In 1922, the beginning of this particular Metonic span, American foundations had already made their place. The capital funds at their disposal had reached vast figures, and the sums distributed under the terms of their charters were correspondingly impressive. The Carnegie Corporation alone had voted more than $88,000,000, including a single gift of $5,000,000 to the National Research Council for building and endowment. Outstanding achievements were already to their credit: by the Rockefeller Foundation in public health and medical education, by the General Education Board in education in the South, by the Carnegie Corporation in library construction, by the Carnegie Institution of Washington in scientific research. In a number of fields foundations had developed influential leaders. They were in a position to enlist distinguished men as members of their boards of trustees, and under the able executives who had been called to their direction the foundations were becoming clearing houses for ideas, an educational service whose importance is often overlooked.

Throughout the Metonic span the attitude of the foundation has reflected the current intellectual and moral climate of the country; 1922 was a day of confidence and buoyancy. It was a day of big things with as yet unshaken confidence in what money could perform. Foundations enjoyed a large and steady income. The path ahead seemed clear. The Carnegie Corporation was carrying a load of over $40,000,000 voted against future income, cheerfully unaware of the gruelling but necessary task lying before it of reducing that load to its present figure.

The chief recipients of foundation grants were the endowed colleges and universities. State institutions were relatively neglected. Grants were mostly devoted to endowment for general purposes or to buildings. Only one profession, medicine, enlisted the interest of foundations, but this profession received immense sums. Large funds were given to a new type of independent non-teaching institution, for example, the Food Research Institute in Palo Alto, the Institute of Economics in Washington and the American Law Institute in Philadelphia.

In addition to institutional gifts, the foundations encouraged elaborate and expensive proposals for general studies, surveys and demonstrations, in which the recently developed techniques of educational and social measurement and appraisal were at times applied with more zeal than judgment. Under the stimulation of the World War I certain agencies concerned with social problems had built up large budgets and undertaken extensive programs; they had enlisted the services of ambitious and energetic officers who succeeded in persuading the foundations to contribute to the carrying out of their plans.

The conditional gift was in general favor. It fitted into the spirit of the times, and individual donors or other trusts could readily be found to comply with the requirements. Many such gifts were made in response to a series of institutional drives conducted under professional direction. For example, the finances of many colleges were strengthened by the joint action of the General Education Board and Carnegie Corporation in voting conditional grants for endowment.—*Dr. Keppel in his final report as president of the Carnegie Corporation.*

PROGRESS AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

ALONG with maintaining our normal educational activities we have been able to initiate or put into effect some highly significant additions and improvements in our facilities and educational programs. Many of these have already been separately reported to the Corporation Visiting Committees since they resulted from recommendations made by these committees, and I will attempt here to brief only some of the most noteworthy ones.

For a number of years the visiting committee of our medical department repeatedly has recommended the addition of both a dental clinic and a psychiatric clinic to our medical service. During the year the Charles Hayden Foundation, upon recommendation of Mr. Willard Hayden, made a grant of $10,000 to equip and start a dental clinic which is now in operation. With the opening of school this fall we also initiated a psychiatric service. A physician trained as a specialist in this field is available for consultation and other services for a two-hour period twice a week.

Last January the corporation authorized a new degree, doctor of philosophy in industrial economics, based upon a new program of graduate study and research in the social sciences. Subsequently friends of the institute have contributed $8,000 for fellowships in this field, and last month the Rockefeller Foundation authorized a grant of $30,000, payable over three years, for a research study of the economic effects of technological change. This research, which requires a combined technological and economic approach, will seek to clarify the role of invention in the business cycle and will involve investigation of factors in an individual firm influencing technological change together with case studies of the effect of inventions on labor policies.

These developments reflect the steady growth of our work in social studies, particularly in relation to the economic and labor problems of industry. Our very active industrial relations section, which was established three years ago and which has been generously supported by industry, will play an important

part in this new program of professional training and research.

Our biological engineering program, which went into full gear this past summer under the direction of its new head, Dr. Francis Schmitt, has received an additional grant of $70,000 from the Rockefeller Foundation for the establishment of a sub-microscope center for studying the application and improvement of the electron microscope, particularly in the biological field.

Recent years have brought increased emphasis at the institute on industrial or applied mathematics and the more extensive application of mathematical techniques to special problems. One example of this is our center of analysis, which provides a wide range of machines for the analysis of technical problems. The new differential analyzer, the major unit in this center and one of the great scientific instruments of modern times, is now nearing completion. In still another direction, a laboratory has been established for the application of mathematical statistics to industrial problems, particularly to quality control. The department of mathematics and the department of economics and social science have joined forces in this program, and they are assisted by a group of cooperating companies which by their support are aiding fundamental research in this field while at the same time receiving assistance from our specialists in the solution of specific problems. As the role of the applied mathematician becomes more defined and recognized we plan the establishment of a more formal program of instruction in the field.—*From the annual report of Dr. Karl T. Compton, president of the Massachusetts Institute of Technology.*

SCIENTIFIC BOOKS

FRANKLIN'S EXPERIMENTS

Benjamin Franklin's Experiments. Edited with a critical and historical introduction, by I. BERNARD COHEN. Cambridge, Massachusetts: Harvard University Press, 1941.

THIS book contains those writings of Benjamin Franklin which present his theories and observations in what was in his time the new and almost unexplored field of electricity. Franklin's attention was directed to the subject by a Dr. Spence or Spencer whom he met in Boston in 1746. By a happy coincidence the Library Company of Philadelphia, of which he was an active member, received about this time from its London correspondent, Mr. Peter Collinson, F.R.S., the present of a glass tube, with some directions for its use in making electrical experiments. Franklin had lately arranged his affairs so that he was no longer engaged in active business, and he was free to throw himself with ardor into the study of this new and fascinating subject. Apparently he was unacquainted with its literature and knew little of what had been done in Europe. He must have been informed of the performance of the Leyden jar, but in practically all his work he relied on his own observations and made his own theories. He gave them to the world in the form of letters, most of which were sent to Mr. Collinson, and were read by him to the Royal Society and published in its Transactions. They were afterwards collected and published in several successive editions, from the fifth of which the text of this edition is taken. These letters were widely read both in English and in French, German and Italian translations, and gave Franklin a reputation as a thinker which served him well when he entered public life.

It would be idle to attempt to decide on the question of Franklin's priority for his discoveries. So many men were working and playing with the electric spark and the Leyden jar, and the communication of their results was so uncertain and often so long delayed, that it is probable that many of the important facts were discovered again and again. We can be sure, though, that Franklin's work was independent and original. His most important achievements were the discovery of the way in which electricity streams from or to a point; the discovery of the way to charge an insulated conductor by induction; the recognition from this experiment that electricity is not produced by the act of friction but is merely altered in distribution; the satisfactory analysis of the charging of the Leyden jar; and the demonstration that lightning is an electric discharge. In describing these results he uses the hypothesis that there exists in all bodies an electric fluid, ordinarily in a normal or passive condition, and that the act of charging a body gives to it a surplus of this fluid, which is taken from other bodies. The one body has a positive charge, the other bodies a negative charge. He is puzzled by the fact that two negatively charged bodies repel each other, but seems to be willing to accept the fact without explanation. This one fluid theory, as it was called, in distinction from DuFay's two fluid theory, which had been announced a few years earlier, and which Franklin does not seem to have known, was for a while the prevalent theory and has left its mark in the nomenclature of the subject.

In a valuable Introduction of 160 pages—the text of Franklin's papers, with some supplementary matters, takes up about 275 pages more—the editor indicates his belief, based on some expressions of Franklin in private letters, that he was essentially a scientist