12:03, both reflexes were active and muscular relaxation was incomplete. By 12:46 with ether percentage at 2.1, corneal and toe reflexes were very active and there was little or no muscular relaxation. Intravenous injection 12:48 to 1:03 of 20 mg./K of Dial-Ciba was followed within two minutes by a state of profound anesthesia with complete muscular relaxation, disappearance of the corneal reflex and almost complete abolition of motor response to violent crushing of the toe. This condition remained unchanged for 1 hour, the ether being kept at 2.0 to 2.1%. At 2:25, with ether reduced to 1.6%, muscle relaxation became incomplete and corneal and toe reflexes became active again. With the shorter acting Nembutal, similar results were obtained except that after 15 to 30 minutes, the anesthesia became progressively less intense. Numerous observations on the effects of Dial-Ciba and Nembutal in the dosage used in these experiments have shown that by themselves they do not appreciably affect muscular relaxation or the activity of the corneal or toe reflexes.

The effect of morphine on ether anesthesia will be reported at a later date.

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Observations on Coronary Occlusion.*

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(Introduced by Raymond Hussey.)

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A series of experiments were made to correlate the anatomic, electrocardiographic and myocardial surface temperature changes following ligation of the anterior descending branch of the left coronary artery. The effect of stellate ganglionectomy on these changes was also studied. Seventeen dogs were used.

Under amytal anesthesia, with respirations maintained by positive pressure the pericardium was exposed by cutting a window through the anterior portion of the left 5th and 6th ribs. The pericardium was opened and sutured to the adjacent pleura. The stellate ganglion was exposed by an anterior axillary approach. The anterior descending branch of the left coronary artery was ligated 1

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or 2 cm. from its bifurcation. No attempt was made to separate the artery from its vein. Both vessels were ligated by means of a single suture. Thermocouples were sutured onto the surface of the myocardium, one being placed in the region supplied by the ligated artery, the other in a region with an independent blood supply. Thermal changes over each area were recorded on a Leeds and Northrup Potentiometer System. Simultaneous records of room and rectal temperatures were obtained. Immediately following coronary artery ligation transient cyanosis and bulging of the surface area supplied by the ligated vessels was noted. In every instance the surface temperature of the ischemic area after ligation fell from 2-7°F., and persisted throughout the period of observation.

Ventricular fibrillation, which was noted in 7 dogs, appeared under the following conditions: (1) In 3 dogs immediately following ligation of the artery; (2) In one dog during suture of the pleura and pericardium; (3) In 2 dogs following release of a vessel which had been ligated for 1 hour and 40 minutes and 3 hours and 40 minutes respectively; and (4) In one dog by manipulation of the heart by a suture needle 96 hours after ligation of the artery.

No changes in the myocardial surface temperature were noted following bilateral stellate ganglionectomy, faradic stimulation of the stellate ganglia, bilateral vagotomy, or following subcutaneous or intracardiac injection of adrenalin.

Histologic study of the heart from areas supplied by the ligated vessels showed no demonstrable characteristic changes in animals surviving for less than 10 hours, with one exception. In this case small focal areas of accumulation of fat droplets in the myocardial fibers was noted. In all those experiments in which the heart was exposed to the air for a period longer than 2 hours a fibrino cellular exudate appeared on the pericardial surface. In the epicardium beneath this exudate polymorphonuclear cellular infiltration and edema was present. In one case a small early mural thrombus was observed in the ligated artery. Three dogs following coronary ligation were allowed to survive 24, 48 and 96 hours, respectively. The myocardium of the animal surviving 24 hours showed intracellular fat droplets. The dogs surviving 48 and 96 hours showed areas of frank necrosis of the myocardium, some polymorphonuclear cell infiltration and hemorrhage. These changes are consistent with those reported by Karsner and Dwyer.[1] In addition to the myocardial changes in these animals there was a marked pericard-

[1] Karsner and Dwyer, *J. Med. Research*, 1916, **34**, 21.

itis, involving also some of the external muscle fibers, and showing some fibroblastic proliferation.

Simultaneous electrocardiographic studies confirmed the presence of ventricular fibrillation as noted above. Successive changes in the R T interval and the T-waves usually associated with coronary occlusion were noted in the longer experiments. In 2 dogs simple opening of the pericardium produced changes in the T-waves similar to those described as due to coronary occlusion. No uniform electrocardiographic changes were noted in animals surviving less than 10 hours.

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Absorption Properties of the Intima of the Carotid Artery.*

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In the course of a series of studies on the structure and function of vessel walls it was determined to investigate the absorption properties of the intima by injecting a diffusible substance into the lumen of a closed vessel. Dogs were used as experimental animals and the common carotid artery was the vessel chosen. For the diffusible substance phenolsulphonphthalein was selected because it has no effect upon tissues and, if absorbed, can be readily detected in the urine in small amounts. The carotid sheath was exposed and the artery doubly ligated without opening the sheath. The ligatures were placed as far apart as possible to allow a maximum of absorption surface, but great care was exercised that no branches should be included in the stretch between the ligatures. The dye was injected through a cannula at a constant pressure equivalent to the carotid pressure (determined for each animal on the contralateral vessel). At the termination of the experiment the phenolsulphonphthalein was evacuated and 1% trypan blue was run through the same system at the same pressure to exclude the possibility of leakage in the system. In a series of 7 animals the dye appeared in the urine in all instances. The appearance time varied between 48 and 141 minutes, whereas the appearance time was 4 to 8 minutes in several

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