

## THE JOHN INNES INSTITUTE

**D**R. K. S. DODDS, director of the John Innes Institute, in his annual report\* of the work of the Institute, anticipates that with the removal of the Institute to a site near the University of East Anglia it will be appropriate to re-fashion its research activities in the light of modern requirements of agricultural research. Meanwhile, the contents of the report suggest that the Institute maintains its high traditions in genetical research.

The work of the Institute is concerned both with fundamental genetical research and with plant breeding. The Department of Genetics is concerned mainly with the former and work has continued on genetical control of the enzyme NADP-linked glutamate dehydrogenase in *Neurospora* and new mutants and new complementation relationships are reported. Work has continued on the genetics of *Ustilago* with special reference to the effect of inhibitors of DNA synthesis on mitotic crossing-over. The enzyme nitrate reductase has also been investigated in *Ustilago* mutants some of which are unable to utilize nitrate or nitrite. The results suggest that the ammonium ion acts as an inhibitor of nitrate reductase rather than by repressing the formation of the enzyme. The work also suggests that induction of nitrite reductase lags behind that of nitrate reductase. These findings have implications for nitrate metabolism of higher plants. Investigations on *Antirrhinum majus* show that changing the environmental conditions during growth affects the germination as well as the somatic mutation rate.

Further work in the Department of Cell Biology confirms that much of the rapidly labelled ribonucleic acid in the cell nucleus undergoes breakdown within the cell, largely in the nucleus, to acid-soluble end-products, and it is concluded that much of this short-lived nuclear RNA does not serve as a template for synthesis of protein either in the nucleus or cytoplasm and its function remains obscure. Little is known concerning the relative amounts of DNA and RNA in different parts of the cell nucleus, and attempts are being made to elucidate this on isolated nuclei of different species of higher plants of varying chromosome size. A new technique for isolating nucleoli will help in separating RNA fractions of the nucleus. In cultures of plant callus cells it has been discovered that chlorophyll formation is more adversely

affected by certain synthetic auxins than carotenoid formation, but prolonged treatment with high levels of auxins did not impair the ability of the cells to synthesize chlorophyll and on restoration to a lower level they resumed synthesis. In all the callus cultures investigated the rate of carotenoids to chlorophylls was consistently higher than in leaves.

The possibility of devising mathematical models to interpret responses to selection is being continued by the Department of Applied Genetics. Other topics under investigation in this Department include the relative distribution of tomato mosaic virus in susceptible and resistant strains and the genetics of the tomato and the garden pea. The prevalence of the tendency for English garden peas to throw rogues is attributed to the narrow genetic base on which English garden peas are established, many varieties having common ancestors.

The Department of Potato Genetics is responsible for maintaining the Commonwealth Potato Collection and it is providing material for countries interested in potato breeding. Within the Department it provides material for studying the genetics of cultivated diploids, a necessary preliminary to the establishment of useful commercial varieties. Disease resistance and tuber dormancy are also under investigation. The discovery that seed and tuber dormancy may be under a common biochemical control will help to establish stocks of known dormancy.

With Mr. W. J. C. Lawrence's retirement from the Department of Physiology and Plant Culture the results of his work on the rogue tomato are summarized. Investigations into the effects of day and night temperatures on growth of tomato seedlings indicate that optimum temperature régime is a constant temperature close to 25° C but is dependent on the light intensity. Day temperatures affect growth more than night temperatures. The developing leaves respond to temperature more than the cotyledons. Contrary to general belief, it is found that respiratory loss is unaffected by night temperature and in fact a high night temperature is beneficial in stimulating leaf growth by increased cell multiplication. In glasshouse experiments, relatively high night temperatures are found to be beneficial to young plants even under conditions which are at variance with normal commercial practice.

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\* John Innes Institute. Fifty-fourth Annual Report, 1963. Pp. 58. (Bayerfordbury, Hertford: John Innes Institute, 1964.) 3s.

## MEDICAL RESEARCH AND THE WORLD HEALTH ORGANIZATION

**T**HE *Medical Research Programme of the World Health Organization, 1958-1963\** should be read by all who wish to know what the World Health Organization is doing and has done in the field of medical research. It is a comprehensive survey of the intensified programme of medical research on which the Organization first embarked in 1958. Before that year the promotion of research had, of course, been an integral part of the work of the World Health Organization. In this volume, the director-general, Dr. M. G. Candau, gives for the first time in print a comprehensive report of the medical research programme of the Organization.

The report begins with a general account of the origin, objectives, nature and methods of the programme and

\* World Health Organization. *The Medical Research Programme of the World Health Organization, 1958-1963: Report by the Director-General*. Pp. vii+298. (Geneva: World Health Organization; London: H.M. Stationery Office, 1964.) 18 Sw. francs; 30s.; 6 dollars.

the promotion and co-ordination of the work done by co-operative effort in many countries. The programme is directed essentially at the solution of problems that are better tackled by co-operative effort than by local groups, but it is not merely concerned with those projects which the World Health Organization helps financially. Some of the work helped by the Organization involves the collaboration of experts in several scientific disciplines, such as chemistry, pharmacology, biology and epidemiology. Others are carried out in clinical departments in various countries.

A wide range of subjects is discussed in the report and they are grouped under the following five headings: (1) "Communicable Diseases", that is, virus diseases, enteric and diarrhoeal diseases, tuberculosis, leprosy, malaria, bilharziasis, diseases caused by spirochaetes and filarial nematode worms, other diseases caused by para-