HÆMATEMESIS—HÆMORRHAGE OF THE STOMACH—VOMITING OF BLOOD.

Definition.—Hæmatemesis and vomiting of blood do not adequately name the malady, for blood may be swallowed and then vomited. Hæmorrhage of the stomach is the correct term.

Causes.—Rupture of a stomach blood-vessel is the essential condition of stomachal hæmorrhage, notwithstanding, under some circumstances, diapedesis of the corpuscular elements does occur. Sufficient blood must escape to excite nausea and vomiting. During an inflammatory stasis, considerable blood may escape from ruptured capillaries, but usually hæmorrhage is due to the giving way of vessels of some size; diapedesis, certainly, is quite inadequate to bring about the escape of much blood. There may be disease of the tunics of the blood-vessels sufficient to cause them to give way on slight increase of the blood-pressure. Furthermore, long-continued abnormal pressure will induce slow changes, without invoking other causes to account for their yielding should the pressure suddenly become greater. In this way may we explain the occurrence of gastric hæmorrhage in cirrhosis, acute yellow atrophy of the liver, yellow fever. Certain lesions, acting mechanically on the portal vein, bring about the same results—for example, an aneurism of the hepatic artery, a large calculus, or tumors in the neighborhood of the portal vein. Any obstruction of the portal vein may be the cause of blocking by a thrombus of a vessel returning blood from a certain part of the mucous membrane—the effect of this being the production of one or a number of superficial ulcers. Severe and protracted hæmorrhage may proceed from such erosions. Still more remotely is the occurrence of gastric hæmorrhage, caused by increased pressure in the portal system due to obstructive troubles of the lungs and heart. The hæmorrhagic diathesis may manifest itself in hæmorrhage from the gastric mucous membrane. Arrest of an hæmorrhoidal discharge, which has continued for a long time, is supposed, by a sudden increase in the blood-pressure within the portal system, to be a cause of hæmorrhage of the stomach.

According to the statistics of Handfield Jones, in seventy-two cases of hæmatemesis there were fifty-three females to nineteen males—showing a great preponderance in the female sex. As regards age, from twenty to forty there were nine males and thirty-six females, and after forty, eight males and fourteen females. These facts indicate that vicarious menstruation through the stomach must be relatively frequent. As in forty the existence of ulcers seemed probable, it is rendered pretty certain, by these figures, that ulcer is the most common cause of stomach hæmorrhage.*

* "Medico-Chirurgical Transactions," vol. xliii, p. 353.

Pathological Anatomy.—More or less coagulated blood, acted on by the acids of the gastric juice to a varying extent, is found in the stomach. It is often impossible to discover the source of the hæmorrhage, unless the hæmorrhagic erosions, already alluded to, have formed. They are usually situated in the neighborhood of the pylorus. When a large vessel has given way, the rent can usually be found with a coagulum in it.

Symptoms.—When a hæmorrhage occurs sufficient in amount to produce definite symptoms, the patient experiences a sensation of warmth in the stomach, while the periphery is cool or cold; distention, nausea, faintness. If the hæmorrhage is large, coming suddenly from a vessel of considerable size, without any apparent cause, the patient turns sick, faint, pallid, and cold, the stomach is distended, and then vomiting sets in, the blood rushing up in a full stream through the mouth and nose, or if less in amount it comes up by successive acts of vomiting. The faintness usually increases at the sight of blood, and only passes off on the cessation of the bleeding. In rare instances a large hæmorrhage occurs, the stomach is fully distended and returns a perfectly flat percussion-note, the patient becomes pale and cold and faint, or he actually does faint and is convulsed, without any vomiting, the blood subsequently passing off by stool. A patient enfeebled by disease may be suddenly carried off by a hæmorrhage in the stomach without vomiting. It not unfrequently happens that, when the blood comes up with a sudden gush, some is carried into the larynx, where it excites coughing, and hence may appear to be coughed up. This fact leads to erroneous interpretation of the nature of the case, and confusion as to the source of the hæmorrhage. The appearance of the blood is different according to the time it has been acted on by the gastric juice. If it comes up at once in large quantities, it is partly fluid and partly coagulated, like ordinary blood; but, if it has been retained, it has a blackish, or brownish-black, or chocolate appearance, and is then rather granular in structure. If but little blood has escaped and slowly, it presents the "coffee-ground" appearance. The gastric juice decomposes the hæmoglobin and sets free the hæmatin, which gives the color to the vomited matters. In concealed hæmorrhage of the stomach, the blood passing into the intestines, and in intestinal hæmorrhage, the same phenomena ensue: there occur sudden distention of the abdomen and colic-like pains, faintness or actual fainting with its attendant symptoms, if the loss of blood be large, and the stools of tarry-like material, altered blood, at first mixed with ordinary fæces, and then consisting of the decomposed blood only. As narrated in the previous article, the author has observed chocolate-colored material in large amount discharged by stool. It assumes this appearance when acted on by alkaline fluids, after the effect of acids. If this be correct, we have a means of determining whether

any given discharge of blood originated in the stomach or intestine. Blood so colored may be vomited, but it comes up after the stomach is emptied, and is forced by the act of vomiting from the duodenum. A very singular result of stomach hæmorrhage is amaurosis, first observed by Graefe, then Fikentscher, and afterward by Hutchinson. No explanation that has been offered satisfactorily explains the occurrence of double, incurable amaurosis after hæmorrhage from the stomach.

Course, Duration, and Termination.—Occasionally vomiting of blood is fatal, as when an aneurism ruptures into the stomach. Although the patient may be faint, cold, and convulsed, yet hæmorrhage of the stomach is rarely fatal, and the patient slowly emerges from the condition of anæmia. The pain of ulcer and cancer is often much relieved by vomiting blood; but the case of ulcer may be made much more serious by it in all other respects. Hæmorrhage due to cirrhosis of the liver far advanced may be difficult or impossible to control, and may add materially to the dangers of the case, or may cause death by exhaustion.

Diagnosis.—The juices of colored fruits (of black raspberries, for example) may be mistaken for blood, especially when vomited in the night. The author has encountered several cases of this kind. The microscope or the spectroscope may be invoked to decide. Much greater difficulty must exist in determining the source of the blood, whether swallowed and vomited, or derived from the stomach or lungs. An examination of the nares will usually demonstrate the origin of the bleeding, if the blood proceeds from any part of the nasal mucous membrane.

Blood from the lungs has an alkaline reaction, is aërated, a bright red, and may contain mucus or pus. Blood from the stomach is acid in reaction; when acted on by the gastric juice, is blackish, brownish-black, or chocolate color, and is not aërated, and may be mixed with food. The act of vomiting brings up the blood from the stomach, of coughing from the lungs (coughing may attend vomiting of blood, and vomiting—the patient swallowing blood coming from the lungs—may attend pulmonary hæmorrhage). The previous history of pulmonary disease and the existence of moist *râles* at the time of the hæmorrhage indicate the lungs to be the seat of the hæmorrhage, and the absence of all the physical evidences of fullness of the stomach negatives the idea of stomachal hæmorrhage. The attack begins in the lungs, by a sense of heat under the sternum, by a soreness in some locality, and by a sense of constriction of the chest; in the stomach, by a sense of fullness and actual distention of the stomach, followed by nausea. After the attack of pulmonary hæmorrhage the patient experiences soreness at the seat of the hæmorrhage; there is more or less elevation of temperature, often a pneumonia or bronchitis of small extent; moist

râles, and the expectoration for several days of small, brownish-bloody sputa. After the hæmatemesis, only the depression and anæmia are present except stools of altered blood, which are usual.

Treatment.—The hæmorrhage, which is a vicarious menstruation, is relieved by diverting the flux to the uterus, its natural outlet. This is best accomplished by the use of the appropriate emmenagogues during the interval, of hot sitz-baths and hot vaginal douches, at the time of the expected flow. In the case of married women, leeches may be applied to the cervix uteri at the time of the menstrual molimen. When due to arrested hæmorrhoidal discharge, leeches should be applied to the anus, and aloes be administered.

When an impoverished condition of the blood exists, or when the so-called hæmorrhagic diathesis is the cause of hæmorrhage, effort must be directed to improve the composition of the blood, and to elevate the tonus of the vessels. When the hæmorrhage is occurring, the most absolute repose must be enjoined; the patient should swallow as rapidly as possible pellets of ice; ergotin should be injected subcutaneously, as much as three to six grains at a time, and it may be repeated as often as necessary; a bag of ice should be put on the epigastrium; and large draughts of iced alum-whey should be swallowed every few minutes. Ligatures around the thighs, tied tightly enough merely to stop a part of the venous blood in the lower limbs, is an excellent adjunct to the measures above proposed. If this is not done, the legs should hang down out of the bed, and the shoulders should be somewhat raised. The salts of iron (chloride, nitrate, subsulphate) may be administered for their styptic effect. A teaspoonful of the tincture of the chloride can be given in four ounces of ice-water. An objection to these ferruginous styptics is the very voluminous and nauseating coagula which they form, and which are apt to excite vomiting. Brandy is an excellent local astringent, and is generally serviceable in these cases, owing to the syncope. The stimulant is beneficial in raising the arterial tension, by furnishing a force for the vaso-motor system, which is in a state of paralysis. Tannic acid is a safe styptic, which can be used frequently and in relatively large (ten grains) quantity. Sulphuric acid may be employed successfully, and this has the advantage that a small quantity imparts astringent property to a large amount of water. Next to alum-whey it is the most efficient hæmostatic. If vomiting is obstinate, the one sixteenth grain of morphia hypodermatically will stop it, and contribute materially to the arrest of the hæmorrhage.

If the hæmorrhage has been sufficient to cause dangerous syncope, inhalation of nitrite of amyl may arouse the failing heart, or the injection of digitaline may be tried. Leube advises the subcutaneous injection of ether—a syringeful every few minutes—in cases of dangerous syncope from the hæmorrhage. Very great care is subsequently required in the alimentation, and in the use of remedies to remove the

anæmia. Only milk should be permitted for some days; but this may be supplemented most advantageously by the rectal injection of defibrinated blood.

DILATATION OF THE STOMACH.

Causes.—Dilatation of the stomach is most frequently produced by stenosis of the pylorus. The great cause of narrowing of the pyloric orifice is cancer, but it may be due to chronic inflammation, hyperplasia, and subsequent contraction of the submucous connective tissue, or to hypertrophy and contraction of the muscular elements—the so-called sphincter—of the pylorus. These forms of local disease, limited to this locality, are excessively rare, while cancer is common. Exterior pressure, as of cancer of the pancreas, a floating kidney or other tumor, may cause stenosis of the pylorus and subsequent dilatation of the stomach. Dilatation of the stomach may be the result of excessive indulgence in the use of fluids, notably of beer. The author has observed several cases, in beer-drinkers, who drank ten, twenty, even forty, glasses of beer habitually every day.

Pathological Anatomy.—When stenosis exists at the pylorus, the whole organ is dilated, often enormously so, but the enlargement is not universal and uniform from the beginning; the dilatation commences in the fundus. With the development of the stenosis there ensues hypertrophy of the muscular layer, in accordance with the well-known pathological law. In dilatation without stenosis of the pylorus the muscular layer is thinner than normal, pale in color, and more or less advanced in fatty degeneration; the mucous membrane is, also, thin, pale, and without rugæ. Stenosis of the pylorus is caused chiefly by cancer, and hence the lesions peculiar to this new formation will be present. If ulcers have been excavated at the margin of the orifice, have subsequently coalesced, and cicatrized, the results of the contraction of the cicatricial tissue will be seen in a distorted and contracted pylorus.

Symptoms.—When stenosis of the pylorus and dilatation of the stomach are results of cancer formation, the symptoms of dilatation are quite dominated by those of cancer. It is necessary, here, to discuss the former only. The symptoms are those of chronic gastric catarrh, or of dyspepsia. There are three signs in addition to those of dyspepsia, which indicate dilatation of the stomach: rather persistent vomiting; return of food partly chymified and partly undergoing fermentative and putrefactive changes; the physical evidence of enlargement. The cavity having greatly increased capacity, enormous accumulations may take place, and hence when vomiting occurs the amount discharged will be great. The attacks of vomiting are more frequent than is usual in ordinary cases of dyspepsia, and they may become habitual. Regurgitation is a common symptom—particles of

partly digested aliment, acid, acrid, and offensive, and foul gases, compounds of hydrogen with sulphur and phosphorus, coming up. In these acid and pasty materials is found the parasite *Sarcina ventriculi*. It is not yet known whether this minute organism is a cause or a consequence of the conditions present; but it is so often associated with dilatation of the stomach as to have some diagnostic value. The bowels are torpid, the fæces dry. The nutrition is much impaired in consequence of the insufficient conversion of the food, and the diminished absorption. Hence the patients affected with this malady waste, and, as the blood is deficient in water, they suffer from muscular cramp, chiefly of the flexors. These cramps were first described by Kussmaul (Leube), but the author has repeatedly observed them in cancer of the stomach, in diabetes, etc., and everybody knows that they occur in Asiatic cholera, the same cause, dehydration of the blood, operating in all these maladies to produce them.

The physical signs of dilated stomach are as follows: On inspection, an abnormal fullness and prominence of the whole stomach region will be seen; on percussion, the signs vary according to the state of the organ; if empty, a tympanitic percussion-note, of a somewhat metallic quality and extending from the sixth intercostal space to or below the umbilicus, is developed; if full, it is high pitched and flat, and, on assuming the upright posture, there is a zone of dullness at the lower part of the space which in the recumbent posture returned a tympanitic note. On auscultation of the dilated stomach, there is almost always heard a good deal of *succussion*—splashing of the fluid in the cavity—when the body is suddenly and strongly shaken. Placing the stethoscope over the pylorus, and smartly compressing the left hypochondriac and lumbar regions, the splashing of the contents of the stomach can be readily heard. The dimensions of the stomach when distended may be demonstrated by causing an abundant evolution of carbonic-acid gas from the reaction of sodium bicarbonate and tartaric acid—a solution of the former being given and followed by a solution of the latter. Another means of diagnosis consists in passing the stomach-tube, and noting the point at which it may be felt through the abdominal parietes.

Treatment.—The first and most important duty is a careful adaptation of the diet to the conditions present. The form of alimentation suitable to these cases is "dry diet," * a diet without fluids. The quantity of other foods should be small, and as far as possible "water-free."

As paresis of the muscular layer of the stomach is an important factor in the dilatation, means must be employed to correct this. Strychnine hypodermatically, in the epigastrium, is an excellent expedi-

* See my treatise on "Materia Medica and Therapeutics," article "Alimentation in Disease."

ent. Tincture of nux vomica and tincture of physostigma are effective remedies—ten to twenty drops of each—three times a day before meals. Great benefit is obtained from the use of galvanism, one electrode placed just beneath the mastoid process and the other at the epigastrium, and a mild current (from five to twenty cells of Siemens and Halske), slowly interrupted, passed through the pneumogastric. Fermentation should be prevented by the use of the sulphites, carbolic acid, etc., but especially by abstaining from starchy and saccharine substances, which produce a great quantity of carbonic-acid gas. The decomposing foods, the fat acids set free by the fermenting butter and other fats, and the unhealthy mucus which is poured out in great quantity, keep up irritation which renders futile the use of the ordinary remedies. This fermentative and decomposing mass must be removed from the stomach. The expedient first advocated and employed by Kussmaul—washing out the stomach with the pump or siphon—has proved to be useful, but it does not maintain the same position, as a therapeutical means, as on its first introduction. Recently Kuster * has opposed its use on several grounds, and advised the treatment by muriatic acid, Carlsbad salts, and nitrate of silver. If the stomach-pump or siphon be used, the stomach should be thoroughly washed out every day. The author can not doubt that, if an emetic is first given, and is followed by an active saline cathartic, the stomach will be thoroughly emptied, and as efficiently as if the stomach-pump were employed. Then, if distention be avoided, a suitable diet enjoined, and remedies to promote contraction of the muscular layer prescribed, the best results can be obtained of which our present resources will admit.

DISEASES OF THE INTESTINES.

CLINICAL EXAMINATION—INSPECTION—PALPATION.

In proceeding to examine intestinal disorders, a careful inspection of the abdomen in all its relations should be made. The patient should be placed on the back, hands folded under the occiput, and the lower limbs extended easily, without being tense. The muscles of the abdomen and back should, also, be relaxed, and the skin of the abdomen bared that every reflection of light from it can be noted. A good northern light should fall upon the parts, and the observer disconnecting his mind from all other subjects, should look carefully over the surface catching the reflection of light from every point. In this way, as the author fully believes, new formations, enlarged organs, etc., may be seen in outline on the skin, photographed as it were, when the most practiced skill in palpation and percussion may fail to develop a lesion of any kind.

* "Allgemeine med. Central-Zeitung," 1876, No. 98.

An examination of the stools is an imperative duty in all cases of diseases affecting the canal. This examination must not be merely perfunctory, but every change in color, consistence, in the products of digestion, and in odor, should be noted. In intestinal diseases, the formation of peptones, the solution of fats, and the reaction which in normal conditions occurs between the bile and the pancreatic juice, may be disordered or prevented, and therefore need to be understood.

The peculiar alkaloidal substances known as *ptomaines* and *leucomaines* which are formed in the intestines—the former from the products of decomposition of animal and vegetable substances and by the action of pathogenic microbes, and the latter by a process akin to a physiological one and yet no doubt due to the vital activity of microorganisms. Ptomaines formed in the intestinal canal are now supposed to be causative of diseased processes, in severity varying from a mere transient sick headache to an essential fever, such as typhoid.

Palpation and percussion are of exceeding value in determining states of the abdominal organs, as to outline, texture, position, etc. Organs that are movable can be detected by *percussion* as absent from their normal place, and by *palpation*, present in some unusual position. Organs, movable, may be pulsating; but as a rule a pulsating tumor has a fixed position, as, for example, an aneurism of the mesenteric artery may be somewhat movable; whereas an aneurism of the aorta or cæliac axis is fixed. Auscultation has limited use in these affections, but may have a place in diagnosticating aneurism, tumors of unknown kind, and obstructions of orifices.

Besides the modes of study above indicated, there are methods partly surgical to which passing reference may be made—filling the large intestine with fluid to ascertain its freedom from obstruction, or with hydrogen gas to demonstrate a rupture of continuity, or with some chemical which by a reaction may show the position of some special lesion. These are mentioned that such resources be not overlooked in doubtful cases, or in emergencies.

CATARRH OF THE INTESTINES.

Definition.—Catarrh of the intestinal mucous membrane may exist in the *acute* or *chronic* form. It receives different designations as it affects the various divisions of the intestinal tract. Catarrh of the duodenum is *duodenitis;* of the ileum, *ileitis;* of the colon, *colitis;* and of the ileum and colon together, *ileo-colitis.* When it is limited to the cæcum it is called *typhlitis*, and when to the rectum, *proctitis.* Again, the designation is derived from some special characteristics, as *cholera morbus, cholera infantum*, etc.