quently is, a monstrosity incapable of completing development and surviving, a completely new anatomical construction may emerge in one step from such a change." Whether or not the production of such "hopeful monsters" may reasonably be considered the main channel of organic transformation is, however, an entirely different matter, as Goldschmidt himself admits (p. 251).

It is impossible to attempt here a critique of Goldschmidt's theory, for this would require a book approximately of the same size as his own. Certain lines which such a criticism might take are adumbrated above. In his concluding chapter (pp. 396–399), Goldschmidt indicates that one of the advantages of his views over neo-Darwinism is the simplicity of the former. It is indeed simpler to assume that major groups of organisms arose ready-made by catastrophic systemic mutations than to visualize the complex interplay of the numerous agents which could bring similar results on the neo-Darwinian scheme. But in the reviewer's opinion the simplicity of Goldschmidt's theory is that of a belief in miracles. It must, nevertheless, be recognized that Goldschmidt's keenly critical analysis has emphasized the weaknesses and deficiencies of the neo-Darwinian conception of evolution, which are numerous, as even partisans ought to have the courage to admit. It would seem that this fact alone obliges any one interested in the modern evolutionary thought to read Goldschmidt's book.

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REPORTS

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY AND THE NATIONAL DEFENSE PROGRAM[1]

PROTECTION of the Western Hemisphere and especially of the North American continent against any possible invasion by force is the firm determination of all true Americans. Equally important, and more difficult, is defense of the freedom of spirit and action which our forefathers won for us by generations of struggle and which is stealthily threatened alike by subversive influences from without and vicious ambitions from within. Both tend to undermine our strength by sowing doubt and discord. Sometimes these influences operate insidiously in the guise of high idealism, as in the cause of peace or of human rights; sometimes they operate openly to incite violence and class hatred.

Research work on national defense problems is being conducted in many of the departments of the institute. Most of this is through contracts with the War and Navy Departments, the National Advisory Committee for Aeronatuics, the National Defense Research Committee, the National Academy of Sciences and with private companies engaged in development of equipment for military purposes.

Members of the institute's staff are serving in a variety of national defense agencies, some having been granted leaves of absence and others having been relieved of a portion of their institute duties to make this possible. Dr. Robert G. Caldwell, dean of humanities, is serving as chairman of the Division of Cultural Relations Among the American Republics, a post he has taken at the request of President Roosevelt. Professor Ralph D. Bennett, of the department of electrical engineering; Professor Francis Bitter, of the department of metallurgy, and Doyle Northrup, of the department of physics, are on leave of absence to carry on an important research program for the Navy Department, while Professor C. M. Van Atta and R. D. Campbell resigned from the physics staff to work on this project.

Professor Jerome C. Hunsaker, head of the departments of mechanical engineering and aeronautical engineering, is a member of the National Advisory Committee for Aeronautics, and is participating in the aeronautical research programs conducted for the Army and Navy by that committee. Through membership in many other boards and committees in Washington he is also aiding the defense program. Professor Walter G. Whitman, head of the department of chemical engineering, is chairman of a subcommittee of the National Advisory Committee for Aeronautics. Professor E. S. Taylor, of the department of aeronautical engineering, has been the chief assistant to George J. Mead, a graduate of the institute, who is in charge of airplane engine production under Mr. Knudsen, head of the National Defense Committee.

Professor John E. Burchard, director of the Bemis Foundation of Technology, is in active charge of a group of scientists and engineers charged with the development of special types of shelters.

Professor Douglass V. Brown is head of the Division of Economics and Statistics for the Stettinius Committee, and his colleague, Professor Douglas M. McGregor, has been called from time to time to undertake special assignments for the Bureau of Labor Statistics.

The National Defense Research Committee, under the chairmanship of our colleague, Dr. Vannevar

[1] From the annual report of President Karl T. Compton to the Corporation of the Massachusetts Institute of Technology.

Bush, formerly vice-president and dean of engineering at the Massachusetts Institute of Technology, has presently available a large fund for research on devices and instruments of warfare. Members of the committee in charge of its four divisions are Dr. Frank B. Jewett (M. I. T., '03), Dr. Richard C. Tolman (M. I. T., '03), President James B. Conant, of Harvard University and myself. Among the committee's section chairmen are Dr. Alfred L. Loomis, of the corporation; Professor W. K. Lewis, department of chemical engineering, and Professor George R. Harrison, department of physics, and on the operating section committees are Professors Tenney L. Davis, chemistry department; Thomas K. Sherwood, chemical engineering department; Edward L. Bowles and Samuel H. Caldwell, both of the electrical engineering department.

These are only some of the present national defense activities of our staff. Many others also will undoubtedly arise in the near future.

Where we possess facilities of personnel or equipment which can contribute in especially significant ways to the national defense program, we should direct them to this effort, always guided by our best evaluation of the national importance of this effort in comparison with other ways in which these same personnel and facilities might be used. We should make this possible by postponing less urgent research projects, by internal rearrangement of teaching schedules and by carrying a more than normal per capita burden of work.

In addition to scientific and engineering research, special courses in various scientific fields have been given and others are expected to follow as the need arises. One of these was an intensive course for junior aeronautical engineers. Fifty-one graduates in civil, mechanical and other engineering subjects from engineering schools in northeastern United States were accepted for this ten weeks' course without tuition. The success of the program has led to requests by aircraft companies that the course be repeated and that similar training be offered in other fields. Congress has under consideration an appropriation of $9,000,000 for financing short intensive courses in engineering schools.

Technology is continuing to participate in the Civilian Pilot Training program and is planning to speed up the ground school program during the current academic year.

Weather forecasting is an essential feature of modern warfare. For a number of years the institute has been giving postgraduate training in meteorology to young men of the Army, Navy and the United States Weather Bureau. This summer a special intensive course was given to recruits for the meteorological service of the Army Air Corps. During the current academic year, training will be given to another group of approximately sixty-five special postgraduate students in this subject, mostly from the Army Air Corps and the Weather Bureau. With these additions we have had a threefold increase in the number of graduate students studying meteorology.

Realizing fully that present conditions make it more important than ever that it keep abreast of advances in science and engineering and that its officers must have the best possible technical training, the Navy Department is sending an increased number of officers for postgraduate study at the institute. At its request there has been established a new course which combines the separate courses in naval construction and naval engineering into a single coordinated program. Of the sixty officers detailed to technology, forty are taking this three-year program and the remainder are distributed among other courses.

As the need arises we are preparing to institute intensive new courses in naval construction and aircraft instruments for special groups of officers.

The Wright Brothers Memorial Wind Tunnel is in continuous and overtime use for the testing of design models of new types of airplanes. With funds provided by two aircraft companies, important new equipment is being added to this laboratory to permit tests on models with power applied to propellers, thus more closely simulating flight conditions.

SPECIAL ARTICLES

PROPERTIES OF THE ISOLATED EQUINE ENCEPHALOMYELITIS VIRUS (EASTERN STRAIN)[1]

REPORTS from this laboratory during the past two years have been concerned with the purification of the virus of equine encephalomyelitis and the study of its properties. Of chief interest has been the investigation of a specific material obtained by ultracentrifugal fractionation of extracts of chick embryos diseased with the virus (Eastern strain). With this material, first described by Wyckoff,[2] is associated the infectivity of the extracts from which it is derived. Continued study has provided increasing evidence that it is identical with the virus.

The process consistently yielding the purified virus

[1] This work was aided by grants from Lederle Laboratories, Pearl River, N. Y., and the Dorothy Beard Research Fund.

[2] R. W. G. Wyckoff, *Proc. Soc. Exp. Biol. and Med.*, 36: 771, 1937.