

SECTION D : LIFE AND EARTH SCIENCES

1) - 01 ANOTHER INTERPRETATION OF POLARITY IN PLANTS IN TERMS OF A PHYSICO-CHEMICAL MODEL INVOLVING AUXIN TRANSPORT

J. Eliezer

(Department of Botany, University of Colombo, Colombo 3)

Polarity is one of the earliest and most fundamental steps in differentiation and organogenesis for zygote or cells in tissue culture. Most plant bodies are polarized with two poles, shoot and root. When small parts of plants are excised and allowed to regenerate, as with cuttings, the polarity of the original plant tends to be restored : roots develop at the morphological base and shoots at the morphological apical pole of the excised part.

Of the many hypotheses that have been suggested to account for polarity in plants, the polar transport of auxin has been one of the foremost. However, no universally acceptable mechanism to account for this characteristic of polar auxin transport has yet been put forward.

Another alternative model involving membrane bound carriers (probably proteins) located either in the plasma-membrane or the endoplasmic reticulum is suggested. It is proposed that the auxin-carrier complex is charged and that the motive force bringing about its movement through the membrane is a gradient in electrical potential along the transport pathway. The consequences of this model and its interpretation to explain the phenomenon of polarity are discussed.