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Cultures of plant cells.

By WILLIAM H. CHAMBERS (by invitation).

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It has recently been shown by Robbins[1] that excised seedling root tips about 1 cm. in length, when planted in flasks of sterile liquid or agar media, grow to a limited extent to form organized root tissue with secondary and tertiary root branches. It is interesting to note that no one has observed a tendency for these plant cells to separate as animal cells separate from fragments placed in a nutrient medium. In a recent series of experiments it has been found that the individual plant cells will separate and migrate away from the fragments if the fragments are of a definite size and are cut from a definite part of the plant. This migration is in every way similar to that seen in animal cells.

Squash tissue was used for this study. Seedlings were grown aseptically and fragments of primary meristematic tissue were excised from the root tip for culture. They were planted in a drop about 1 mm. thick of a nutrient salt medium similar to Pfeffer's, with the addition of 0.04 per cent peptone, 2 per cent dextrose and 0.6 per cent agar, and kept in the incubator at 27°C. The reaction of the medium was pH 5.6. The size of the fragments varied in diameter from 0.3 mm. and 2.5 mm. From fragments of this tissue 0.4 to 1.0 mm. in diameter the cells reacted like the cells of higher animals. Pieces of tissue 1 mm. or greater in diameter, on the other hand, grew to form organized root tissue having a length often as much as 8 to 10 mm.

In animal tissue Burrows has shown that the rate of cell migration and growth is related to the size of the fragment, the original cell density of the fragment, and the original blood supply. Why the plant cells in fragments of a certain size migrate, while in larger ones they remain together and grow to form an organized tissue has not been determined.

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[1] Robbins, W. J., *Bot. Gaz.*, 1922, lxxiv, 59.

In the cultures of fragments between 0.4 mm. and 1 mm. the individual cells migrated over the surface of the medium in some cases to a distance of 1.7 mm. from the tissue block. In a few cases marked elongation of the fragment took place subsequent to the migration. Migration occurred for the most part over the upper and lower surfaces of the drop of agar medium. Only occasionally did the cells invade the solid medium. On the lower surface a viscid film was plainly visible diffusing from the fragment. The individual cells were evenly distributed through this film which held them immobile against shaking. After 24 hours some of the isolated cells were plasmolyzed, others have remained viable for more than 30 days.

The migration of the plant cells from the smaller fragments is similar to that of the cells of the higher animals. In the growth of the larger pieces to form parts of a plant the reaction of the plant tissue is unlike that of the higher animals but resembles the growth seen in pieces of tissue of some invertebrates. These pieces may regenerate parts or whole animals.

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A new method of using phenolsulfonephthalein for testing renal function.

By SANFORD M. ROSENTHAL* (by invitation)

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Following the intravenous injection of phenolsulfonephthalein, its rate of disappearance from the blood was studied in normal animals and in those with experimentally produced renal pathology. A dosage of 0.5 mg. of dye per kilo of body weight was found most satisfactory. A striking difference in results was found to exist between normal dogs and normal rabbits. This is shown in the following table; the figures represent the concentration of dye in the blood serum at the stated time after injection, the percentages expressing that part of the total amount injected.

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