it has been our privilege to work together for this end, and that out of the affliction of a little child a blessing has come to so many?

The success of our schools in which we rejoice to-day is due not only to the superiority of the oral system over the sign-language system, not only to the energy and perseverance of their founders, but, more than all, to the devotion, to the untiring zeal, and to the ability, of our teachers. No other teaching is so exacting, requires such constant attention and unwearied application.

The names of all are too numerous to mention. In our earthly as in our heavenly firmanent one star differeth from another in glory, but bright as constellations shine the names of Miss Rogers, Miss Fuller, and Miss Bond.

This school is appropriately named the Horace Mann School, since Mr. Mann was the first to recommend the adoption of the oral system; but it was to Mr. King that this school owes its existence. The names of those who laid the foundation and built the edifice should not be forgotten.

But it is to Mr. King that this school owes its existence. A bronze tablet should be affixed to its walls; and associated with the name of Horace Mann should be the names of Dexter S. King and Sarah Fuller, inscribed thereon, that thus the names of the three who have done so much for the education of the deaf may be perpetuated.

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY.[1]

AN institution of learning may make a demand upon public recognition and gratitude because of its good work in training successive classes of young men for usefulness in life, even though it be not an innovator in education, and uses only the old and familiar methods of instruction; but it may acquire a further and larger claim by becoming a leader in its department, by introducing new methods, and opening the way to a better kind of intellectual and professional training.

How the Institute of Technology has dealt with the thousands of young men who have been its pupils since 1865, what it has done for them, what places they now occupy in the industrial system, what services they have rendered to the arts and industries of the country, common fame will tell. Those who would study this matter more carefully will find material in the lists of its graduates and of the places they fill, as told in the annual catalogues.

But in addition to its work in training a certain number of young men for the duties of life, the Institute of Technology has been pre-eminently a leader in education. Its influence has not been confined to what it has done for its own pupils, but has extended as far as its example of advanced scientific and technical instruction has gone.

Almost at the very outset a long step forward was taken in the establishment of a laboratory of general chemistry. Up to that time general chemistry had been taught wholly by means of text-books, or by lectures with experiments by the lecturer. The student's part was only to look and to listen, and learn in this way what he could. It was not until the student was put into the analytical laboratory, and took the retort into his own hand, that he did or discovered any thing for himself. Under the inspiration of Professor Rogers and the enterprise and administrative skill of Professor Charles W. Eliot and Professor Frank H. Storer, a laboratory of general chemistry was established, and the pupil from the first day of his chemical studies was set to teach himself. This was no analytical laboratory. It was simply designed as a means of illustrating, emphasizing, and supplementing the instruction of the lecture-room in regard to the nature of chemical action and the characteristics of the principal elements. The student was not told what he should find. He was told to do something, and note what occurred. He was thrown upon his own faculties of observation and reflection. He learned to know himself, and to measure his own power, and he acquired ease and accuracy of manipulation by practice. So far as known, this was the first laboratory of such a character set up in the world. Certainly it was the first one instituted in the United States for the instruction of considerable classes of pupils. The publication of "Eliot and Storer's Manual," designed for students taking this course, marked an epoch in the history of education.

Another equally important step in scientific education, and one of which the originality is beyond doubt, was taken at about this time in the establishment of a laboratory now known as the Rogers Laboratory of Physics. Under the inspiration of President Rogers, the scheme of a laboratory where the student of physics should be set to make observations and conduct measurements for himself, in demonstration and illustration of the physical laws taught in the lecture-room, was carried out with remarkable ability on both the scientific and administrative sides by Professor Edward C. Pickering, now director of the Harvard Observatory. So complete was Professor Pickering's study of the needs and capabilities of such a laboratory, so masterly his treatment of it, that it has required only more room and additional apparatus to allow the system he then devised and formulated to be extended successively to classes of fifty, of one hundred, and even of one hundred and fifty students.

In the school year of 1871–72 another forward step in education was taken at the Institute of Technology. Down to that time the instruction in mining engineering and metallurgy had been, here as elsewhere, conducted by means of text-books, lectures, drawing models, and assays of small pinches of ore, supplemented, in the case of the more fortunately situated schools, by occasional visits to mines in actual operation. In the year named a scientific expedition to the Rocky Mountains was undertaken by a large party of students and instructors from the institute. While in the Colorado mining regions, Professor Runkle conceived the idea of a laboratory which should add to the existing means of instruction in mining and metallurgy the practical treatment by the students of economic quantities of ores. This conception, so fully in the line of the general work of the institute, was given effect by the purchase in California, before the return of the expedition, of a number of pieces of apparatus suitable for the beginnings of such a laboratory. The apparatus thus obtained was set up by Mr. Robert H. Richards, then instructor, and now for many years professor, of mining engineering.

From these small beginnings made under Professor Richards's care it has grown steadily to this day. It was the first proper metallurgical laboratory devoted to the purposes of instruction in the world. It is under its title, "The John Cummings Laboratory," by far the largest and the best in the world to-day. Its graduates are found in the most important mines and smelting and reduction works of the

[1] From the Commemorative Address by Augustus Lowell, Esq., at the twenty-fifth anniversary of the Massachusetts Institute of Technology.

United States, showing the effect of their training at the institute, in which theory and practice were so happily combined, and in which every thing taught in the lecture-room is at once put to use in experiment and research.

In 1873 a further step in technical education led to the establishing of a laboratory of steam-engineering. An engine of sixteen horse-power was set up, and the necessary apparatus for engine and boiler tests was provided. Out of this humble beginning has grown the largest and best equipped mechanical engineering laboratory to be found, in which not only is the work of instruction carried further than ever before, but original research, conducted jointly by the students and their instructors, is pushed to points often beyond the range of ordinary expert investigation within the profession. In the same year the Lowell Free School of Industrial Design was established at the expense of the Lowell Institute, for the purpose of promoting the industries of the country, and especially the textile manufactures, by cultivating the American taste in respect to form and color.

In 1876 the system of shop-work as a means both of general and professional training was introduced. Half an acre of shops, filled with the best tools, machines, and engines, with over two hundred students pursuing this branch of instruction, represent to-day the poor, mean shed, with its scanty appliances, which was all that the funds at the command of the institute allowed to be erected in 1876.

In 1881 was established a laboratory of applied mechanics, devoted especially to the tests of building-materials in wood, stone, and iron. The equipment of the laboratory has been increased from year to year, until it comprises a great variety of apparatus and machines, designed largely by the instructors in that department, for making almost every kind of test which the purposes of the engineer, the architect, the ship-builder, or the mill-owner may require, — beam tests, column tests, belting tests, rope and wire tests, shafting tests, tests by tension, by transverse strain, by compression, by tensile strain, and continuous, intermittent, or instantaneous tests.

In 1884 the germ of a biological laboratory, which had existed in a corner of the shed used for the workshops of 1876, was developed with the aid of a large amount of physiological apparatus. The resources of the laboratory were turned, first, upon the preparation of its students for subsequent medical studies, and, secondly, upon bacteriological investigations, to which the marvellous discovery of Koch and Pasteur had pointed. It is not too much to say that there is scarcely a place in this country where as much important bacteriological work has been done during the past three years as in this laboratory of the institute.

In 1882 the increased demands upon the department of physics for the higher and more technical instruction of students, looking forward to electrical practice, led to the establishment of a distinct service devoted exclusively to that end, and, in connection with the new building of 1883, to the equipment of an electrical laboratory, with engine, dynamos, electric motors, and a great variety of electric testing apparatus. Notwithstanding this equipment, this course in electrical engineering, as it has been developed at the institute, could not be sustained but for the machinery and ample appliances of the engineering laboratories. The training of the electrical engineer at the Institute of Technology differs from that usually followed, in that the electrical engineer is here regarded as primarily a mechanical engineer, but a mechanical engineer who has specially studied the mechanical requirements of the electrical industries and enterprises, just as the chemical engineer under the course established two years ago is regarded in his relation to the chemical industries. And this introduces us to the last contribution made by the Institute of Technology to the philosophy of scientific and technical education, in the recognition of laboratory work in mechanics as an essential feature of a proper training in any branch of the great engineering profession. In the mechanical laboratories the students in each branch of engineering, civil, mechanical, mining, electrical, chemical, and sanitary, are called to perform the work of experiment, and to deal with the generation of power, and its application to the exigencies of their several contemplated professions.

We have thus roughly traced the history of the Institute of Technology. We have seen within how few years it has grown from a doubtful experiment into one of the most important schools of the country. We have seen how largely it has enjoyed the confidence and liberality of the public, and we feel that we may securely rely upon the same generous support hereafter. We have seen how its methods of instruction have been adapted to the changes and developments of practical science. We have seen that in this mobility, this power of adaptation, lay the grand idea of the whole scheme; and we are sure, that, so long as it continues to be its guiding principle, the Institute of Technology will stand, — a monument to the character, learning, and wisdom of its founder, worthy the community in which its establishment was possible and by which it has been maintained, an honor to the instructors who have devoted their energies to its service, and fortunate, as we trust it may long be, under the direction of so distinguished and able a president as Gen. Francis A. Walker.

HEALTH MATTERS.

The Influenza in Massachusetts.

THE secretary of the State Board of Health closes his annual report with the following facts about last winter's epidemic: "1. The first appearance of the influenza in Massachusetts as an epidemic, in the past season, may be stated to have been on Dec. 19 or 20, 1889, and the place of its first appearance was Boston and its immediate neighborhood. 2. It increased rapidly in the number of persons attacked, and reached its crisis generally throughout the State in the week ending Jan. 11, 1890, after which date it gradually declined in severity, and had nearly ceased as an epidemic by Feb. 10, so that the duration of the epidemic was about seven weeks. It reached its crisis earlier by several days in Boston than in the smaller cities and the remoter parts of the State. Its course was still later in Nantucket, Dukes, and Barnstable Counties. 3. The ratio of the population attacked was about forty per cent, or more exactly, as indicated by the returns, thirty-nine per cent, or about eight hundred and fifty thousand persons of all ages. 4. People of all ages were attacked, but the ratio of adults was greatest, of old people next, and of children and infants least. 5. The weight of testimony appears to favor the statement that persons of the male sex were attacked in greater number and with greater severity than females. 6. The average duration of the attack (acute stage) was from three to five days. 7. The predominant symptoms were mainly of three general groups, — nervous, catarrhal, and enteric, — the last being much less common than the others; the special symptoms much observed in the nervous group being extreme depression, pain, and weakness; in the catarrhal group, cough, dyspnœa, and coryza; and in the enteric group, nausea, vomiting, and diarrhœa. 8. The chief diseases which followed in the train of influenza, and were intimately associated with it, were bronchitis and pneumonia. Phthisis, when already existing in the victim of the attack, was undoubtedly aggravated, and in many cases a fatal termination was hastened. 9. The