

R. A. Millikan and the California Institute of Technology

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IF one examines a list of the publications of R. A. Millikan, arranged in chronological order, one finds essentially no break in continuity in this list from 1910 to the present, except for the war years, 1918–20 and 1941–45. In particular, the years 1921 to 1940 were among the most productive of his career. One would never suppose that in 1921 Dr. Millikan assumed an administrative task of such great magnitude that it would have effectively stopped the research activities of most ordinary men.

Moreover, one cannot explain this phenomenon by the assumption that Dr. Millikan gave but brief attention to his new administrative duties. On the contrary, his new tasks were carried forward with such zeal, vigor, and effectiveness that one who examines the history of his administrative achievements during the two decades after 1921 can only be astonished that a single man could carry such a burden even though he gave it all of his time and attention. His successor in these tasks hardly dares hope that he can ever resume a scientific career.

In 1920 the name of a small technical school in Pasadena, California was changed from Throop College of Technology to the California Institute of Technology. This change in name was the external evidence for the culmination of the dreams and practical efforts of Dr. George Ellery Hale, the founder and, for many years, the Director of the Mount Wilson Observatory of the Carnegie Institution of Washington. By 1908, Dr. Hale had seen the possibilities for establishing a great and unique center of pure and applied science in Southern California, and he started active work toward this goal. In 1913 he enlisted the aid of Dr. A. A. Noyes, distinguished chemist of the Massachusetts Institute of Technology, who came to Throop College first on a part-time basis, and in 1919 assumed full-time direction of the Laboratory of Chemistry.

In 1916 R. A. Millikan, then a professor of physics at the University of Chicago, was invited to give a series of lectures at Throop College and to advise on the development of a research laboratory of physics. While he was there during that winter, a proposal was made that he accept a part-time appointment at the college to direct the physics laboratory. At this point World War I intervened, and Dr. Millikan assumed heavy responsibilities in connection with war research. At the conclusion of the war, however, Dr. Millikan came to the Institute part time between 1919 and 1921 to begin the development of a research laboratory of physics. During that period, generous gifts by Dr. Norman Bridge and Mr. Arthur H. Fleming assured the financial future of the Institute, and the name was changed to the California Institute of Technology. In September 1920 the President of the Institute, Mr. James A. B. Scherer, retired, and Dr. Millikan was then asked to come to the Institute on a full-time basis to serve as President and Director of the new Norman Bridge Laboratory. He proposed instead that the administrative responsibilities of the Institute be vested in an executive council of which he would be willing to be the Chairman. His proposal was accepted, and Dr. Millikan's appointment as Chairman of the Executive Council and Director of the Norman Bridge Laboratory of Physics was confirmed by the trustees on July 26, 1921.

It will be recalled that in 1921 when a scientist moved west of the Mississippi River he was still regarded by his eastern colleagues as somewhat of an adventurer. In fact, Millikan, Hale, and Noyes did embark on a bold adventure, indeed, an adventure which rapidly converted an obscure polytechnic school into one of the nation's leading centers of pure and applied science.

It might be said, of course, that this institution was riding on a wave of destiny anyway, for the metropolitan area in which it was located (Los

Angeles County) grew from a population of just over 1,000,000 in 1921 to almost 4,000,000 in 1947, while the State of California climbed from eighth to third place among the states in population during the same period. This growth in population was accompanied by an even more spectacular rise in the industrial activity of the Southern California area.

But while this growth in Southern California made it an appropriate location for a strong

scientific center, it was without question the genius and energy of R. A. Millikan that created this center. The accompanying photographs of the California Institute of Technology in 1922 and in 1947 tell a dramatic story. The financial balance sheets of the Institute give a similar picture of growth during this period by a factor of ten.

But the important developments are not found in pictures or figures. They are more truly found

FIG. 1. Air view California Institute of Technology in 1922.

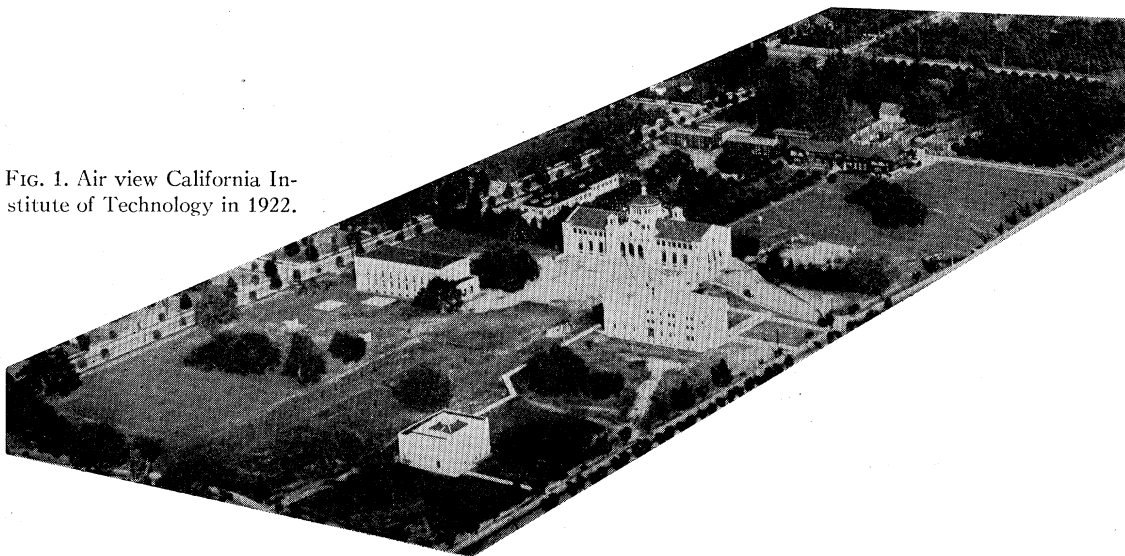


FIG. 2. And in 1947.



in names: Nobel Laureates—R. A. Millikan, Thomas Hunt Morgan, Carl D. Anderson; Physicists—P. S. Epstein, W. V. Houston, C. C. Lauritsen, J. R. Oppenheimer; Chemists—R. C. Tolman, Linus Pauling; Biologists—G. W. Beadle, Frits Went; Geologist—John Buwalda; Paleontologist—Chester Stock; Mathematicians—E. T. Bell, Harry Bateman; Aerodynamicists—Theodore von Kármán, C. B. Millikan; Engineers—W. N. Lacey, Royal Sorensen, F. C. Lindvall; Historians—W. B. Munro, J. E. W. Sterling. These, and many other outstanding men in many fields were attracted to this new center of learning. They shifted the nation's scientific center of gravity perceptibly to the southwest.

What did they find in Pasadena which attracted and held them? Of course, they found a pleasant climate, an attractive city, and (before 1940) low living costs. No one who knows the facts would ever claim that they found high salaries! The Institute has never been wealthy, and Dr. Millikan did not believe in "buying" men. Rather these men came in response to a challenge and an opportunity. They responded to the Hale-Noyes-Millikan ideal: a small institution devoted wholly to pure and applied science, based on the thesis that educating creative scientists could be accomplished only in an atmosphere of research.

But most of all, these men were held together by the personal magnetism of "The Chief" who personified these ideals.

In what way did Dr. Millikan make the California Institute of Technology different from other technological institutes of its day? In the first place, the Institute was built on the principle that the most important thing in the education of scientists and engineers was not the practical arts but the basic sciences. A great share of the energy and funds of the Institute during the first twenty years was devoted to the establishment of outstanding departments of basic science.

Secondly, it was assumed that, both in undergraduate and graduate instruction of scientific

leaders, it was essential that research activities be given a primary, rather than a secondary place. It should be emphasized that this was done not to create primarily a research center, but rather to create a unique educational opportunity.

Third, it was early realized that scientists and engineers were also citizens and that a substantial part of their education should be devoted to non-scientific subjects. The Institute pioneered among technical institutions in aiming at this ideal and in building an exceptionally strong "Division of Humanities."

Other institutions, of course, have now followed these ideals, but they were not commonly practised in the early 1920's.

It has been said the Institute was never wealthy in the sense that funds flowed in before they were needed. However, funds did come as they were needed because Dr. Millikan and his associates acquired an extraordinary facility for capturing the imagination of leading men in the community, retaining their full confidence, and eliciting the essential support needed to meet urgent requirements to attain important goals. One by one, the fields of physics, chemistry, mathematics, biology, geology, aeronautics, and humanities were provided with facilities needed to develop positions of international leadership.

In short, in his educational administration, as well as in his scientific work, Dr. Millikan's chief characteristic was imagination. His chief joy was entering new and unexplored fields. His greatest attributes were, and still are, vision and wisdom. He became, and remains, one of the most eminent and highly esteemed citizens of Southern California.

One of the Institute's largest and more recent benefactors said in his will, "My choice of the California Institute of Technology as the recipient of this fund is inspired in great measure by my admiration and affection for Dr. Robert Andrews Millikan who has revealed to me the noble purposes which in a large measure occupy the Institute activities."

FIG. 1. Air view California Institute of Technology in 1922.

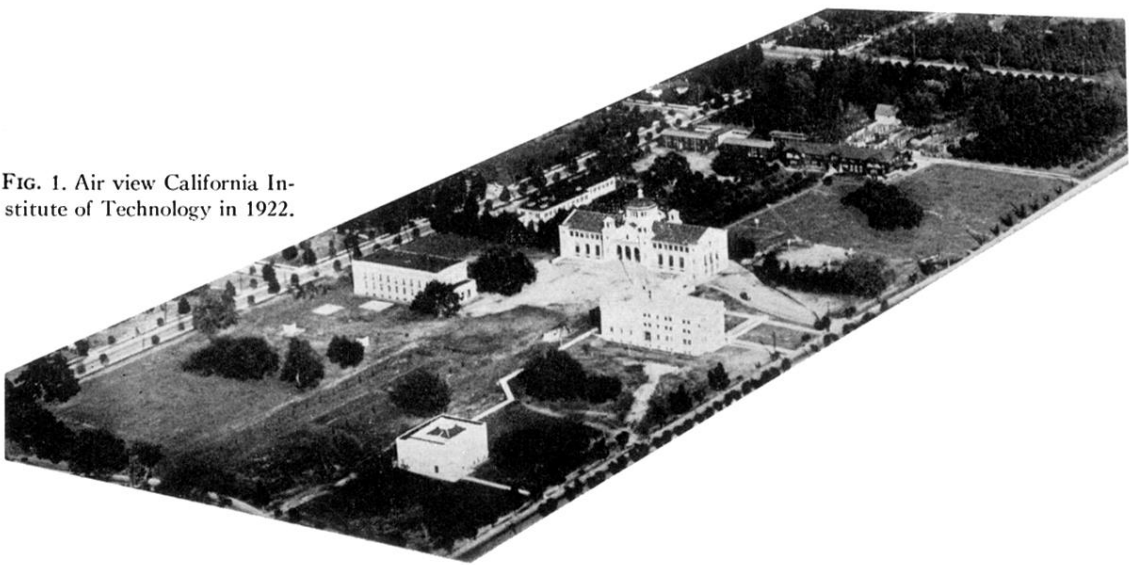


FIG. 2. And in 1947.

