

infected aphids show significant decrease in oxygen consumption. V. Moericke discusses some electron micrographs of the salivary glands of *M. persicae*. (Unfortunately the micrographs are not reproduced.) Those from infected aphids contain rod-shaped particles ($50 \times 200 \text{ m}\mu$) which are suspected to have some connexion with leaf roll virus if they are not the virus particles themselves.

The papers by C. Wetter and J. Brandes report some recent work at the Biologische Bundesanstalt, Braunschweig, Germany, which increases our scope for grouping viruses on serological relationships. Using Freund's adjuvant, antisera to viruses, having rod-shaped particles, were produced with precipitation titres of up to 1:500,000 (unusually high titres for viruses). With such antisera it has been possible to demonstrate serological relationships between viruses previously considered unrelated.

Even more unexpected is the relationship found between viruses differing in particle-length such as between potato virus X ($520 \text{ m}\mu$) and white clover mosaic virus ($480 \text{ m}\mu$).

There are five papers on the resistance of potato varieties to virus infection, the inheritance of resistance and some practical aspects in testing for resistance. However, there is only one paper on field experiments. This may be the fault of the selection committee and not that this important kind of work is lacking.

In recent years soil-borne viruses are in the mode. In this respect the *Proceedings* are up to date, but of the several viruses discussed only potato rattle virus is appropriate to the conference. From the three papers attempting to review "some aspects" of virus research none contains anything new which has not been previously discussed in other review articles.

B. KASSANIS

CHROMOSOMES OF NEUROSPORA

RESEARCH workers at the University of Texas are investigating the genetic and nutritional simplicity of the red bread mould, *Neurospora*, to map the locations, on particular chromosomes, of the determinants of biochemical reactions by which particular substrates are metabolized for utilization in life processes. The work is expected to lead to a clearer definition of the gene.

The red bread mould *Neurospora* has long been regarded as one of the most useful of genetical experimental organisms. Pure strains can be multiplied a million-fold in a few days without genetic change. Each cell nucleus contains only a single set of genes, so recessive characters are not hidden by dominants. *Neurospora* can be grown in pure culture on a chemically known medium containing only sugar and a vitamin B (biotin) plus a few inorganic substances. In the natural state, the mould possesses the biochemical apparatus to make, from these simple materials, all the other constituents of its cells. Thus when a genetic element is disrupted experimentally by irradiation, the mutation may be expressed and mapped in terms of the measurable changes which occur in the simple nutritional requirements of the organism.

A large group of such nutritional mutations of *Neurospora* have been described by R. P. Wagner, C. E. Somers and A. Bergquist at the University of Texas in Austin. Plotting the distribution of the

mutations on a map of *Neurospora* chromosomes, Wagner's group traced them all to a limited area of the fifth chromosome. Wagner's report is preliminary, but appears to record the first demonstration, in any organism with a single or double chromosome complement, of a direct relationship between one small segment of a single chromosome and a particular set of biochemical reactions. (Damage in the segment of chromosome affected directly the transformation of precursors of two important amino-acids—iso-leucine and valine.)

The results also indicate a linear arrangement of the chromosomal material, with its active elements arranged to correspond to the order of sequence of the biochemical reactions it controls.

Wagner's work is supported by the Division of General Medical Sciences and the National Cancer Institute of the U.S. Department of Health, Education and Welfare. The publication *Highlights of Research Progress in General Medical Sciences, 1960*, presents a summary of Wagner's work and that of other investigators who are sponsored by the Division*.

* United States Department of Health, Education and Welfare. Public Health Service Publication No. 815: *Highlights of Research Progress in General Medical Sciences, 1960*. Items of Interest on Research Studies and Research Training Programs supported by the Division of General Medical Sciences, National Institutes of Health, Bethesda 14, Md. Pp. v+45. (Washington, D.C.: Government Printing Office, 1961.) 25 cents.

A CONCEPT OF ATOMIC EXISTENCE

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IN classical terms we have a manageable concept of physical existence. We represent things in a space-time map. Usually the processes by which recognizing, naming and surveying are accomplished are not shown in this map. Nevertheless, they could be, and whenever there is doubt or unclarity in their application, they are so represented for the purpose of clarifying representation. So long as the precision of representation does not approach the limits set by the Uncertainty Principle, all the apparatus and

procedure just referred to can be used. We have confidence in ordinary language and rely on the training of physicists needed for applying it successfully in this context. The force of this consideration is illustrated in the skilful elaboration of classical explanation by Thirring in the first chapter of his *Principles of Quantum Electrodynamics*.

At the microphysical level, of course, there are physical impediments to applying ideas that we take for granted in the unformalized improvisation neces-