

shows a tracing such as we sometimes meet with. This is from an old woman with a dilated and irregular heart, but no murmurs. The venous tracing shows, as a rule,

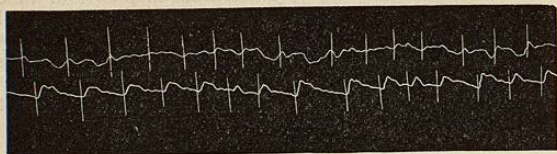


Fig. 3919.—Jugular Pulse (above), Radial (below). Corresponding points are marked.

the most pronounced collapse during diastole and resembles somewhat the ventricular pulse shown in Fig. 3918. There was no positive beat in the veins of the neck, however, and there were no heart murmurs, so I ascribed the condition to dilatation and threatening paralysis of the auricles without any serious amount of regurgitation. In this tracing a presystolic rise and systolic collapse are occasionally seen, so that the paralysis of the auricles was not absolute.

**THE VENOUS PULSE IN IRREGULAR HEART ACTION.**—A number of observers have recently been making use of the venous pulse as a means of deciding the primary seat of irregularity in the rhythm of the heart. One example will have to suffice. Fig. 3920 is a tracing taken from one of the cases referred to, in discussing the arterial pulse, of a father and son, both in good health and both with irregular pulses. This tracing is taken from the son. The venous pulse is small, as is usually the case

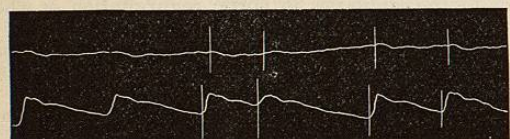


Fig. 3920.—Jugular Pulse (above); Radial (below). Corresponding points are marked.

in a healthy adult, but suffices for the purpose. An irregularity may be seen in both the arterial and the venous pulse of the nature of a premature beat. In the ordinary beats preceding and following the premature one, a faint wave may be detected in the venous pulse synchronous with the primary wave in the radial. This is the systolic wave. Just preceding the systolic wave a fainter one which is presystolic and due to the auricular systole may be seen. In the venous beat corresponding to the premature wave in the radial a systolic wave may also be seen, but the auricular wave follows it instead of preceding it, showing that the auricle in this case contracts after the ventricle, and therefore the anomalous stimulus causing the premature beat must have acted on the ventricle. If measurements be made it will be found that the pulse intervals on either side of the premature beat are together equal to the preceding and succeeding ones, or to two average pulses. This, according to Hering, Cushman, and

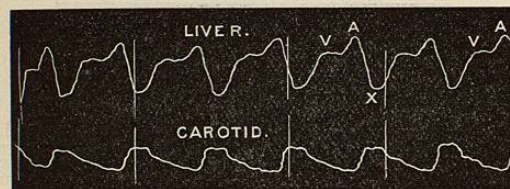


Fig. 3921.—Auricular Liver Pulse.

others, points to the auricle not being implicated in the irregularity. When the auricle is the primary seat of the disturbed rhythm, such a correspondence is not usually found. This rule is said by Gerhardt, however, to

be not without exceptions. The full importance of thus differentiating the seat of the irregularity is not fully worked out, but on the whole those cases in which the irregularity is confined to the ventricle are less serious than those in which the auricle is also irregular in its rhythm.

**THE LIVER PULSE.**—A pulsation can be felt and recorded in the liver in certain cases in which the right side of the heart and the veins are much distended. In some cases the tracing has the form corresponding to the auricular venous pulse. In these cases, according to Mackenzie, there are usually tricuspid stenosis and auricular hypertrophy, as the normally weak auricular waves have not force enough to make themselves felt in the liver.

In other cases the liver pulse has the characters of the ventricular venous pulse, and then we may be reasonably

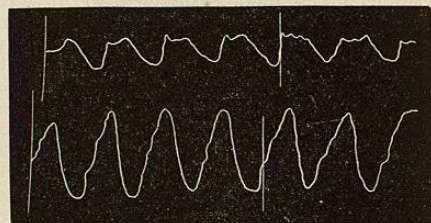


Fig. 3922.—Ventricular Liver Pulse. (Carotid above; liver below).

certain of the existence of tricuspid regurgitation. Tracings of these two forms of liver pulse taken from Mackenzie's book are shown in Fig. 3921 and Fig. 3922.

**CAPILLARY PULSE.**—This consists in alternate reddening and paling of an area of the skin with each heart beat. It is most frequently looked for in the bed of the finger nails, and may be brought out most distinctly by raising the arm. Quincke, who first described the capillary pulse, recommends rubbing gently a spot upon the forehead and looking for it there. The capillary pulse may be taken as an indication of aortic regurgitation with a strongly acting ventricle (hypertrophied).

William S. Morrow.

#### REFERENCES.

I desire to acknowledge my special indebtedness to the book on the pulse, by James Mackenzie, and warmly to recommend it to those desiring to read something more exhaustive than this article. I have also received help from the following: The Physiologies of Schaefer, Halliburton, Howell and Hall; Vierordt's "Medical Diagnosis"; Hutchison and Rainy's "Clinical Methods"; Gibson's "Diseases of the Heart"; Balfour's "Diseases of the Heart"; Fagge's "Practice of Medicine"; Green's "Examination for Life Insurance"; Ewart's "Heart Studies"; Hürthle's "Beiträge zur Häemodynamik" in Pfüger's Archiv, vol. xlix.; D. Gerhardt's "Klinische Untersuchungen über Venenpulsationen" and "Einige Beobachtungen an Venenpuls" in Archiv für experimental Path. u. Phar., vols. xxxiv. and xlvii.; Karl Schmidt, Jr., "Herz-Kammer Systole und Pulsecurve," Pfüger's Archiv, 1902, Heft 5 u. 6; W. S. MacCallum, Johns Hopkins Hospital Bulletin, March, 1900; Cushman, "On Intermittent Pulse," British Med. Journ., September 29th, 1900. A good bibliography will be found in Gibson's "Diseases of Heart and Aorta."

**PUMPKIN SEEDS.**—*Pepo*, U. S. P. *Semen Peponis*. The dried ripe seed of *Cucurbita pepo* L. (fam. *Cucurbitaceae*).

The nativity of the pumpkin is not certainly known, though it was probably North American. It presents numerous varieties, and the squashes, at least some of them, have been regarded by some botanists as pertaining to the same species. Although squash seeds appear to possess similar properties, they are not included, as a drug, under the above title.

Pumpkin seeds are about 2 cm. ( $\frac{3}{4}$  in.) long, broadly ovate, flat, white, or whitish, nearly smooth, having a shallow groove near to and parallel with the edge; containing a short conical radicle and two flat cotyledons; inodorous; taste, bland and oily.

The active constituent is supposed to be a small amount of a soft, green, acrid, and bitter resin, which possesses the same properties as the entire drug. With this there

exists a yellow or somewhat reddish-yellow, bland fixed oil, to the extent of about thirty-five per cent., a little sugar, crystallizable albumin, and other unimportant constituents. The oil, which consists of glycerides of palmitic, myristic, and oleic acid, portions of which acids also exist in a free state, has been credited with the properties of the drug, but possibly, if pure, does not possess them.

Pumpkin seeds are markedly diuretic, but their medicinal use is as a pleasant and moderately certain tennicide. Only the kernel should be used, and it is commonly given in the form of an electuary or emulsion, the dose amounting to from 25 to 50 gm. ( $\frac{3}{4}$  to  $\frac{5}{8}$  iss.). Fifteen grains of the resin is an equally efficient dose, though not so pleasant.

Throughout the West Indies, Mexico, Central America, and many other countries, pumpkin seeds, as well as squash seeds, are largely consumed as food.

Henry H. Rusby.

**PURGATIN.**—Purgatol, anthrapurpurin diacetyl ester, is an odorless, tasteless, yellowish-brown powder recommended by von Hösslin as an agreeable laxative. It acts slowly, requiring thirteen to twenty-four hours, and produces a copious, non-liquid stool. The urine is colored red. Dose, 0.5–2 gm. (gr. viij.–xxx.).

W. A. Bastedo.

**PURGATIVES, OR CATHARTICS,** are medicines which are used to produce alvine evacuations. According to their activity and power, they are divided into laxatives and mild and drastic purgatives.

Purgatives which act very gently, producing soft, feculent stools without notable irritation, are called *laxatives*. This term is also applied to more powerful purgatives when they are given in small doses, so as to act mildly. (See *Laxatives* in Vol. V.)

Purgatives which operate briskly, usually producing more or less fluid evacuations, sometimes with griping and tenesmus, but without serious irritation, are called *mild or simple purgatives*. To this group belong some of the salts of magnesium, sodium, and potassium, which, from their resemblance in chemical and physical properties, and in physiological action, are termed *saline purgatives*.

The term *drastic* is applied to those purgatives which operate energetically, producing numerous evacuations, and, in excessive doses, more or less gastro-intestinal irritation.

Purgatives which produce watery stools, especially the salines and some of the drastics, are called *hydragogues*, and those which cause the evacuation of large quantities of bile, *cholagogues*.

**MODE OF ACTION.**—All purgatives accelerate the peristaltic movements of the intestines. Radziejewsky carefully observed the rapidity of peristalsis in dogs, both before and after the administration of purgatives. In the normal state the movements of the small intestine were rapid, those of the large intestine very slow. After the administration of purgatives, the movements of both became much accelerated, but most markedly those of the large intestine.

It was assumed that purgatives, especially the hydragogues, also induce a discharge of fluid from the intestinal mucous membrane. Experiments on animals at first seemed to show that this was an error. Thiry completely separated a portion of the small intestine from the rest of the bowel, without dividing its vessels and nerves, sewed up one end, which was returned into the abdominal cavity, and attached the open end to the wound in the abdominal wall. Into the cul-de-sac thus formed he introduced croton oil, senna, and Epsom salt. No accumulation of fluid took place. Schiff experimented in a similar manner with aloes, jalap, and sulphate of sodium, and Radziejewsky with croton oil and sulphate of magnesium, both with the same negative result. Radziejewsky also analyzed the feces before and after the administration of purgatives. The evacu-

ations produced by purgatives contained more water and sodium salts than normal feces, and sometimes products of pancreatic digestion, but never as much albumin as should have been present if transudation of fluid from the intestinal blood-vessels had taken place. It was therefore concluded by these investigators, and is still maintained by some recent authors, that purgatives do not induce either transudation or increased secretion, and that the watery character of the stools results only from the greatly accelerated peristalsis, which interferes with the absorption of the fluid normally secreted.

But subsequent investigations yielded different results. Moreau introduced sulphate of magnesium into a portion of intestine isolated by means of two ligatures, and after some hours found a decided accumulation of fluid. Brunton, experimenting in a similar manner, found that croton oil, gamboge, elaterin, and Epsom salt caused a decided accumulation of fluid. That the accumulated fluid was not a transudation was evident from the fact that it contained very little albumin. Brieger injected into an isolated portion of intestine very small quantities of colocyth. No accumulation of fluid took place, but the bowel was contracted and slightly reddened. Larger quantities of colocyth, as well as croton oil, caused an accumulation of bloody fluid, with decided inflammation of the mucous membrane. After injecting calomel, senna, rhubarb, aloes, and castor oil, Brieger found the bowel empty and firmly contracted. Sulphate of magnesium in very dilute solution caused no accumulation of fluid, but concentrated solutions of this salt, so also Glauber salt, caused very decided accumulation. That the fluid was a secretion, and not a transudation, was evident from the fact that it readily converted starch into sugar and dissolved raw fibrin.

Thus it has been found in experiments that sulphate of magnesium, sulphate of sodium, croton oil, gamboge, colocyth, and elaterin, not only accelerate the peristaltic movements of the intestines, but also induce a secretion of watery fluid from the intestinal mucous membrane; and that castor oil, rhubarb, aloes, senna, calomel, and minute quantities of colocyth accelerate peristalsis, but do not notably increase secretion.

Hess, in experiments on dogs, endeavored to determine the manner in which purgatives increase the peristaltic contractions. He made gastric fistulae a short distance from the pylorus, so that he could easily introduce purgatives into the duodenum. After paving determined the quantity of the purgative (sulphate of sodium, castor oil, croton oil, senna, colocyth, gamboge, and calomel) which would act briskly, he introduced into the duodenum a small, empty india-rubber ball, to which was attached a long, fine india-rubber tube. After this had been carried by the normal peristaltic contractions a certain distance, which varied in the different experiments, he filled it with water to such a degree as to obstruct the bowel. The purgatives which previously had acted briskly then completely failed. Hess therefore concluded that the peristaltic movements excited by purgatives are probably not propagated through long distances by means of nervous apparatus, or, according to Engelmann, from muscle to muscle, but that they are reflexly excited in each part of the intestine by direct stimulation of its mucous membrane.

**MILD PURGATIVES.**—Of the purgatives which act vigorously, without causing severe irritation of the intestines, the following are commonly employed: aloes, rhubarb, senna, castor oil, salines, and mercurials.

**Aloes.**—In large doses, from five to twenty grains, aloes produces semi-liquid or liquid stools. The first evacuation rarely occurs before six hours, and often not before ten or twelve hours. Some griping usually precedes the evacuations, and they are often attended by a feeling of heat in the anus, and by straining, especially if the medicine be repeatedly taken. From the slow action and the tenesmus, it is supposed that aloes influences the rectum more than other parts of the intestines.

In experiments on rabbits, Kohn found that aloes caused moderate hyperæmia of the stomach, intestines,