

was injected into the white matter. The symptoms were with few exceptions the same as those following toxic doses of citrate when given subcutaneously or by mouth. This led them to conclude that they were mainly of cerebellar origin.

We made a study of citrate in a series of experiments on cats in which sodium citrate was given after removal of the cerebrum. The subcutaneous injection of toxic doses failed to cause the symptoms usually produced by citrate. Tonic and clonic convulsions, muscular twitching and other symptoms produced by the same doses of citrate in our controls were absent in all of our decerebrated animals.

Tests made on frogs have shown, however, that convulsions and muscular effects may be produced in these animals in the absence of the cerebrum and of the rest of the brain. But when the spinal cord was destroyed no convulsions were observed. Toxic doses of citrate given after division of one sciatic failed to produce spasms of the corresponding leg, and the symptoms produced by citrate disappeared after section of the sciatic.

153 (1900)

Alkaloid actions as test for synapse-function in insects.

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Injection of strychnine solution, even at saturated concentration (0.5 c.c.), in a series of sphingid caterpillars (genera *Samia*, *Automeris*, *Ceratonia*), fails to induce "reversal of inhibition"; and save in the case of those species normally the most excitable it fails to induce any opisthotonic symptoms. Opisthotonic curvature (spasmodic) can be induced, however, by tetraethylammonium chloride. General excitation is produced by a variety of neurophil substances (but not by creatin). Only with atropine is one able to bring about reversal of inhibition in the use of antagonistic muscle groups; it is in this case very clearly shown in the behavior of the prolegs, which no longer react to embrace an ob-

ject touching the skin between the members of a pair, but instead are pulled widely apart after such stimulation, with their terminal combs retracted.

By the action particularly of pilocarpine, it can be shown that in species normally sluggish, responding mildly to external excitation, the much more violent type of behavior characteristic of species armed with urticant spines may be induced through the effect of neurophil drugs. Therefore the effect of these substances is brought about in relation to nervous pathways already existing. And a suggestion is had as to the basis of behavior differences in species structurally related.

The failure of strychnine to produce its "typical" effects, in these insects, coupled with the observed "reversal" under atropine, points to possible chemical differentiation of the synaptic homologues in insects, and argues for caution in the use of drugs as a test for synapse-function in invertebrates.

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Selective pairing in gammarids.

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Studies on the sexual coupling of organisms have shown it necessary to recognize that association of mates may be selective rather than random. It is evident that such selective coupling may have important evolutionary consequences.¹ The problem of selective coupling on the basis of somatic characteristics, however, is an entirely different problem from that of selective union of germ cells. This point must be clearly in mind; the distinction has occasionally lapsed in discussions of the topic.²

It has been shown by Pearl and by Jennings that paramœcia assort with respect to size; and the nature and effects of this assorting have been pointed out. More recently it has been shown that the nudibranch *Chromodoris zebra*, which practises internal

¹ Wright, S., *Genetics*, 1921, vi, 144.

² Cf. Jones, D. F., *Biol. Bull.*, 1920, xxxviii, 251.