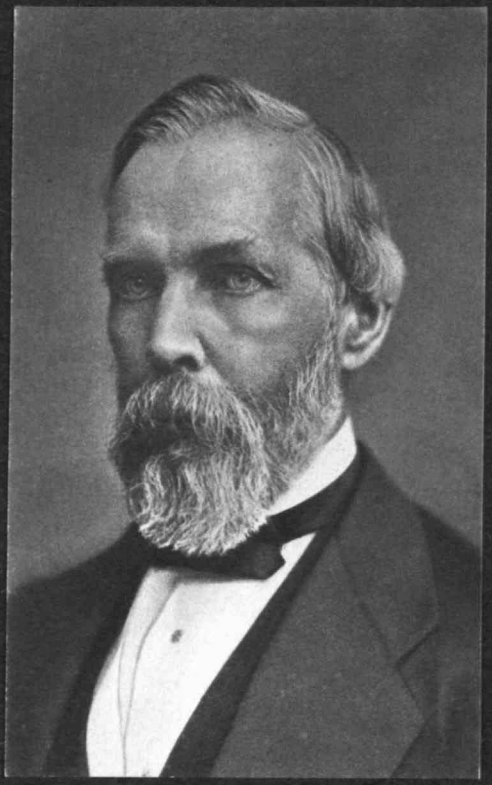

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JOHN BENJAMIN HENCK

Professor of Civil and Topographical Engineering, 1865 to 1881

John B. Henck, for many years Professor of Civil Engineering at the Massachusetts Institute of Technology, and author of the well-known "Field-book for Railroad Engineers," died at his residence at Montecito, California, on January 3.

Professor Henck was born at Philadelphia, October 20, 1815, the son of George Daniel and Caroline Spiess Henck. Both his parents were Germans, but had lived for many years in Philadelphia. His father died in 1831, leaving a widow and eight children, the oldest son being but seventeen years of age. The subject of this sketch prepared for college mainly by home study, being determined to have the best education within his reach. He entered Harvard, and, notwithstanding the fact that he found it necessary to add to his resources by tutoring, he made a record for scholarship which few have surpassed, graduating in 1840 with the degree of A.B., as valedictorian of his class. While he showed unusual excellence in his mathematical work, and was a favorite pupil of Professor Benjamin Peirce, yet his scholarship was remarkably even in all the branches which in those days constituted the college course, literature, philosophy, and the classics being subjects in

which he was much interested and very successful. Among his classmates at Harvard may be mentioned Judge J. C. Bancroft Davis, the late W. G. Russell of Boston, also William A. Crafts, the secretary of the Massachusetts Railroad Commission, and the late Samuel Kneeland, for many years his colleague at the Institute.

After his graduation he was for a year principal of the Hopkins Classical School in Cambridge, Mass. In 1841 he went to the University of Maryland, as Professor of Latin and Greek in the Academical Department, a position which he occupied till 1843, when he returned to Germantown to accept a similar position in the old Germantown Academy, where he remained till 1848.

In the year of his return to Philadelphia, 1843, he was married to Mary A. Kirby, the daughter of an old Quaker family of that city; and two sons were born there. He found the financial outlook on the teacher's salary of those times not sufficiently encouraging for a man with a growing family, and decided to turn his mathematical abilities to account in the field of civil engineering.

Accordingly, in 1848 he entered the office of Felton & Parker, civil engineers, in Charlestown, Mass., now a part of the city of Boston. Mr. Felton of this firm was the engineer for the Fitchburg Railroad; and Mr. George Y. Wellington, now living in Arlington, Mass., was the division engineer in charge of double-tracking the road, with headquarters at Fitchburg. With this firm Professor Henck had his first engineering experience. After remaining in the office about a year, he was sent to join Mr. Wellington's party at Fitchburg, where he stayed until 1850. In that year he formed a partnership with Mr. William S. Whitwell, who had been employed in the construction of the Cochituate Water-works, under the firm

name of Whitwell & Henck, with offices at 41 State Street, Boston, the site of the present Exchange Building. This firm carried on a general engineering business, and had work to do in connection with the construction of the first street railways in Boston. In 1859 Mr. Whitwell retired from the firm to become treasurer of the Boston & Roxbury Mill Corporation, and Mr. Henck carried on the business alone.

Probably the most important work which was undertaken by Mr. Henck's firm, and by Mr. Henck personally, was in connection with the filling-in and improvement of what is now the Back Bay District in Boston. This work was carried on by the Commonwealth of Massachusetts; and the firm of Whitwell & Henck was employed to do the engineering work, beginning in 1855. The work was under the direct authority, first, of the Commissioners of the Back Bay, then of the Land Commissioners who had succeeded to the duties of the first-named board, and finally, in 1879, of a Board of Harbor and Land Commissioners, upon whom all work pertaining to harbors and public lands was finally concentrated. Mr. Henck continued in the employ of all these boards up to the year 1881, having charge of the work of filling-in the land, laying out and paving the streets, and laying out the house-lots as fast as they were sold by the Commonwealth. It will interest many engineers to know that the late A. M. Wellington, who so ably edited *Engineering News* for many years, was an articled student in Professor Henck's office from 1863 to 1866.

About the time of his appointment by the Commission, he took up his residence in Dedham, where he lived for ten years, and where a third son and a daughter were born.

In the years of labor which preceded the establishment of the Institute of Technology, Professor Henck took a

warm interest in the plans of President Rogers; and when the actual work of instruction was begun, in 1865, he willingly assumed charge of the Department of Civil ngineering, of which he remained the head until 1881, when he retired. In those early days, when the means of the Institute were scant and the number of teachers small, the work of instruction took practically all his time, although he still carried on more or less outside work, principally in the laying out of the Back Bay lands. In 1881, after retiring from the Institute and from all active business, he went abroad and spent the next three years travelling in Europe. Returning in 1884, he spent about a year in this country, and then went abroad for another year, after which he finally settled at Montecito, near Santa Barbara, Cal., where he passed the remainder of his life in quiet and retirement.

The principal work of Professor Henck's life was undoubtedly that in connection with his professorship at the Institute of Technology. He established the department of Civil Engineering, organized the course of study, and determined the character of the instruction. To him perhaps more than to any other one man is due the high standard of scholarship and attainment which was set by the Institute, and which soon gave the school the enviable reputation which it has ever since maintained. Professor Henck was pre-eminently a teacher rather than an engineer, and it is as a teacher that he will be longest remembered and that his influence has been most felt. He was a man of broad mental grasp and distinctly a scholar, in the old-fashioned meaning of the word. His principal characteristics, which impressed themselves upon his students, were thoroughness and accuracy. He would tolerate no slipshod methods, but insisted upon a thorough and careful

working out of each problem. He knew the distinction between teaching and merely giving information, and the students in his classes were made to reason and think for themselves instead of having their minds simply filled with facts. His own professional work was characterized by the same care and accuracy. In the work of laying out the Back Bay, and especially in laying out the house-lots, although the land was quite valuable, selling for from one dollar to five dollars per square foot, no question was ever raised as to the accuracy of his work. Indeed, he was, if anything, too particular and too accurate. The only professional criticism that could be made of him was that he sometimes carried refinements too far. The students used to say, jokingly, that Professor Henck corrected his pacing for temperature. He did not possess the quick decision, the intuitive perception of the practical relations of things, or the ability to make a quick and accurate guess which characterizes most engineers. He was constitutionally unable to approximate, or to give a snap judgment, or to form a quick decision. It was always necessary for him to work a thing out thoroughly and accurately. He had, however, an exceptionally clear and original mind, and was exceedingly methodical in his work; and, in working out his problems, he frequently devised new and simple methods of computation, which resulted in great saving of time, combined with increased accuracy. This is true in regard to his methods for computing earthwork, which he devised while engaged upon the Fitchburg Railroad, and the value of which was at once appreciated by the other engineers upon the work. The rough work necessary in supervising construction, however, did not appeal to him; and in carrying out the fieldwork of construction his associates generally considered him too particular, and thought that he required

them to make the measurements with a great deal more accuracy than was warranted by the conditions. All this goes to show why Professor Henck found his most congenial occupation and did his greatest work in connection with his professorship at the Institute.

He will be remembered with affection and respect by scores of former students, who have long ago forgotten what at the time they called his "fussiness," and who only remember his kindness of heart, his clearness of exposition, the thoroughness of his teaching, and the high ideals which he set for himself and for them. Many of them owe more to him than they realize. It is a human characteristic to exaggerate the importance of that which we do not possess and to underrate the importance of that which is given to us. Habits of careful thought, of methodical work, and of accuracy, upon which Professor Henck laid so much importance, have undoubtedly done much to make the success in life of those who came under his influence, and should always be gratefully remembered by them. As the first professor of civil engineering in one of the oldest of our engineering schools, his services, not only to his students, but to the cause of engineering education, should not and will not soon be forgotten by those who knew him, or who are in a position thoroughly to appreciate his character, his aims, and the results of his labors.

Professor Henck was probably best known to the engineering profession as the author of his "Field-book for Railroad Engineers," first published in 1854, and revised and enlarged in 1891 and in 1896. This little book was a perfect model of careful, methodical, and concise mathematical presentation. In these respects it has never been excelled, and it stands to-day as a sample of what should be the ideal in books of this kind. It went through many

editions, and will probably continue for some time to be a necessary part of the library of every railroad engineer. It is thoroughly typical of the man, and any one who is familiar with it can form a fair conception of his mental charac teristics. His calculation and computation books, showing the work of his old firm and his own work when he succeeded to the business, are likewise models of clearness, and can be taken up to-day and read and understood by anybody.

Professor Henck received the degree of A.M. from Harvard University in 1843, and was a Fellow of the American Academy of Arts and Sciences. He contributed several papers on mathematical subjects to the *Mathematical Monthly*, under the editorship of Professor Runkle, with whom he early became intimate. The death so near together of these two men, who were for so many years associated in the early days of the Institute and as colleagues in its Faculty, must recall to us that few are left of those who took part in the establishment of the Institute, and who went through with the trials and tribulations incident to the successful launching of what has become perhaps our foremost engineering school.

During the years of his residence in California several of the older graduates and teachers of the Institute have had the pleasure of seeing their old teacher and colleague, and have always been received by him with cordiality and affection. During these years of quiet he indulged a long-cherished desire to have the use of an astronomical observatory of his own; and in the small observatory which he put up he passed a great many pleasant hours in what had always been a favorite study and amusement with him. He retained his faculties to the last, and was dressed and out of his room on the last day of his life; but he had been

failing for some time, and finally passed away from a sudden collapse of the whole system. He had had a long life, singularly free from illness of any kind, and is survived by two sons and a daughter.

GEORGE F. SWAIN, '77.

FIRE INSURANCE ENGINEERING

Fifty years ago the Fire Insurance Engineer was unknown. He is the product of an era of development in the insurance business, in which science has been replacing chance as the basis of underwriting. Up to the middle of the nineteenth century, underwriters would accept a policy on almost anything offered, making a rate based on past experience on similar classes of property, and would then trust largely to chance. In those days, fire hazards were comparatively few, while fire-detecting and fire-fighting appliances were comparatively simple. The latter consisted mainly of buckets, augumented in the cities and larger towns by public "hand-tubs," hose and ladders.

As manufacturing plants became larger, and as processes became more varied and complicated, fires were more frequent and of greater severity. In consequence the rates had to be raised, in order that the insurance companies might do business at a profit. No adequate steps were taken by the underwriters to reduce the fire loss; and, as a result, the rates finally became so high that manufacturers demurred, and sought methods of insuring themselves. Thus was formed, about the middle of the century, the Factory Mutual Insurance System, inaugurated by the cotton and woollen mills, but since extended to cover numerous classes of business. In fairness to the others, it was necessary that no mill be taken into the system that was not up to the average standard in regard to fire protection and the proper arrangement of the hazards. Therefore, an inspec-

tion department became necessary, the duties of which were: first, to report on the condition of mills desiring to be taken into the system, and, second, by frequent inspection of the plants already insured, to keep in touch with any possible changes and to improve the plants as fire risks by making suggestions for lessening the hazards and for bettering the fire protection. This was perhaps the beginning of Insurance Engineering. The stock companies soon found that they, too, must form inspection departments, for the purpose partly of competing with the Mutual Companies and partly of improving the plants from a fire insurance standpoint, thus reducing their fire loss. The more progressive underwriters began also to appreciate the necessity of having an accurate report on a factory before undertaking to insure it.

The growth of expert inspection was greatly stimulated by the use of interior fire-extinguishing devices, which began to assume some importance about 1875. These required scientific supervision for their proper installation and maintenance. A brief account of the development of these devices is necessary for a full understanding of the subject, for the growth of Fire Insurance Engineering is very closely related to it.

Formerly the only interior fire protection in manufacturing plants was that afforded by pails or buckets. Next came the standpipe, usually of cast iron, about four inches in diameter, located inside or just outside the wall, and with hose connections on each floor. It was usually supplied by private fire pumps, but sometimes by public water. About 1870 the system of perforated pipes began to be used in extra hazardous places, such as the picker-rooms of cotton-mills. These pipes were of iron, three-quarters of an inch, and larger, in diameter, with small holes drilled about a foot apart near the upper side. They were attached to the ceiling, about ten feet apart, and were connected to a supply pipe running to a yard main. Each floor had its separate riser; and the water was controlled by a valve, located outside the building, which could be opened in case of fire. This crude system had two impor-