

Comment on Tables. "Survival"—disappearance of reflexes and of heart beat were usually nearly simultaneous, the survival period being between limits given. *Notes on individual experiments.* Na pentobarbital—recurrence of tetanus after 26 minutes shows that the strychnine dosage used is capable of causing a prolonged tetanic stage; observation was interrupted 70 minutes after the second tetanus, the preparation was left on artificial respiration and was in good condition 4½ hours later. Na amytal—it will be noted that the abolition of tetani may result from even very moderate dosage with barbiturate, but that this does not necessarily restore to the spinal cat preparation its normal viability of many hours. Alurate in diethylamine solution—92 minutes after onset of tetanus the preparation was in very good condition; observation terminated. Dial, in urethane-monoethyl urea solution, these bases present in amounts claimed not greatly to affect dial action⁵—the preparation was left on artificial respiration and found in good condition 2 hours later. Pernocton—a weak tetanus occurred 14 minutes after the first, and the reactivity then spontaneously and rapidly diminished to zero.

The present work is, of course, purely preliminary. It indicates, nevertheless, the existence of a barbiturate-strychnine antagonism in the cord animal. Experiments of a more quantitative nature are in progress.

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Electrocardiographic Changes in Acute and Chronic Pericarditis in the Goat.

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Clinical electrocardiographic experiences emphasized to us the similarity of the subjective, physical and electrocardiographic findings in hemopericardium and acute fulminating pericarditis, but we also noted electrocardiographic changes in the subacute or chronic healing stages of pericardial inflammation.¹ In order to get more

⁵ New and Non-official Remedies, 1934.

¹ Herrmann, G., and Schwab, E. H., *Trans. Assn. Am. Phys.*, 1934, **49**, in press.

exact information, Cohnheim's² classical experiments were repeated but instead of using oil or saline as Katz, Feil and Scott³ and the Foulgers⁴ had done in the dog, we used air, oxygen and blood as well as saline pressure in the pericardium of the goat. (Fig. 1.)

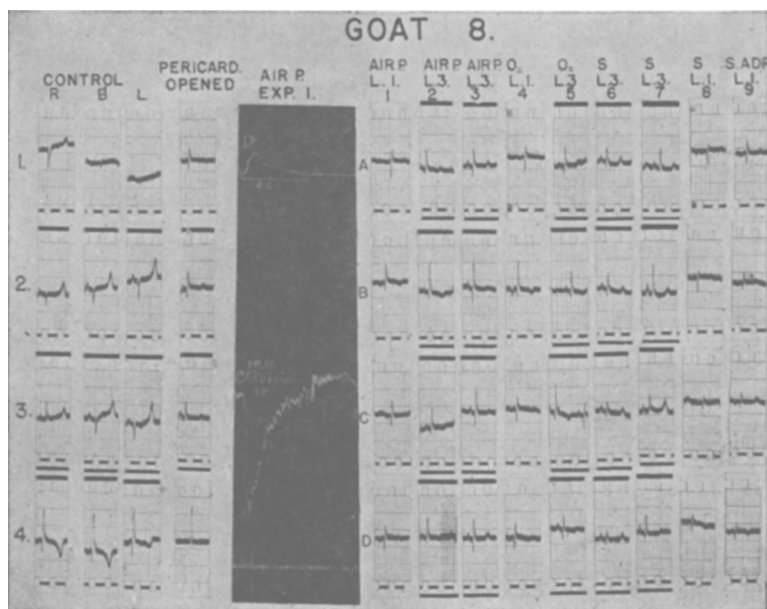


FIG. 1.

Electrocardiographic and kymographic tracings taken as control and during the acute air, oxygen and saline pressure experiments in Goat 8. The control electrocardiograms in leads 1, 2, 3, and 4 are shown first with the goat on his right side R, then on his back B, and then on his left side L; again after the chest and pericardium were opened and the pericardial cannula was in place. Under AIR P. EXP. I is shown the kymographic record of intrapericardial pressure, time during which the electrocardiogram was taken and the mean carotid blood pressure with as base line a time marker in seconds. Then follow electrocardiograms taken at the beginning A; at the 10 mm. IP pressure height B; at the falling to 5 mm. IP pressure C; and at the return to the baseline of the IP pressure D. Exp. 1, 2, 3, with air pressure in leads 1, 3, and 3, Exp. 4 and 5, with oxygen in leads 1 and 3; Exp. 6, 7, and 8, with saline in leads 3, 3, and 1; and Exp. 9, saline in lead 1 with an injection of 0.1 cc. of adrenalin solution when the carotid pressure was at its lowest.

We also found, as others³ have a direct relationship between intra-pericardial pressure and electrocardiographic changes. After the acute pressure experiments (Fig. 1) protein solution or bacterial cultures were introduced into the sutured closed pericardium and the subsequent developments studied. (Figs. 2 and 3.)

² Cohnheim, J., *The New Sydenham Society*, London, 1889, 1, 21.

³ Katz, L. N., Feil, H. S., and Scott, R. W., *Am. Heart J.*, 1929, 5, 77.

⁴ Foulger, M., and Foulger, J. H., *Am. Heart J.*, 1932, 7, 744.

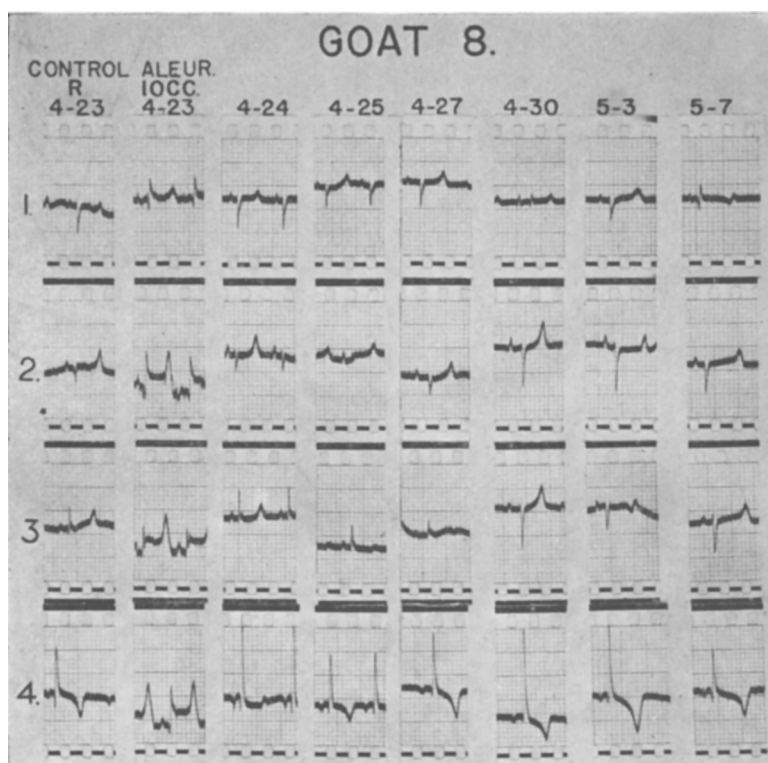


FIG. 2.

Goat 8, electrocardiographic tracings in leads 1, 2, 3, and 4 from above downward, taken as control and directly after filling the pericardium with saline and 10 cc. of protein solution and on several dates afterward, 4-24 to 5-7. It is to be noted that the acute positive elevations in all leads on 4-23 (10 cc.) disappear and subsequent T wave changes appear.

The elevation of the RST sector in all 4 leads was produced as shown in Fig. 2 (4-23) by the acute great increase in intrapericardial pressure, also lesser RST interval changes with slight elevation, upward convexity and negative T waves. (Fig. 1.) These changes were preceded by, and probably chiefly the result of, the sharp drop in peripheral BP that resulted from the auricular collapse incident to the increased intrapericardial pressure. (Fig. I KYMO. AIR. P. EXP. I.) The electrocardiographic changes disappeared shortly after the intrapericardial pressure was reduced or as the pericardium stretched or the fluid was absorbed. The electrocardiographic findings in hemopericardium or acute fulminating exudative pericarditis may be explained on the same premises.

As the chemical or bacterial pericarditis developed in a few days

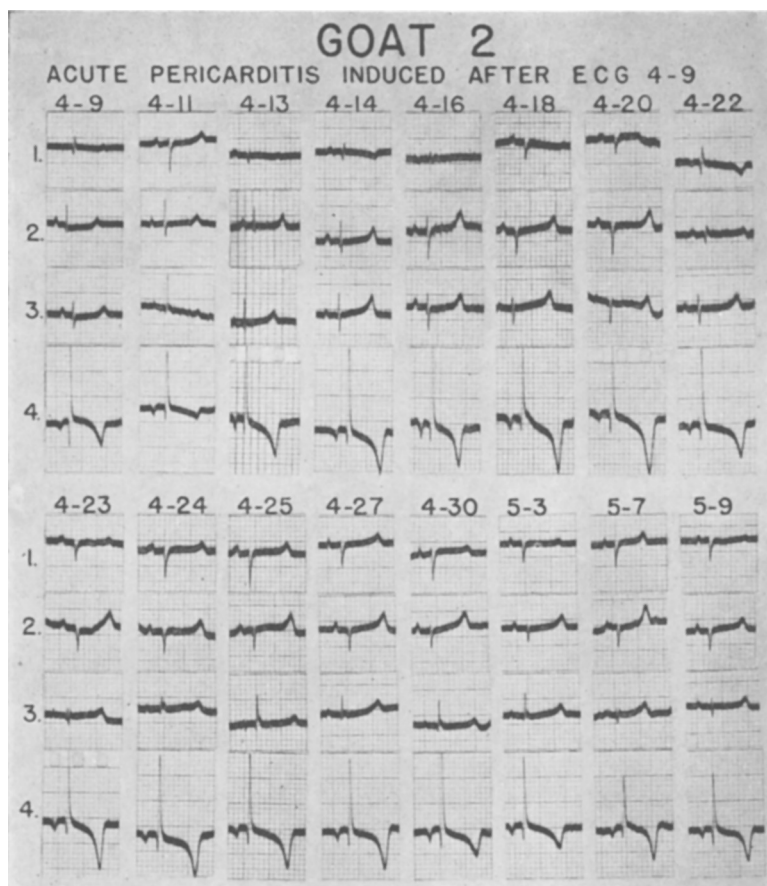


FIG. 3.

Goat 2, like the above except that only 3 cc. of the protein solution were injected. The more chronic cycles of T wave changes especially in lead 1 are to be noted on the various dates from 4-9 to 5-9.

there evolved ST interval changes and T wave negativity beginning in lead 1 and progressively developing in other leads and then slowly retrogressing as healing took place. (Figs. 2 and 3.) These findings as those in the human cases were accompanied by an epicarditis and a subepicardial myocardial involvement. The evolution and disappearance of the changes is more rapid in sterile chemical pericarditis. Recurrent phases of T wave changes may appear in the more subacute inflammatory processes. Thus the 2 types of electrocardiographic changes in pericarditis, the acute and the subacute are accounted for.