TABLE I.

The amounts of chloroform expressed as cc. per milligram of brain tissue (fresh), in rat brains following death and anesthesia by the inhalation of chloroform vapor.

Dosage: cc. in 1-liter dish.	Chloroform in brain tissue, cc. per mgm.
0.2	0.03780
0.4	0.03579
0.8	0.06810
1.0	0.07281
2.0	0.09136
4.0	0.08992
5.0 or more	0.09210
anesthesia, slight	0.01190
anesthesia, deep	0.03028

These results indicate that the amount of chloroform present in the brains of rats at the time of death varies directly with the dosage. In other words, the amount of chloroform in the brains of rats killed by chloroform is not constant. This fact may be explained by assuming that the immediate cause of death from chloroform is exerted on some tissue or organ other than the brain; or that the effect of chloroform on the brain is secondary in so far as death is concerned. Further experiments are being done to identify the tissue or organ whose poisoning by chloroform causes death.

[1] Cole, W. H., *J. Biol. Chem.*, 1926, lxxi, 173.

[2] Luedeking, C., *Am. Chem. J.*, 1886, viii, 358.

[3] Angiolani, P., *Chem. Centralbl.*, 1891, lxii, 1068.

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Galvanotropism of Roots.

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Every one interested in plant irritability has always considered the galvanotropic response of roots as remarkable.

From previous work it could be deducted that for high densities of current or long exposures, anodic curvature (Elfving's curvature) is obtained.

For low densities of current or short exposure, cathodic curvature (genuine galvanotropic response) is obtained.

The opinions differ in many respects regarding the origin ascribed to this last curvature. Brunchorst believes an injury is produced by H_2O_2; Rischawi considers the phenomenon similar to the electrosmosis of water in du Bois-Reymond's experiments with albumin. Ewart and Bayliss attribute this fact to chemiotropic stimulation. Gassner finds it a traumatic response to unilateral injury.

But in practically all this work the technic is too crude. For instance, the formation or diffusion of products of electrolysis is scarcely considered; often electrodes and roots dip in the same liquid. Often, too, the density of current is not given.

For these reasons the experiments were repeated and the technic elaborated keeping in mind the following points: (1), reduction of polarisation products (non-polarizable electrodes); (2), prevention of diffusion of electrolysis products by agar blocks; (3), variable densities of current by use of troughs with definite geometrical shapes and sizes.

The electrodes used were zinc—zinc sulphate electrodes. The densities of current varied between 0.058 MA/cm^2 and 1 MA/cm^2, the potential difference from 0.5 volt to 115 volts; the time of exposure from 15 minutes to 360 minutes. The plants used were *Vicia faba* and *Phaseolus vulgaris*. The seedlings, grown in sawdust at 20° C., were employed when the roots had 4 to 6 cm. in length, the part dipping in the liquid ranging from 8 to 10 mm.

When all products of electrolysis are prevented from reaching the roots (*i. e.,* trough with agar blocks and non-polarisable electrodes) no curvature is shown. In a trough without the agar blocks, put in series with the first, all the roots curve perfectly.

The immediate conclusion is that the products of electrolysis act directly to produce "galvanotropic" curvature.

The current itself is not indispensable to cause a curvature. If the roots are placed in a trough without agar blocks, where undisturbed electrolysis products have been formed, these roots curve, but in an indeterminate way. The current determines therefore the direction of curvature.

That the electrolysis products act as injuring agent on the root is demonstrated by the following experiment: Roots are placed for 2 minutes in a $N/_{100}$ solution of copper nitrate, and subjected thereafter to a current between agar blocks and non-polarisable electrodes; curvature occurs.

The experiments show that two steps must be considered: (1) the toxic effect of electrolysis products; (2) the further increase of the first by persistence of the current.

If we consider a root, circular in cross section, we can assume that by the toxic action of the electrolysis products a larger number of cells on the two opposite halves of the root are injured. These cells may act now as two electrodes directly applied on the internal tissues.

These electrodes determine an electrical field where the conducting paths are made by the cellulose membranes imbibed with aqueous solutions (the protoplasm itself is, practically, a perfect dielectric for D. C.). The resulting electrolysis acts now on the deeply situated cells.

From this action there results inside of each cell chains of + and — charges, and consequently a relative increase of ions on each side of the root (increase of anions on the anodic side, of cations on the cathodic side).

The first effects of the anions is not to prevent growth. On the contrary, the increase of cations slows the growth, and by further increase stops it completely. The total effect is a bending towards the cathode.*

* Full account will be found in *J. Gen. Physiol.*, x, in press.