The Technology Review

VOL. I. JANUARY, 1899 No. 1

ANNOUNCEMENT

To a community groaning under an ever increasing weight of periodical literature, a new magazine is forced to present itself in an attitude of apology. Like those college men with whom its interests are to be most closely bound, THE TECHNOLOGY REVIEW must make plain its purposes, its capacity, its determination to be useful, before it can expect to receive recognition from a public too busy to be indulgent. Realizing this, and mindful, too, of the spirit and traditions of the Massachusetts Institute of Technology, THE REVIEW neither throws itself upon the charity of its friends nor prays them to be blind to its shortcomings. Doubtless it will need indulgence, doubtless its attainment will fall much below its aspiration; but if it does not so far succeed in its attempt as to gain support through feelings other than those of simple friendliness, the existence of THE REVIEW cannot be too quickly ended.

Few appreciate how vast and complicated the interests of the Massachusetts Institute of Technology have become. With students, past and present, in every State, and in almost every part of the world, occupied in all manner of work and every civic duty; with studies of great range and courses of wide divergence; with always new and ever more complex problems of education crying for solution, the Institute obviously stands in need of a clearing-house of information and thought, to increase its power, to minimize

waste, to ensure among its countless friends the most perfect coöperation.

Such a clearing-house THE TECHNOLOGY REVIEW purposes to be. The scattered news, the isolated suggestions and criticisms, the wide-spread evidences of the soundness of Institute teaching, will here be gathered and, in orderly form, put upon permanent record. The Corporation, the Faculty, the graduate, the "special," the undergraduate, will in these pages learn more of one another, check each the other's work, and realize better what all must do to serve the high ends of the Massachusetts Institute of Technology.

It is this feeling of solidarity that, above all, THE REVIEW hopes to promote; for through such a spirit alone can be created a binding force sufficient to overcome that disruptive tendency which the rapid growth of the Institute and the multiplicity of its interests threaten to induce. Buildings and laboratories scattered over a considerable area, classes so large and so sub-divided that classmates have little opportunity of wide and close acquaintance, absorption in studies leaving little leisure for social intercourse, professional demands which lead the alumni to the ends of the earth, — all these things tend to rob the Institute of that personal, intellectual, and spiritual cohesion which is essential to the well-being of every college.

With such objects in view, the course of THE TECHNOLOGY REVIEW is clear. In its longer and more formal articles of description, of friendly criticism, of free discussion, it will follow the amazing growth of the Institute of Technology, suggest new directions of expansion, and call attention to the large, immediate problems of education confronting every college, but pressing with unusual urgency upon those which, like this, are pioneers.

Less formally will be presented the news of Institute life as it relates to the administration, the teaching staff, the students, and the public. The work of graduates and non-graduates will be recorded by classes, and these records will deal not simply with their professional successes, but with their achievements as men, as citizens, as scholars. The literary chronicle will be kept through lists of publications and through reviews of books; while the social side of the Institute will be presented through reports from the Alumni Association, the subsidiary graduate associations, the Technology Club, and the undergraduate organizations. Portraits, views of buildings, plans, and other illustrations will be used in such measure as seems desirable. In short, nothing concerning the life of the Massachusetts Institute of Technology will fail of recognition, and in a shape to make it of genuine interest to every one having any relations, however remote, with this great institution.

The Association of Class Secretaries, by which the conduct of THE REVIEW has been undertaken, while arrogating to itself no extraordinary powers, is clearly the body best able to conduct a magazine upon the lines that have been indicated. Including, as it does, men of every class, from the graduate of 1868 to the undergraduate of 1899, embracing representatives from the Corporation, the Faculty, the Alumni Association, the non-graduate body, and the students, having at command the machinery of class organization, the Association touches Institute life at every point and has within itself the possibility of reporting with due proportion every phase of the problem involved in the upbuilding of an institution of its magnitude and complexity.

In the selection of a committee of publication and an editor the same principle of representation has been kept in mind. Therefore, if THE REVIEW fails to be broad, if

it sacrifices things of general to those of narrow interest, if it inclines to become a technical journal or a student record, or a petty critic of details, if it grows to be in any way unrepresentative, the fault will lie with the execution, not with the aims, of its projectors.

Those projectors have but one end in view: the welfare and advancement of the Massachusetts Institute of Technology. They appeal, therefore, for support, to every one who has any interest, past, present, or future, in that college, and they feel sure that their appeal will not be vain. There is a singular heartiness in Institute men, a liberality of thought, a breadth of interest, a freedom from cliques, which render them, busy and widely separated as they are, most friendly and helpful to whatever promises to be of service in this direction. Already has THE REVIEW received most noble earnest of this spirit. The Corporation and Faculty, through committees, the Alumni Association, through its officers, the student body, through its *Tech* and *Technique* boards, have given it most cordial aid and counsel. Coming now before the larger bodies which have been thus represented, appearing in its first issue to a still wider public bound to the Institute by many ties, THE TECHNOLOGY REVIEW asks that, at least, its aim may be encouraged, and that this public, already seeking individually to be of service to the Institute, unite with one another and with this magazine to make the Massachusetts Institute of Technology, not simply an ever more effective school of industrial science, but a true University, great in every meaning of that term, and differing from others only in resting fundamentally, not upon the Humanities, but upon the pure and applied Sciences.

JAMES MASON CRAFTS

"THE great business of a college president," as defined in 1846 by Josiah Quincy, "was to overlook the conduct of the young men, and by timely interference prevent bad habits, detect delinquencies, and administer reproof and punishment, in all instances in which he could, apart from the faculty." Happily for the cause of education, the older colleges have long outgrown this curious tradition, the influence of which, by rare good fortune, the Massachusetts Institute of Technology has altogether escaped. "The great business of a college president," as interpreted by President Rogers and his successors, is one to tax to the utmost limit the resources of a great administrator. As the head of a complex organization, which touches at many points the life and work of the community it serves, the college president to-day stands between that organization and the community; quick to perceive and to respond to the changing needs of each in its relations to the other. Where these relations are concerned, he must feel the trend of public thought as a helmsman feels the pressure of the wheel, and as far as may be direct that thought to sound conclusions. Within the institution problems of ways and means, before which courage shrinks, must often be solved by faith alone, questions of policy must be decided, though the decision may determine the measure of the institution's influence, and when the claims of all departments are urged by earnest advocates, there must be preserved that nice adjustment which secures to each its due proportion. Above all is the duty of building up and sustaining the spirit of enthusiasm and coöperation which is the life and soul of any college, the uniting and compact-

ing of all forces within and without the college which may help on its work.

In view of these multifarious demands before which any man of business might well pause, and bearing in mind the popular idea that a scientific man, by reason of his training, is necessarily not to be regarded as a man of affairs, it is a matter of no little interest to note how frequently in recent years the duties of this position have fallen upon scientific men, and particularly upon those men whose department of science has been chemistry. In the early days of the Massachusetts Institute of Technology Professor Eliot gave up the chair of chemistry to assume the presidency of Harvard. In more recent times Doctor Drown has left us to become president of Lehigh. The names of Doctor Morton, the head of the Stevens Institute of Technology, Professor Chandler, dean of the Columbia School of Mines, and Doctor Schaeffer, chancellor of the University of Iowa, come at once to mind.

President Crafts brings to his office a reputation as the pupil of Bunsen and Wurtz, as the friend and associate of Sainte-Claire Deville, Dumas, and Friedel, and as the author of numerous papers, which have placed him in the front rank of organic chemists. He is no stranger to the Institute, but has the sympathy and comprehension born of old acquaintance with its aims, its methods, and its alumni. Like the college itself, his first inspiration was derived from William Barton Rogers.

James Mason Crafts was born in Boston, March 8, 1839. His family is one well known to the older residents of Boston, his father, R. A. Crafts, having been a merchant of the city, and a pioneer in the manufacture of woollen stuffs in New England. His mother was Marianne Mason, the daughter of Jeremiah Mason, a

famous lawyer of the period, who was often opposed to Daniel Webster, and who served as United States Senator from New Hampshire, from 1813 to 1817.

The boy grew up in the midst of the pleasant social and intellectual life of the city. He first attended Mr. Kidder's School in Bowdoin Square, and then one kept by Mr. Sullivan, near Park Street Church, where he prepared for the Boston Latin School. His taste for the natural sciences and for experiment developed early, and soon led him to leave the Latin School to pursue general studies with Dr. Samuel Eliot, under whose instruction he remained for a year, until ready for college.

Boston, in 1855, was the centre of an especially stimulating intellectual life to which so active a mind as that of young Crafts could not fail to respond. There was something of the eager interest in the more popular forms of science which had manifested itself a little earlier in London, where the streets leading to the Royal Institution were blocked with the carriages of people of fashion on the days of Faraday's lectures. Agassiz, Cooke, and Rogers, among others, were giving courses of lectures which the boy attended. He was still more fortunate in coming into direct personal contact with President Rogers, who then lived on Temple Place, and frequently visited the Crafts, where he used not infrequently to try simple experiments in illustration of some point raised in conversation. Just as Giotto gave evidence of his ability by drawing perfect circles with one free sweep of the brush, so President Rogers would sometimes show his skill with one stroke of the crayon. An early consequence of the boy's natural scientific tastes and the stimulus of such surroundings was the fitting up of a laboratory. The Crafts' house on Tremont Street was a very wide one, having a frontage of

fifty feet, and here, in a large attic room, he attempted such experiments as he had seen tried by Cooke or Rogers, and made others which he found described in Doctor Hare's Chemistry, all doubtless to the mingled pride and trepidation of the family. As a result of one of the first of these essays the boy found himself one night surrounded by glowing eyes, which effectually banished sleep, until it was discovered that they had their origin in numerous little pieces of phosphorous which had become scattered around his bedroom.

The Lawrence Scientific School had been recently founded in Cambridge by Abbott Lawrence, with Professor Hosford at the head of the chemical department. Young Crafts's tastes turning naturally in its direction, his original intention of taking a collegiate course was abandoned, and he entered the Scientific School, from which, in 1858, he was graduated. The course at that time was one to throw a young man much upon his own resources. There were occasional recitations covering the material of Regnault's Chemistry, a two-volume English translation of which had appeared in 1853, but for the most part the time of the students was devoted to laboratory work much after the manner of their own inclinations. At this period the immensity of the undeveloped mineral resources of the United States began to be recognized, and the experience of the pioneers of 1849 was still fresh before the country. The profession of mining engineering was one which seemed to afford great opportunities, and young Crafts was led to spend a post-graduate year at the Lawrence Scientific School in the study of engineering. The next year, 1859, he went to Freiburg, Saxony, to pursue his study of mineralogy and mining engineering. Plattner's fame as a metallurgist, and especially his *Probirkunst mit*

dem Löthrohr was bringing to Freiburg students from every part of Europe, although Crafts was one of the first Americans to take this course. Plattner had died in 1858, but his influence and methods still prevailed in the celebrated School of Mines, which remained the foremost institution of its kind. An unusual variety in the mineral products of Saxony afforded abundant opportunity for the practical study of mining and the processes of metallurgy. Silver, iron, copper, bismuth, lead, tin, zinc, and cobalt were and doubtless still are all worked in the little kingdom.

With growing knowledge and in the midst of these opportunities there came to the young man a recognition of his fitness for the pursuit of pure chemistry, and after a year at Freiburg he removed to Heidelberg, where he came at once under the influence of Bunsen, and later into close relation with that great teacher. Bunsen and Kirchhoff had just begun their classical research in spectroscopy. Cæsium had been discovered in the Durkheim waters with a single bisulphide of carbon prism, and the arrival of a new three-prism instrument from Fraunhofer stimulated Bunsen to greater efforts. The recognition of Rubidium followed while Crafts was Bunsen's assistant, and the occurrence of Cæsium in the waters of Nauheim was for the first time demonstrated by Bunsen late one night when working in the laboratory with his pupil.

In 1861 the fame of Wurtz as the foremost exponent of the theory of types, the discoverer of the glycols and compound ammonias and as the successor of Dumas and Orfila, drew Crafts to Paris, where he enrolled himself as a student in the *Ecole de Médicine*. Here he remained four years under the direct instruction of Wurtz, to whose teaching and inspiration the course of his later work is mainly due. He returned to America in 1865, examined some