

158 (1905)

Chemical stimulation of the nerve cord of *Cambarus clarkii*.

By A. R. MOORE.

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A preparation of the central nervous system of crayfish was made by decapitating the animal and uncovering the nerve cord of the posterior abdominal segments. Application of a stimulating substance to this portion of the cord resulted in convulsive movements of the thoracic appendages. Stimulation was obtained from application of excitants of the first class, BaCl_2 , KCl , Na_3 citrate, in concentrations isosmotic with the animal's blood. Tetraethylammonium chloride in M/64 concentration acted as a strong excitant. Of the excitants of the second class, camphor, strychnine, atropine, picrotoxin, nicotine, caffeine and phenol were active. Creatine alone showed no effect. The central nervous system of *Cambarus* therefore differs from that of *Lumbricus*¹ in being sensitive to the action of nicotine, phenol and caffeine. The two forms are alike in being insensitive to creatine, and in the fact that the latent period for chemical stimulation is very short, less than a minute.

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The respiratory rate of the nerve cord of *Cambarus clarkii*.

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The rate of production of CO_2 of the nerve cord of *Cambarus* was determined by means of the colorimetric method previously described.² The nerve cord was removed entirely freed from other tissue. Stimulation due to cutting was only momentary. It could be shown, by leaving the cord attached at the anterior

¹ Moore, A. R., *J. Gen. Physiol.*, 1921, iv, 29.

² Moore, A. R., *J. Gen. Physiol.*, 1918-19, i, 613.

end, that irritability was retained by the posterior dissected portion of the cord for more than 45 minutes. Since it is possible to complete a respiration experiment in 20 minutes, the tissue must have been irritable throughout each experiment.

The procedure consisted first in determining the rate of CO₂ output for the resting cord. The effect of activity on the respiratory rate was found by suspending the tissue in the indicator tube on platinum electrodes which were passed through a paraffined stopper, and then stimulating the cord with induction shocks while the reading was being made. The current used for this purpose was not sufficient of itself to cause any change in the tint of the indicator, no matter how long continued. A third reading was now made with the tissue at rest. The relative rates of respiration in the three cases were determined by calculating the second and third readings as per cents. of the first. Averages of ten experiments made on the nerve cords of as many different animals yielded the following result: Resting 100 per cent., stimulated 89 per cent., resting 86 per cent. Electrical stimulation, therefore, not only did not increase the rate of CO₂ production of the nerve cord of *Cambarus*, but failed to interrupt the normal fall in rate. The question may thus rightly be raised whether functional activity of the cells of the central nervous system of the cryfish is accompanied by increased metabolic activity.

160 (1907)

The value of intratracheal route of immunization with pneumococcus.

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The ease with which gases diffuse through the respiratory mucosa is well known and is widely utilized in the practice of anesthesia. The absorption from the trachea, however, is not limited to gases. Thus, Mayer¹ found potassium ferrocyanide in

¹ Muller, *Manual de physiologie*, Paris, 1851, p. 186.