

the series of acacia injections was as follows: dog 2, 4.98% and 4.54%; dog 4, 5.67% and 4.93%; dog 5, 4.70% and 2.86%, and dog 6, control lost and 4.20%.

It has been repeatedly demonstrated that blood fibrinogen comes from the liver.⁶ The markedly delayed clotting of the blood and fragile fibrous appearance of the clot which is formed seems to indicate that the deposition of acacia in the liver markedly affects factors in the clotting mechanism which have their origin in that organ. The average fibrinogen values for the blood from 4 dogs, drawn several days after the last acacia injection was 0.16% as compared to 0.37% before injection.

The results of this investigation indicate that the deposition of acacia in the livers of dogs produces impairment of liver function in carbohydrate and plasma protein metabolism.

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The Tonotropic Action of Acetylcholine on the Auricle of the Terrapin, (*Pseudemys elegans*).

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Tonic oscillations of the auricular musculature in certain species of terrapins is a well established fact.¹ This tonicity apparently depends upon the presence of auricular smooth muscle² since tonus is not found in the auricles of species which do not contain it. Tone is increased by pituitrin, histamine, nicotine, potassium chloride and barium chloride and depressed or abolished by epinephrine and tyramine.^{4, 5} Tonus is generally believed to be increased by stimulation of the vagus.^{1, 6} Recently, however, it has been reported that the tonus mechanism is not innervated by parasympathetic motor nerves since it is not influenced by physostigmine or atropine.⁷

Therefore, for a more complete understanding of this mechanism, it seemed necessary to know the action of acetylcholine on tonus.

¹ Fano and Fayod, *Arch. Ital. de Biol.*, 1888, **9**, 143.

² Laurens, H., *Anat. Rec.*, 1913, **7**, 273.

³ Chu, Hung-pih, *Chinese J. Physiol.*, 1930, **4**, 263.

⁴ Gruber, C. M., and Markel, C., *J. Pharm. and Exp. Therap.*, 1919, **12**, 435.

⁵ Gruber, C. M., *J. Pharm. and Exp. Therap.*, 1921, **16**, 405; *Proc. Soc. Exp. Biol. and Med.*, 1926-27, **24**, 92.

⁶ Botazzi, P., *Arch. Ital. de Biol.*, 1900, **24**, 17.

⁷ Greene, C. W., and Maneval, K. E., *J. Pharm.*, 1932, **46**, 303

In the experiments here described, the terrapin (*Pseudemys elegans*) was used. The auricles were carefully cut away from the ventricle and large veins and suspended by threads between the tip of a glass L-tube and a heart lever. This was then suspended in a muscle bath and bathed with Ringer's solution. A small stream of air was delivered to the solution by the L-tube throughout the experiment. The solutions used were at room temperature (18-20°C.). The concentrations of the solutions referred to in the text indicate the concentration of the drug in the muscle bath. In Ringer's solution, strong rhythmic contractions were obtained, these usually continuing for many hours. Only occasionally were tonus waves absent.

The addition of acetylcholine increased the tonic oscillations. The sensitivity of the auricular preparation to acetylcholine varied greatly from one experiment to another. The actual concentration used with any particular preparation is not significant. Often a definite response could be elicited by 1:50,000 and again with another preparation responses were obtained only with 1:1000. With an effective concentration of acetylcholine, the auricle responds with inhibition of the fundamental rhythm along with a sustained increase in tonus resembling a "contracture", the amplitude of which was often greater than that of the fundamental rhythm (Fig. 1).

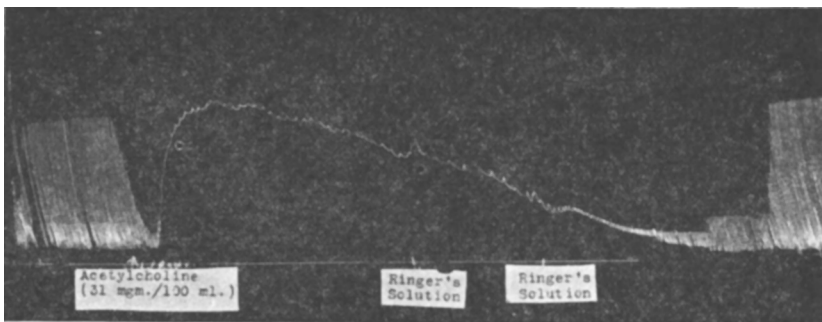


FIG. 1.

Acetylcholine to make a concentration of 31 mg. per 100 ml. of solution induces a strong tonic contraction of the auricle.

This action of acetylcholine is prevented or abolished by atropine, (1:20,000).

Acetyl beta methylcholine chloride has the same action as acetylcholine, often inducing an increase in tonus in dilutions of 1:200,000. Atropine prevents or abolishes this response.

The addition of a potassium excess in Ringer's solution or the substitution of a 0.7% solution of potassium chloride induced tonus

responses almost identical to those described for acetylcholine. They are usually of longer duration and are not prevented by the previous administration of atropine. Epinephrine inhibits the tonus response whether the stimulating agent is acetylcholine or potassium chloride

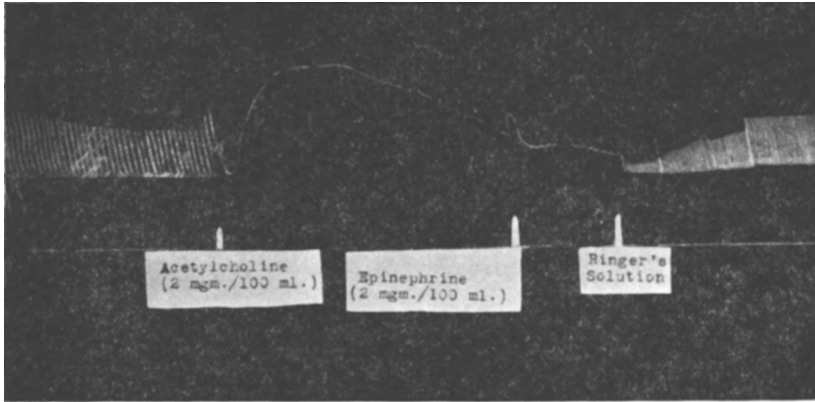


FIG. 2a.

Acetylcholine to make concentration of 2 mg. per 100 ml. of solution induces a strong tonic contraction. Epinephrine shortens the recovery period.

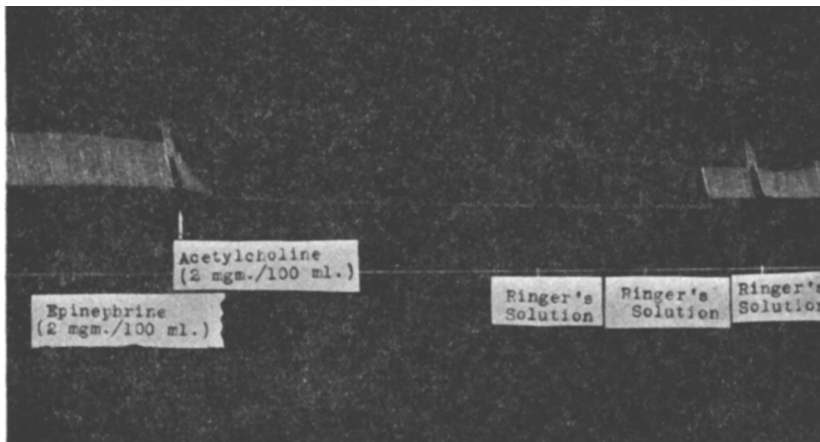


FIG. 2b.

The same preparation as in Fig. 2a, but epinephrine to make 2 mg. per 100 ml. of solution prevents a response to acetylcholine.

(Fig. 2). In agreement with Gruber⁸ pilocarpine hydrochloride was found to exert a markedly depressant action on the fundamental rhythm of the auricles but had no influence on the tonus waves.

⁸ Gruber, C. M., *J. Pharm. and Exp. Therap.*, 1920, **15**, 23.