ordinary curare or by quaternary ammonium derivatives. Decurarization by veratrine 1/200,000 is accompanied by the same electrical reactions as those which have been described in preparations treated by curare.

On mammals, the alcaloid has little curariform activity; on the isolated phrenic-diaphragm preparation of the rat, incomplete block was produced at a concentration of 1/5000.

## Cytological Consequences of Decapitation in Onion Roots

During a cytohistological investigation on growth responses and root-forming effects in *Allium Cepa*, the results of which will be published later (D'AMATO and AVANZI, in preparation), I have frequently tried the combined influence of decapitation and various chemicals on onion roots. Results of special interest have been obtained recently by subjecting onions with decapitated and intact roots to different colchicine treatments (exposure to colchicine for 3–6 days followed by recovery in water; alternative periods of treatment with colchicine and water; exposure to colchicine prolonged for 4—5 weeks, and so on). The numerous observations made hitherto do not need to be mentioned in this connection. It will be sufficient to note that, under the influence of colchicine, decapitated roots show a quicker and more intense production of lateral roots as compared with the intact ones. After 3 days of treatment in colchicine, a very great number of cells in the exterior layers of the central cylinder at a distance of about 2—8 mm from the cut surface are to be found in the various stages of C-mitosis, whereas the first indications of C-mitosis in the remaining root region near the wound appear only after 6 days. Owing to repetition of C-mitosis, the cells which were first stimulated to divide reach a higher degree of polyploidy than do those stimulated later. A similar condition can be easily demonstrated by a cytological analysis of the root initials produced by decapitated roots at different distances from the wound surface.

The conclusion seemed, therefore, likely that decapitation alone might stimulate to mitosis the differentiated cells of the region of elongation. Moreover, such a stimulation should be a centrifugal one, that is to say, beginning at a certain distance from the cut surface and gradually moving towards it.

Decapitated roots grown in tap water and fixed at various intervals have proved this conclusion to be true.

Stimulation to mitosis in this case reaches its maximum intensity 6—9 days after the wounding, when some root initials are developing from each root. Mitoses in the cells of the cortical parenchyma are generally of the type with diplochromosomes (as to the effect of colchicine on the cortical cells reference will be made elsewhere); but various stages of the same type of mitosis occur also in the central cylinder.

Apart from the smaller degree of their frequency, the cytological phenomena induced by decapitation are similar to those first described by LEVAN[1] in onion roots treated with various growth substances. According to LEVAN, the cell enlargement caused by growth substances is the stimulus to the chromosome doubling in differentiated cells.

This does not seem to be the case in our decapitation experiments, since no cell enlargement whatever can be noticed. Evidence in the same direction has been recently obtained from a cytological analysis of the root swelling caused by sodium 2,4-dichlorophenoxyacetate[1]. It has been noted that mitoses with diplochromosomes in old differentiated cells can occur as far as 22 mm from the root cap, their greatest frequency being in the not swollen region behind the tumor.

I am, therefore, inclined to conclude that nuclei with diplochromosomes are already present in the old cells of onion roots, these having originated during the differentiation of the cortex and central cylinder. Growth substances and wounding (as to the cytological effect of wounding see also GRAFL[2]) do not—at least in many cases—induce chromosome doublings, but stimulate old polyploid cells to divide.

The possibility is, however, not excluded that the C-tumor growth may sometimes be the cause of chromosome doublings, as pointed out by LEVAN[3].

Another question of interest arising from these decapitation experiments relates to the cytological mechanism underlying the production of tetraploid callus shoots in decapitated stems of tomato and *Brassica*. As recently suggested by HOWARD[4], they might originate through stimulation to mitosis of tetraploid nuclei contained in old vacuolated cells of the stem.

Concerning the possibility of changing the frequency of mitoses with diplochromosomes in onion roots through the combined influence of decapitation and sodium 2,4-dichlorophenoxyacetate, experiments have been very recently performed. It has been observed that, at least in most concentrations, decapitation exercises an antagonistic action to the typical stimulating effect of sodium 2,4-dichlorophenoxyacetate.

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*Résumé*

En décapitant des racines d'Oignon en culture aqueuse, on a pu mettre en évidence tous les stades de la mitose à diplochromosomes dans les cellules différenciées du parenchyme cortical et du cylindre central (la plupart de celles du péricycle, généralement diploïdes, exclues).

En se basant sur ces observations et sur d'autres relatives à l'action cytologique du 2,4-dichlorophénoxyacétate de Sodium (D'AMATO, 1948), on arrive a conclure en faveur de l'existence de noyaux à diplochromosomes dans les cellules différenciées de la racine d'Oignon.

[1] F. D'AMATO, Atti Accad. Naz. Lincei, Cl. Scienze Fis., ser. 8, *4*.
[2] I. GRAFL, Chromosoma *1*, 265 (1939).
[3] A. LEVAN, Hereditas 25 (1939); Hereditas *30*, 161 (1944).
[4] H. W. HOWARD, Genetics *44*, 1 (1942).

## Preliminary Data on the Chromosome Cycle of *Lycœides idas* L.

It is known that in some populations belonging to many Lycœnidi the females show on the wings a thin coat of blue scales which often cover entirely the upper wing surface. These scales make the female wing closely similar to the masculine one which is normally blue.

Some investigations on these forms were undertaken by COCKAYNE[1] on *Plebejus argus* L., *Lysandra corydon*

[1] A. LEVAN, Hereditas 25 (1939).

[1] E. A. COCKAYNE, Trans. R. ent Soc. Lond., 322 (1916); ib. 225 (1922).