The underlined gibberellins seem to be terminal and the remainder seem to be intermediates in the fungus. The enzymes involved show limited substrate specificity, so that it is possible, for instance, to metabolize steviol to GA_{17} , GA_{18} and 13-hydroxy GA_{12} .

I. D. Railton, R. C. Durley and R. P. Pharis (University of Calgary) reported on the metabolism of gibberellins in the tissues of higher plants. In general, the gibberellins are converted to increasingly polar derivatives; for instance in the pea, where the native gibberellins are GA_{20} and GA_{29} , two sequences seem to be:

Thus it seems that most of the gibberellins found naturally are intermediates in the synthesis of a small number of terminal gibberellins.

K. Hiraga, T. Yokota, N. Murefushi and T. Takahashi (University of Tokyo) reported the isolation of further free acidic gibberellins, bringing the number to forty-two, and also the identification of several neutral gibberellins. The last mentioned proved to be gibberellin glucosyl esters.

It is generally accepted that there is a considerable range of plant growth substances vet to be characterized. The isolation and identification of three new growth substances produced by phytopathogenic fungi were reported by S. Tamura, Y. Kimura, A. Hinota, T. Inoue and A. Suzukii (University of Tokyo). One of them, pestalotin from Pestalotia cryptomerciaecola, enhances the shoot elongation response of rice seedlings to GA3; another, Nr-3 from Colletotrichum lagenalium, is an antiauxin; the third, Cyl-2 from Cylindrocladium scoparium, is potent plant growth inhibitor.

T. Hashimoto and K. Hasegawa (Institute for Physical and Chemical Research, Wako-shi) reported the characterization of the batatasins, the compounds which seem to control dormancy in yam bulbils. The isolation of a particularly interesting inhibitor of ethylene production from etiolated mung bean hypocotyls was described by H. Imaseki and S. Saki (University of Nagoya). The substance is a protein with a molecular weight of 112,000, consisting of two subunits. It binds selectively to epidermal cells at physiological concentrations.

Studies on the mode of action of plant growth substances at the molecular level have been hampered by lack of several of the critical molecules, for example, the receptor molecules and mRNA species; and by the lack of systems showing an *in vitro* response. A number of developments were reported.

J. H. Cherry (Purdue University, Lafayette) discussed his interesting in vitro system from soybean hypocotyls. A factor released from plasma membrane preparations by auxin (1AA and 24D) promotes the activity of a purified, α -amanitin-sensitive RNA polymerase. The factor is not released by the biologically inactive analogue 35D or by cyclic AMP; it is of high molecular weight and is inactivated by protease.

The isolation of a heterogeneous, rapidly labelled RNA species containing poly(A) from mung bean root polysomes was described by T. J. V. Higgins (Australian National University). The RNA stimulates amino acid incorporation in vitro. Abscisic acid has no detectable effect on the synthesis of species of this messenger-like RNA, although inhibiting the induction of nitrate reductase.

A stimulation in vitro of photophosphorylation of isolated chloroplasts by auxin at physiological concentrations was reported by I. A. Tamas and B. Breithaupt (Ithaca College, New York): auxin seems to inhibit the uncoupled loss of H from thylakoids. K. Kasamo and T. Gamaki (University of Tokyo) found, on the other hand, that auxin in vitro stimulates a partially purified, membrane bound, Mg²+ activated ATPase from mung bean hypocotyls: the ATPase purified with the plasma membrane fraction.

CELL BIOLOGY

Using Microcalorimetry

from a Correspondent

On the invitation of Dr I. Wadsö, an international group of about forty investigators from the fields of chemistry, biochemistry, cell biology and clinical medicine, met from July 9-11 at the Chemical Centre of the University of Lund, Sweden, to discuss the application of microcalorimetry to cellular systems. The meeting took the form of an informal workshop in which there was a lively exchange of views on the application of microcalorimetry in medical and biological research. though calorimetry has long been in use in chemical investigations, it is only during the past few years that the development of microtechniques has made possible its application to the clinical sciences and cell biology.

Four sessions were held during the three-day meeting. The first, introduced by Wadsö, dealt with the general principles of calorimetry, and he was followed by others on microcalorimetric instrumentation and titration calorimetry. The designs of a microcalorimeter suitable for the study of cells grown in tissue culture and of a modified stopped-flow calorimeter were described respectively by P. D. Ross and R. L. Berger (both of the

US National Institutes of Health. Bethesda). The specific features of the Lund ampoule drop calorimeter and the NBS microcalorimeter were also presented and discussed. The NBS microcalorimeter developed by E. J. Prosen and his group at the National Bureau of Standards in Washington, DC, seems to have great possibilities of application in clinical biochemistry. The determination of serum glucose by the single enzyme (hexokinase) reaction using this microcalorimeter gives values which are not only easily and rapidly reproducible but also compare very favourably with those obtained by more conventional and laborious techniques. The simplicity of its operation, which does not require any previous experience in calorimetry, suggests that it may well become a versatile instrument with wide application in clinical medicine.

The subject of the second session—the application of microcalorimetry to the study of blood cells—attracted considerable interest and discussion. Among the eleven contributions on this subject were the reports of a study of some of the factors which influence the generation of heat by red cells, by J. A. Ikomi-Kumm and A. E. Boyo (University of Lagos), and that of the heat effect of cell-surface interactions by Brooks (University of Cambridge).

Monti and Wadsö (University of Lund) reported the successful diagnosis of thyrotoxicosis by microcalorimetry based on the increase in the heat produced by the red cells of patients with this condition. The one case which failed to give the characteristic heat response, although initially classified on clinical data as a case of thyrotoxicosis. was subsequently shown to be a case of clinical 'mis-diagnosis', thus confirming the specificity and the reliability of this diagnostic method. The successful diagnosis of systemic lupus erythromatosus (SLE) based on the heat produced as a result of the phagocytic action of 'LE cells' was also reported by Levin (Sweden). Using this technique, fourteen out of fifteen positive cases of SLE were successfully diagnosed.

The other two sessions of the meeting dealt with the use of microcalorimetry in the identification of different bacteria, the measurement of heat produced by tissue cells and its application in the field of immunology. R. C. Woledge (University College, London) discussed the results of microcalorimetric measurements made on muscle biopsy specimens and during human muscle contractions in vivo. Differences between normal and hypothyroid patients were observed. The possible applications of microcalorimetry in the study of immunological cellular reactions discussed by A. Rosenberg (University of Minnesota) and other participants provided a fitting conclusion to the workshop.