage of a full-sized bougie, should prevent any error in diagnosis. The nervous sensation may, however, produce dysphagia, and will perhaps continue for weeks. A full dose of opium at bedtime has sufficed to stop it. Quinine, valerianate of zinc, and galvanism are the remedies to employ in obstinate cases. The way in which this error was overcome in former days is shown in the *Essays* of old Montaigne, first published in 1603.* He says,—"A woman fancies she had swallowed a pin in a piece of bread, complained of an intolerable pain in her throat, where she thought it felt it stick; but an ingenious fellow that was brought to her, seeing no outward tumour nor alteration, supposing it only to be a fancy taken at some crust of bread that had prickèd her as it went down, caused her to vomit, and unseen threw a crooked pin into the basin, which the woman no sooner saw, but believing she had cast it up, she presently found herself eased of her pain.*"

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**DISEASES OF THE STOMACH.**

**V. DYSEPSIA.**

Dyspepsia \[Δυς = difficulty + πίστως = to digest\], or Indigestion \[In = neg. + digerâ = to concoct or digest\], is one of the most


London, 1853.
common diseases we have to treat. Anything which interferes with the healthy action of the stomach and intestines may give rise to it.

Pathology.—There is a gastric and an intestinal digestion. The first occupies an average from two to three hours; and it essentially consists of an exposure of the food to the solvent powers of the gastric juice. This fluid is composed of water holding in solution hydrochloric and perhaps lactic acid, most of the salts which are found in the liquor sauginis, and an albuminous matter absolutely necessary to the solvent powers of the juice, named "pepsine," or ferment substance. Moreover, it is always diluted with saliva: sometimes there is an admixture of bile. The proper admixture of the gastric juice with the food is secured by peristaltic movements of the stomach which travel from the cardiac to the pyloric extremity. The object of the gastric juice is to render soluble the albumen, fibrin, casein, &c. (the albuminoid matters), submitted to the stomach; and this it effects by a so-called catalytic action, converting them into a new organic and non-coagulable substance, which has been called "peptone." Of the peptones part are probably at once absorbed, and mingle with the blood; while the remainder, with the fatty substances of the food, pass onwards into the duodenum, &c., to be acted upon by the biliary, pancreatic, and intestinal secretions. The conversion of starch into sugar is commenced in the mouth, by the power of the secretion of the several salivary glands; but whether it is completed in the stomach, or whether its conversion there is delayed to be again renewed in the duodenum, is uncertain. Whatever then disturbs the normal relation between the food and the digestive fluid will affect the digestion and cause dyspepsia, as for instance, food in undue quantity or bad in quality; deficiency in the amount of gastric juice secreted, or departures from its normal character, whether these arise from alterations in the blood, or from local or general want of vigour, or from derangements caused by nervous influence. Or again, weak or irregular action of the muscular coat of the stomach may prevent the proper admixture of the food with the digestive fluid. When digestion is retarded, from whatever cause, the food undergoes decomposition, actuous fermentation occurs, with the formation of acids and evolution of gas, which are the source of most of the discomfort attending dyspepsia. Sometimes in dyspepsia the walls of the stomach are found to be thin, and there is degeneration of the stomach tubes, but usually there is no appreciable structural change.

According to M. Lucien Corvisart the pancreas, together with Brunner’s glands, is to be regarded as a supplementary organ to the stomach: so that those matters which escape gastric digestion become quickly acted upon in the duodenum by the pancreatic juice. Its chief use, however, is to emulsify the fatty constituents
of the food and prepare them for absorption by the lacteals. The quantity of the pancreatic juice secreted in the twenty-four hours has been differently estimated at seven or eight ounces, and at ten to fifteen ounces avoidusps; but though it is so much less than the gastric juice (which according to Dr. Draper amounts to seventy ounces, and according to other experimenters from six to ten or even fifteen pints), yet its fermentive matter is said to be ten times more effective. It of course follows from this, that we have a duodenal dyspepsia caused by vitiation of the pancreatic juice, just as we may have gastric dyspepsia.

Causes.—The most frequent causes of dyspepsia are the use of food in too large a quantity, and of an improper nature, or badly cooked; or the consumption of it at irregular times; or the imperfect mastication of it from carelessness, or hurry, or owing to the pain of bad teeth, &c. Dr. Beaumont clearly proved, in his well-known experiments on Alexis St. Martin, that spirituous liquors were most injurious to the stomach; whence persons in the habit of using them often suffer from indigestion. The drinking of too much fluid of any kind at a meal must be mischievous by over-diluting the gastric juice. Another cause of indigestion is an error frequently committed, of not allowing a sufficient interval between the meals to permit of the stomach doing its work and resting: the rule that five or six hours should intervene between each meal, cannot be long broken with impunity. Want of bodily exercise, excessive labour, eating while in a state of exhaustion from exertion of any kind, or work or hurried walking immediately after meals, inordinate intellectual exertion, mental anxiety, general debility, the constant use of narcotic drugs, immoderate smoking, and snuff-taking are fruitful sources of this affection; while of course disease of the mucous membrane or of the muscular coat of the stomach, and derangement of the liver or pancreas, will also give rise to it. So likewise morbid states of the brain, lung, liver, or uterus may, by reflex action, produce functional gastric disorder, attended with most troublesome vomiting. Again, where the blood is rendered impure from any morbid poison in the system, as that of fever, cholera, pyæmia, &c., we find the functions of the stomach destroyed; while this organ will retain nothing in advanced Bright's disease, when the blood is contaminated with retained urca owing to the imperfect action of the kidneys.

The nervous irritability of many literary and scientific men has its origin in dyspepsia. Sedentary pursuits with over-mental labour cause disorders which speak by the stomach in the first instance. The truth is, unfortunately, that one man may injure his constitution by excessive devotion to good work, almost as readily as another may do so by dissipation. It would be well if Bacon's suggestion could be acted up to,—"that we make appli-
cation of our knowledge to give ourselves repose and contentment, and not distaste or repining.” But in these days, hard labour and scant repose are the conditions under which those who aspire to teach their fellow men must be content to live.

**Symptoms.**—The symptoms of that functional derangement of the stomach which is commonly known as indigestion, vary very much in nature and severity; one individual suffering severely when his dinner “disagrees” with him, while another has merely slight depression. But in the chronic cases for which advice is sought, there will usually be, in a greater or less degree, anorexia or loss of appetite; a sensation of pain, weight, and fulness at the epigastrium; flatulence, or the undue formation and collection of gas in the intestinal canal; costiveness alternating with diarrhoea, acidity, furled tongue, and foulness of the breath, nausea and vomiting; palpitation of the heart; a weak pulse, and a sense of oppression about the chest; pain around the loins, and aching of the limbs; with dull headache, vertigo, neuralgia, an inability for exertion, and hypochondriasis. Occasionally the patient complains of *gastralgia* [Γαστρίγη = the stomach + ἄλγος = pain] or heartburn; of *gastrodynia* [Γαστρίγη + δύναμις = anguish] or cramp in the stomach; or of *pyrosis* [Πυρώμ = to set on fire] or water-brash, which consists in the frequent eructation of a thin and watery and acid or tasteless fluid. Pyrosis occurs more frequently in women than men; it is not uncommon in advanced life; and it often exists in connexion with some derangement of the nervous or uterine system, or with organic disease of the stomach or pancreas or liver.

The consequences of slow digestion from a scanty secretion of the gastric juice, are—feelings of fulness and distension in the left hypochondrium, as well as at the pit of the stomach, after taking food; flatulence, sour fetid eructations, constipation, a coated tongue, and loss of appetite; palpitation of the heart, irregularity of the pulse, headache, and occasionally dimness of vision; with distressing mental depression. When the stomach becomes greatly distended by gas, oppression of the breathing is often produced; owing to the descent of the diaphragm being impeded. The low spirits induced by gastric irritation may vary from slight dejection and ill-humour to the most extreme melancholy; the latter sometimes inducing even a disposition to suicide. The patient misconceives every act of friendship, he is irritable with those who desire to serve him, while he exaggerates slight ailments into heavy grievances.*

* A humorous sketch of these dyspeptic miseries and their consequences, which may claim attention by the way, was drawn by Sydney Smith in his customary shrewd manner. He says—“Happiness is not impossible without health, but it is of very difficult attainment. I do not mean by health merely an absence of dangerous complaints, but that the body should be in perfect tune—full of vigour and alacrity. The longer I live the more I am
Sometimes pain and vomiting are more than usually prominent symptoms, when the dyspepsia will be found to have a nervous origin, and will be generally associated with other evidences of undue nervous excitability. Not unfrequently in these cases the pain is relieved by eating, and there may be extraordinary perversion of the appetite, or food usually easily digested may cause more suffering than substances far more irritating and indigestible.

In some cases of nervous gastric disturbance the appetite is exaggerated, while it is hardly appeased by taking food. Digestion may take place easily and naturally, or it may be accompanied with acid eructations and pyrosis. The chief feature of bilious dyspepsia (so termed by Dr. Guipon) is, however, that the desire for food returns almost directly after a good meal. The patients suffer from constant hunger; and unless they eat immediately the desire for food comes on, they get faint and low spirited, and especially complain of a painful sense of sinking about the precordia. The remedy which I have found most rapidly curative is cod-liver oil, pepsine being also given if there be any difficulty in digesting it; but Dr. Guipon states that he has succeeded best with minced raw meat. Charcoal is also useful in checking the acid eructations.

Diagnosis.—The difficulty of diagnosing correctly the various morbid affections of the stomach is by no means slight; since not only are we for the most part ignorant of any direct means for ascertaining the physical conditions of this viscus during life, but the prominent symptoms of many of its different diseases are almost identically the same. Thus the condition of the tongue as an aid to diagnosis and prognosis is of importance to the extent of showing the way in which the functions of the stomach and intestines, the pancreas and liver, are being performed, rather than as giving any real information as to the absence or presence convinced that the apothecary is of more importance than Senee; and that half the unhappiness in the world proceeds from little stoppages, from a duct choked up, from food pressing in the wrong place, from a vexed duodenum, or an agitated pylorus.

"The deception, as practised upon human creatures, is curious and entertaining. My friend sups late: he eats some strong soup, then a lobster, then some tart, and he dilutes these esculent varieties with wine. The next day I call upon him. He is going to sell his house in London and to retire into the country. He is alarmed for his eldest daughter's health. His expenses are hourly increasing, and nothing but a timely retreat can save him from ruin. All this is the lobster: and when over-excited nature has had time to manage this testaceous incumbrance, the daughter recovers, the finances are in good order, and every rural idea effectually excluded from the mind.

"In the same manner old friendships are destroyed by toasted cheese, and hard salted meat has led to suicide. Unpleasant feelings of the body produce corresponding sensations in the mind, and a great scene of wretchedness is sketched out by a morsel of indigestible and misguided food. Of such infinite consequence to happiness is it to study the body."—A Memoir of the Reverend Sydney Smith. By Lady Holland. Vol. i. p. 125. London, 1855.
of organic disease. When this organ is habitually clean and moist, neither too florid nor yet too pale, of natural size, and not so flaccid as to be indented by the teeth,—under these circumstances it may safely be inferred that there is no dyspepsia. When, on the contrary, there is irritation or inflammation of the mouth or fauces, or of any portion of the gastro-intestinal tract; when the tonsils are inflamed, when the cavities of carious teeth are allowed to retain decaying food, or when digestion is imperfectly performed,—then the tongue puts on an unhealthy appearance. Speaking generally, the dorsum of this organ gets furred; a condition produced by an increased formation of epithelium, the scales of which (perhaps in a state of fatty degeneration) become mixed with buccal-mucus and concretæ and remnants of food. Thus matted together, a more or less dense fur is constituted, which varies in colour according to the substances taken into the mouth, and which may peel off or be scraped away in dense flakes. As a rule, the appearances of the unhealthy tongue alter according to the amount of this fur, the state of the papillæ, the colour, and the moisture. Thus, the whole surface may be thickly furred; or through this fur there are seen protruding elongated and florid papillæ; or there will be a thick fur at the base, with excessive redness of the tip and sides; or with more or less fur, there are cracks and perhaps little ulcerations; or the whole organ is found rather swollen, pale, flabby, and indented at the edges by the teeth. During fevers and inflammations generally, in cerebral and pulmonary disorders, and in fact throughout the progress of most diseases, the tongue is furred or otherwise disordered; but whether the unnatural appearances are directly due to the disease itself, or arise indirectly in consequence of the influence of this on the gastro-intestinal mucous membrane is a dubious point. The probability of the latter view being correct is strengthened by our knowledge that the epithelium of the stomach tubes in scarlet fever is affected, just as this structure is rapidly produced and exfoliated on the tongue. So again, the thin metallic-looking fur which gives the tongue a silvery hue when arsenic has been taken for some time, only forms when this metal is producing dyspepsia.

In the second place, we find pain and soreness at the epigastrium not only common to most of the organic affections of the stomach—as to cancer, simple ulcer, and inflammation of the mucous membrane and deeper structures; but also to many of the merely functional derangements, being generally present in the sympathetic vomiting of phthisis and in that of several diseases of distant organs. The diagnosis may, however, be assisted by remembering that when the pain depends upon organic disease, it is generally most severe soon after taking a meal, sometimes even of very small quantities of food, but especially if heavy and indigestible; while when it is due to functional disorder only it usually comes on later when fermenta-
tion with the production of acid and gases have taken place, while
sometimes it is relieved by food. This last fact has been explained
on the supposition that the uneasiness is mainly owing to an un-
healthy condition of the gastric secretions, which of course act the
less violently the more they are diluted. In ulcer of the stomach,
pain is usually constantly present, being considerably aggravated
by food; in cancer, it is of a dull aching character, is most acute
after meals, and often continues severe while the stomach is full;
while the pain of simple indigestion (the remorse of a guilty
stomach, as it has been facetiously called) only requires absintheme
for its complete alleviation. Tenderness on pressure at the epi-
gastrium can usually be elicited in ulcer, cancer, and inflammatory
sections of the stomach, while it is generally absent in simple
dyspepsia. A caution is not altogether uncalled for to prevent
any aching in the recti muscles of the abdominal wall from being
mistaken for gastric pain.

Another important symptom, namely vomiting, will be produced
by a greater number of circumstances than those which give rise to
pain. For example, sickness can be caused by the ingestion of too
much food, or of food of a character unsuitable for the patient, or
by the simple accumulation of food in the stomach; by organic
disease of any portion of the alimentary canal, particularly of
the stomach or duodenum or cæcum; by mechanical obstruction
of any part of the intestinal tract; by irritation in distant organs,
as the brain, uterus, kidneys, &c.; and by morbid states of the
blood. When the sickness is due to organic disease, it generally
coexists with pain; and it may be diminished by eating very light
food, by taking but little at a time, by counter-irritation to the
epigastrium, and often by bismuth and ice and sedatives. In the
vomiting from mechanical obstruction of the alimentary canal, we
learn much by noting the time of its occurrence, the nature of the
vomited matters, as well as the extent and urgency of the general
symptoms. Thus in stricture of the pylorus, the vomiting only
takes place when the stomach is full and distended; so that the
matters brought up are large in quantity, while they frequently
have a yeasty appearance and consistence. When the constric-
tion is in the small or large intestines, the contents of the bowel are re-
turned into the stomach (by a process hereafter to be described)
and then rejected. In cerebral vomiting it is rare to find pain or
tenderness about the epigastrium, or nausea, and it occurs in-
dependently of the ingestion of food; while the tongue is clean,
the bowels are confined, there is severe headache, and other ner-
vous phenomena are manifested. With the sickness from hepatic
derangement, or in that caused by an unhealthy state of the
blood, there is usually a constant and very depressing feeling of
nausea, a thickly furred tongue, with headache but no other pain:
flatulence is also often complained of, and there is commonly dis-
ordered action of the bowels.
This leads me to speak of a fourth general symptom of the functional and organic diseases of the stomach, which is often very annoying, and not always easily relieved—viz., flatulence, or the undue collection of gas in the intestinal canal. It may arise from one or more of two or three causes, that is to say, from air swallowed, from gas generated by decomposition of the contents of the stomach or bowels, or possibly from gas secreted by the mucous membrane of the intestinal canal. In the first instance, the air is thrown up by eructation, and is nearly odourless and tasteless; in the second, the gases are passed upwards or downwards, are very fetid, and often accompanied by nausea, griping sensations, borborygmi, tenesmus, &c.; while in the third case, which is rare except in hysteria (if it ever really occurs, which is doubtful), the gas is generally expelled per anum, and has the odour of healthy faces.

The subject of haemorrhage in connexion with disease of the stomach will be treated of later. Pyrosis or water-brush, heart-burn, acidity, distaste for all kinds of food, oppression about the epigastrium, voracious or depraved appetite, sick-headache, &c., are all symptoms of different varieties of dyspepsia, dependent upon various causes, and requiring special treatment.

Treatment.—Abernethy used to say that no person could be persuaded to pay due attention to his digestive organs until death, or the dread of death, was staring him in the face. This no doubt is true of some men, whose love of good cheer seems to increase with the weakness of their stomachs; and who consequently may be said to suffer from a perpetual indigestion. Nevertheless, when advice is at length sought, the invalid is importunate for speedy relief. It is therefore a happy circumstance, that of all the organs of the body the stomach is that on which we can exert the most powerful action, both indirectly and directly. Daily observation has taught us all how thoroughly digestion is improved by those means which invigorate the system generally; as by rest and early hours, relaxation from severe studies or from the harassing cares and anxieties of business, one day’s holiday in every seven, change of air, sea bathing, cold or tepid sponging, horse exercise, the disuse of tobacco and of alcoholic stimulants where these have been too freely indulged in, and so on.

The regulation of the diet alone will often effect a cure; while in no case need we expect to give any relief unless we can persuade the dyspeptic to pay attention to the quantity and nature of his food. Supposing that the physician has to deal with a severe case, it is fortunate that he can give the stomach a complete rest for twelve or twenty-four hours; or even for a longer time by resorting to nutrient emetica. This fast being completed merely the plainest food should be allowed, and only small quantities ought to be taken at a meal: asses’ milk, cow’s milk and lime water, gruel, sago, arrowroot, mutton or chicken broth, and beef tea or
Liebig’s extract of meat, will all be useful. As we find these articles can be assimilated without causing any pain or uneasiness, we may increase the diet; and white fish (especially whiting, sole, or turbot), poultry, venison, pheasant, rabbit, or mutton can be ordered. Stale, or unfermented, or aerated* bread may be eaten; but vegetables (with the exception of cauliflower, asparagus, spinach, and vegetable marrow), raw fruit (save grapes, strawberries and oranges), cheese, every kind of beer, port wine, and undiluted spirits should be strictly forbidden. Pastry and confectionery are seldom admissible: “things sweet to taste, prove in digestion sour.” If any stimulant be needed, a little dry sherry or pale brandy and water will prove the least injurious, and in some instances may even be beneficial. Simple aerated water—water charged with carbonic acid gas—is often very grateful to an irritable stomach; or soda water (that which really contains a few grains of soda) can be recommended. Coffee (not chicory) taken upon an empty stomach occasionally acts as a valuable stimulant; but swallowed soon after a meal it merely serves to hinder digestion, and to make a simple dinner disagree. Then the dyspeptic should be careful to masticate his food thoroughly, so that the digestive fluids may quickly liquefy and transform it. And lastly, he ought to try and encourage an indolent sense of contentment for some little time after eating, so as not to divert from the stomach the nervous force required for the due performance of its functions; since it must in the end happen that “unquiet meals make ill digestions.” For this reason it is better that busy men dine towards the close of day, when the hurry and turmoil of active life are relaxed.

After recovery from the urgent symptoms attention will still be needed to prevent any relapse. While supervising the diet scale, however, it must be remembered that too much simplicity is bad. For not only does man absolutely require a mixed food, but that which is eaten with relish is better digested than that taken with indifference or disgust. As typical of many cases met with in practice, we may imagine the following:—A gentleman between thirty and fifty-five years of age, engaged for six or eight hours daily in his office or warehouse, with an irritable, revengeful stomach and no great amount of vital power, not only wishes to be well, but what is rather more unusual is willing to take the necessary steps to secure health. To enable him to accomplish his purpose, he may be recommended to adopt* for several months, some such diet-table as this:—

* This bread, made by the process of Dr. Dauglish, is clean and pure, and produced entirely from wheaten flour of the best qualities. It is mixed by machinery, and is untouched by the hand. Being formed without ferment or leaven (carbonic acid gas is substituted for yeast), it relieves flatulence instead of promoting it; and as it is more easily digested and more nourishing than common household bread, so it is more economical.
7.0 A.M.—A tumblerful of equal parts of milk and soda water, or of milk and lime water.

7.30 A.M.—To rise from bed. Use a tepid or cold sponge bath: rub the skin thoroughly with a coarse towel. Dress leisurely.

8.30 A.M.—Breakfast. A large cup of weak tea with half milk, or milk and water. Sole or whiting; or the lean of an underdone mutton chop; or a new-laid egg lightly boiled. Stale bread and a little fresh butter. Watercresses now and then, if they do not cause flatulence.

1.0 P.M.—Luncheon. Oysters (conditionally that they agree); or an underdone mutton chop, or a slice out of a roast leg of mutton, when meat has not been taken for breakfast. A biscuit, or stale bread. One glass of sherry (Manzanilla or Amontillado). Or, if there be little or no appetite, a raw egg beaten up in sherry and water, and taken with a small biscuit, will be useful.

6.0 P.M.—Dinner. Cod-fish, sole, whiting, smelts, turbot, or brill. Mutton, venison, chicken, grouse, partridge, hare, pheasant, tripe boiled in milk, sweetbread, boiled leg of lamb, or roast beef. Stale bread. Cauliflower, asparagus, vegetable marrow, French beans, floury potato, or sea-kale. Half a wineglassful of cognac in a bottle of soda water. Two glasses of good dry sherry or of claret after dinner. A few grapes, an orange, a baked apple, or perhaps strawberries may be taken, if desired. A dose of peptone, where needed. Where there is constipation, an excellent pill for daily use can be made with four grains of pig's peptone and half a grain or rather more of the extract of Barbados aloe.

9.0 P.M.—A small glass of cold brandy and water, with a biscuit; or a cup of weak tea with half milk, and a slice of bread and butter; or a tea-cupful of milk-arrowroot.

11.0 P.M.—Bed. To sleep on a mattress, without too much covering. A wet compress (F. 136) over the epigastrium is of assistance. The room is to be properly ventilated. A fire will be very beneficial in cold weather. It is presumed that a good night's rest has been earned by a fair amount of exercise in the open air.

The foregoing table may of course have to be modified according to the season, though generally it will be found sufficiently suggestive. The attempt to give variety, however, is not to be overlooked. There is only a partial truth in the caution of Socrates, "Beware of such food as persuades a man, though he be not hungry, to eat; and those liquors that will prevail with a man to drink them, when he is not thirsty."

Under the head of medicines in the treatment of dyspepsia,

Some cynic indeed has said, in opposition to this text, that one of the great privileges of the human species over other animals is the being able to eat without feeling hungry, and to drink without being thirsty.
several can be referred to as having serviceable properties. Perhaps the first which ought to be mentioned is pepsine, the digestive principle of the gastric juice; generally valuable when there is an imperfect performance of the functions of the stomach, and especially where this is indicated by pain or other disturbance following the use of animal food. It should be given in doses proportioned to the necessity of the case, with the two chief meals of the day. In some instances an advantage seems to be gained by the simultaneous use of a small quantity of the dilute hydrochloric acid. Where the pepsine alone fails to relieve the annoyance of indigestion about the one-seventh of a grain of the hydrochlorate of morphia should be combined with each dose; or when great atony prevails, the one-twenty-fourth of a grain of strychnia, or five minims of the tincture of nux vomica, may be employed in the same way (F. 420). There are also other agents which increase the gastric secretions, such as the nitro-hydrochloric acid, rhubarb, ipecacuanha, and ginger; the first being often especially useful, when given in small doses well diluted (F. 378). If we wish to restrain undue secretion, as manifested by pyrosis, we resort to moderate doses of the aromatic sulphuric acid, bismuth, nitrate of silver, conium, belladonna, the compound kino powder or hydrocyanic acid; if to relieve pain and vomiting we can use ice, morphia, and carbonic acid—by means of effervescing draughts; while if there be an excessive formation of acid we order alkalies. Supposing that an acute attack of gastrodynia is caused by the stomach being loaded with unhealthy acid secretions, we must endeavour to give relief by producing vomiting. For this purpose the free administration of warm water will usually suffice; or if it fail, a teaspoonful of mustard in a tumblerful of water will make the stomach eject its contents. Afterwards one or two doses of a mixture containing soda, morphia, and hydrocyanic acid (F. 70) can be advantageously ordered. Alkalies are not to be persistently given, however, because there is a greater secretion of gastric acid than is proper; since they will only tend to keep up the mischief by stimulating the mucous membrane of the stomach to still greater secretion, so that there will remain a surplus of free acid over the amount neutralized. When there is a feeble digestion with no great gastric irritability, one or other of the vegetable tonics will often prove invaluable, and recourse may be had either to gentian, calumba, quassia, or bark. Salicin (F. 388) is especially worth trying in many instances, often agreeing well where quinine cannot be tolerated. If aperients are needed only those of a mild nature ought to be prescribed; such as grey powder and the compound rhubarb pill (F. 171), taraxacum and nitric acid and senna (F. 147), ipecacuanha and rhubarb (F. 165), magnesia (F. 169), or simple enemata (F. 188), &c. Finally, to make the cure complete, and to prevent a relapse as far as drugs will do so, mild preparations of steel (F. 401, 403, 408) are to be ordered;
while it may be noted that frequently I have found benefit from combining pepsine with the reduced iron (F. 394). Where there is any suspicion that the digestion is still torpid from want of tone, few remedies will prove of greater service than quinine and ipecacuanha (F. 334).

When nervous symptoms are prominent and there is no evidence of gastric irritation, arsenic or phosphorus may be most useful. Sulphate or oxide of zinc (gr. ij) is sometimes of service when the dyspepsia is traceable to anxiety or exhaustion, or to indulgence in alcohol.

With regard to the use of wine and well-diluted spirits to prevent dyspepsia, it must be granted that they are often very beneficial; provided that they be taken in strict moderation, and only at mealtimes. It is no doubt true that the stomach which requires stimulants to enable it to act efficiently, can hardly be said to be in a healthy state. But at the same time we should remember, that the battle of life is not waged without much wear and tear, without almost overwhelming anxieties and sickening disappointments; and that the digestive organs are the first to sympathize with the depressions of the mind, no less than with the fatigue of the body. Hence the precept furnished by St. Paul to Timothy may well be adopted generally,—"Drink no longer water, but use a little wine for thy stomach's sake and thine often infirmities."

VI. GASTRITIS.

Under the head of Gastritis [Γαστρίτις = the stomach; terminal -itis] several important affections of the stomach, more or less closely connected with the inflammatory process, have to be considered. The well-directed labours of many eminent physicians, both abroad and at home, during the past few years, have done much to improve our knowledge of these obscure but highly important diseases.

1. ACUTE GASTRITIS.

Acute inflammation of the mucous membrane of the stomach is a disease which in all probability never arises idiopathically. It is, however, a frequent result of poisoning by any of the irritants—by the mineral acids, caustic alkalis, arsenic, &c.; and it sometimes occurs from swallowing boiling water, or large quantities of irritating emetics when they fail to produce vomiting, or excessive doses of tartar emetic.

Symptoms.—In gastritis produced by irritant poisoning we shall generally find an increasing burning pain in the epigastrium, aggravated by the slightest pressure; constant distressing nausea, soon followed by violent retchings; an accelerated pulse, with
more or less difficulty of breathing; and great thirst, with an unremitting desire for cold drinks which are vomited as soon as taken. Very shortly there sets in extreme prostration; denoted particularly by faintness, feebleness and great frequency of the pulse, marked pallor, cold clammy extremities, and intense anxiety of countenance. When the inflammation continues, the tongue becomes red and glazed and smooth, unless it has been injured by the action of the poison; the bowels are constipated; the urine is scanty and high coloured; there is great restlessness and hiccup; while the prostration increases, till death takes place from exhaustion. These symptoms are not present in all cases; the immediate effects of severe injury to the stomach being sometimes comparatively slight. When the Eddystone Lighthouse was destroyed by fire in 1755, one of the keepers happened to be burnt by the fall of the molten lead. The man asserted that some of the metal had passed down his throat; but as he had gone through much fatigue after the accident, and had begun to amend at the sixth day, his statement was not credited. However, on the eleventh day he rapidly grew worse and died; when, on examining the body, a piece of lead weighing more than seven ounces was removed from the stomach.

Morbid Anatomy.—The morbid appearances usually found are patches of intense dark redness, hemorrhages and erosions, especially upon the rugae, softening, sloughing, and sometimes (when one of the powerful escharotics has been taken) perforation. Redness alone is by no means evidence of the previous existence of inflammation, since it may be produced after death by gravitation of the blood to the most dependent parts: where death occurs, too, from any cause during the process of digestion, the stomach is sometimes found stained intensely red. So also with regard to softening and perforation, we must remember that these may occur from the post-mortem action of the gastric juice—from the stomach actually digesting its own tissues, a fact which was first pointed out by John Hunter.

Few subjects in pathology are more interesting than this one of Cadaveric softening of the Stomach. It is a condition not uncommonly found when death has occurred suddenly from an accident soon after a meal, and when the body has been kept in a warm situation. The most frequent site of the softening is the fundus and cardiac end of the viscus; and it is perhaps most often met with in young subjects, and after death from phthisis, or severe cerebral disease giving rise to great exhaustion. It is distinguished from ulceration or inflammatory softening or perforation by absence of thickening and by greater transparency, by the irregular form and ragged softened edges of the aperture if perforation have occurred, and by the absence of inflammatory changes in surrounding parts reached by the extravasated contents of the stomach. Some interesting experiments
have been made by Bernard, Harley, Pavy, and others, upon this power of the gastric juice. Through a fistulous opening in the stomach of a dog, Dr. Pavy introduced, during the process of digestion, the hind leg of a living frog and the ear of a live rabbit. In both cases the parts underwent digestion after two or three hours. Hence Dr. Pavy argues, that the capability of resisting their own digestive powers possessed by the walls of the stomach during life, and which ceases with death, is not due, as Hunter thought, to the vital force with which they are endowed. If then, this reputed influence of the "living principle" have no foundation, what view can be substituted? Recourse has been had to the theory that the immunity to destruction which the stomach enjoys during life is due to its epithelial lining. For, it is said, while digestion is going on the gastric epithelium and mucous are constantly being dissolved, but then they are as constantly being reproduced. After death the gastric juice still acts upon the epithelium, when as no new layers are formed the deeper coats suffer. Dr. Pavy has found, however, on submitting this view to the test of experiment that it completely fails; inasmuch as he removed a considerable-sized patch of mucous membrane, and yet food was afterwards digested without the slightest sign of any attack being made on the deeper coats of the stomach. The question therefore remains unanswered up to this point. And now Dr. Pavy has another suggestion,—i.e., that the protection is to be referred to the circulation within the walls of the organ of an alkaline current of blood. His argument is that the presence of acidity is necessary for the accomplishment of gastric digestion: alkalinity is a constant character of the blood: during life the walls of the stomach are everywhere permeated by a current of this alkaline blood: hence here we find an opposing influence, the effect of which is to destroy, by neutralizing its acidity, the solvent properties of the digestive fluid tending to act upon the texture of the organ. The blood being stagnant after death, the opposing influence is lost. Should life happen to close during digestion, there is only the neutralizing power of the blood actually in the vessels of the stomach, to impede the progress of attack upon the organ itself; and the consequence is, that erosion of its parietes proceeds, so long as the temperature remains favourable for the process, and the solvent power of the digestive liquid is unexhausted. The apparent contradiction to this hypothesis which is offered in the fact of the living frog's legs and the rabbit's ears being digested, is said to be a question of degree of power between two opposing influences. The very active circulation through the stomach suffices to protect its walls; while the comparatively exsanguine ears of the rabbit and legs of the frog suffer.

Treatment.—The treatment of acute gastritis will in a great measure be the same, whatever may be its cause. In most cases
SUBACUTE GASTRITIS.

I should rely on opium, and the sucking of ice—which will frequently relieve the vomiting, as well as lessen the inflammation. Perhaps, at the same time, it might not be injudicious to allow small quantities of barley water, milk or cream, cold arrowroot, or gruel. As a rule, however, it will be much better to nourish the patient by nutritious enemata (F. 21, 22, 23) than by food administered through the mouth. In some instances fomentations applied to the epigastrium give much relief; while in others a bladder of ice has proved more soothing. When any of the corrosive poisons have been taken, emetics will very rarely be necessary, since the destructive agents themselves induce vomiting; the stomach-pump should never be used. During convalescence great care will be required in regulating the diet; farinaceous substances and broths being chiefly allowed, while these ought only to be given in small quantities at a time.

2. SUBACUTE GASTRITIS, or GASTRIC CATARRH.

This form of inflammation is almost as common as the preceding variety is rare. It is fortunately a mild disorder, unless of long duration; when it may produce thickening and induration of the coats of the stomach, narrowing of the pylorus, or even ulceration perhaps going on to perforation.

The causes are numerous. There is no doubt that it may be brought on by excess in eating or drinking or by indigestible foods. Dr. Beaumont frequently witnessed this result in Alexis St. Martin; who, in consequence of a gunshot wound, had a permanent fistulous opening through the abdominal parietes into the stomach, thus affording an opportunity for watching the process of digestion. Under the continued use of improper food, the inflammation always became aggravated; whereas under the influence of low diet and cooling drinks the stomach rapidly recovered. Acute or chronic alcoholism is one of its most common sources; and so is the use of beer, especially when this is drunk at odd times during the day. On the other hand, long-continued abstinence is a cause of this form of gastritis; as has been proved in experiments upon dogs and other animals when deprived of food. Sudden changes of temperature, cold water taken freely after great exertion, a powerful emotion soon after eating, may give rise to gastric catarrh. So also this disease sometimes arises during the progress of acute inflammations and febrile diseases, particularly of some of the exanthemata—as scarlatina, cholera, hooping cough, erysipelas, diphtheria, pyaemia, &c.; small quantities of arsenic, in whatever way they may be introduced into the system, will produce it; sometimes the poison of gout in the blood seems to give rise to it; and lastly, it may now and then be due to some narrowing of the pylorus impeding the passage of food into the intestines.
When slight, these disorders are usually spoken of as "bilious attacks," the symptoms being little more than those of simple indigestion, such as a furrowed tongue, oppression at the epigastrium, constipation, anorexia, vomiting of bile, giddiness, and "sick headache." The habitual sick headache, however, to which many persons, especially women, are subject, though often excited by errors of diet, has its origin in the nervous system. For the treatment of these cases nothing more is necessary than a purgative pill of calomel and rhubarb, or of aloe, at bedtime; followed by a scillitiz powder or bottle of soda water early on the following morning. A meagre diet and plenty of cold water for the succeeding twelve hours will complete the cure. Alcoholic stimulants had better be avoided.

In more severe cases the epigastric uneasiness and oppression is very great, and there may be cramp-like pains and tenderness. There is severe frontal headache with extreme depression of spirits, and sometimes palpitation and faintness. A distressing nausea is felt and the mouth fills with water; usually there is vomiting of food and much acid fluid, or the bowels may be disordered, and diarrhoea, with griping pains, be set up; more commonly there is constipation. The tongue is covered with a thick, moist fur; the breath is offensive; and there is great thirst, with loathing of food. These symptoms may persist for some time if improper treatment is adopted.

Occasionally, especially in children, there is considerable febrile reaction, which may easily be taken for the early stage of enteric fever, and hence attacks are often spoken of as "gastric fevers." In these cases the skin is hot and dry, the pulse is quick and full, there is vomiting with epigastric pain, and scanty urine which is loaded with lithates.

Pathology.—Under the influence of this form of inflammation, Dr. Beaumont noticed, in the case of Alexis St. Martin, that the gastric mucous membrane lost its healthy pale pink colour, and assumed a somewhat livid redness. Red pimples were scattered here and there over it, which later filled with whitish matter; or red patches appeared and sometimes upon these false membranes. Again abrasions were seen and gumous blood exuded from small portions of the mucous membrane; while at one time neither gastric juice nor mucus was secreted, at another there was much ropy mucus having an offensive odour.

After death all redness may have disappeared from contraction of the minute vessels, or from decoloration of the blood by the gastric juice. The mucous membrane will be thickened and opaque, and may have a dead white appearance, or present red points or patches. Under the microscope the gastric tubes are found distended by degenerated epithelium and granular matter, while the intertubular connective tissue is infiltrated. The solitary glands also are enlarged, and there may be erosions.
As regards the treatment, attention must be paid to those rules which have been laid down in the remarks on Dyspepsia. In many cases removal of the cause, assisted by low diet and cold water as a drink, will thoroughly cure the disease in a short time.

In all the stomach should have rest, and no solid food should be allowed till the epigastric pain and tenderness have subsided. In a severe attack an absolute fast of twenty-four hours or longer duration may be required, the patient being allowed to sip cold water, or suck small pieces of ice, but not to drink largely. An aromatic of iquecanha, followed by copious draughts of warm water taken very early, may cut short an attack. The remedy most generally available is a mercurial purge followed by a saline aperient, and later by effervescing draughts, with hydrocyanic acid to check the sickness. Hot fomentations and sinapisms afford relief, and in rare cases leeches may be of service. When the acute symptoms have subsided, bismuth and mild tonics will be found useful in restoring the tone of the stomach.

In the gastric fever of children a mild aperient (F. 176) repeated one or two evenings, low diet, and effervescing salines will soon bring about a cure.

3. CHRONIC GASTRITIS, or CHRONIC GASTRIC CATARRH.

Chronic catarrh or mucous flux may succeed a bilious attack, or it will occasionally arise as a separate affection. As causes must be mentioned, habitual excess of food or indulgence in improper food—pork, goose, duck, salmon, mushrooms, cucumber, iced ecaus; the abuse of wine and spirits and beer, including their moderate employment in some conditions and constitutions; an unhealthy state of system, as the presence of scrofula, gout, syphilis, albuminuria, &c.; and the employment of particular medicines, especially copaiba, cubeb, turpentine, &c. Passive congestion of the stomach from obstruction to the return of blood to the heart, as in organic diseases of the heart, lungs, and liver. Extreme congestion of this kind, leading perhaps to severe hematemesis, is most frequently due to some cause which prevents the free flow of blood through the liver, as "hobnail" or "gin-drinker's" liver. Gastric catarrh often coexists with chronic bronchitis, phthisis, and emphysema of the lungs. The symptoms vary greatly in different cases and at different times in the same case. Oppression and discomfort after eating, or a feeling of faintness and epigastric pain when the stomach is empty, a craving for food but an inability to take more than a very little when it is supplied, great thirst, offensive breath, a spongy state of the gums, a furred or red tongue, especially at the tip and edges, with enlarged fungiform papillae. Flatulence, acid cructations, heartburn, pyrosis, constipation, vomiting of glairy fluid on awaking in the morning, weak-
ness, coldness of the extremities, headache, languor, depression of spirits, sleeplessness, palpitation, &c., are often connected with gastric flux, and there is generally evidence of want of nutrition, loss of flesh, and sallow skin.

Pathology.—In chronic gastritis there is usually more evidence of vascularity after death than in acute catarrh, and not uncommonly haemorrhagic erosions are seen. The mucous membrane is of an ash-grey colour, especially near the pylorus, and thickened, while the basement membrane of the tube is thickened, and their secreting epithelium in a state of fatty degeneration.

Treatment.—The most useful remedies for restoring the stomach to its natural condition are those which restrain the secretion of mucus; such as the sulphite of soda (F. 48), bismuth (F. 65, 112), perhaps the oxide or nitrate of silver (F. 47, 59), oxalate of cerium (two or three grains in a pill with henbane or gentian every six or eight hours), kino and logwood (F. 108), the official infusion of matico, and occasionally the iron alum (F. 116). If there be much constipation, I think a dose of five grains of calomel is one of the best purgatives; the action of the bowels being subsequently kept regular by small doses of aloes at dinner, or by effervescing citrate of magnesia before breakfast, or by Pullna or Friedrichshall water, or compound rhubarb powder. When the affection is traceable to alcoholic liquors opium is often very useful; if to syphilis, mercury will sometimes give a speedy cure. Of course attention must be paid to the diet; and it will usually be better for two or three days to keep the patient almost entirely upon milk rendered alkaline by admixture with lime-water, allowing small quantities at short intervals. Then arrowroot made with milk, bread and milk, and one or two eggs lightly poached, with stale bread and fresh butter, may be permitted; followed after a short time by white fish, poultry, mutton, sherry and water, &c.

4. INDURATION OF THE PYLORUS.

Induration or fibroid infiltration of the pylorus appears to consist of an abnormal development of fibrous tissue in the submucous areolar membrane about the pyloric portion of the stomach. This condition may come about as the result of chronic inflammation; or perhaps it will arise from the healing and contraction of an ulcer, or from repeated irritation caused by the habitual use of raw spirits. The appearance of the diseased structure to the naked eye somewhat resembles scirrhous, so that by some pathologists this disease has been erroneously regarded as malignant; but minutely examined it is found to be composed of tissues resembling those of a simple fibroid tumour, and not to consist of the copious cell-growth characteristic of cancer. The walls of the pylorus are at times only slightly thickened; or they may be converted into fibro-cartilaginous tissue, with such contraction of
the opening that ultimately nothing larger than a crowquill can pass. In proportion to the amount of obstruction, there will be found dilatation of the stomach, together with hypertrophy of its muscular coat.

Although the pyloric region is by far the most frequent seat of the fibrous deposit or infiltration, yet the cardiac orifice may also suffer, or even the whole of the viscus can be affected. In the latter case, the necropsy shows a large stomach of an opaque pearly-white appearance, of increased weight and density, of gristly feel, and having its coats greatly thickened. This condition now and then exists without giving rise to any symptoms of importance, except in cases where there is constriction of the pyloric valve. Fibroid infiltration appears to be a good name for it, unless the reader should prefer the designation suggested by Dr. Brinton—cirrhotic inflammation, or plastic linitis.

The symptoms of fibroid infiltration of the pylorus are in some respects like those produced by malignant disease affecting this part. There is emaciation with progressive debility, pyrosis, acid eructations, and constipation. At times there are attacks of hæmatemesis. Although the appetite is commonly ravenous, great moderation is obliged to be practised owing to the severe suffering which a hearty meal induces. Vomiting takes place three or four hours after a meal—especially after dinner; the matters brought up being partly digested, mixed with water, often yeasty-looking, and perhaps containing sarcinae or torulae. Ordinarily, except towards the last, the sickness only occurs at intervals of a few days; while if there be much hypertrophy the contents of the stomach are ejected with considerable force. As the patient gradually wastes, so the thickened pyloric tissues can be felt (like a tumour, perhaps the size of a small orange) through the abdominal parietes; the swelling only being really painful when there is any ulceration. By its pressure on the aorta it usually gives rise to troublesome pulsations. After a time the feet and legs get oedematous, the mind is active but dispirited, there is epigastric soreness, the sleep is disturbed, diarrhoea often intervenes, and death ultimately occurs from inanition. In many instances, however, by strict attention to diet, life may be prolonged for several years.

The treatment ought to consist in allowing only simple soft food,—such as milk, cream, raw eggs beaten up in sherry and water, strong beef tea, and soups. Cod liver oil often proves useful during the early stage. At the same time steel and quinine are of service. When there is any temporary exacerbation of the symptoms, the stomach should be rested for a day or two, and nutrient enemata resorted to. The patient had better be warmly clothed; an elastic abdominal belt gives agreeable support; while the gastric irritability can often be relieved by a belladonna plaster.
VII. ULCER OF THE STOMACH.

This is a particularly interesting and not uncommon disease. It is variously spoken of by authors as the simple, chronic, round, or perforating ulcer of the stomach. The features chiefly presented by it are debility, pain, indigestion, sickness, and hematemesis. The ulcer will perhaps cicatrize, and complete recovery ensue. On the contrary, the loss of substance may gradually increase. Life is then terminated by marasmus from want of nourishment; or in a few hours by perforation and consequent acute peritonitis, or by abundant hemorrhage.

Causes.—The cause of ulcer of the stomach has not as yet been determined. This affection is most frequent in women; while there appears to be some uncertain relation between gastric ulcer and disturbed menstruation—particularly amenorrhea. Out of 39 histories of cases terminating by perforation, in females, collected by Dr. Edwards Crisp, the state of the uterine functions is only mentioned in 14; in 13 of these the catamenia either having never appeared or being irregular, or being suppressed.

According to Virchow, the first step in the production of the ulceration is the arrest of the circulation through a sufficient depth of the gastric tissues to permit of the destructive power of the acid gastric juice being exerted without the check it naturally receives from the alkaline blood. The circulation is supposed to be arrested from arterial obstruction by embolism; from extravasations owing to obstructions of the portal vein, or to mechanical violence in retching; or to diminished calibre of the vessels, the consequence of some morbid condition of their coats.

Pathology.—A large number of complicated and important points in the pathology of this disease were laboriously investigated by the late Dr. William Brinton; and from his valuable monograph many of the following observations have been selected.* As, however, I have not hesitated to modify these observations where it has seemed necessary to do so, the responsibility for the different statements must not be shifted from my shoulders.—Among the 4000 cases of different diseases which formerly came under Dr. Brinton's care annually at the Royal Free Hospital, he calculated that there were at least 40 examples of ulcer of the stomach. This observation agrees in the main with that of foreign pathologists. It is probable that in the post-mortem room a cicatrix or an unhealed ulcer will be found in from 3½ to 4 per cent. of the total cases examined.

The ulcer is more frequent in the female than the male, in the proportion of at least two to one. It is specially a disease of middle

and advancing life except that it is common in young women, hardly ever occurring before puberty; while it is more frequent in the poor than in the rich, and perhaps amongst needlwomen and domestic servants than other females. The ulcer is rarely smaller than a fourpenny piece, or larger than a crown piece; its shape is usually circular or slightly oval; and the edges are at times sharp as if the tissue had been punched out when the ulcer is recent, and they may be infiltrated with blood; in other instances the margins are thickened and raised, and sloping so that it has a crater-like appearance, all the coats of the stomach being matted together. It is much more frequently found on the posterior surface, the lesser curvature, or the pyloric pouch, than on the anterior surface, the greater curvature, or the cardiac extremity; while two or more ulcers are frequently present in the same stomach. About two-thirds of the instances of this disease undergo what is probably a spontaneous cure, and a cicatrix results which may cause puckering of the surrounding mucous membrane; in exceptional cases the ulcer has been fatal in ten days, generally by perforation; sometimes by exhaustion, caused or hastened by vomiting; and very rarely by haemorrhage. As regards the majority of fatal instances, a period of several weeks or months precedes death. Perforation, however, is an exceptional occurrence in gastric ulcer: where it occurs, the ulcer has commonly been found on the anterior surface of the stomach. When perforation does take place, the contents of the stomach are generally poured into the abdominal cavity, where they give rise to fatal peritonitis. But in some very few instances the effusion—owing to the presence of adhesions, &c.—is confined to the neighbourhood of the perforated spot; so that circumscribed peritonitis is set up, suppuration takes place, and a kind of chronic abscess is formed. This may prove fatal in many ways, as, e.g., by discharging its contents through the diaphragm into the thorax; or, more fortunately, it will possibly open externally through the abdominal walls. In the latter case a gastric fistula becomes established, which either remains open, like that of Alexis St. Martin, or may gradually close and permit of complete recovery. Dr. Brinton conjectured that of every 100 ulcers of the stomach, 50 may cicatrise, $13\frac{3}{4}$ perforate its walls, $3\frac{1}{4}$ corrode its large vessels, and 2 or 3 kill by the sheer exhaustion and inanition they involve. There is still a proportion of about 30 ulcers in every 100 left quite unaccounted for; many of which can be fortunately allowed to swell the number of cures, Dr. Brinton's estimate being decidedly too small.

Symptoms.—The symptoms are liable to some variety, and hence the discrepancies which are to be found in the descriptions of different observers. The most constant indication is a wearying burning pain in the back over the lower dorsal vertebrae, and in the epigastrium. With respect to the latter situation, the aching or
uneasiness is often referred to a small spot just below the ensiform cartilage, when there is almost always tenderness on pressure; while it is frequently described as dull and sickening, and almost always as being increased by food and especially by hot fluids. Sometimes the pain is associated with violent pulsations, with attacks of syncope, or with convulsions; and in some few young women it has apparently been increased by the access of menstruation. There is occasionally eructation of a sour fluid, and at times nausea with vomiting. The food is rejected unaltered or converted into chyme according to the time it has been retained. The appetite does not usually fail; but the patient feels it can only be gratified at a heavy penalty. The bowels get inactive. The state of the tongue varies and is not characteristic, but it is frequently red and angry-looking. The patient generally loses flesh as well as strength, but otherwise the constitutional symptoms are slight; with this exception, that in young females amenorrhoea is often produced, especially in those cases where there is copious haæmorrhage from the ulcer. After the disease has continued a longer or a shorter period, the patient may sink from exhaustion; or perforation will perhaps occur after a full meal, or in an attack of vomiting; or failing this, there may be a severe attack of haæmorrhage. But in favourable cases the ulcer gradually heals; the pains and sickness and attacks of haæmatemesis diminish; and the patient completely recovers, save in a few exceptional instances where the cicatrization produces contraction of the pylorus, &c.

Supposing perforation to result, with effusion of the contents of the stomach into the peritoneum, the symptoms will be so severe that the nature of the case cannot be mistaken. There is violent pain, beginning in the epigastrium but soon spreading over the whole belly; the abdomen becomes swollen and tympanitic; the patient assumes that position which most relaxes the abdominal muscles; there will probably be complete suppression of urine; and there is great anxiety, with rapidly increasing prostration. Moreover, these indications of the giving way of the coats of the stomach usually occur after a full meal; and perhaps from some sudden exertion, as that produced by vomiting, coughing, sneezing, &c. After an interval, a state of almost painless collapse sets in; and death usually occurs within thirty-six hours from the time of rupture. I have, however, known of immediate dissolution from shock.

Treatment.—In the management of cases of ulcer of the stomach we have chiefly to rest the diseased viscus, to support the system, and to facilitate the cicatrization of the ulcer. When the pain is very severe, hot fomentations, sinapisms, and turpentine stupes applied over the epigastrium, give relief: in obstinate vomiting, or in haæmorrhage, the application of cold (ice and salt in a bladder) is more advisable. Opium can often be administered with very great advantage, either alone in the form
of the extract, or combined with henbane, Indian hemp, &c. Bismuth is also a good sedative, and may be given in ten-grain doses, thrice daily, mixed with five or ten grains of compound kino powder. Where there is much flatulent nausea, Dr. Brinton recommended the iodide of potassium in small doses, with the bicarbonate of potash and some bitter infusion. Supposing the vomiting to be very troublesome, I have seen most relief from five minims of the officinal laurel water in half an ounce of iced water—repeating the dose every two or three hours. Effervescent draughts, champagne, soda water, &c., will often check the sickness temporarily, but usually at the expense of aggravating the pain. Where there is but little pain or nausea some mild preparation of steel (F. 398, 401, 403) will prove very valuable; or, if the patient can bear it, quinine and iron (F. 380) may be ordered. Supposing that aperients are needed during the progress of the case, small doses of castor oil will be most efficacious, provided that simple enemata are inapplicable.

Any of the foregoing remedies, however, will be almost worse than useless, unless great attention is paid to the nature of the food and the quantity taken at each meal. At the commencement it will be better merely to allow farinaceous substances—as a little oatmeal or arrowroot—with milk; taking care that only a very small quantity be used at a time. Cold milk, mixed with one-fourth part of lime water to prevent its coagulating in the stomach, can be taken in small quantities at a time, at intervals of two or three hours, to the extent of three or four pints in the twenty-four hours. It is probable that milk thus rendered alkaline is digested in the intestines; so that its administration really rests the stomach. Should even this food be rejected by the stomach, that viscus ought to be allowed a complete rest; nourishment and medicine being administered entirely by enemata (F. 21, 22, 23, 188). Then, as the symptoms decrease, a more strengthening diet will advantageously but cautiously be permitted; until the patient can painlessly digest and enjoy white fish, light puddings, poultry, &c. During the whole progress of the case, tea and coffee, uncooked fruit and sugar, vegetables and pastry, beer and other alcoholic stimulants, should be forbidden; but if the latter be called for by the wants of the system, only a little weak brandy and water ought to be ordered.

With regard to the management of threatened or accomplished perforation all that can be done is to administer full doses of opium for several days; to keep the stomach empty; and to place the patient in such a position that the ulcer may be uppermost, and not where fluids can gravitate to it. And lastly, under all circumstances, after a cure has been effected the patient must be warned that a careful avoidance of errors in diet, of pressure over the epigastrium, as well as of violent exercise, will be necessary for many months. A single excess, several weeks subsequent to re-
CANCER OF THE STOMACH.

The stomach may suffer from scirrhous, medullary, or colloid cancer; while the affection is generally primary. The disease often comes on gradually, the early indications of it being obscure.

Pathology.—A record of 9118 cases of death from cancer, in Paris, from 1830 to 1840, shows that the disease was seated in the uterus in 2956 cases, in the stomach in 2303, and in the breast in 1149. The pyloric aperture is the part most frequently attacked, next the cardiac orifice, and then the space along the smaller curvature. "Sometimes the cancer, at the time of death, is of small extent: but occasionally, and especially in colloid cancer, the disease spreads, until the greater portion, or even the whole of the stomach, is involved."* When the disease causes obstruction or narrowing of the pyloric orifice, the stomach generally becomes greatly dilated. Gastric cancer is possibly slightly more common in men than in women. It is rare before the age of forty: taking the number of persons living into account, the liability seems greatest between 60 and 70. Very few cases survive two years from the first appearance of the symptoms: in scirrhus—the most common variety of gastric cancer—life will rarely be prolonged for three years; while in encephaloid and colloid, death often takes place within twelve months.

Symptoms.—During the early stage there are simply indications of dyspepsia, and in some few cases dyspepsia with gradual emaciation, may be the only phenomena observed throughout, but usually after a time more marked symptoms set in, which vary in character according to the situation of the disease. When it is in or near the cardiac orifice, there will be merely considerable pain and some difficulty on passing food into the stomach; if in the pylorus, pain and sickness, when a few hours after eating (digestion being completed) the chyme has to pass into the duodenum; while, where the lesser curvature is the seat of the affection, the suffering may often be very slight until near the termination of the case.

Speaking generally, the principal symptoms may be described thus:—Pain in the epigastrium, of a burning, lancinating, or gnawing character, augmented after eating, and often increased by pressure; retraction of the abdominal wall; eructations of fetid air; frequent nausea and vomiting, the matter ejected consisting at first of ingesta and glairy mucus, subsequently of a bloody

sanious fluid, and sometimes of dark grumous matter having a
coffee-ground appearance; constipation; together with an extreme
and increasing emaciation and debility. Occasionally a pulsating
tumour is felt in the epigastrum when the cancerous mass lies
over the aorta; or merely a tumour may be detected in some part
of the epigastric, umbilical, or hypochondriacal regions so placed as
not to receive any impulse from the bloodvessel. And then, in
almost all cases, the countenance will present the peculiar cachectic,
hue and expression so characteristic of the cancerous diathesis.

Treatment.—As in all other malignant diseases our remedies
for cancer of the stomach can only be palliative; for the disease
makes continual progress, and rapidly exhausts the powers of life.
Opium, administered either by the mouth, or rectum, or subcuta-
neously, will be necessary; and it should be given in free and
repeated doses to subdue the pain. When the vomiting is very
severe, nourishment must be given by means of enemata: where
it can be borne, however, a milk diet with two or three raw eggs
in the twenty-four hours will be serviceable. In some instances,
perhaps it may be advantageous to lessen the work of the stomach
by the administration of pepsine; but this remedy could only be
of any real service at an early stage of the complaint. Cod liver
oil is occasionally easily digested. If the crutications are very
fetid, a little freshly-prepared wood charcoal will do good, or that
made from vegetable ivory as suggested by Dr. Leared can be
recommended, or charcoal biscuits may be had recourse to.
The extract of belladonna, or a piece of lint soaked in hot tincture
of opium, applied to the epigastric region will often prove grateful
to the patient’s feelings; or the subcutaneous injection of morphia
can be tried; or a small blister may even be raised, and its raw
surface afterwards dusted with from one-third of a grain to two
grains of morphia, according to the patient’s susceptibility to the
influence of this drug.

IX. HÆMATEMESIS.

This term, signifying strictly vomiting of blood [Hμα = blood
+ εἰμί = to vomit], is generally employed to denote hæmorrhage
from the stomach. The blood is usually vomited in large quanti-
ties, is not frothy, is sometimes mixed with food, and is often of a
dark colour from admixture with the hydrochloric acid of the
gastric juice (all acids blacken the blood). Hence it presents
marked differences from the blood in hæmoptysis; which is
brought up by coughing in mouthfuls at a time, is of a florid red
colour, is frothy, and is frequently mixed with spora. Moreover,
in hæmoptysis the hæmorrhage is generally preceded by cough,
dyspnoea with palpitation, tickling in the throat, and a peculiar
sensation in the thorax.
To make the distinction more clear, the chief signs of each variety may be thus tabulated:—

In haemoptysis:—
- Dyspnoea; pain or heat in chest.
- Blood coughed up in mouthfuls.
- Blood frothy.
- Blood of a florid red colour.
- Blood mingled with sputa.
- Absence of melana.
- Bronchial or pulmonary symptoms.

In haematemesis:—
- Nausea; epigastric tension.
- Blood vomited profusely.
- Blood not frothy.
- Blood dark coloured.
- Blood mixed with food.
- Melana very common.
- Gastric or duodenal symptoms.

Haematemesis occurs every now and then without any appreciable cause; or perhaps it happens to be vicarious of some other haemorrhage, especially of the catarrh; or it results from changes in the blood itself, as in scurvy; or it arises from aneurism of one of the abdominal vessels, the sac communicating with the bowels;* or it may be owing to congestion of the stomach from some impediment to the free passage of the blood, such impediment being due to disease of the heart, liver, &c. Thrombosis of the portal vein (arising either from disease of the coats of the vessel, or from obstruction of its canal by the compression of cancer or cirrhosis or abscess) has on more than one occasion proved to be the cause of fatal haematemesis. But the most direct provocative of this form of haemorrhage is either passive congestion of the walls of the stomach, or simple or malignant ulceration. In simple ulceration, the blood most frequently comes away slowly, in small quantities, and often after a meal; though sometimes a large vessel is laid open, and a gush of blood takes place which possibly proves fatal. So also in the ulceration of a cancerous mass the bleeding is usually slight. When from any causes the extravasation is moderate, the vomited matters are said to resemble "coffee-grounds."

Haematemesis is more common in women than in men. It is generally preceded by a feeling of oppression and weight, by dull pain or tenderness in the epigastric and hypochondriac regions; as well as by a sense of anxiety and faintness. Often there is only nausea, dizziness, and lowering of the pulse in frequency and force. The haemorrhage commonly produces great depression;

* Dr. Gairdner has recorded (Clinical Medicine, p. 495. Edinburgh, 1862) an instructive example of aneurism of the superior mesenteric artery; which opened in the duodenum twenty-two months before death, causing repeated and very copious haematemesis. The symptoms and history closely resembled those of gastric ulcer. And there was this remarkable circumstance, that between the patient's admission (she was a servant girl, sixteen years old) into the Edinburgh Royal Infirmary on the 4th January, 1848, and her death on 28th November, 1849, complete convalescence took place. This was somewhat interrupted by an ulcer on the leg, amenorrhoea, and dyspepsia; but the haematemesis did not recur after the 7th February, 1848. On the day of her death she fell down suddenly in the street with an attack of syncope. At the autopsy it was found that the aneurism had burst into the peritoneum, in the cavity of which more than 3 lbs. of blood had been extravasated. The duodenal opening was closed.
owing partly to that alarm which is always engendered by "spitting of blood," and partly to the quantity of blood lost.

In gastric hæmorhage, the blood frequently passes into the intestines, and is voided per anum; or part will be vomited and part expelled with the feces. When the intestinal evacuations contain blood, whether this comes from the vessels of the stomach or only from those of the intestines, the patient is said to be suffering from melæna [Melæna = black]. As this name implies, the evacuations are often black, and sometimes resemble tar; but the dark appearance is by no means constant, and does not occur if the blood comes away too quickly to be acted upon by the intestinal juices. Cirrhosis of the liver, or any disease which produces obstruction of the portal system, necessarily gives rise to congestion of the gastric and intestinal veins; a condition which often terminates in the extravasation of large quantities of blood that are expelled with the stools as well as by vomiting. Amongst the other less common causes of melæna may be mentioned enteritis, dysentery, intussusception, simple and carcinomatous ulcerations, aneurismal and other tumours, &c. It must not be confounded with bleeding from the rectum, owing to the presence of a polypus or of hæmorrhoids.

The treatment of acute hæmatemesis should consist in enjoining abstinence from solid food, with perfect rest in the horizontal posture; and in extreme cases it may be necessary to trust entirely to nutrient enemata for three or four days, no food or medicine being taken by the mouth. Cold acidulous drinks, ice, strong essence of beef, and perhaps some astringent Hungarian or Greek or Bordeau wine may be prescribed. If the patient be prostrated, enemata of beef tea with port wine or brandy and a little opium will do much good. With respect to drugs, a mixture of gallic acid with the aromatic sulphuric acid (F. 103) will often answer well. The oil of turpentine is thought by some to be a specific (F. 102), while by others, the first place is given to acetate of lead and opium. In one case, a single dose of a concentrated solution of the perchloride of iron (one teaspoonful in glycerine) effected a cure. Prolonged application of cold to the epigastrium is occasionally useful.

Where the bleeding is chronic, or when it is continuous but slight in amount, the mineral acids with bark (F. 376) will often do more real service than any other remedies. Quinine and iron, however, prove very valuable in some instances (F. 380). Cream, raw eggs, essence of beef, various broths, and perhaps cod liver oil, ought also to be allowed. As regards cases of melæna, where there is no gastric disease, active purging will be necessary; and hence a full dose of calomel and jalap or of podophyllin (F. 140, 160) should be given, followed by the common black draught or castor oil. Subsequently the mineral acids with bitters (F. 378) may be tried.
X. DILATATION OF THE STOMACH.

Dilatation of the stomach is a curious disease, to which attention has lately been directed. The enlargement is usually the irremovable issue of some affection of the pyloric orifice; which, causing contraction, prevents the food from readily passing into the duodenum. Occasionally dilatation occurs without organic stricture of the pylorus, and Dr. Fagge has described an acute form of the affection. Usually, however, the stomach slowly and gradually dilates until at last it comes to occupy the greater portion of the abdominal cavity, giving rise to appearances as if a large tumour were present. These phenomena are the more deceitful when the stomach is full of fluid, because fluctuation may then be present: when this viscera contains gases only, there will be a widespread tympanic sound on percussion. Sometimes the diagnosis of this condition may be made by observing the peristaltic movements of the distended organ, which extends downwards across the abdomen from left to right often to near the right iliac fossa.

The patient suffers severely from gastralgia, gastrodynia, pyrosis, flatus, constipation, and sometimes from vomiting. In two instances which I rather closely watched, the appetite was voracious to a marked degree; but whether this was partly the cause or the consequence of the dilatation can only be a matter of speculation. In favour, however, of its having been the cause it should be mentioned, that in one instance the symptoms during life were those of torpid digestion, with such mental depression that suicide was at length committed; while at the examination after death, no pyloric narrowing or other reason for the dilatation could be detected.

Where there is sickness, the vomited matters are frequently very large in quantity; while they rapidly ferment, are intensely acid, and often resemble yeast in appearance. On being microscopically examined, they are seen to contain large quantities of those vegetable parasites first described by Goodsir, the Sarcinae ventriculi, together generally with the yeast fungus—Torula cerevisiae. Dr. Todd discovered the sarcinae in ulceration of the stomach with contraction of the pylorus; and he suggested that these vegetable organisms were the result of the long detention of food in the stomach. These is but little room for doubt that this explanation is correct. At the same time it is also probable, that the intensely acid fluid in which the sarcinae are found may itself irritate and close the pylorus spasmodically. In such cases, consequently, if we check the formation of these growths we shall greatly relieve the disease. Thanks to Sir William Jenner and Professor Graham, we are enabled readily to accomplish this object by the administration of the sulphite of potash, or by the
sulphite of soda; which latter (F. 48) is perhaps preferable, since it is a more stable salt, and is less liable to be decomposed by keeping than the sulphite of potash. The beneficial action of either of these salts depends upon their being decomposed in the stomach by the acids generated therein; sulphurous acid gas being liberated, which quite destroys the fungi. Dr. T. K. Chambers prefers the hyposulphite of soda, in doses of gr. 5 to 20, thrice daily. The patient’s diet should be regulated, and it will be better for him to be allowed the unfermented in the place of the common household bread.

In severe cases great relief has been obtained by emptying the stomach by the stomach-pump and the organ may be washed out with warm Vichy water. This treatment, introduced by Kussmaul, has been curative in many cases, and may be adopted with advantage even before the dilatation is extreme.

XI. GASTRIC FISTULA.

In malignant as well as in simple ulceration of the stomach perforation will from time to time take place, with escape of the contents of this viscus—fortunately not always into the peritoneum. Communications are in this way occasionally formed through the parietes, between the stomach and the outside of the abdomen; or between the stomach and colon; or between the stomach and duodenum; or even between the stomach and the pleural cavities, lungs, or pericardium.

Gastro-cutaneous fistula will result from suppuration in the abdominal walls or from wounds, as well as from gastric disease. Dr. Murchison has recorded an extraordinary case, where, after the introduction of a seton into the epigastrium, the patient (an hysterical woman, 34 years of age) prevented the wound from healing by making constant pressure upon it with a penny-piece; the ulceration gradually advancing, until at the end of three years (in 1854) it penetrated into the stomach, this organ having become adherent to the abdominal walls. Three years afterwards (in 1857) the opening measured four inches transversely, and three from above downwards: while directly a plug which she wore was removed, the contents of the stomach escaped. The health was delicate, but improving.

Gastro-colic fistula are much more common than gastro-duodenal; while they have generally for their cause malignant rather than simple ulceration. In gastro-colic fistula, moreover, the stomach and colon are not always found closely adherent; but a cavity may intervene, as if a mass of cancerous or tuberculous matter had connected the two, and had been gradually hollowed out. The symptoms produced by such a fistula are chiefly faecal vomiting, and the expulsion of undigested food with the stools;
owing, in the one case, to the retrocession of the contents of the colon into the stomach, and in the other to the passage of the gastric matters directly into the large intestine. When these effects follow upon the symptoms of malignant or simple gastric ulcer, the diagnosis cannot be a matter of much difficulty.

XII. DISEASES OF THE DUODENUM.

The small intestine, consisting of the duodenum, jejunum, and ileum, is a convoluted tube, some twenty feet in length. The duodenum [Duodenal twelve; because this portion of the bowel was said by the ancients to be equal in length to the breadth of twelve fingers] extends from the pyloric orifice of the stomach to the jejunum, is some ten inches long, has no mesentery, is imperfectly covered with peritoneum, and is more fixed than any other portion of the small intestines. In it, the chyme having passed through the pylorus, becomes acted upon by the bile, pancreatic secretion, and intestinal juices; the latter being chiefly derived from Brunner's glands. With regard to the special diseased conditions of the duodenum, as distinguished from those of the small intestines generally, we know very little; and even that little is chiefly derived from examinations which have been made after death.

Duodenal dyspepsia is an obscure and troublesome complaint. It can generally be diagnosed when there is great pain about the region of the duodenum some hours after food has been taken. It is often accompanied by nausea, a feeling of faintness, and extreme depression of spirits; and occasionally by jaundice. The latter is not uncommon when the indigestion is due to the abuse of alcoholic liquids; in which cases also there is well-marked tenderness about the right hypochondrium, partly owing to the inflamed condition of the duodenum, and partly perhaps to sympathetic irritation of the liver.

Perforating ulcer of the duodenum presents many of the symptoms of an ulcer in the stomach, but in a mitigated form. Consequently fatal perforation occasionally takes place suddenly, when the patient has previously made but little complaint. A curious observation has been made by Cumin, Dupuytren, Long, Curling, and Erichsen, to the effect that a sloughing ulcer sometimes forms in the upper part of the duodenum within a few days after a severe burn, and doubtless in consequence of it. Still it will be satisfactory for this point to be further investigated, so as finally to refute or confirm the statement; inasmuch as Dr. Wilks, in many autopsies after death from burns, has found the duodenum free from all disease. When an ulcer exists, it is capable of producing
Diseases of the Duodenum.

Diarrhoea, with bloody stools, nausea and vomiting, severe pain three or four hours after a meal, and great prostration; while it may destroy life by haemorrhage, or by peritonitis consequent to perforation.

Supposing perforation to occur acute peritonitis is set up very rapidly, the suffering becoming most acute. In addition to great anxiety and general distress, there will be hurried breathing, urgent thirst, incessant vomiting of greenish bilious-looking fluid, and pain which is rendered most agonising by pressure. In many instances there has been complete suppression of urine. So great is the suffering, that oft-times no justifiable dose of opium relieves it; and the practitioner is bound for very pity’s sake to have recourse to the prolonged administration of chloroform by inhalation.

Primary cancer of the duodenum is a very rare affection. But this portion of the bowel not unfrequently becomes secondarily involved in the course of hepatic cancer, as well as in malignant disease of the pancreas or neighbouring lymphatic glands. In cancer about the pylorus, the disease does not spread into the duodenum as frequently as might be expected.

Obstruction of the bowels is seldom due to a mechanical impediment seated in the duodenum. I have seen an instance, however, where a very large biliary calculus had ulcerated through the coats of the gall-bladder, and where it was found, after death, as firmly impacted in the duodenum as a cork is wedged into the mouth of a bottle. The history and symptoms pointed strongly to obstruction by a biliary concretion, and to such obstruction being situated high up in the bowel, but the site could not be more accurately defined. For although the secretion of urine was very scanty, the vomiting an early symptom, and the matters ejected bilious but free from stercoraceous odour, yet the same occurrences take place in occlusion of the jejunum.

A small nematode helminth—the Scleroestoma Duodenale or Anchylostoma Duodenale—is occasionally seen in the human duodenum and jejunum. The female worms are more numerous than the males, and are rather larger; the latter measuring about one-third of an inch in length. There are four oral papillae, by which it attaches itself very firmly to the mucous membrane of the bowel. This entozoan is found in the inhabitants of Northern Italy, but especially in those of Egypt. The chief symptoms produced by it are stools containing small quantities of blood, slowly progressive emaciation and debility, possibly albuminuria, and ultimately severe anaemia. From the latter, the disorder is known as Egyptian chlorosis.

Post-mortem perforation of the duodenum is apt to occur under
the same conditions as give rise to it in the stomach; provided that, in addition, the pyloric orifice is so patulous that the gastric juice readily flows through it. Under these circumstances, the coats of the duodenum will possibly be found even more extensively acted upon than those of the stomach.

XIII. ENTERITIS.

Enteritis [from ἔντερον = an intestine + the terminal -ītis], or inflammation of the small intestines, varies much in severity; being sometimes so slight as hardly to attract notice, and now and then so severe as to threaten or even rapidly destroy life.

The intestine is very seldom affected throughout its whole extent; but I know of no marked signs by which we can localize the morbid action so as to assert that it is only in the duodenum, or in the jejunum, or in the ileum. Moreover, the inflammation may affect all the coats of the intestine or only the mucous lining; the latter, distinguished as muco-enteritis, being a not uncommon disease of childhood, particularly during the progress of dentition.

Muco-enteritis is frequently met with, while enteritis involving all the structures of the bowel is rare as an idiopathic affection. It may result from strangulation in its various forms, from impaction of a foreign body, &c., complicating these conditions, and indeed giving rise to the more prominent symptoms attending them. In the severe forms of muco enteritis the mucous membrane will be found congested, thickened, and softened, the surface covered with threads of false membrane, and extravasations of blood are seen in patches, especially on prominent folds. In milder cases an excess of mucus, with perhaps some congestion, will constitute the only evidence of inflammation. Occasionally ulcerations are met with. In enteritis proper the portion of intestine affected, often only a short length, will be purple or dark grey externally, and may present shreds of lymph; the muscular coat is thickened and infiltrated with inflammatory products, while the mucous membrane is congested, marked by patches of extravasated blood, or even gangrenous. It is always dilated from paralysis of the muscular coat, and the bowel above is usually full of fluid which the inflamed portion has been unable to transmit downwards.

Symptoms.—Enteritis generally sets in with rigors, hot skin, thirst, and a hard and frequent pulse. The patient complains of severe colic-like pains about the belly, especially around the umbilicus, and of distressing nausea and vomiting; and with the pain there is extreme tenderness on pressure, whereas in colic pressure gives relief and the patient lies on his back with his knees drawn up so as to relax the parietes of the abdomen. The bowels are obstinately constipated from the first. Very quickly these
ENTERITIS.

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Symptoms are followed by gradually increasing tympanites, the pain usually diminishes and may entirely cease, but the vomiting and constipation continue, hiccup is frequently troublesome and a state of collapse comes on. The face becomes pinched and anxious, the pulse small, the extremities cold, the surface bathed with cold perspiration; usually the intellect remains clear to the last. The vomited matters at first consisting of the contents of the stomach with the gastric secretion and bile, later become highly offensive, and are sometimes stercoraceous. The pulse is at first full and hard, but it soon becomes wiry and almost imperceptible.

Muco-enteritis, or inflammation of the lining membrane of the intestine, now and then occurs in young children from six to eight months old. The infant gets hot and restless in the early stages, and suffers from thirst; the tongue becomes dry or covered with a brownish crust; there is frequent screaming, and disturbed sleep; the abdomen becomes distended from flatus, while there is pain which is increased on pressure; and there is irregular action of the bowels—in most cases diarrhoea, the faeces being green and offensive and often discharged with considerable force. Towards night there is usually an exacerbation of the febrile symptoms. Thus far the disease does not differ much from a sharp attack of diarrhoea. Severe constitutional symptoms, however, soon set in: such as great febrile oppression, thirst, vomiting, dryness of the tongue, watery diarrhoea, &c.; followed by rapid and unexpected exhaustion, or sometimes by coma with a peculiar pale and waxen appearance of the body. These symptoms may come on before the disease has lasted any considerable time, and whilst it can scarcely be distinguished from the ordinary bowel complaints of children. It should be remarked that an erythematous redness is generally observed around the anus.

Diagnosis.—Enteritis has been more than once mistaken for hernia, or for obstruction of the bowels from some internal cause. A careful examination of those regions at which intestinal protrusion may take place, should be made; while the general history of the case must be well considered. In mechanical obstruction not involving strangulation the symptoms come on slowly and steadily, the sickness is urgent, the pain is fixed, and there have often been previous attacks of constipation: with intussusception there is sudden pain like that of colic, with the discharge of a bloody mucus. Colic is recognised by the absence of tenderness on pressure and by the temperature remaining normal.

Enteritis from chronic poisoning is not to be easily distinguished from inflammation due to natural disease. But in the former the vomiting is most urgent, the stomach rejects everything, there is diarrhoea after taking food, and the pain is less severe. Where there is the least doubt, however, all the excreta should be analysed; while until the uncertainty is removed,
care must be taken that the food and medicines cannot be
tampered with.

Hysterical tympanites, peritonitis, cerebral disease, and sup-
pression of urine (any of which may induce sickness and constipa-
tion) have been mistaken for enteritis, though it seems difficult to
imagine how such an error could be committed.

Treatment.—Opium freely administered is invaluable; while
hot fomentations sedulously applied to the abdomen will also give
great relief. Perfect quiet in bed must be enjoined. All purga-
tives are to be rigidly avoided; though attempts ought to be made to
empty the lower parts of the intestinal canal with simple enemata,
especially by warm water thrown up in large quantity, gradually
and slowly, by means of a long flexible tube (such as that of the
stomach pump). After the inflammation has ceased, mild aperients,
particularly castor oil, may be prescribed; followed by vegetable
tonic, such as the infusion of cascarilla or the tincture of bark. In
strumous subjects cod liver oil, or glycerine and steel wine, do good
service. The diet should be very simple: it ought to consist chiefly
of demulcent drinks, mutton and chicken broth or beef tea, and
farinaceous foods with milk. Ice or cold water can be freely
allowed with the best consequences. Where there is a disposition
to collapse, stimulants must be resorted to.

In the nuco-enteritis of children, opium must be given with
very great caution. The warm bath, followed by fomentations or
linseed poultices to the abdomen, will give relief. Chlorate of
potash in weak tea or sugared water is often useful; or if an
astringent be needed, the tincture of kino and decoction of logwood
will best answer our purpose. When the child is at the breast, no
other food should be allowed; otherwise the diet must be very mild,
consisting chiefly of milk with a little broth, and nicely flavoured
mucilaginous drinks. Goat’s milk is often more easily digested
than cow’s or ass’s milk; especially if the animal be kept clean,
and fed upon hay and clover. Moreover, whichever milk be
ordered, it ought to be tested with litmus paper; so that if it be
found to have lost its alkaline property, the acidity may be
neutralized by the addition of three or four grains of carbonate of
soda to the half-pint, or with a few drops of spirit of nitric acid.

Where there is much exhaustion, from ten to thirty
minims of brandy in thin milk arrowroot, or in cold sugared water
may be given at short intervals; while sometimes, when the case
has seemed almost hopeless, I have been much gratified at finding
recovery follow upon the use of a solution of raw meat (F. 2). When
a case is seen early, a most efficacious plan of treatment is to with-
hold all food except weak barley water with a little sugar and perhaps
a few drops of brandy for 12 or 24 hours, giving small doses of
laudanum and spirit of chloroform or ether in dill-water at
frequent intervals. The mercury and chalk powder is often given
to children directly an inflammatory disorder is diagnosed. I
have seen it administered in muco-enteritis, and invariably it has
aggravated the symptoms.

A thickened state of the coats of the intestines frequently
results from inflammation of a chronic or subacute kind or from
lardaceous change. An irritable mucous membrane accompanies
this condition: whilst the peristaltic movements are impeded by
the deposit of exudatory matter in the intestinal walls. Hence,
it results, that the characteristic symptoms consist of attacks of
diarrhoea, or even of mild dysentery, alternating with constipation
and retention of scybala; together with slight tenderness on
pressure, and a feeling of resistance on practising palpation over
the affected parts. Friction with iodine ointment, a nourishing
but unstimulating diet, and regulation of the bowels by astringents
or by mild alterative aperients—according as diarrhoea or con-
stipation exists, will often remove the deposit.

XIV. INFLAMMATION OF THE CÆCUM.

The cæcum or its appendix (situated in the right iliac fossa,
and covered only anteriorly and laterally by the peritoneum) is
now and then found seriously diseased, without any other part
of the intestines being involved. Thus, severe colic and even fatal
obstruction may arise from the lodgment in this portion of the
alimentary canal of hard faecal matter, skins or stones of fruit,
portions of unripe apples or plums, biliary and intestinal concres-
tions, balls of lumbrici and oxyurides, &c. Sometimes the intes-
tinal matters accumulate to such an extent as to produce a large
tumour; and many are the cases where patients have recovered
upon passing an immense quantity of faeces, after a careless
examination has led the practitioner to diagnose ovarian disease,
or abscess or cancer of the right kidney. When any of the
foreign matters get impacted in the vermiform appendix or the
cæcum, dangerous inflammation ending in abscess is very likely
to arise; while, as we shall presently see, the persistence of
disease in the appendix will occasionally form the starting-point
of the morbid action in the cæcum itself.

The inflammatory process may affect only the vascular mucous
surface, or all the coats of the cæcum; in either case, the affection
being termed cæcitis \[Cæcūs = \text{blind} + \text{the terminal -itis}\], or
typhilitis \[Τυφλὸς = \text{blind} + \text{the terminal -itis}\]. So we can merely
have inflammation of the appendix cæci, which is attended with
more acute symptoms than simple typhilitis. Or the abundant
connective tissue which attaches the cæcum to the psoas and iliac
muscles will be especially involved; and then perityphilitis \[Πει =
around + τυφλὸς; \text{terminal -itis}\] is the rather pedantic name
applied to the disorder.
Whether it be true or not that an important part of the process of digestion is carried on in the cæcum, it cannot be denied that irritation and perhaps the suspension of the functions of this part by disease soon gives rise to prominent and distressing symptoms. Thus there is always more or less general constitutional disturbance, slight fever, sleeplessness, anorexia, most troublesome nausea with retching, and either diarrhœa or looseness alternating with constipation; together with fulness and tenderness about the right iliac region, the pain being rendered exquisite by pressure upon the cæcum or the parts in its immediate vicinity. The patient lies on the back or on the right side; with the trunk somewhat bent and the knees drawn up, so as to relax the tissues about the seat of inflammation. The pulse is not quickened to the same extent, nor is the countenance as anxious, as in peritonitis or enteritis. Supposing the disease to progress, the peritoneal surface of the cæcum becomes involved, the appendix gets inflamed, and we are very likely to have evidence of the existence of general peritonitis; while the surrounding connective tissue also becomes affected, and suppuration and abscess result. The latter may open externally, or into the intestinal canal, or into the vagina; the patient recovering at least temporarily. Unfortunately, the abscess often slowly fills again; and this happening time after time, and the pus burrowing in various directions, the most serious complications arise. Where, in the first instance, the purulent matter is discharged into the cavity of the peritoneum, this untoward accident is followed by great suffering, and in a few hours by death.

When the inflammation begins in the appendix from constitutional causes or owing to the escape into this part of morbid materials or foreign bodies, the symptoms are usually very acute from the commencement; consisting especially of excruciating torments, tympanites, hiccup, violent sickness, pain in the right ovary or testicle and thigh, and obstruction of the bowels. Gangrene of the affected part, with general peritonitis, frequently ensues and proves fatal. Or, a portion of the large intestine and cæcum with the vermiform appendix may slough off, and be passed away in a stool; restoration to health perhaps following at the end of a few weeks. In tuberculous typhilitis, ulceration occurs more frequently in the appendix than in the cæcum itself.

The early symptoms of perityphlitis are severe pains shooting from the right iliac region, diarrhœa and tenesmus, sickness, mental depression, great restlessness, fever, &c. The parts around the seat of inflammation become swollen and—unless resolution take place suppuration occurs. Frequently the abscess opens into the cavity of the cæcum, and then with care the patient recovers.

Occasionally the physician meets with tedious cases of chronic inflammation of the cæcum. The symptoms come on very slowly and insidiously. There are paroxysmal attacks of pain, indications
of failing health, weakness and loss of flesh, colicky pains in the right iliac region, and flatulence and anorexia. Diarrhea alternates with constipation. Frequently the mucous coat of the bowel ulcerates, and then numerous mucous discharges with attacks of hæmorrhage ensue; the loss of blood at times being considerable. Where there is much thickening and tunecfaction of the walls of the caecum, the case might be mistaken for an aneurism of the iliac artery. If death occur, it is generally from exhausition; while at the necropsy the intestinal coats are found considerably hypertrophièd, inflamed, and ulcerated. Very rarely is there perforation.

The treatment of all affections of the caecum requires considerable caution. I have had to watch a few cases where no little mischief has arisen from the abuse of purgatives; and in one particular instance had it been necessary for me to state the cause of death, I should hardly have conscientiously given any other certificate than—"Comp. and colocynth pills." Generally speaking, and yet fomentations or poultices will have to be assiduously applied, while opium ought to be given internally. This latter remedy must be used in doses sufficient to keep the patient free from pain; and its influence should be maintained for several days. Prolonged hot hip-baths often give great relief. Efferveescing drinks, soda water or lemonade, bismuth, diluted hydrocyanic acid or laurel water, and ice will be useful in relieving the nausea; while if it appear necessary to interfere so as to obtain an action from the bowels, castor oil enemata may be employed. Great care must be taken to keep the patient quiet in bed, as well as to enforce the use of only liquid nourishment, until all symptoms of disease have completely passed away. When there are rigors and other indications of suppuration having occurred, milk or cream, raw eggs, essence of beef, and bark with brandy or port wine will be needed. If the abscess point externally, it should be cautiously opened. Subsequently, comfort will often be derived and the abscess prevented from refilling by the guarded employment of regulated pressure. A shield of gutta percha moulded to the part, padded with wool and then lined with chamois leather, and kept in place by an ordinary truss spring, will prove an efficient instrument.

In chronic cases I have seen most good from simple nourishing food, from which potatoes and table vegetables generally should be excluded, warm bathing, sedative applications (F. 165, 281) used night and morning, and the administration of cod liver oil; together with the employment of small doses of the mineral acids with quinine (F. 379), or of iodide of ammonium and bark (F. 38).
XV. DYSENTERY.

Dysentery [from Δυτικ = difficulty or badness + Ιντσιον = intestine] consists of a specific inflammation and ulceration of the mucous membrane (occasionally also of the other tissues) of the colon, especially perhaps of the lower part of this gut and the rectum. The morbid action is attended with considerable febrile disturbance, frequent mucous and bloody stools, tenesmus, and griping pains. There is a tendency to great prostration. The disease has been sometimes termed colitis. Cases, however, are occasionally seen in which the ulceration does not stop at the ileo-cecal valve, but extends for many inches up the small intestines.

Causes, &c.—Severe dysentery is now a comparatively rare disorder in this country, either as an idiopathic affection, or as a complication of some other disease. It appears, however, occasionally to prevail as an epidemic in our prisons, or in unhealthy localities; for during the last ten years (1857-66) the deaths registered from it in England have annually ranged between 1000 and 1698. In tropical regions it is at times very prevalent, and is often particularly fatal to our soldiers and sailors. Miss Nightingale has remarked that the per-centage of mortality in acute and chronic dysentery was perhaps greater in the Crimea (1854-55), owing to bad food, than has even been known in any disease except the worst form of epidemic plague.

Dysentery has been ascribed to the action of wet and cold and damp night air, to contagion, to malaria, to drinking polluted water, to intemperance, to deprivation of fresh vegetables and fruit, to impure or insufficient or salt food, to detention in crowded barracks or transport ships, to insufficient clothing and bedding, to poisoning by retained excretions, to the use of drastic purgatives, &c. All cachetic states of the system predispose to it, in those countries where paludal fevers are rife. Moreover, intermittent or remittent fevers and dysentery often coexist, or they succeed each other in the same individual. Whether malaria can be said to be an exciting cause of dysentery, as it is of paludal fevers, is uncertain.

Symptoms.—At the commencement, there will be found general uneasiness, pains in the abdomen of a griping character (tormenta), with a frequent inclination to go to stool. This necessity being gratified, the action is followed by relief. As the disease becomes developed, and as ulceration or sloughing commences, the desire to empty the bowel gets more frequent and imperative, while the ease which succeeds is more transient. The evacuations are thin, mucous, and bloody; and frequently they are mixed with small, hard, separate lumps of faeces, termed scybala. The scanty evacuations soon produce distress rather than relief. The patient is constantly tormented with tenesmus and griping; the stools
become fetid, dark-coloured, and mixed with blood and purulent matter and shreds of lymph; while the bladder sympathizes with the rectum, causing frequent micturition. The urine also is high coloured, and gives rise to scalding when passed: sometimes there is strangury.

With regard to the other symptoms it must be noticed that in all instances there is more or less fever with constitutional disturbance. In mild cases the fever is slight; and there will be neither depression, nor loss of appetite, nor an unnatural appearance of the tongue. But usually complaint is made of restlessness and inability to sleep; the countenance is anxious; and there are troublesome cramps. The tongue is furred, and the papillae prominent; the pulse is frequent and small; skin harsh, hot, and dry; thirst urgent, with a total disgust for food; while there are fits of dyspnœa, and great prostration. * Supposing that the patient recovers, the symptoms of amendment set in very gradually, beginning with an abatement of the purging and pain; while for some few weeks we never can feel certain that a relapse may not suddenly take place. Convalescence is usually protracted. On the other hand, in fatal cases, the abdomen becomes tense and full and tender, especially on pressure; the pulse gets weaker; the tongue is found dry and red and glazed, with aphthæ about its root and on the insides of the lips and cheeks; and there will be continued wakefulness, or short disturbed snatches of sleep. The evacuations are now extremely offensive and shoddy and watery; there is a repulsive corpse-like odour about the body; hiccup comes on, with great exhaustion and emaciation; and then death soon follows.

During the American war there were many cases of chronic camp diarrhœa in which, after the patients had passed two or three loose stools daily for several days, acute dysentery set in suddenly. Frequently, in addition to severe tormina and tenesmus, there would be low fever and muttering delirium; succeeded by fatal sinking at the end of a few days. After death, the ulcerated colon was found coated with croupous lymph. In other instances, such complications as scrofulous apoplexy, diphtheria, pneumonia, albuminuria, &c. were met with.

Complications.—This disease may be complicated with some form of continued fever, with scurvy, with enlargement or inflammation of the liver, or with hepatic abscess. The two latter occurrences are so frequently met with in hot climates, that in all cases the liver should be daily examined; such examinations being continued for some short time after the prominent symptoms have ceased. Whether dysentery and abscess of the liver have any mutual relation is still undecided; but the balance of evidence seems to be in favour of their being dependent on the same cause, though unconnected with each other. According to Dr. George Budd, the abscess is the consequence of the dysentery; the former
resulting from the fetid gaseous and liquid contents of the bowel, or the unhealthy pus produced by its ulceration, being absorbed and conveyed immediately to the liver. In opposition to this view it is to be noticed, that out of many hundreds of cases of dysentery which occurred in Millbank prison during seven years, not one (according to Dr. Baly) was complicated with hepatic abscess, and it is stated that the hepatitis resulting in abscess often precedes the dysenteric symptoms.

Terminations.—Dysenteric inflammation, when violent, may end in perforation of the bowel and fatal peritonitis; or in rupture and faecal abscess; or in pyaemia and secondary abscesses; or in healing of the ulcerations, with subsequent troublesome constipation from the contraction of the cicatrices; or in fatal exhaustion, particularly where the mucous membrane has got shapelated.

When the disease becomes chronic, it is often most intractable. There is usually atrophy of the mucous membrane, with degeneration of the glands; or imperfectly cicatized ulcers remain in the mucous lining of the caecum, colon, or rectum. Many of these cases ultimately recover; but in other instances the sufferer gradually wastes away, the skin is rendered harsh and dry and scaly, there is improvement one day with a relapse the next, the tongue is florid and glazed, the discharges of faecal matter mixed with thin pus and blood are most offensive, while the griping pains and tenesmus, &c., exhaust the patient so thoroughly that death is looked forward to as a welcome source of relief.

The immediate mortality from this disease, in hot climates, varies from five to thirty per cent. of those attacked. According to several authorities, where it does not at once end fatally, it leads (when once fairly impressed on the system) to so much suffering and slow exhaustion, that life is ultimately destroyed by it.

Pathology.—This disease commences as an affection of the tubular and solitary glands of the large gut, which glands get enlarged and filled with a jelly-like substance. After a time, the glandular structures rupture and an ulcer is formed; and this happening in several parts large patches are produced by the ulcerations running into each other. Then, too, the intervening mucous membrane gets inflamed and pulpy, secretes a large quantity of mucus, and readily bleeds under the influence of any irritation. After death the most extensive and ragged ulcerations are found; with perhaps portions of the mucous coat in a sloughy or gangrenous condition. The mesenteric glands are often swollen.

Rokitansky states that the dysenteric process is divisible into four degrees or stages, ranging from inflammation and softening of the mucous lining of the colon to complete mortification. Dr. Parkes considers that ulceration is always present, and that the solitary glands are much affected. Dr. Habershon thinks it probable that the diseased condition is closely allied to that of the
DYSENTERY.

pharynx in diphtheria; and that in severe examples the membrane rapidly sloughs, without antecedent ulceration.

Treatment.—Bloodletting, both by the lancet and by leeches applied in the track of the colon, is usually recommended; this practice being, I believe, still adopted by many. In the dysentery of this climate, it is worse than unnecessary to bleed; while it is equally injurious to administer large doses of calomel. And this is probably the case in most countries; but it is certainly so when the morbid action has advanced so far that there is ulceration running into gangrene of the affected tissues.

During the early stages our object ought to be to soothe the inflamed membrane, and to remove all sources of irritation. Hence, demulcent drinks must be copiously given; while the diet is to be free from stimulants, and of the lightest kind—farinaceous food, cream or milk, calf's foot jelly, and thin broths. Perfect rest in bed, in a well-ventilated apartment, is desirable even in mild cases. The warm bath can be frequently employed with great advantage; while the wet compress, fomentations, and hot poultices always afford great relief. When we fear the lodgment of scybalae, a few doses of castor oil may be given, the action of which should be aided by enemata of gruel; or a plan of treatment which is often efficacious is to give drachm doses of sulphate of magnesia with tincture of hyoscyamus every three or four hours till the apertent effects of this salt become evident, and afterwards a Dover's powder or hyoscyamus and opium in mucilage. The bowels having been thus acted on, no remedy appears to exert so good an effect as ipecacuanha. This agent seldom produces nausea and vomiting, when given in large doses; while it is beneficial by its action upon the skin, and by causing an increased secretion of mucus. The best mode of administering this drug, either in the dysentery of tropical regions or in such severe forms of it as occasionally occur in this country, is as follows:—A large and hot linseed poultice, containing two or three tablespoonfuls of mustard, is to be applied over the epigastrium. Next, a full dose of opium, proportionate to the age, is to be exhibited in the form of an enema or suppository; and then thirty or forty-five minutes afterwards (the use of fluids having been interdicted for three or four hours previously), a dose of from thirty to sixty grains of ipecacuanha powder should be given in the form of a bolus, or wrapped up in wafer-paper, or suspended in a small mucilaginous draught. A second dose is seldom needed; but if required, it may be ordered at the end of six, twelve, or twenty-four hours. If preferred, a decoction of ipecacuanha may be taken, made with an ounce of the bruised root to the pint of water. The whole is to be consumed in the twenty-four hours, diminishing the strength of the mixture as the symptoms lessen. Emetina again, the active principle of ipecac, has been successfully employed.

When the dysenteric inflammation has reached an advanced
stage (when there is extensive disorganization of tissue) then
there are still two points to be aimed at—viz., to support the
general strength, while the diseased structures are to be kept as
quiet as possible. Under these circumstances, ipecacuanha, followed
by tonics and astringents and opiates, are to be the tools with which
we work. Supposing the patient to be very weak and anæmic, we
may try such remedies as salicin, quinine, bark, cascarilla, or some
mild preparation of stale; although if the dejections continue
abundant and frothy and sanguineous, we are first to use bismuth,
gallic acid, kino, logwood, iron alum, or sulphate of copper. In
both classes, but chiefly in the last, opiates by the mouth or sub-
scutaneously, or often preferably by the rectum, will be invaluable.
The diet ought to be generous; milk, raw eggs, strong broths,
restorative soup (F. 2), ripe grapes, and perhaps alcoholic stimu-
lants well diluted, being necessary. In scorbatic cases a free
supply of lemon or orange juice is to be allowed.

For chronic dysentery the patient must seek relief in a mild,
dry, equable climate. If unable to obtain change of air, he should
be treated according to the principles just inculcated. The different
preparations of bael or Beugal quince are much used in India.
They seem to have a twofold property, first being astringent and
then aperient; and they are especially recommended where the
stools are frequent and mixed with blood and mucus, while the
system is free from fever (F. 97). The Australian red gum has
also been found useful in these cases, and may be given alone or in
combination with the bael. The remedy which seems to have had
the most salutary effect in the chronic dysentery from which our
soldiers suffered in the Crimea, is morphia. One grain of the
hydrochlorate was given twice or three times a-day, with some
aromatic spirits of ammonia and nitrous ether.

XVI. DIARRHŒA.

In most works on practical medicine many varieties of diarrhœa
are described, such as the feculent, the bilious, the mucous or
catarrhal, the dysenteric, &c. These subdivisions are, however,
quite unnecessary. It would seem much better to apply the term
diarrhœa [Διάρροη = to flow through] to all examples of simple
purging; that is to say, to those cases in which the alvine evacu-
ations are frequent, and loose or liquid, without any coexistent
inflammation of the intestines.

Causes.—The causes of diarrhœa are numerous; the most
common being over-feeding, or the use of improper food—such as
unripe fruit, raw vegetables, sausages, pork, veal, goose, duck,
salmon, &c. It may follow exhaustion consequent upon starva-
tion, or the drinking of foul water, or the inhaling of fumes from
decaying animal or vegetable matter, or great mental emotion, or
exposure to damp and cold or to too great heat. From the latter cause relaxation of the bowels is common during the summer months; and hence it is frequently termed summer or English cholera. Diarrhoea is often also a symptom of many different diseases, as of phthisis, typhoid fever, congestion of the liver, &c. But when simple diarrhoea prevails in a household, or in a community, it may be set down as due to some unhealthy state of the atmosphere, or to the use of contaminated water, or to the consumption of bad food.

Symptoms.—In addition to the purging there is generally some degree of nausea, a dirty or furred tongue, foulness of the breath, flatulence, and tenesmus. There are also griping pains, acid eructations, &c. Moreover, the stools are unhealthily; either consisting of liquid feces, or of a watery feculent mucus, or of a thin frothy serum, or of a pale yeast-like matter. In severe summer cholera the evacuations are often composed chiefly of bile, the pains in the abdomen become violent, there are cramps in the legs, the patient complains of being chilly, and the depression is frequently great.

Prognosis.—This is usually favourable; except in the diarrhoea of young children, or of old people with enfeebled frames, or in purging complicating some exhausting disease. Nevertheless, the fatality of diarrhoea has much increased since 1838, when the deaths from it in England amounted to 2482. Thus in 1847, the number was 11,595: in 1857—21,189: in 1861—18,746: in 1863—14,943: in the three following years 16,432 and 23,531 and 17,170.

Diagnosis.—Diarrhoea is distinguished from dysentery by the absence of blood from the stools, and by the comparative mildness of the tenesmus and general disturbance. From cholera it is diagnosed by the comparative mildness of the symptoms, &c.; though this affection often commences like a common diarrhoea.

As an important point in practice it must be remembered, that in examples of faecal accumulation there is constantly tenesmus with the frequent passage of small quantities of liquid feces. I have seen more than one instance where the patient’s life has been endangered by recourse being had to chalk mixture and opium, when the removal of a hard mass with the help of enemata and the scoop ought to have been adopted. Again, cases in which the power of the sphincter ani has become diminished, either from paralysis or from very great prostration, are sometimes mistaken for diarrhoea. Where the rectum is irritable and the sphincter weak, matters which would otherwise remain some hours and accumulate, pass away at once. Of course no benefit can arise from treating such cases as if they were instancies of simple purging. The recumbent posture, ferruginous tonics, cold sponging or bathing, and good diet will more probably effect a cure.

Treatment.—This will manifestly depend upon the cause. When
the purging arises from the presence of some offending matter in the intestinal canal, the expulsion of such matter must be aided by administering from five to ten grains of powdered rhubarb, or about two fluid drachms of the tincture of rhubarb, or half a fluid ounce of castor oil; combining a few drops of the liquid extract of opium with the draught if there be much pain. Granting no such cause exists, we can endeavour to relieve the symptoms by a draught of ether and opium (F. 85); or by two or three doses of calomel and opium (F. 25); or by the chalk mixture with catechu, &c. (F. 97); or by the officinal aromatic powder of chalk and opium; or by sulphuric acid and opium (F. 100); or by a mixture of matica and rhatany (F. 105); or by kino and ippecuanha and logwood (F. 108). Many cases may be quickly cured by thoroughly washing out the rectum with warm water; immediately afterwards employing the officinal opiate enema, or a suppository of opium (F. 340). Ten or fifteen grains of tannic acid added to the enema will now and then increase its efficacy. Where the irritation appears to be kept up by faecal fermentation, no remedy proves more serviceable than fresh vegetable charcoal (F. 98). Ippecuanha and opium are especially useful in the diarrhoea of children, or in that of adults when due to inflammatory congestion of the mucous membrane of the intestine (F. 333, 324, 339). Attention must invariably be paid to the diet; emollient drinks, tapioca or sago or arrowroot milk, custard or baked rice puddings, and white fish only being allowed during, as well as for a few days after, the attack. If any stimulant be needed, a little cold brandy and water may not prove injurious. Moreover, where the intestinal canal is irritable, subjecting the individual to attacks of diarrhoea on slight causes, great benefit will often be derived from constantly wearing a flannel roller wound twice or thrice round the abdomen. This practice has also been found useful by those who have resided in tropical climates; and who, having suffered from yellow fever, dysentery, &c., are liable to looseness of the bowels.

XVII. COLIC.

Colic [Κόλωκον = the large intestine] is characterized by severe twisting pain in the belly, especially about the umbilicus, occurring in paroxysms. There is no inflammatory action in simple colic, and the pain is relieved by pressure. The disorder is accompanied by constipation, and often by vomiting; there is no fever, and no quickness of pulse; neither do we find any depressing anxiety as in enteritis, although the pain may be as severe.

Attacks of colic often arise from indigestion accompanied with flatulence; the suffering being severe until vomiting, or eructation, or expulsion of the wind by the anus gives relief. A second com-
mon cause is the presence in the bowel of morbid secretions, or of retained excrementitious matters; easily cured by hot brandy and water, and a dose or two of castor oil. Then we from time to time have to treat nervous or spasmodic colic, such as occurs from fright, cold, hysteria, gout, &c.; and which demands the use of antispasmodics, like ether, chloroform, belladonna, and opium. Lastly, we may have colic from the slow cumulative action of mineral poisons, such as copper, lead, &c.

Flatulent colic, or that which arises from the undue accumulation of air in the stomach or intestines, is attended with pain, depression, and coldness of the surface. The air is generally derived from the decomposition of the food and glandular secretions; while there is every probability that, in certain states of the system, gaseous exhalations can take place from the mucous membranes. Air, swallowed with the food may be a cause of excessive flatulence; examples of which are often seen in infants when they have been fed from a bottle by a careless nurse.

Flatulence [from Flo = to blow up] may exist as an idiopathic disorder, or it may be symptomatic of some other affection. In the first case, the flatus is usually most abundant when the patient has been fasting, and its presence is unaccompanied by any marked derangement of the general health. Nervous and hypochondriacal women who partake freely of tea, are liable to it; or it can be produced by the use of any food which is liable to undergo fermentation. There is generally a want of tone about the system, and especially a relaxed condition of the muscular fibres of the intestinal walls. In the second place, the flatulence is an attendant upon indigestion, inflammatory disorders of the stomach or bowels, organic disease of the liver, peritonitis, pelvic cellulitis, typhoid fever, uterine or ovarian irritation, gout, &c.

Idiopathic flatulence is generally to be cured by the avoidance of vegetable food and tea and beer; by the use of tonics, especially the mineral acids with strychnia or nux vomica (F. 376, 378); and by the exhibition of creasote (F. 41), or vegetable charcoal (F. 98). In tympanites from intestinal atony and weakness of the abdominal muscles, electricity is very useful; it being sufficient to apply both electrodes on different points of the abdominal parietes, and not to place the positive electrode in the mouth and the negative in the rectum, as advised by Beequerel. Supposing the distress proves so urgent that immediate relief is demanded, a draught containing spirit of chloroform or ether, carbonate of magnesia, &c. (F. 62, 85, 86), will be found most efficient; while a turpentine stupe had better be applied over the belly. The symptomatic variety of flatulence will have to be treated in various ways according to its cause. Conditionally that their employment is not forbidden by the nature of the existing disease, enemata of turpentine, assafetida, and rue (F. 189) will be useful; while
when the quantity of air is excessive its escape may be facilitated by passing the tube of the stomach-pump for several inches up the rectum.

In copper colic the pain often comes on very suddenly, and is aggravated by pressure; the distress being most severe at the pit of the stomach, or lower down—just above the umbilicus. The paroxysms are often of short duration; though they may possibly last for twenty-four or thirty-six hours. The bowels for the most part act regularly; there will generally be nausea and vomiting. The complexion is of a peculiar sallow hue, the countenance is anxious, the eyes appear sunken and the lips livid, while around the gums is a purple line which is characteristic of copper poisoning. Sometimes there are attacks of dyspnœa from laryngeal and bronchial spasm, possibly due to the inhalation of minute particles of copper. This disease is not frequently met with. The sufferers are coppersmiths, but principally and most severely the workers in copper at ship-building yards, &c. According to Dr. Maisonneuve no injurious results are produced by the working of cold metallic copper. The ill effects are observed when the fused metal is poured into moulds, or in workshops where molecules of oxide and carbonate of copper float largely in the air, whence they get introduced into the air-passages and alimentary canal.

The management of these cases is simple. Attempts ought to be made to eliminate the poison from the system by purgatives; while the patient is to be relieved at the time by hot baths, sulphur baths, turpentine stupes or sinapisms, and the administration of ether with opium. The men often treat themselves, milk in large quantities being a favourite remedy. Efficient ventilation of the workrooms, and habits of temperance, must be enforced.

Lead colic—or Colica Pictonum, so called from its former frequency among the Pictones or inhabitants of Poitou—has super-added to many of the symptoms already mentioned, an intense grinding or twisting sensation around the navel, with retraction of the abdominal integuments towards the spine. There is usually pain in the back. The existence of a blue or slate-grey line around the edges of the gums is a pathognomonic symptom of the presence of lead in the system. Painters most frequently suffer from lead colic, in this country: they often have several attacks before the muscles of the arms become affected with paralysis, causing drop wrist. Sleeping in a recently painted room, drinking fluids which have been kept in leaden vessels, or water which has been kept in leaden cisterns, and especially rain water which from the absence of salts does not readily form an insoluble protective film over the lead: taking snuff adulterated with lead, &c., are not unfrequent causes of this affection.

In the treatment of lead colic, our first object must be to get
the bowels to act. This is usually accomplished with difficulty; but it will generally be best effected by administering from three to five grains of the resin of jalap, followed after some hours by full doses of sulphate of magnesia (F. 141). Two or three hours subsequently the patient may be placed in a warm bath, and part of the water injected into the bowels. Should these means fail, an ounce of castor oil may be given; or two or three doses of sulphate of magnesia with sulphuric acid (F. 142). Opium and belladonna will afterwards be necessary to remove all the pain. Opium may, however, be given from the first, and an excellent combination is sulphate of magnesia with ether and opium; or opium alone or with belladonna will overcome the constipation without purgatives. Only farinaceous food ought to be allowed; and the purging should be kept up for a few days by the sulphate of magnesia, administered every morning. As a principle, it is as well not to give calomel in these cases; since it possesses no advantage over simple remedies, and it might happen that the symptoms of the disease would be attributed to the effect of the mercurial. Under no circumstances, however, is calomel admissible save as a purgative; for surely no physician ought to give one mineral poison to a patient who is already suffering from the effects of another.

The application of electricity by induction—Faradization, is sometimes an excellent palliative; affording relief to the pain more speedily than any other remedy. If the practitioner be afraid of the electricity at first intensifying the suffering, the patient can be put under the influence of chloroform. When the attack has been relieved, and the bowels have been freely acted upon, the iodide of potassium should be administered (F. 31); while a hot sulphur bath (F. 125) had also better be ordered. Benefit will be derived from frequently repeating the latter.

XVIII. CONSTIPATION.

Constipation [Constipio = to crowd thickly together] is apt to arise during the progress of many acute or chronic diseases, or it may happen as an idiopathic affection. In either case, too much importance is usually attached to its occurrence; and consequently it is often treated with unnecessary activity.

The alvine evacuations, in a properly fed man, amount to 4 or 5 oz. daily (91 lbs. to 114 lbs. in the year). There is some variation in different individuals with regard to the frequency with which the bowels act during health. As a rule, most people have an evacuation every day; but some persons habitually go to stool twice in the twenty-four hours, while others only have an operation every second or third day. The most important consequences
which result from habitual constiveness (by which term is meant, a departure from the standard natural to each individual) are irritation of the gastro intestinal mucous membrane, and perhaps the reabsorption of excrementitious matters. The functions of the stomach, liver, pancreas, intestinal glands, &c., become imperfectly performed. Hence complaint is made of a sense of oppression, mental and bodily: the intellectual faculties are dulled, the complexion gets sallow and pasty, the skin is harsh and dry, the urine is scanty and usually loaded with urates, while such motions as come away are pale and clay-like and very offensive. In obstinate cases the sufferer will possibly lose all power for exertion, he may have frequent attacks of wearisome headache, and dispiriting fits of palpitation of the heart are not uncommon; while more or less severe paroxysms of neuralgia torment him, and he gets hyped or even becomes a confirmed hypochondriac.

The causes of constipation are numerous. It may arise from structural disease of the intestinal coats, e.g. tumour, cancer, and the contraction of cicatrices; or from some painful affection of the rectum, such as haemorrhoids and fissure of the anus; or from debility of the abdominal walls, so that the parietal muscles cease to contract firmly and thus fail to assist the peristaltic movements of the intestines; or from disease of the nervous system; or from the secretions of the liver or pancreas or intestinal glands becoming disordered, or merely deficient in quantity. But of all causes the most frequent is a torpid condition of the colon, leading to insufficient contraction of this gut with the accumulation of faecal matter. This occurs in old people, in individuals weakened by exhausting disease, in chlorotic females, in the votaries of fashion accustomed to indolent and luxurious habits, in those who neglect to attend to the calls of nature, as well as in such as are engaged in sedentary occupations. In addition to constipation there is defective appetite, slow digestion, a pale sodden tongue indented at its edges, flatulence, fetid breath, a dingy complexion with dark lines under the eyelids, and low spirits. When there is an accumulation of faeces the masses may be felt through the abdominal parietes, unless these walls are loaded with fat. Large collections sometimes take place about the cecum, in the sigmoid flexure of the colon, and in the rectum. Sometimes the quantity of retained faecal matter gets so excessive that a large abdominal tumour is formed; which will perhaps give rise to jaundice by its pressure on the biliary duct, or to oedema by impeding the flow of blood through the inferior vena cava. Cases have been observed in which the abdomen has been enormously distended, where a motion has not been passed for ten or twelve weeks, and where the contents of the rectum have had to be scooped away to procure room for the use of enemias. Now and then we hear it urged that an accumulation cannot have taken place, because the patient is tormented with tenesmus, and (as he persists in believing) with
diarrhoea. The fact is, however, that when the descending colon and rectum become blocked up, small quantities of fecal matter may flow through a channel formed in the mass, or they may pass between the substance and the walls of the bowel, and so lead to deception. I have seen several such cases, occurring in delicate females during the period of pregnancy.

In attempting to cure habitual constiveness, the grand aim of the practitioner must be to do away with the use of purgative drugs. This cannot usually be effected at one rude blow; although it is possible at one to substitute simple aperients for the various patent medicines, the mischievous blue pills, and the nauseous black draughts, with which the public are so fond of tormenting themselves. The remedies that may for a time be employed, at properly regulated intervals, are castor oil, olive oil, rhubarb and magnesia (the official compound rhubarb powder), syrup of senna, sulphate of soda (F. 144, 148), purified ox bile (F. 170), nitric acid and taraxacum (F. 147), Sciditz powders (F. 169), glycerine, resin of podophyllum with rhubarb or puccaunha (F. 30, 160) &c. Small doses of the extract of Barbadoes aloes are often of great service; from half a grain to three grains, in a pill, at dinner, producing a comfortable action in from six to twelve hours. The dose found to be sufficient to insure one stool daily should be persevered with just as long as is deemed necessary, and then gradually diminished. The effect of the aloes is increased by combining it with the extract of nux vomica, with sulphate of zinc, and with pepsine, or with extract of belladonna. On the contrary, the aperient action is lessened by administering it with reduced iron and quinine, or with sulphate of iron. An imitation of the Cheltenham or Carlsbad waters (F. 180, 181) will often prove useful; the Friedrichshall water suits some cases. So too, simple electuaries (F. 194) may be tried; or five or ten grains of spirits of tar, formed into pills, and taken every night at bed-time for some weeks sometimes succeed; or frequently it will be much better if the patient can be persuaded to trust to enemata of soapy water, of salt and barley water, or of castor oil (F. 188, 189, 190). A suppository made with sixty or eighty grains of cocoa butter, or the same quantity of soap, can be easily introduced into the rectum, and will generally act quickly. To restore tone to the colon, tonics are invaluable; and hence many of the prescriptions just recommended contain these agents in combination with the peracetics. But after ten or fourteen days the aperient medicines had better be gradually discontinued and tonics alone trusted to; the best drugs of the latter nature being quinine and steel and strychnia (F. 380), quinine and rhubarb and hop (F. 385), sulphate of zinc and nux vomica (F. 409), strychnia and nitro-hydrochloric acid (F. 378), valerianate of zinc and belladonna (F. 410), different preparations of pepsine (F. 420), and cod liver oil (F. 389). With nervous cases a mixture containing the hypophosphite of soda or
lime (F. 419), or a solution of phosphorus in cod liver oil (F. 417), taken twice or thrice daily, often acts advantageously; while in those examples of chronic disease attended with suffering, where opium is needed, the constipating effect of this drug may generally be obviated by combining the extract of belladonna with it (F. 340, 344).

None of the foregoing remedies will prove of permanent service unless attention be paid to the diet. It is of the greatest importance that the food be wholesome and digestible; a variety of dishes being only injurious when they lead the patient to eat to excess. Vegetables are often objectionable, more especially if they produce flatulence; while the necessity for them, until the function of digestion is healthily performed, can often be obviated by the use of ripe fruits in the morning. When the latter fail, figs or prunes soaked in olive oil will perhaps succeed. Oatmeal porridge for breakfast is regarded as a specific by some patients; while others look to their pipe or cigar for affording the necessary provocative. Brown bread—that containing the bran, can often be substituted for the fine bread usually consumed; but for the stomach to be able to utilize that outer covering of the wheat, rich in gluten and fatty matter, it must be strong enough to digest it properly. The aerated loaf is generally to be preferred either to brown or the common white bread, since it is certainly more easily assimilated.

Daily exercise in the open air, either on foot or on horseback, stands foremost amongst the remedies for constipation. General indolence, with too much sleep, must be avoided. There are very few cases of costiveness with dyspepsia, arising from sedentary pursuits, that may not be cured by the sufferer retiring to bed at eleven o’clock, and drinking a tumblerful of spring water; rising at seven in the morning and taking a bottle of soda water, then walking for three-quarters of an hour, and afterwards breakfasting upon weak tea with plenty of milk, fat bacon or cold meat, bread, &c. In the hepatic sluggishness of old age, nothing is more beneficial than a daily walk, or even a ride in an open carriage.

There are, in conclusion, two or three suggestions which may be advantageously remembered. Thus, it is very necessary that the different meals should not be hurried, it being important to masticate the food thoroughly. Where the teeth are unsound or deficient, they ought to be replaced by well-made artificial ones.—The bowels can be advantageously solicited to act at a regular hour every day; soon after breakfast being perhaps the best time. —A tepid salt water sponge or shower-bath every morning, followed by friction with coarse towels, gives tone to the alimentary canal.—In some instances, where the liver is congested or the secretion of intestinal mucous deficient, marked benefit arises from wearing the “wet compress” at night; this application merely
consisting of two or three folds of thin flannel or calico, wrung out in cold water, laid upon the abdomen, and covered with gutta-percha or a piece of impermeable cloth.—When the abdominal muscles are weak and flabby, and the peristaltic action of the contractile fibre-cells of the intestinal walls is deficient, galvanism proves of great utility.—And lastly, in the cases especially of children and old people, gentle kneading of the abdominal muscles, or friction with some stimulating liniment, will often produce a daily evacuation without any discomfort.

XIX. OBSTRUCTION OF THE BOWELS.

Intestinal obstruction is a fearful disorder which may arise from several conditions. The chief of these are stricture, intussusception, and internal strangulation. Pathologists who like learned words speak of obstruction with fecal vomiting as Ileus [Ἑλεος = I twist or contract]; while the disease is also known as the Ileus passion, Volvulus, and Cotique de Miséricorde. The most frequent cause perhaps of an obstruction to the passage of the feces through a part of the intestinal tube is strangulated hernia; and consequently in every case of obstinate constipation the practitioner should make a careful examination of those parts of the abdomen, thigh, and hip, and (in woman) of the vagina, at which the intestines may protrude.

Pathology, &c.—Dr. Haven has collected, from various sources, the histories of 258 cases of intestinal obstruction; which, without including examples of inguinal and femoral and umbilical hernia, he has thus tabulated:

Three divisions of the causes of intestinal obstruction are made, viz:—

1. Intermural, or those originating in and implicating the mucous and muscular coats of the intestinal walls:
   a. Cancerous stricture.
   b. Non-cancerous stricture, comprising—
      i. Contractions of cicatrices following ulceration.
      ii. Contractions of walls of intestine from inflammation, non-cancerous deposit, or injury.
   c. Intussusception.
   d. Intussusception associated with polypi.

2. Extramural, or those causes acting from without, or affecting the serous covering:
   a. Bands and adhesions from effusion of lymph.
   b. Twists or displacements.

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c. Diverticula.
d. External tumours or abscesses.
e. Mesocolic and mesenteric hernia.
f. Diaphragmatic hernia.
g. Omental hernia.
h. Obturator hernia.

3. Intramural, or obstructions produced by the lodgment of foreign substances:
   a. Foreign bodies, hardened feces, concretions having for nuclei gall-stones, &c.

In the first class, the large intestine is affected more than twice as frequently as the small; in the second class, the reverse happens. The average duration of the attack of obstruction is shorter in the first class than in the second; on the whole, the average is about three weeks. Sir Astley Cooper mentions three other causes of obstruction, viz.—hernia at the ischiatic notch, at the foramen Winslowii, and perineal hernia; but none of these causes existed in any of the 258 reported cases.

In 169 examples of intestinal obstruction collected by Mr. Phillips*—63 were instances of invagination or intussusception; 60 of strangulation by the constriction of bands, adhesions, and abnormal openings; 19 were caused by disease of the coats of the bowel; 11 by impaction of hardened feces, or concretions; and 16 were owing to the pressure of tumours external to the bowel.

When the strangulation is due to bands or twists, the lower part of the ileum is the most frequent seat of the mischief. There may be only one band, and it may have various attachments in different cases. Most commonly perhaps, it is connected by one or both ends with the mesentery. In some rare instances a portion of bowel has slipped down into the pelvis in front of the pedicle of an ovarian tumour, and has become fatally strangulated.

In intussusception (that condition where one part of the bowel is drawn into another portion, just as the finger of a glove can be made to glide within itself) the passage of the gut gets more or less obstructed by the congestion, effusion, and inflammation which result. Most frequently the intussusception is single, though three or four of even ten distinct invaginations have been found in the same subject. The traction is usually from above downwards,—that is to say, the upper segment of the bowel is drawn into the lower. Probably in half the cases, the ileum and cæcum are protruded into the colon, the ileum first passing through the ileo-cæcal valve and then dragging the cæcum with it. This kind of obstruction is most common in young children and in old age; while in addition to the sickness, constipation, tenesmus, sudden violent pain, &c., there is often a discharge of blood and mucus per anum. Some-

times the invaginated ilcum comes within reach of the finger in
the rectum or even protrudes from the anus. Spontaneous
reduction of the invagination may take place; but when it does
not happen, inflammation of the peritoneal coats of the involved
portion of the bowel usually sets in between the third and seventh
days, the opposed surfaces probably becoming adherent in from
two to eight days after the commencement of the peritonitis.
Where the intussusception does not cause complete obstruction,
weeks may elapse without any inflammation occurring. In a con-
siderable number of instances the inflammatory action ends in
gangrene, and many inches of the included sphecated bowel
have come away by the rectum, leaving the canal of the gut free;
so that a cure will often ensue if care be taken not to disturb the
adhesions. From the discovery of intussusception in the dead
body it must not always be inferred that this displacement existed
during life. Where no symptoms of this state have been pre-

tented before death, it is probable that the occurrence has
happened subsequently from contraction of the muscular tissue
during the rigor mortis.

Intestinal concretions (alvine calculi) are very rarely found in
the human intestines, compared with their frequency in large rumi-
nating animals. In man, they are more common in the cecum
and colon than in other portions of the alimentary canal. Bezoars
consist chiefly of imperfectly crystallized earthy salts and indi-
gestible fibrous matters, arranged in concentric layers round a
nucleus—a gall-stone or any foreign body. Other concretions
may consist solely of hardened fices, with the phosphates of lime
and magnesia; or of chalk or carbonate of magnesia, where these
substances have been largely taken; or of hair, cotton, or paper
when a depraved appetite has led to the consumption of either;
or of gall-stones with layers of inspissated mucus and fecal matter.
Either kind may gradually increase in size, until there is complete
obstruction of the gut. In fortunate cases, concretions have been
expelled by vomiting or passed at stool. When situated in the
rectum they can be removed by the scoop. If one or more can
be felt through the abdominal parietes, producing obstruction, an
incision into the intestine has been recommended, all other plans
failing. I am not aware that such an operation has been performed.

Compression of the duodenum by enlargement and induration
of the head of the pancreas may cause obstruction. The canal of
the bowel may thus become entirely closed; partly by the direct
pressure and partly by the great congestion and thickening of the
coats of the gut set up by the compression.

With regard to cancerous stricture, the sigmoid flexure of the
colon and the rectum are the parts usually affected. The walls of
the bowel need not be infiltrated with cancer in their entire cir-
cumference. There is a history of previous suffering. There
have been discharges of blood and mucus from the bowels; whilst
the faeces have been small and flattened, or reduced to the size of the stem of a tobacco pipe. Moreover, the general symptoms of malignant disease are superadded to the signs of occlusion of the intestinal tube.

**Symptoms.**—The principal symptoms of obstruction of the bowels are constant vomiting, which is at first simple—consisting of the contents of the stomach and mucus, but which in a few days becomes stercoraceous or faecal; pain varying in degree, often very severe; gradually increasing tympanites, with violent borborygmi, unless the occlusion be high up; severe hiccup, particularly in stranguation of the upper part of the small intestine; great mental depression; and the pathognomonic symptom—constipation. Very careful palpation will often detect, at an early period, a feeling of increased fulness just above the obstruction. Percussion elicits diminished, resonance, more marked at the point at which the intestinal transit is blocked than elsewhere. In almost all instances, the prostration sets in early. Acute peritonitis very commonly occurs in a few days; while gangrene is most frequent in intussusception and obturator hernia. The lower the obstruction is situated the less urgent will be the vomiting. If, for instance, it is in the duodenum, the vomiting will be incessant from the beginning; if in the colon, it may be absent for some time. It might be thought that the illo-cæcal valve would prevent the return of the contents of the colon into the ileum; the preliminary dilatation, however, renders this valve quite patulous. When urine is freely secreted, the obstruction cannot be very high up, since absorption is only partially checked. The urine, however, may be scanty when the scat of occlusion is low down, if there be copious vomitings of fluids; or if there be much fever present.

From the time of Galen the occurrence of faecal vomiting has been explained on the supposition that it was effected by an anti-peristaltic movement of the intestinal canal. Dr. Brinton, however, has shown conclusively that the natural peristaltic action of the bowel above the occluded point is not reversed; but that the intestinal contents are gradually propelled until stopped at the obstructed point. Here they accumulate so as to distend the canal with a liquid mass; and then a double current is formed, one at the surface or periphery of the tube having the direction of the peristalsis itself, and one in its centre or axis having exactly the reverse course.

When the obstruction is in the upper tract of the small intestine, and our treatment fails to remove it, death usually occurs from collapse in a period varying from five to ten days; while occlusion of the colon, from being attended with less pain and distress, and from not interfering so much with the absorption of nutriment, may only prove fatal after several weeks. More-
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over, it must be remembered that in cases apparently hopeless, a spontaneous cure sometimes takes place almost at the last moment; so that the more protracted the duration of the disease, the greater the chance of recovery.

TREATMENT.—In the management of cases of obstruction of the bowels there must be at first a period when the diagnosis can only be doubtful. At this early stage purgatives will certainly be resorted to, though they need never be of a violent or drastic nature. An ounce of castor oil may be given, or two or three grains of resin of jalap, or ten grains of the pill of colocynth and hyoscyamus; though preferably an enema (F. 189, 190, 191) should be tried, the patient being directed to retain it for an hour or two if possible. But directly the practitioner is convinced that there is some mechanical obstruction to the passage of the stools, all remedies of this class ought to be strictly withheld, since they are positively mischievous.

Under these circumstances the increase in the severity of the symptoms is to be retarded by attention to the nourishment of the patient, and by alleviating pain. As regards the first point, it is certain that the more freely food and fluids are partaken of, the greater will be the distension and torment and danger. It is absolutely necessary therefore that the sufferer exercise great self-denial; and that instead of attempting to quench his thirst with copious draughts, he be content to alleviate it by sucking ice and frozen milk, as well as by frequently washing out his mouth with cold water. To support the strength small quantities of extract of beef, or soup thickened with flour and eggs (F. 1, 2, 3, 5), had better be given; a little tea with cream is often refreshing; while iced brandy and water will form the best stimulant. If the vomiting be severe, food by the mouth must be stopped, and nutrient enemata (F. 21) trusted to.—The second indication is to be carried out by a recourse to sedatives. When the suffering is not acute I generally trust to the administration of belladonna and hyoscyamus (gr. ¼ of the first to gr. 5 of the last); repeating this pill every three or four or six hours according to the urgency of the symptoms and the way in which the drugs are tolerated. But there are more severe cases where stronger remedies are needed, and then opium is to be administered. This medicine frequently proves invaluable under these circumstances; inasmuch as it relieves or removes pain, checks spasm and contraction, diminishes the peristaltic action of the bowels, and supports life by lessening waste of tissue. Large quantities will usually be needed; while no preparation is better than the official extract, given at first in grain doses every four, six, or eight hours. If preferred, however, the subcutaneous injection of morphia and atropia (F. 314) can be tried instead of exhibiting the opium by the mouth. Relief will also be afforded by the free application of belladonna mixed
with extract of poppies (F. 297) over the abdomen, together with the assiduous employment of large hot poultices or fomentations.

But it may fairly be inquired,—are there no direct means which can be tried in order to overcome the obstruction? There are two: a surgical operation; and the injection of large quantities of fluid or air into the bowel, with manipulation of the intestines by pressure upon them through the abdominal walls. As regards gastrotomy, the want of success which has attended this operation has been so universal, that many excellent surgeons now consider it unjustifiable. For they argue, that while on the one hand this proceeding has almost always proved fatal, on the other, many desperate cases which have been let alone have ended favourably; recovery setting in just as all hope was being abandoned. Allowing the great force of these objections, it still seems to me that there are a few—possibly quite exceptional—instances where surgical interference may be the means of prolonging life, when all else seems to have failed. Thus, if we can be certain that the occlusion is due to malignant disease or to some tumour in the sigmoid flexure of the colon or rectum, then by opening the colon in the left loin (Amussat’s operation) and forming an artificial anus, the surgeon may be the means of relieving much suffering and lengthening life. So also in cases where the obstacle is in the transverse portion of the colon, a similar proceeding can be resorted to in the right loin. Again, if by a careful and searching examination we come to the conclusion that the obstruction is in the small intestine, and is caused by a diverticulum, or by a constricting band of organized lymph round the bowel, it is the duty of the practitioner to perform gastrotomy. Gastrotomy has also been performed successfully for intussusception, the invaginated intestine being withdrawn from the part of the canal into which it had descended. On the contrary, in the case of intramural obstructions, of stricture from the contraction of cicatrices, of obstruction complicated with enteritis or peritonitis, of obstruction from cancer of the small intestine,—in neither of these instances has any operation the least chance of success.

The use of large enemata, with manipulation, remains to be mentioned. And first it must be remarked, that though this proceeding is here spoken of at the end of this section, it is really to be practised at a very early stage, and certainly before there is any fear that the tissues have become gangrenous. Supposing that ordinary injections into the rectum have failed in their object, the patient should be placed on his back, with the pelvis considerably elevated while the shoulders are depressed. A long stomach-pump tube is then to be carefully passed as high as it will go; the anus is to be compressed around the tube by pressure with the hand and napkins; and warm water is to be slowly injected, as much as possible being thrown up until there is distension of the
bowel. As the fluid is allowed to come away the surgeon is to press with the flat of his hands upon the abdomen so as to move the coils of the intestine upon one another, and to press them upwards against the diaphragm. This proceeding may be adopted more than once; and in many cases it will be advantageous to have the patient under the influence of chloroform while practising it.—Inflation of the bowel is a "hopeful proceeding in the intussusception of children." The air should be slowly injected, until the abdomen is greatly distended; while stimulants ought to be at hand, since the proceeding is apt to give rise to syncope.

Inasmuch as I should never resort to the use of crude mercury in doses of one or two pounds, or of small shot, or of strong tobacco injections, these agents need not be noticed, except to mention that they have each been recommended.

XX. INTESTINAL WORMS.

Helminthology [from Ἑλμυντ = a worm + λύγος = a discourse], or the science which treats of the internal parasites of man and animals, has of late years attracted considerable attention. The number of these different parasites met with in the human subject is rather large (at least thirty-one), for there is scarcely a tissue or organ in the body in which they are not known to lodge and nourish themselves. The classification of the helminths into those inhabiting the intestinal canal and those residing in other organs is only to be sanctioned on the ground of convenience; for scientifically such a division is imperfect.

There are seven principal entozoa [Ἐντοξ = within + ᾦων = an animal] occasionally found inhabiting the human intestinal canal. Of these, four possess an alimentary tube, and are therefore called hollow worms, or Ccelomintha [Κοῖλος = hollow + Ἑλμυντ]; while there are three which have no abdominal cavity, and are hence termed solid worms, or Sterelmintha [Στρες = Ἑλμυντ].

In the first class we have the following:—

1. The Tricocephalus dispar, or long thread-worm, is a small nematode [Νημα = a thread + Ἑλμυντ = form] helminth, usually found in the cæcum and large intestines. It measures from an inch and a half to two inches in length, and has a very slender body. This parasite is said to be often present in considerable numbers, even in the intestines of healthy persons; and certainly it must be very prevalent in some localities, if M. Davaine’s calculation is correct, that half of the inhabitants of Paris are infested by it. During life these worms give rise to no special symptoms.

2. The Ascariis lumbricoides, or large round-worm, is found in the small intestines, especially of ill-fed children. This nematode
helminth somewhat resembles in size and appearance the common earth-worm. It varies in length from six to twelve or fourteen inches, is of a light yellow colour, and is unisexual. The female is larger than the male. Although the habitat of this worm is the small intestines, yet it may migrate upwards into the stomach or downwards into the colon; and consequently be vomited in the one case, or evacuated with the stools in the other. Sometimes these worms are very numerous; thus Dr. Hooper has recorded an extraordinary instance in which a girl passed more than two hundred in one week. The symptoms which they give rise to are usually obscure; but there may be thirst, disturbed sleep with grinding of the teeth, moroseness with low spirits, pallid countenance, fetid breath, swelled belly, emaciated extremities, depraved appetite, slimy stools, itching of the nose, tenesmus, and irritation of the anus.

3. The _Oxyuris vermicularis_, or small thread-worm, is found in the rectum, about the sigmoid flexure of the colon, and even in the caecum and lower end of the ileum. It is the smallest of the intestinal worms, averaging usually about a quarter of an inch in length, while the female is longer than the male. This nematode worm is very frequently met with in children, and is permanently got rid of with great difficulty. It is very rarely found solitary, being generally present in groups or masses. The symptoms produced by these oxyurides are chiefly, intolerable itching and irritation about the anus, tenesmus, depraved appetite, picking of the nose, offensive breath, and disturbed sleep. Exceptionally, more serious results ensue; such as convulsions, chorea, epileptiform attacks, and irritation of the sexual organs leading to other evils.

4. The _Sclerostoma duodenale_, a small nematode worm about the third of an inch long, is unknown in this country. As shown in the remarks on diseases of the duodenum this entozoon is very common in Egypt, its presence in the small intestines of the natives giving rise to severe anaemia. The people of Northern Italy also suffer from it.*

In the second class we find three species:—

1. The _Taenia solium_, or common tapeworm of this country, belongs to the cestode [Greek: Κερτός = a girdle + ετέρας = a group] group of helminths. It may occur singly, or there will be some three or four taeniae. This parasite consists of a number of separate joints,

* The _Distoma crassum_ and the _Distoma heterophyes_ (small trematode helminths) have also been discovered in the small intestines. The first variety was once found by Mr. Busk in the duodenum of a Lascar; the second kind was discovered by Dr. Bilharz, of Cairo, in two cases.—Dr. Cobbold has also shown that the common _Ascariis mystax_ of the cat may infest the human intestine. This nematode worm is especially characterized by the presence of aliform appendages, one being placed on either side of the head. The male acquires a length of about two inches and a half, whilst the female is nearly twice as long. The cases in which this helminth has been detected in man are only three or four in number.
called proglottides. It exists in the small intestines; while it varies in length from five to fifteen yards, and in breadth from two lines at its narrowest part to four or five at its central or broadest portion. The head of this parasite (or perhaps more properly, its root) is small and flattened; having in its centre a projecting papilla, armed with a double circle of hooks, around which are four suckers or mouths by which the worm attaches itself to the mucous coat of the bowel. The generative apparatus consists of a ramified canal or ovarium containing the ova; and of a minute spermatic duct, both occupying the centre of each joint or segment. This worm is probably nourished by imbibition through its tissues, just as algae imbibe nourishment from the sea-water in which they float. The researches of Küchenmeister have shown that the Tenia solium is the same parasite as the Cysticercus cellulose (pork-measle) of the pig, which is the larval or scolex condition. The symptoms which arise from the presence of the tapeworm are not very striking, its existence being generally unsuspected until single joints are passed in the stools. In certain cases, however, there is a continual craving for food, debility, pain in the stomach, irritability of the bladder, vertigo, noises in the ears, attacks of faintness, restlessness, emaciation, and itching about the nose and anus.

2. The Tenia mediocanellata is a cestode worm, with its segments somewhat larger than those of the common tapeworm. It differs from the latter also in other respects, but particularly as regards its head; which, although furnished with large sucking-discs, is destitute of any hook apparatus—is unarmed. The "measles" or cysticerci which produce this helminth are found in the muscles of cattle. According to Dr. Cobbold the hookless tapeworm is as common in this country as the Tenia solium, for which it is generally mistaken. "One may even go so far as to state that, admitting occasional exceptions, the hooked worm infests the poor, and the hookless worm the rich. This circumstance accords with the fact that the lower classes subsist chiefly upon pork, whilst the wealthier prefer mutton, veal, and roast beef."

3. The Bothriocephalus latus, or broad tapeworm, is almost peculiar to the inhabitants of Switzerland, Russia, and Poland. It is the largest cestode helminth ever met with in the human subject; sometimes, according to Dr. Cobbold, attaining a length of more than twenty-five feet, and a breadth of nearly an inch. The extreme fertility of the Bothriocephalus latus may be imagined by considering that each foot of the well-developed worm contains 150 segments or joints, each joint possessing its own ovary and male organs. Hence each joint is fertile; and as each ovary

could produce 8000 ova, it may be calculated that ten feet of such a worm might create 12,000,000. These parasites are very rarely met with in this country, but nevertheless they are discovered occasionally. Professor Owen, examining the collection of a worm doctor in Long Acre, found three specimens: two had come from persons who had been in Switzerland, but of the third nothing was known.

*Causes.*—The eggs and larvae of the entozoa gain admission into the stomach through the use of raw and underdone animal food, especially pork. They also get introduced with vegetable food,—probably with watercresses, celery, lettuce; possibly with fruit, such as apples and pears; and certainly with impure drinking water. The eggs and embryos of the taenia solium, of the taenia mediocanellata, and of the taenia echinococcus may often be found in pond and ditch and other stagnant waters.

*Symptoms.*—The most common symptoms produced by intestinal worms are—colicky pains and swelling of the abdomen; picking of the nose; itching of the rectum and fundament; pruritus of the perineum; foulness of the breath; irregularity of the bowels; attacks of headache; grinding of the teeth at night; pallor and slight puffiness of the face; a frequent feeling of malaise; and voracious or impaired appetite. The most conclusive sign is the passage of some of the worms, or of joints of them, in the faeces; and indeed without this, the other symptoms are of little value.

When intestinal worms produce much irritation, the nervous system may become affected by reflex action; and hence convulsions, or epileptic attacks, or fits of hysteria are not infrequently the result. So also there may be noises in the ears, giddiness, considerable anaemia, and even insanity. Küchenmeister mentions, without confirming the observation, that Dr. Ficinus of Stolberg regards habitual pains in the crown of the head as dependent upon tapeworm. He found this symptom almost always accompanied with this parasite, although only so in women.

*Treatment.*—We have several remedies for the round and tape-worms, such as the oil of turpentine (F. 183), santonin (F. 185), kousso (F. 184), kamela (F. 182), calomel with scammony or jalap (F. 159), and especially the liquid extract of male fern. I am in the habit of trusting to the latter, which may be employed in full doses even for children three or four years old, and which is to be thus administered. On the first morning the practitioner commences hostilities with a dose of castor oil, aloe, or a Seidlitz powder; while during the day he takes care to keep the patient on very low diet, only allowing a little good beef tea. At night the purgative is repeated, so that the worm or worms get thoroughly uncovered by the removal of the contents of the alimentary canal. Consequently they receive the full benefit of the (to them poisonous) dose of male fern, which is taken the first thing on the following morning, according to F. 187. By this means, perhaps once or
twice repeated, there will seldom be any difficulty in removing the whole worm, including the head. To prevent the development of another worm tonics should be given, especially the mineral acids with steel in infusion of quassia. The patients ought likewise to be directed to take plenty of salt with their food; and to have the latter well-cooked.

The oxyurides can generally be killed by enemata of cold water, or of infusion of quassia, or of steel and quassia (F. 192), or of a solution of common salt (F. 188), or of lime water, or of fifteen minimis of sulphuric ether in an ounce of water, or of the tincture of the perchloride of iron—in the proportion of half an ounce to half a pint of water for adults. Mercurial purgatives have seemed to me to act beneficially, while sometimes large quantities of the worms have come away after an attack of bilious diarrhoea. Nevertheless, it is often very difficult to effect a thorough cure in the case of patients tormented with the Oxyuris vermicularis. The reason is that the parasites live and breed in the upper part of the colon and caecum as well as in the rectum. The only effectual way to exterminate them thoroughly is to administer a series of three or four brisk purgatives, which will dislodge them from the upper part of the large intestine and bring them within reach of enemata, which must be persevered with twice a week for several months, while some preparation of steel is given and the aperients are repeated from time to time. Unless this is done the worms may be apparently quite destroyed, and for a time there will be a cessation of annoyance; but again and again they return, until the sufferers or their parents give up all treatment in disgust.

XXI. TRICHINIASIS.

Trichina disease, or Trichiniasis [from ὀξυς, ἀρσιχρός = a hair] is a peculiar febrile helminthic affection, somewhat resembling typhoid fever in its general symptoms, and although the entozoon does not inhabit the alimentary canal exclusively, it may be most appropriately described here since it is introduced in the food, and it is in the intestine that the trichinae are bred and from which they migrate.

Dr. F. A. Zenker, in the year 1860, first proved the existence of this disease (in the case of a girl who died at Dresden) and showed that it was due to trichinal infection. The small nematode worm which has attracted so much attention since the publication of the striking observations of Dr. Zenker was discovered by Professor Owen, in the year 1835, in a portion of the muscles of a male subject sent to him by Mr. Wormald. A peculiar speckled appearance of the voluntary muscles had attracted the attention of this gentleman; and these specks were
found by Mr. Owen—as Tiedemann and Mr. John Hilton had previously shown to be the case in similar instances—to consist of minute encysted entozoa. For this parasite Mr. Owen proposed the name of *Trichina spiralis*, owing to its hair-like and spirally-coiled form. Since this period it has been frequently discovered in the dissecting-room by German and English anatomists; although, prior to 1860, it was regarded as an interesting curiosity, rather than as the cause of a serious disease. If a muscle infested by trichinæ be examined, it will generally be found to present a peppered appearance owing to the presence of small and greyish-white gritty granules. These specks or granules are the round or oval, and more or less calcified, cysts. They contain the immature worm, or worms; and each capsule generally measures the $\frac{1}{2}$ of an inch in its longitudinal direction, and the $\frac{1}{10}$ of an inch in the transverse diameter. The young trichina, when extracted from the cyst, is usually disposed in two, or in two and a half, coils; while on being straightened out it is found to be about the $\frac{1}{3}$ of an inch in length, and the $\frac{1}{5}$ of an inch in diameter (Owen). Trichinæ may, however, exist abundantly in muscular tissue, though only to be recognised by means of the microscope, without any cysts or capsules being present; the latter being only abnormal formations, according to Leuckart. The fully developed and sexually-mature male trichina measures the $\frac{1}{15}$, and the adult female the $\frac{1}{6}$, of an inch (Cobbold); the increased size of the latter being due to the great development of the oocytes and oviducts.

An excellent account of the trichina was published by Leuckart, at Heidelberg, in 1860; and though some of his conclusions have been disputed by subsequent observers, yet generally they are believed to be correct. He sums up the results of his labours in sixteen propositions, which are as follows:—

1. The trichina spiralis is the juvenile condition of a small nematode worm hitherto unknown, to which the genus name "trichina" has also to be given. 2. The sexually developed trichina inhabits the intestinal canal of numerous warm-blooded animals, particularly of mammals, and of man, and always in great numbers. 3. Already, on the second day after immigration, does the intestinal trichina attain its full sexual maturity. 4. The eggs of the female trichina are developed in the uterus of the mother into filaria-like very minute embryos; which, beginning from the sixth day, are born without any covering derived from the egg. 5. The newly-born trichinae soon commence a migration. They penetrate the walls of the intestines, and pass through the abdominal cavity directly into the muscles of the animal in which they are bred, where they are developed into the well-known form, provided the conditions are favourable. 6. The direction in which they move is marked out by the intermuscular cellular
tissue. (7) The majority of embryos remain in the group of muscles surrounding the abdominal cavity, particularly the small muscles with much connective tissue. (8) The embryos pierce into the interior of the single primitive muscular fibres, and here they attain within a fortnight the size and organization of the well-known trichina spiralis. (9) The infected muscular fibre loses its original structure soon after the entrance of the parasite. The fibrillae are transformed into a finely granular matter, while the nuclei of the sarcolemma are metamorphosed into oval nucleated cells. (10) The infected muscular fibre retains its original shape until the young trichina is fully developed, while afterwards its sarcolemma is thickened and contracts from both ends towards the middle. (11) The spot inhabited by the coiled-up parasite is converted into a spindle-shaped dilatation, round which the sarcolemma is thickened and hardened by the deposition of calcareous particles, producing the lemon-egg- or ball-shaped cyst. (12) The migration and development of embryos is also effected by the transfer of pregnant trichinae into the intestine of a new suitable animal. (13) The development of muscular trichinae into sexually ripe animals is quite independent of the presence or absence of the calcareous membrane, and begins whenever the former are fully developed. (14) Male and female individuals can already be distinguished in the juvenile state. (15) The immigration of great numbers of young trichinae causes a very dangerous, and, under circumstances, fatal disease. (16) The mere eating of trichinous flesh may (without immigration of young trichinae) cause more or less dangerous or even fatal conditions.

The symptoms of trichiniasis vary in degree, being mild or severe according as only a few or many of the worms have been swallowed, as well as in proportion to the number of the progeny and the extent of their migrations. Thus, Dr. Althaus remarks that in the epidemic of Burg, near Magdeburg, a woman who had eaten a quantity of raw pork with bread, fell ill and died: her child, who had sucked a spoon used by the mother, suffered slightly and recovered.—According to the accounts given by most authors, the earliest symptoms are loss of appetite and general malaise; to which succeed nausea and retching, prostration, diarrhoea, a sense of thorough indisposition, and a painful stiffness about the neck and arms and legs. This pain is due to the immigration of the young trichinae into the muscles; and it is accompanied with high fever, and an oedematos swelling about the eyelids and face. The pulse is frequent, and there are copious offensive perspirations; but although the temperature of the body is raised it does not reach the same height as in typhus and typhoid fever. For some days the stiffness of the limbs continues to increase; while all the muscles seem to be painful and swollen and very sensitive to the touch. The movements of the intercostal
muscles in respiration are attended with suffering, so that repose is impossible; while there will be troublesome hiccup if the diaphragm be invaded, with hoarseness and loss of voice where the laryngeal muscles get inhabited. Neuralgia of a very severe description, in the celiac and mesenteric plexuses, has likewise been present in certain cases. When a large quantity of trichinous meat has been eaten, so that the immigration of the trichinæ into the muscles is great, the patient may lie almost paralysed in a state of great exhaustion. The facial œdema generally lasts about a week, its disappearance being followed by swelling of the feet and legs, and ultimately of the trunk. There is no effusion, however, into any of the cavities; nor does the urine become albuminous, although it is always lessened in quantity and may be loaded with urates. About the beginning of the fourth week the patient is in a pitiable condition. The pulse and respirations are very frequent, the tongue is red and dry, the pain is severe, the sweating is profuse, the mouth can scarcely be opened, no sleep can be obtained, and there is great anxiety or delirium; death not unfrequently occurring with all the symptoms of profound exhaustion. Such complications as pneumonia, peritonitis, and pleurisy with effusion, are not uncommon. In favourable cases, however, the pain and swelling and diarrhœæ abate; the oppression of the chest passes off; sleep is obtained; a desire for nourishing food is evinced; the power of the limbs is regained; and there is only left great anæmis, with a falling off of the hair, &c. The parasites have taken up their abode in the muscles, and have fortunately become encysted.

The diagnosis of trichiniasis is not difficult, especially if the symptoms come on shortly after very underdone or raw pork, ham, or sausages have been eaten. In the early stages, the trichinæ may be discovered in the stools; but the necessary microscopic examination will often occupy some hours. Subsequently, the worry can be found by taking out a small piece of an affected muscle and minutely examining it. In this way, the fact that the disease has been present may be ascertained long after recovery. Dr. Althaus quotes from Dr. Griepenkerl the following confirmation of this opinion:—From 1859 to 1862, an epidemic occurred in Blankenburg, in the Duchy of Brunswick, which was believed to be of the nature of gastro-rheumatic fever. Some time afterwards, when attention had been directed to the occurrence of trichina disease in other parts of Germany, the similarity of the latter distemper and the epidemic just mentioned, struck the doctors of Blankenburg; and a gentleman who had fallen ill there in 1859, but had recovered after a protracted illness, was informed that he had probably suffered from trichiniasis. He therefore offered to have a small piece of muscle cut out, and the specimen being examined by the microscope revealed no less than seven encysted trichinæ. It was thus shown that the Blankenburg