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Wissenschaftliche Original-Mittheilungen.*)

The Physiology of Tendrils.

By

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In a recent article descriptive of an extended series of experiments upon the physiology of tendrils, Herr Correns announces his discovery of the fact that these organs form curvatures when subjected to temperatures of 40° C. He says (1): „und brachte zunächst eine Topfpflanze von *Passiflora gracilis* mit einer Temperatur von ca. 20° C in eine solche von ca. 40° C. Zu meinem Erstaunen begann die Ranke sich nach kurzer Zeit von der Spitze an einzurollen, anfänglich in sehr raschem Tempo, dann langsamer". If Herr Correns had consulted the results of my work upon the

*) Für den Inhalt der Originalartikel sind die Herren Verfasser allein verantwortlich. Red.

irritability of tendrils published three years ago (2) his astonishment would not have been so great, since I distinctly announced that. I found such a relation of tendrils to temperature in the following words: „Drops of water at ordinay temperatures thrown either gently or forcibly against the tendrils produced no curvature". If the temperature of the water in the previous experiment were raised to 40° C curves were produced: or if a small rod heated to 50° C were held near the tendril like results followed." In experiments with ice I used only small pieces which when rubbed against the tendril were covered with a layer of water, and were inoperative on this account as contact stimuli while their mass was not sufficient to lower temperature to such an extent as to act as stimuli. These experiments were carried on in November 1892 in a plant house at a temperature of 22° C — 26° C.

In the low temperature tests Herr Correns has brought out many new and interesting reactions, but I am not able to agree with him in his conclusions concerning the general nature of temperature reactions. The disparity between the sensibility of tendrils to contact and temperature stimuli, the fact that a gradual increase of temperature acts as a stimulus, (3) and that Weber's law may not be applied to the reactions point to the inference that the temperature curvatures are not entirely due to the special irritability of the tendrils but to conditions operative in other organs as well: a conclusion which I reached in my original work. „The results of these high and low temperature stimuli are doubtless due to their direct influence on the osmotic action of the cells, since in the experiment with the heated rod the tendril can be made to curve backward."

Herr Correns has also seen fit to disregard my work upon the chemical irritability of tendrils. In killing and fixing material for use in obtaining sections by the paraffin imbedding method, I found that a mixture of alcohol, chloroform, and acetic acid would kill and fix the protoplasm almost instantly and before any but a very slight curvature had been produced, although each of the three components of the mixture would cause the tendril to assume the form of a helix when used separately.

As to the mechanism of curvature, I have now in press the results of some extended work which point to the conclusion that curvatures are to the activity of the tissues of the convex, or irritable side of the tendril.

1. Correns, C., Zur Physiologie der Ranken. (Bot. Ztg. 1 Abth., Heft 1. 16. Jan. 1896.)
2. Mac Dougal, D. T., Tendrils of *Passiflora caerulea*. II. External phenomena of irritability and coiling. (Bot. Gazette. Vol. XVIII. p. 123—130. 1893.)
3. Mac Farlane has found similar relations to obtain in *Dionaea muscipula*. Contributions to the history of *Dionaea muscipula*. (Ellis. Cont. Bot. Lab. Univ. of Pennsylvania. Vol. I. No. 1. 1892.)