

highly concentrated wheat germ oil precipitate, extracted and generously donated by Mr. Reginald Auchincloss, of New York City. It was obtained from the ether-extracted oil by first mixing it with a 10% solution of NaOH in methanol, refluxing it 1½ hours, and then saponifying it. This was then mixed with an equal amount of water, extracted with ether 3 times, and washed in water 3 times. The extract was then dried over Na₂SO₄ over night and the ether finally distilled off leaving the unsaponifiable extract containing sterols and vitamin E. This product was so heavy it had to be liquefied by warming in giving it to the rats. Being about a 10-fold concentration of the supposed active principle only 2-minum doses were given the animals on alternate days. One of the rats died after it received 24 feedings, while the remaining 3, after having received 94 feedings, are still alive 4 months later. No tumors are discernible by palpation in these animals.

Although additional experiments are being continued and widened, the present series, now being concluded, admits of this report on our failure to produce tumors in rats through the administration of wheat germ oil.

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Experimental Hypertension. Effects of Kieselguhr Injection and of Splanchnic Stimulation.*

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Several observers have determined the effects on the blood pressure of injecting multiple emboli into the renal arteries. Senator¹ injected liquid paraffin into the renal arteries of cats and no elevation of blood pressure occurred. Cash² injected insoluble Berlin blue into the renal arteries of dogs. The blood pressure did not become elevated. Similarly, no rise in the blood pressure of dogs was detected by Apfelbach and Jensen³ following the injection of particles of charcoal. On the other hand, Maegraith and McLean⁴ reported

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¹ Senator, H., *Z. f. klin. med.*, 1911, **72**, 189.

² Cash, J. R., *Bull. Johns Hopkins Hosp.*, 1924, **35**, 168.

³ Apfelbach, C. W., and Jensen, C. R., *J. Clin. Invest.*, 1931, **10**, 162.

⁴ Maegraith, B. G., and McLean, F. J., *J. Physiol.*, 1938, **92**, 44.

recently the results of experiments in which arterial hypertension was produced in rabbits by the injection of a suspension of Kieselguhr white into one renal artery. Even more interesting is their finding that the blood pressure returned to normal following the excision of the renal nerves. Renal denervation, or in fact total sympathectomy,⁵ does not abolish in dogs the hypertension that is associated with partial constriction of the renal arteries by Goldblatt clamps. Because of this difference, the effect on the blood pressure of dogs of injecting Kieselguhr into the renal arteries has been determined.

A total of 14 dogs were used. Eight died after intervals of one to 21 days following the introduction into the right renal artery of from 0.5 to 20 cc of 1% suspension of Kieselguhr white. None of these animals developed a rise in blood pressure as determined by needle puncture of the femoral artery. Varying degrees of destruction of the kidney substance were observed. Complete liquefaction followed the introduction of the large doses. The right kidneys of 6 dogs surviving for 20 to 35 days the injection of the right renal arteries with from 1.0 to 6.5 cc of Kieselguhr suspension were explored and changes varying from complete necrosis to a small hard kidney were found. The left renal arteries of these dogs were then injected with from 0.25 to 2 cc of Kieselguhr. Three of these died in less than 7 days and moderate to severe infarction of renal tissue was found. On 3 subsequent occasions at intervals of 2 weeks, 0.5 cc of Kieselguhr suspension was introduced into one of the renal arteries of the 3 surviving dogs. An elevation in the blood pressure did not take place in any of these animals. Death followed the last injection and examination revealed hemorrhagic and anemic infarcted areas with marked degeneration.

The hypertension associated with the application of a Goldblatt clamp is believed to be due to an ischemia of living renal tissue. It is likely that Kieselguhr plugs the small renal vessels and results in a complete anemia with death of the part which is affected.

An entirely different type of experiment was performed on 3 dogs. Stimulation of the splanchnic nerves produces a vasoconstriction in the splanchnic area and a rise in blood pressure. To determine if prolonged mild stimulation of the splanchnic nerve in the unanesthetized dog would result in a sustained hypertension, a method similar to that described by Manning and Hall⁶ was used. Unipolar electrodes were applied to the splanchnic nerve between the dia-

⁵ Freeman, N. E., and Page, I., *Am. Heart J.*, 1937, **14**, 405.

⁶ Manning, G. W., and Hall, G. E., *J. Lab. and Clin. Med.*, 1937, **23**, 306.

phragm and the upper pole of the adrenal gland. Three satisfactory preparations were obtained, 2 unilateral and one bilateral, in which the electrode did not pull out or cut through as determined by post-mortem examination in each case. Stimulation consisted of a 60 cycle alternating current of low voltage, from 0.1 to 0.5 volt, the voltage being raised to the point where the animal was annoyed by the stimulus, but below the level of pain as judged by reactions. The stimulus was alternately applied for 3 minutes and interrupted for 30 seconds in an attempt to avoid nerve fatigue. Except for a few minutes each day required to determine the blood pressure by the needle puncture method, the stimulus was maintained continuously for 17, 11, and 4 days in the 3 dogs. Except for one dog which showed a rise from a preoperative mean blood pressure of 115 mm Hg to an average of 155 mm Hg for the first 4 days, followed by a return to normal, no continued rise in pressure was demonstrated.

10375 P

Development of Cardio-pericardial Adhesions Following the Use of Talc.

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Hydrous magnesium silicate (talc) powder was used inside the pericardial sac to produce adhesions of the pericardium to the epicardium. The reaction consisted in the development of a bread and butter pericarditis without the formation of fluid.

Adhesions occurred between the 2 surfaces as early as 18 hours. After one week the 2 surfaces were firmly adherent, and after 4 weeks the pericardium and the epicardium were fused as one layer of tissue.

There was no widespread development of adhesions beyond the area of the powder, the adhesions forming only at the site of the powder. The talc remained within the pericardial sac *in situ* and at autopsy was not discovered in the regional lymph glands.

The presence of new blood vessels between the pericardium and the epicardium was demonstrated at subsequent operations when bleeding was observed from both tissues when the 2 layers were separated. Also microscopic sections demonstrated the presence of new blood vessels.