

# SCIENCE

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## THE CHEMICAL BASIS OF AXIAL POLARITY IN REGENERATION

### I

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WHEN a piece of a stem is cut out from a plant one or more new shoots will usually arise at the apical, and roots at the basal end of the piece. This phenomenon of axial polarity was explained by the older botanists as being due to a flow of shoot-forming substances to the apex and of root-forming substances to the base. The gathering of these substances at opposite ends of the piece was believed to be responsible for the phenomenon of polarity in regeneration. While this may or may not be correct, the writer has recently found facts which suggest an additional or a different mechanism for this polarity, namely, that the apical bud suppresses the growth of the buds situated more basally in the stem by sending out inhibitory substances in a basal direction.

The experiments were made on *Bryophyllum calycinum*. Each node of the stem of this plant has two leaves in an opposite position, and in the axil of each leaf is found a dormant bud capable of giving rise to a shoot. The line connecting two buds of one node is at right angles to the line connecting the two buds of the next node.

*Experiment I.*—A piece of stem, containing six or more nodes, is cut out from a plant, all the leaves are removed and the piece is put into a horizontal position with the line connecting the two buds of the most apical node vertical. In this case both buds in the apical node may begin to grow, but as a rule only the upper bud will continue to grow, while the growth of the lower bud will soon stop altogether or will