

1934

Studies of the Electromotive Force in Biological Systems: IV. The Effect of Carbon Monoxide on the E. M. F. of Frog Skin

A. B. Taylor
State University of Iowa

Edgar John Boell
State University of Iowa

Let us know how access to this document benefits you

Copyright ©1934 Iowa Academy of Science, Inc.

Follow this and additional works at: <https://scholarworks.uni.edu/pias>

Recommended Citation

Taylor, A. B. and Boell, Edgar John (1934) "Studies of the Electromotive Force in Biological Systems: IV. The Effect of Carbon Monoxide on the E. M. F. of Frog Skin," *Proceedings of the Iowa Academy of Science*, 41(1), 316-317.

Available at: <https://scholarworks.uni.edu/pias/vol41/iss1/116>

This Research is brought to you for free and open access by the Iowa Academy of Science at UNI ScholarWorks. It has been accepted for inclusion in Proceedings of the Iowa Academy of Science by an authorized editor of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.

eral intermediate mesoderm. The proliferation takes place first immediately posterior to the pronephric anlage and proceeds posteriorly as the embryo grows older.

Extirpation of the left pronephric anlage was found to affect the size of the Mullerian duct of the same side. Its diameter in some cases is smaller than that of the right. In other cases after more complete operation, its formation may be entirely suppressed. The operation apparently has no effect on gonad size.

DEPARTMENT OF ZOOLOGY,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

STUDIES OF THE ELECTROMOTIVE FORCE IN BIOLOGICAL SYSTEMS: IV. THE EFFECT OF CARBON MONOXIDE ON THE E. M. F. OF FROG SKIN

A. B. TAYLOR AND EDGAR JOHN BOELL

Using a method similar to that previously reported by Steinbach (1933), Pumphrey and Francis (1933), and others the authors have studied the effect of different carbon monoxide-oxygen mixtures upon the inherent E. M. F. of pieces of isolated frog skin.

Carbon monoxide was prepared by heating formic acid with sulphuric acid and was collected in a gasometer and mixed with the desired amount of oxygen. Analysis of the gas mixtures was made by the Haldane method. Frog Ringer's was boiled to free it of oxygen and, while cooling, the solution was saturated with a particular carbon monoxide-oxygen mixture. In all experiments the solution used was in contact with the frog skin for a period of one hour.

It has been observed that carbon monoxide produces a reversible depression of the E. M. F. of frog skin, the degree of which depends upon the concentration used.

Experiments with various nitrogen-oxygen mixtures show that the results observed with carbon monoxide are not due to decreased oxygen tension.

Preliminary observations show no increased diminution of E. M. F. when carbon monoxide treated skins are subjected to complete darkness as has been previously reported by Francis (1934).

Restoration of skins to aerated Ringer's results in complete re-

covery of E. M. F. In most cases an overshooting effect was observed. This might be expected as a result of the oxygen debt incurred.

ZOOLOGY LABORATORY,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

A STUDY OF THE INHERITANCE AND THE PHYSIOLOGICAL BEHAVIOUR OF DWARFISM ASSOCIATED WITH AN EYE DEFECT IN RATS

A. SCIUCHETTI AND W. V. LAMBERT

Four dwarfed rats recently appeared in two separate closely related litters of an inbred strain of rats in our colony. There was associated with the dwarfed condition a marked opacity of the eyes apparently causing blindness.

A study of the genetic and physiologic behaviour of these defective characters has been started. While not complete, certain conclusions may be drawn. These two defects are recessive and seem to be absolutely correlated. The results obtained indicate that only one gene is involved. The defects are not sex linked nor sex-limited. In order to determine the age at which the size difference became manifest, weights of each animal were taken at intervals of four days beginning with the fifth day after birth. An analysis of variance of the weights from two defective litters at three age intervals has been made. The analysis of variance of the weights at the first and second age interval shows no significant differences in weight among the individuals of the litters. The results at the third age interval, on the contrary, show highly significant variation between the defective and the normal groups of rats within a litter. The reduced size, therefore, begins to manifest itself significantly at an age of 12 to 13 days. As soon as the eyes are opened the defect is clearly seen. At the 10th to 12th day the hair of the defective rats appears much softer and it is thinner than the hair on normal rats. At a later age the ears are larger than those of their normal litter mates.

The defective animals are in general much weaker than their litter mates. Their appearance is quite infantile and they are much less active. At 150 days dwarf individuals are about three-fifths the weight of their normal mates. Both male and female so far have proven entirely sterile.