

80. *The General Idea of the Theory of Decrementless Conduction.*

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It is a well known fact that the nervous impulse propagates without decrement in its intensity and velocity in the normal fresh nerve to which the all or none principle is valid. On the other hand, in the narcotised region of nerve, the decrement theory has been generally accepted. According to this theory,

1. The intensity of nervous impulse suffers decrement during passage along the narcotised region of nerve, that is, as it will be seen in Fig. 1, the size of the nervous impulse becomes progressively less as it passes through the narcotised stretch of nerve.

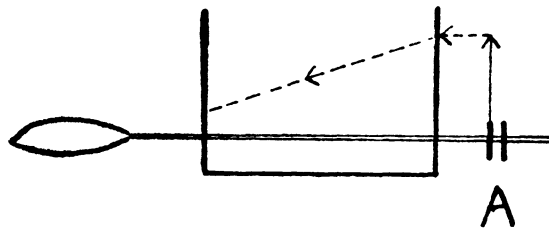


Fig. 1.

2. The rate of nervous conduction suffers decrement during passage along the narcotised region.

3. The all or none principle is not valid ; in other words, in the narcotised nerve the size of the nervous impulse is dependent on the strength of stimulus applied—heterobol in the sense of Verworn.

This decrement theory is the basis upon which the modern physiology of nerve and muscle has been based.

From critical review of the experiments from which the decrement theory above mentioned is derived, and at the same time from the nature of the nervous excitation and its conduction, I came to doubt the decrement theory. With twenty members in my laboratory the problem