The first conclusion is that sera may be conveniently arranged in the order of their resultant swelling tendencies with respect to standard blocks of gelatin. The second is that the serum composition variable of primary importance in determining this resultant swelling tendency in any case is the total protein level. This effect of the protein level of the swelling solution upon the state of swelling of gelatin is predictable on the basis of recent findings of Northrop and Kunitz.[3]

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Observations on Coronary Occlusion.* II. Electrocardiographic Changes.

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In the course of experiments designed to study the effects of coronary artery ligation in dogs[1] it has been interesting to observe rather varied electrocardiographic changes and at this time a brief note is presented to describe some of the characteristic features observed.

Seventeen dogs were used. Under amytal anesthesia, with respirations maintained by positive pressure, the pericardium was exposed by a subperiosteal resection of the anterior portion of the fourth rib on the left. The anterior descending branch of the left coronary artery was ligated 1.5 cm. from its origin. Using conventional limb leads, electrocardiographic tracings were taken at hourly intervals for the first 12 hours, again at 24 hours, at daily intervals for the next week, and at weekly intervals thereafter. In each instance a control tracing was taken before the operation was begun, the animal being under full amytal anesthesia at the time. Two dogs served as controls. The operative procedures were duplicated in every detail except the actual tying of the ligatures about the coronary artery.

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[3] Northrop, J. H., and Kunitz, M., *J. Phys. Chem.*, 1931, **35**, 162.

* This investigation is supported by funds from the Josiah Macy, Jr., Foundation.

[1] Sutherland, F. A., Dial, D., and Harris, B. R., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 1430.

The changes noted consisted of (A) disturbances of rhythm and (B) changes in direction and configuration of the T, ST and RST components of the electrocardiogram.

A. *Disturbances of Rhythm.* In 6 dogs ventricular fibrillation appeared as a terminal phenomenon within from 3 to 20 minutes following ligation. In a seventh dog ventricular fibrillation was noted approximately 23 hours after ligation. In this dog the ventricular fibrillation was transient, was followed successively by ectopic ventricular tachycardia, premature ventricular contractions, and finally by normal rhythm. Nodal and ventricular premature beats appeared in approximately half of the dogs at varying intervals after ligation—3½ to 24 hours—with the greatest incidence of onset from 6 to 8 hours after ligation. Usually within an hour or 2 after the onset of premature contractions, an irregular, ectopic ventricular tachycardia set in. The appearance of ectopic ventricular tachycardia usually presaged death of the animal within 24 to 48 hours. In 2 instances, however, the animals survived, the rhythm later reverting to normal.

B. *Changes in Direction and Configuration of T, ST and RST Components.* After ligation of the coronary artery varying changes in direction and configuration of T, ST and RST components were noted. These alterations were successive but not uniform in character. Within an hour after ligation there was a conspicuous increase in amplitude of the T waves which persisted for several hours. The most constant effect was an early cove-shaped negativity of the T waves; in most instances most marked in Leads I and II, but frequently present in all leads. These changes were noted within 1 hour following ligation, and varied from hour to hour thereafter. Early T negativity was usually followed later by increasing positivity, in some instances completely reversing the original changes. Progressive T changes continued to take place at a slower rate in the longer experiments but were present as late as 51 days following ligation. ST and RST segment deviations were less frequently noted, being present in only 5 instances. Contrary to the experience of Barnes and Mann[2] these deviations were not constant, 4 dogs exhibiting the T_1 type of RT deviation, one dog the T_3 type of RT deviation.

The control electrocardiographic tracings taken before operative procedures were begun indicate extreme variability of the "normal" T wave in the dog. Ten of 17 dogs exhibited T negativity of varying magnitude in Lead I usually accompanied by T negativity

[2] Barnes, A. R., and Mann, F. C., *Am. Heart J.*, 1932, **7**, 477.

also in Lead II. The negative T waves were usually sharp, cove-shaped, not unlike that described as *typical of coronary closure.* In only one instance, however, was there any RST or ST deviation in these control tracings. In one of the 2 control animals no early electrocardiographic changes were noted. Nine hours after operation, however, there were slight directional changes in the T waves which became quite pronounced by the third, fourth and fifth days. Further slight directional changes were noted over a period of 3 weeks. In the second control animal marked T, ST and RST changes were noted in the first 9 hours post-operatively. Twenty-two hours after operation there were further directional changes in the T-waves and 2 days later the dog was found dead.

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Destruction of Levo-, Dextro- and Racemic Hyoscine by Egg White and Rabbit's Serum.

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It was demonstrated[1] that rabbit's serum destroys atropine (dl-hyoscyamine) and its isomers, levo- and dextro-hyoscyamine, at different rates and it was suggested that this accounts for quantitative differences of the systemic action of these alkaloids in different species. In the following report levo-, dextro- and racemic hyoscine* were studied as to their destruction by egg white and rabbit's serum.

The determination was performed in the same manner as described in the previous paper. In the first series 20 mg. of the alkaloids were dissolved in 2 cc. of water, mixed with 8 cc. of fresh egg white and incubated for 0, 3, and 6 hours at 38°C., three experiments being done for each compound and each series. At the end of the incubation period the alkaloids were isolated and determined by means of the Vitali reaction. It was found that with all 3 alkaloids without incubation all material added could be recovered

[1] von Oettingen, W. F., Marshall, I. H., *J. Pharm. Exp. Therap.*, in press.

* The levo- and dextro-hyoscine used in this study were prepared by the Sandoz Chemical Works, Basle, Switzerland, and furnished through the courtesy of Dr. E. Rothlin in Basle.