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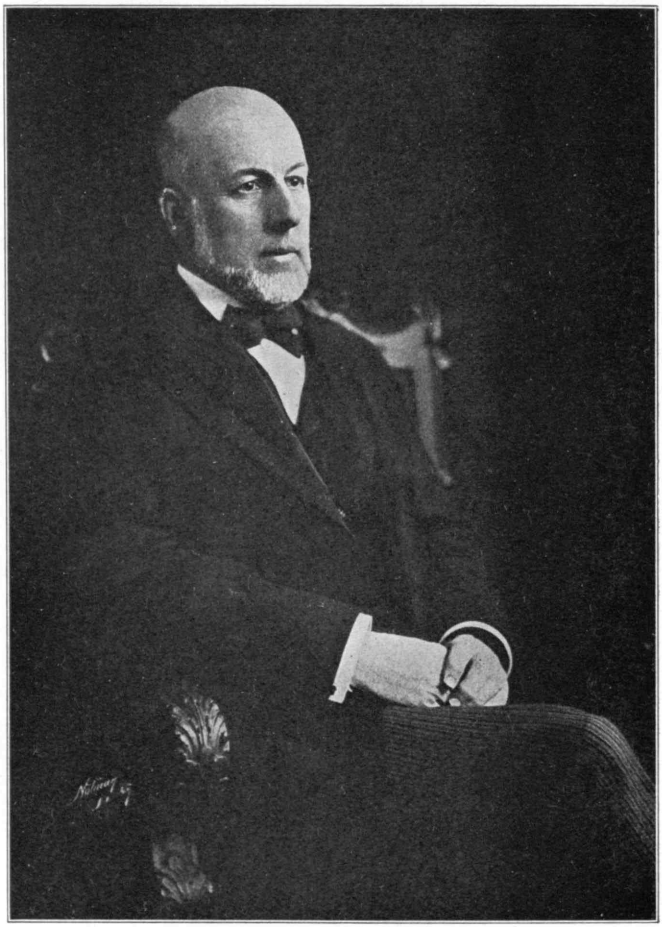

CHARLES ROBERT CROSS, '70

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PROFESSOR CROSS RESIGNS

The record of a half century devoted to scientific work

Professor Charles R. Cross, who will be accorded a well merited period of rest after forty-six years of the greatest devotion to the Institute, was born in Troy and for many years past has been a resident of Brookline. He is an alumnus of M. I. T., receiving his degree in 1870 with the third class to graduate, and since that time has been a member of the Institute teaching staff. He returned to Tech the fall following Commencement as an instructor and from 1871 till 1874 was assistant professor in physics. The next year his official title included astronomy and from 1875 till 1878 it was descriptive astronomy that he taught in addition to physics. Since 1878 he has been Thayer professor of physics and since 1886 also director of the Rogers Laboratory of Physics.

Professor Cross has been a foremost figure not only in the Institute but in the scientific world; not only in the development of technical education but in work of investigation in various specialties. As a consulting physicist his opinions in the matter of the telephone are historic and in another division of his specialty, that of acoustics, he stands at the head of investigators who have given attention to its musical aspects. Within the Institute he has rendered enduring service by his long continued devotion and enthusiasm. By the establishment of courses in electrical engineering he earned the gratitude of the whole educational world. Recognizing the need of such study in which he was indeed the pioneer, he began in the early eighties the instruction of this specialty as a part of the department of physics. He instituted the courses, developed them and bore the brunt of the introduction of a new line of special education to the world. In the late nineties electrical engineering became a separate department at Tech, one

of the exceedingly important ones in touch with the needs of modern industries. Education owes a great debt to Professor Cross for his foresightedness, the courage of his own convictions and the will power and industry necessary to carry them out.

Within the domain of physics in its more restricted sense, Professor Cross developed the work of experimental lecturing, with great inventive power and discernment and incredible labor in evolving the technique. The line of experimentation in his courses is exceedingly elaborate, and the wealth of material and the methods of handling assembled and developed under his care place Technology at the head of all institutions in this fascinating work.

Outside the Institute Professor Cross has the highest reputation for the quality of his attainments. He is a member of many scientific associations here and abroad and, in the larger world, a foundation member and past president of the Appalachian Mountain Club. In the American Academy of Arts and Sciences he has been for a long time chairman of the Rumford Fund Committee, a most important function devoted to the forwarding of scientific research, and in the great American Association for the Advancement of Science, he is chairman of the Research Committee of the Committee of One Hundred. In the professional world he has been often employed in consultation in most important interests.

THE WORK OF PROFESSOR CROSS AT THE INSTITUTE

By a Colleague

Professor Cross has occupied a unique position in the Institute of Technology. In his own person he embodies almost its whole existence—more than fifty years. He entered as a second-year student in 1867, when the Institute had but recently left its first cramped quarters on Summer street for the daring magnificence of the Rogers Building, he retires after a year in a vast edifice beside which old Rogers seems modest enough. In the meantime he has, during thirty-three years, occupied quarters of his own planning in the Walker Building. He was student-assistant in German in his fourth year, instructor in physics for a year, then, at a tender academic age, assistant professor. He has thus been a colleague of every member the Faculty has ever had, save only eight—most of them his teachers—who had retired before his appointment. Of the present Faculty a very large proportion have been his students before becoming his colleagues.

In another notable respect Professor Cross's status is unique. The Institute curricula have always been founded on mathematics, chemistry and physics; they have always included English, history and modern languages as common elements. In most of these subjects, however, classes have been subdivided among several teachers, and in all of them, professors have come and gone after longer or shorter terms. In physics, alone, one man has lectured year in and year out to all second-year students for nearly thirty years, only since 1903 relinquishing half the class to an associate. Thus Professor Cross has taught an incomparably larger proportion of all Tech men than any other member of its Faculty. To thousands of them "Charlie Cross's" lectures in second-year physics are still—however much or little enjoyed at the time—models of clear and elegant scientific exposition. Living in a period of marvellous scientific inventions, with not a few of which his own professional contact has been intimate and important, he has brought to his lectures a continual wealth of fresh experimental illustrations.

The vitality of the course in physics during all these years has been conspicuously shown both by the scientific distinction of the

men who have graduated from it, and by the successive branching from it of new courses: in electrical engineering (1885), in electrochemistry (1900), and in industrial physics (1914). Among its graduates it may suffice to mention Holman and Goodwin, who have shared with Cross in the development of the department, Hale of Mt. Wilson, Wendell of Columbia, Abbott of the Smithsonian, among many who have won distinction in other fields.

To one who has known Professor Cross for thirty-seven years, those years seem to have touched him but lightly. He seemed not very young in 1880, at any rate to an undergraduate, he seems not very old in 1917. There is the same clear, deliberate, sometimes caustic, thought and expression now as during all that period, the same breadth of interest, the same scorn of low standards, pretentiousness and shams. It was like him to ask excuse from accepting the invitation of his Faculty associates to be their guest of honor at a complimentary dinner.

In another respect Professor Cross's relation to the Institute has been exceptionally fortunate. He knew the school from its small beginnings and knew it whole. To him it could never become a mere federation of separate departments. No small part of our progress and welfare have depended on the centripetal integrating forces which have thus far held their own in counterbalancing the adverse tendencies of increasing size and differentiation. One need not be a mere *laudator temporis acti* to feel that the new Institute cannot afford now, or ever, to sacrifice more than it perforce must of the unity of aims, traditions and ideals which it has so far preserved. That these have been so maintained is due in large measure to Professor Cross.

HARRY W. TYLER, '84.

FLAG RAISING AT COMMENCEMENT

TECHNOLOGY SERVES THE GOVERNMENT

What the Institute has been doing to help in the way of speedy preparation for war

The war found the Institute prepared and glad to put its plant, equipment and brains at the disposal of the government. As soon as war was declared President Maclaurin formally offered the laboratories for whatever use might be made of them, and in addition took steps to acquaint the War and Navy Departments with the resources of M. I. T. The result is that all summer long the white buildings by the Charles have been a scene of constant activity, the government having found the Institute one of the most suitable places at its disposal to train the men who must do our fighting.

The beginning was a course in naval architecture planned to train men quickly as draughtsmen for the navy yards where they were badly needed. Professor Peabody freely offered the services of himself and his department, and about fifty men enrolled for the intensive course which planned to give in ten weeks the principles of marine engineering and design and the practical duties of naval draughtsmen. It was a gruelling course of ten hours a day, in which nearly the regular half year's work was accomplished. By the end of June the men were ready to go to the Charlestown Navy Yard there to do four months' service in the nature of further training before they are taken definitely into government service and given their ratings. The teaching, with which Admiral D. W. Taylor professed himself as being highly satisfied, was done by Professors Peabody and Owen and Evers Burtner. Professor Hovgaard, of the department, who is a former commander in the Danish Navy, is spending the summer in Washington doing special work for the Navy Department. It is probable that the department will continue this work next year, turning out in as large numbers as possible the naval architects so necessary to our increased and urgent ship-building program.

The Naval Reserve

Next in order came the use of the left wing of the Institute facing the river as a summer school for the naval reserve, commonly

called the "Naval Plattsburg." Here under Captain J. P. Parker of the National Naval Volunteers some sixty men were sent for a four months' training, of the general character of that given at Annapolis, to fit them for ensigns' commissions in the naval reserve. They will graduate in October and will probably be given active service at once.

The Naval Reserve works under as near navy conditions as is possible on land. Their quarters have been termed *U. S. S. Newton*, from the chief name on the pylon of the wing in which they live and the men pass a crowded day to the sound of the bugle, learning military drill, charting, signalling, tactics, work with rapid-fire guns and water evolutions with the two navy cutters moored in the basin. The school at the Institute is the ninth of the sort already established in the United States.

Military Ground Aviation School

As soon as it became obvious that one of the most important duties of the United States upon her entry into the war was to furnish an overwhelming preponderance of scouting and fighting aeroplanes, to "put out Germany's eyes," our sad lack of aviators became manifest and the government at once looked about for schools at which to give them the preliminary training before they were sent to the flying stations. The Institute was chosen as one of six of these ground schools, the others being Cornell, Ohio, Illinois, Texas and California universities.

As soon as this was decided on, instructors Alexander Klemin and Dean Fales of the Institute and Professor Robert DeC. Ward, temporarily transferred from Harvard, took the federal oath and proceeded to Toronto where they spent several weeks studying the Royal Flying Corps' method of training aviators. On their return the school opened with twenty-five men, who were reinforced each week with twenty-five more, each of whom were to take an eight weeks' course; which meant that once the school was well under way the Institute was housing, feeding and training over two hundred picked men, recruited from Plattsburg and the other training camps.

There is no attempt made to fly. The instruction includes the science of flight, the war uses of aeroplanes, the commanding of flying corps, the theory of heavier-than-air flying, and knowledge of internal combustion engines, rigging, instruments, signalling,

use of compass, wireless and photography, map-reading, artillery observation, bombing and aerial machine guns, and topography. The men study all morning, have drill and calisthenics all afternoon, and study again evenings till the early "taps" is blown.

At date of writing there are about one hundred and fifty men at the Institute and each contingent as it graduates and is sent to the flying grounds is replaced by another. The school is under command of Captain B. U. Mills, U. S. A., assisted by four Institute men, Lieut. Claude H. M. Roberts, '17, former colonel of the M. I. T. battalion, and C. G. Miller, '17, A. F. Benson, '17, and Leon H. McGrady, '17. F. V. duPont, '17, is instructor in combustion engines in the shops.

The importance of this school at the Institute may be seen by the fact that Tech is at present housing and training one fifth of all the aviation students in the United States and it is expected that when the Walker Memorial is available the number may be largely increased.

One of the interesting devices for instruction deserves mention. A large contour map has been built in the basement of the hydraulic laboratory. This map is constructed to such a scale that it has the same appearance from the balcony of the hydraulic laboratory as does the earth to an aviator at an altitude of 5,000 feet. The map is studded with tiny electric lights, each one controlled from a central switchboard. The balcony of the laboratory is connected to the switchboard by a telegraph line. Lights lighted on the map represent shells bursting, and the man on the balcony telegraphs the estimated range to the switchboard. By lighting the light on the map corresponding to the estimated range the observer is shown just how close his observation and estimate was. The system is a duplicate of that used in the schools for the Royal Flying Corps, in Canada.

Naval Aviation School

So successful has this school apparently been that the Navy Department decided to do the same thing for its officers in the hydroplane branch of the service. The course, like the other, lasts eight weeks and the first enrollment was about fifty, with fifty more coming in every two weeks. The men will be housed on the top floor of building 2 above the military flying-men, until the Memorial is opened to them.