by Professor Steward, "Nutritional Problems Raised by Work with Root Cultures" and "Studies on the Hormonal Control of Root Growth" both by Professor Street "In vitro Culture of Flowers and Fruits" by Dr. Nitsch; "Experimental Modification of Growth and Differentiation in Plant Tissue Culture" by Professor Reinert, and "Plant Tissue and Organ Culture from the Point of View of an Embryologist" by Professor Maheshwari. Suffice it to say that each of them was rich in illustrative information. In the concluding session there was a brief but objective discussion on "Techniques, Appraisal of Progress and Future Outlook on Tissue Culture Research".

A special feature of the Symposium was the exhibition of live-tissue cultures set up by the Department of Botany.

N. S. RANGA SWAMY.

A NEW GALVANOMAGNETIC EFFECT IN SEMICONDUCTORS

DR. Sikorski, of the Institute of Fundamental Technical Problems, Polish Academy of Sciences, Warsaw, has carried out a theoretical analysis of the electrical conditions in an inhomogeneous semiconducting specimen, which has one face uniformly illuminated and has a magnetic field applied perpendicular to the face A general formula for the current density in such a specimen has been deduced and from this a new galvanomagnetic effect has been predicted. Experimental investigations have been carried out to confirm these theoretical predictions (*Proc. Intern. Conf. Semiconductor Phys.. Prague*, 1960).

The effect is best observed in a thin rectangular semiconducting plate (xy), with electrodes making ohmic contacts at the ends (x axis). A conductivity gradient ($d\sigma/dy$) exists in the plate perpendicular to its length (*i.e.*, along the y axis). The upper face is uniformly illuminated (over a length l) and the magnetic field (B) is applied perpendicular to this face (z axis). The theory shows that under these conditions a voltage is developed between the end electrodes. Dr. Sikorski proposes that this effect be called the bulk photoelectromagnetic effect (Bpem). The Bpem may be considered as a Hall effect in which the movement of non-equilibrium current carriers δp in an internal field (directly related to the conductivity gradient) must be taken into effect. The new effect is, however, related to the photoelectromagnetic effect (*Phys. Rev.*, 1956, 101, 1713) and the bulk photo-voltaic effect (*Czech J. Phys.* 1956, 6, 96), already known.

In the case of an n-type semiconductor the expression for the voltage U (bulk photoelectromagnetic effect) can be reduced to

$$U = -(kT/e)(e\mu_p \delta p \theta/\sigma^2)(d\sigma/dy)\,l$$

where e is the charge of an electron, μ_p is mobility of holes, σ is the mean value of the conductivity and θ is the product of the Hall mobility and the magnetic field.—(*Nature*, 1962, 193, 32.)

MEASURING THE POLARIZATION OF RADIO-WAVES

ACCORDING to Prof. H. C. van de Hulst, Professor of Theoretical Astronomy in the State University of Leyden, radio astronomers working at the Dwingeloo Observatory, Netherlands, have been able to prove conclusively that part of the radio-radiation from the universe is polarized. This has been made possible by using a highly specialized receiver and a radio telescope exceedingly well suited to the purpose, which enabled not only measurement of the weak signals but also their analysis.

The electro-magnetic waves which penetrate the earth's atmosphere from the universe and which can be detected with radio-telescopes consist of vibrations in numerous directions. The measurements taken in November and December last showed that a small portion of the radiation from some areas of the heavens was found to vibrate in one particular direction. This result was forecast by theoretical calculations designed to explain the origin of the radio-radiation. This theory, however, has to be proved and radio astronomers in various countries have been endeavouring in recent years to produce this proof, so far with negative, or at least highly doubtful, results. According to the theory, part of the radio-radiation is emitted by rapidly moving electrons under the influence of magnetic forces. These electrons, which move at speeds almost equal to that of light, describe enormous spiral courses through the Milky Way.

The measurements of polarization at present being carried out provide the theoreticians with an opportunity to pursue their calculations with greater confidence.