very interesting to ascertain to what extent lecithin is concerned in venom lysis caused by fresh serum.

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Effects of experimental injuries of the pancreas.

By **ISAAC LEVIN.**

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A review of the experimental work done so far shows clearly that injuries of the pancreas produce different effects on the organism than the complete removal of the organ. After the latter operation the animal succumbs with the symptoms of subacute diabetes, but a comparatively slight injury to the organ may kill it within twenty-four hours, producing an entirely different symptom complex.

It seems very difficult to form a correct idea of the etiological relation between a certain injury to the pancreas and the disease process that so rapidly kills the animal, because in all the experimental work thus far reported, an injury which results fatally in a certain number of animals, produces no effects on others.

Doberauer reported (in *Centralbl. für Chir.*, Nr. 28, 1906) a series of twenty-one experiments on dogs. In each case he doubly ligated and severed the pancreas with identical results in all the experiments, viz., the development of fat necrosis, sub-serous peritoneal hemorrhages and free hemorrhagic fluid in the peritoneum. The animals were either dead or moribund within twenty-four hours. The author ascribes the fatal results in his experiments to a combination of stasis of secretion, some abnormality in the circulation and a lesion of the parenchyma of the pancreas. The experiments of Doberauer differ from all previous investigations in the fact that he obtained the same results in every experiment. It seemed advisable to repeat his experiments, because, if found correct, they could subsequently be varied so as to afford a clearer insight into the etiological moment of the injury which produced the acute fatal disease of the animal.

The operation of Doberauer was first repeated in exactly the

same manner on six dogs. Of these animals only one died in twenty-four hours. The autopsy showed congestion of the pancreas near the ligatures (otherwise the organ was macroscopically normal), sero-fibrous peritonitis and no fat necrosis. The other animals remained healthy, and when subsequently killed, showed nothing abnormal at autopsy. Thus the results in this first series of experiments did not seem to coincide with those of Doberauer. It remained to be seen whether better results could not be obtained by varying the experiments to some extent. A priori it seems certain that the deleterious effect of the injured pancreas on the organism is due to a change either in the secretion of the organ or in its circulation or in the parenchyma, or in a combination of the three. In the first series of experiments the result was mostly a stasis of secretion.

In the second series undertaken on four dogs, a part of the pancreas about an inch long was crushed with an artery forceps in the middle of the gland and every bleeding vessel ligated separately. In this way some of the parenchyma of the organ was injured and instead of producing a stasis of the secretion, it was given a free exit in the peritoneum. All four animals remained normal.

In the third series of experiments the pancreas was either doubly ligated or part of it crushed and, besides, the most important veins leading from the pancreas were ligated. In this operation a hemostasis was added to the results produced in the previous experiments. The operation was performed on six dogs. Three dogs died in from twenty-four to forty-eight hours. The autopsy showed acute pancreatitis with fat necrosis. The other three dogs remained apparently healthy, but when killed subsequently showed at autopsy a condition of interstitial pancreatitis. These investigations are not yet near completion, but so far as can be judged from the material on hand, those injuries produce the gravest effect on the organism which cause the most serious interference with the circulation of the pancreas. To produce a fatal disease it does not suffice to interfere partly with the free secretion of the pancreatic juice into the intestines as in the first series of experiments, or to injure some of the parenchyma and at the same time allow the juice to secrete into the peritoneal cavity, as in the second series.

The interference with the circulation must be such as to produce a lesion of the whole organ so that not only will the organism be deprived of the normal function of the pancreatic cells, as after extirpation of the organ, but also every cell will become diseased and begin to act abnormally and injuriously to the organism.

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The pathology of function; an experimental laboratory course.

By **HAVEN EMERSON.**

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To fill the gap between physiology and histology on the one hand and pathology as usually taught upon the other, the following experimental procedures were given in a three weeks course on some common disorders of function and the physiological methods of detecting them and treating them.

1. Peripheral arterial blood pressure in man varied by the following procedures:
   - During digestion.
   - Variations of position.
   - Attempted defecation.
   - Adrenalin administration.
   - Amyl nitrite administration.
   - Faradic stimulation of nares.
   - Inhalation of ammonia.
   - Exercise.
   - Hyperpnea.
   - Administration of coffee.
2. Pericardial effusion imitated by saline solution introduced into the pericardial sac.

   Myocardial changes produced by injecting alcohol into the heart muscle.
3. Aortic stenosis.
4. Aortic regurgitation.
5. Pleural effusion.