ciated in the final phase of crystllisation of the Jogimardi trap brought about the alteration of the trap into serpentinous material. Alteration of galena to anglesite along the boundary is also believed to be due to the process of oxidation brought about by the volatiles.

The following sequence of events is suggested : Separation of lead sulphide along with volatile emanations from the magma—Solidification of magma as Jogimardi trap—Crystallisation of galena—Action of volatiles on the trap rock and galena.

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PLANTLET FORMATION IN TISSUE CULTURES FROM LIGNOTUBERS OF *EUCALYPTUS CITRIODORA* HOOK.

Eucalyptus citriodora Hook. is a tree introduced from Australia and grown as an avenue tree or in plantations for the production of its essential oil.[1] In view of great variations in oil content from tree to tree, this laboratory has been interested in vegetative propagation of this species in order to have high oil yielding clones. Attempts made to multiply the high yielding trees from stem cutting were not successful. Therefore tissue culture technique was applied for vegetative multiplication. The results are reported in this paper.

E. citriodora has a swollen outgrowth, called lignotuber, on the main axis at the region corresponding to the rootstock. The lignotuber plays a role in the survival of *Eucalytus* species after the main trunk is cut off or destroyed by bush fire.

The tissues from the main aerial stem, from the lignotuber, and from the root tips of germinated seeds, were grown on Murashige's inorganic salts medium supplemented with sucrose (2%), *meso*-inositol (0·5%), coconut water (15%), *amino-acids*, *vitamins*, 2-naphthoxyacetic acid (1 ppm. and 10 ppm.), and agar (0·4%).

Root Tissue.—The initiation of callus started in one to two weeks but the rate of development was enhanced on subsequent subculture of the callus. At 1 ppm naphthoxyacetic acid the callus formed roots, but at 10 ppm a non-granular mass of undifferentiated tissue was formed.

Stem Tissue.—The callus developed only after prolonged contact with the medium and was initiated only in a medium supplemented with 10 ppm naphthoxyacetic acid. But it could be maintained later at 1 ppm of the hormone. The callus also required subculturing every 3-4 weeks in order to obtain rapid growth. The callus was granular as if formed by conglomerations of somewhat spherical, 2-3 mm. broad, whitish, bud-like pellets.

Lignotuber Tissue.—It produced a granular mass of callus, at first somewhat similar to that obtained from stem tissue. However, in 3-4 weeks growth in medium containing 1 ppm naphthoxyacetic acid, each bud-like segment of the callus mass became transformed into a green, aerial bud (Fig. 1) which in the subsequent 3-4 weeks developed into a plantlet.

FIG. 1

Thus, several plantlets were formed which produced roots. The results obtained with the lignotuber tissue culture have significance in two respects : (1) Within the same medium composition and auxin concentration the ability to form plantlets is inherent in the tissue from which the callus originated, and (2) the ability of lignotubers of *E. citriodora* to form plantlets *in vitro* offers a potential which can be exploited in raising high yielding clones. Work is in progress to standardize this technique for commerce.

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Jammu, *September* 17, 1968. C. K. ATAL.

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