Quantitative Biology

THE Sixteenth Symposium on Quantitative Biology, sponsored by the Biological Laboratory of the Long Island Biological Association, was held in Cold Spring Harbor June 7–15. Over 300 participants gathered to consider the topic "Genes and Mutations." Many of those attending came from abroad. The following countries were represented: Brazil, Denmark, England, France, India, Italy, Japan, Norway, Scotland, Sweden, Switzerland, Turkey, and Yugoslavia.

Thirty formal papers were presented, and each was followed by an extended and lively discussion. The symposium may be regarded as the most successful of the series of Cold Spring Harbor meetings. The topics, arranged by M. Demerec, director of the Long Island Biological Laboratory, centered around the problems of genetics that have been most intensively studied in recent years. The great changes that have been taking place in the concepts and methods of genetics during the past decade can be well demonstrated by comparing the present symposium with the Cold Spring meeting on the same topic in 1941.

A number of papers were concerned with the modern concept of the gene and its evolution. From different fields, particularly the study of spontaneous mutations, the action of pseudoalleles, and position effects, material has accumulated which is leading toward a revision of the older concept of the gene as a particulate, well-defined unit. Although no agreement exists among the different workers in the field on the extent and kind of revisions necessary, recent developments seem to favor a more flexible and functional description of hereditary units. Among the papers dealing with this aspect of genetics, McClintock's representation of her work on "Chromosome Organization and Genic Expression" aroused particular interest.

One day was devoted to a discussion of cytoplasmic inheritance. The existence of cytoplasmic particles endowed with the ability to reproduce their own kind has been demonstrated for microorganisms, animals, and plants. The interaction of cytoplasmic particles with chromosomal genes in the production of characters was also considered.

In the discussion of induced mutations, the action of chemical mutagens occupied the center of attention. The mutagenic action of ionizing radiations, which had been one of the main topics in the 1941 symposium, was taken up in two papers.

A large part of the symposium was devoted to the genetics of microorganisms. It is becoming increasingly clear that, from a genetic point of view, microorganisms do not behave differently from the higher organisms studied earlier. This was borne out by the demonstration of bacterial chromosomes by DeLamater, by the discussion of the recombination and linkage experiments of Lederberg, and by Witkin's proof that bacterial mutations are nuclear events. For bacterial viruses, mutation and recombination were discussed by Luria and by Hershey. Of especial significance is the discovery of bacterial transforming principles for several characters other than the classical capsular antigens in pneumococci, which was reported by H. Ephrussi-Taylor.

Another topic which led to extended debate was the one-gene–one-enzyme theory of genic action. Horowitz reported an intensive study of temperature-dependent biochemical mutations, which is in good agreement with the theory. Bonner, on the other hand, described experiments demonstrating that many of the biochemical blocks are not absolute, and that the action of one particular enzymatic block may be under the control of several genes. These results seem to require extensive modifications of the original theory.

The symposium ended with a paper by Mirsky on the enzymes found in cell nuclei, and with a discussion by Sonneborn of results obtained by him in *Paramecium* and by Moewus in *Chlamydomonas,* bearing on several aspects of the problems that concerned the participants in the symposium.

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