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AN ATTEMPT TO DETERMINE THE PROGRESS OF DECAY IN FISH MUSCLE BY ELECTRICAL METHODS

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An Attempt to Determine the Progress of Decay in Fish Muscle by Electrical Methods

By G.O. Langstroth

When an electrical potential difference is impressed on a piece of fish muscle a current is set up which does not reach a constant value for some time. The object of this work was to determine whether the state of preservation of the muscle influences, on a large scale, either the magnitude of the current or the time taken for it to reach its saturation value. No attempt to investigate small scale variations could be made due to lack of suitable equipment, and it is doubtful in view of the nature of the material, whether or not such variations would have been significant, if found.

The limited research carried out by the writer indicated a negative result, that is, no consistent large difference in the electrical properties was noted between fresh fish and that in an advanced state of decomposition.

The procedure used by the writer was very rough, but should have detected any large variation. The apparatus is shown in figure 1.

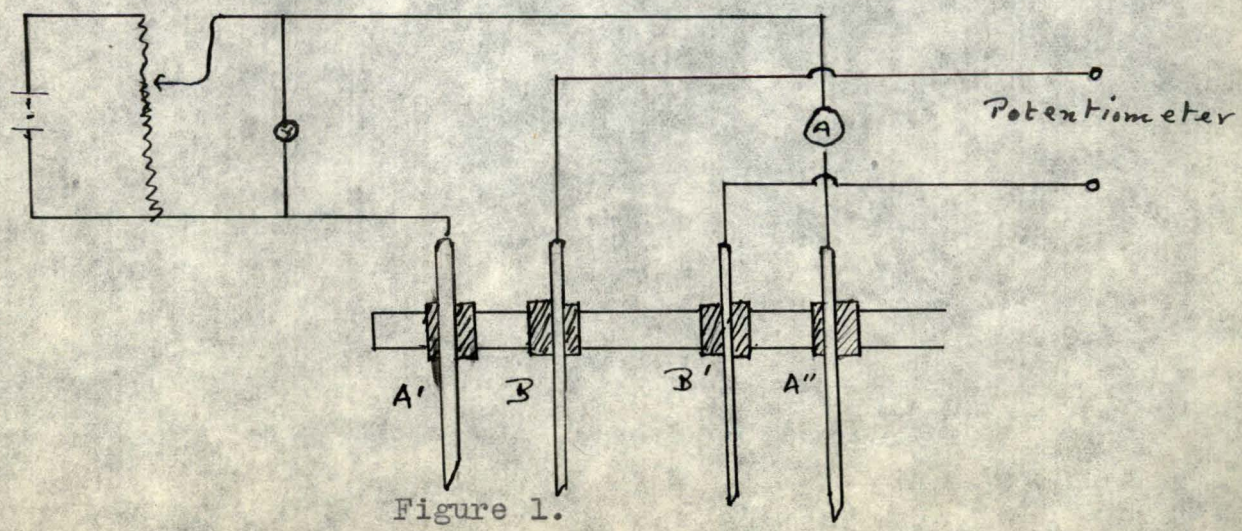

Figure 1.

Four steel knife electrodes (A,B) were fastened rigidly in a wooden block. The power electrodes A',A", were connected through a potentiometer to a source of direct potential. By this arrangement voltages of from 0 to 12 volts could be impressed on the material under investigation. The electrodes B, B', were potential electrodes, and since practically no current was taken through them there was no trouble with the polarization effects which occur at the power terminals. The potential difference between these electrodes was measured by means of a potentiometer reading 0.0001 volts.

The electrodes were inserted for a distance of two centimeters into the muscle, and a series of potential-time readings were made, until the potential reached a constant value. The muscle was then left until the state of preservation had changed to a marked degree. The electrodes, which had been carefully cleaned were again inserted and the process was repeated. No variation which could definitely be attributed to the change of the state of the muscle was found.

Small contact potentials were observed to be set up between the electrodes and the muscle. This suggested the possibility of a variation in the potential difference between a zinc and copper electrode inserted in the muscle. Accordingly electrodes were made and a series of experiments were carried out. The chief difficulty here lay in the fact that good contact could not be secured for the electrodes, and small movements of them resulted in large variations in the potential difference. The results in this experiment were also negative.

Acknowledgement for the loan of a voltmeter, ammeter, and galvanometer is made to the physics department, Dalhousie University.