Robert Hallowell Richards

THE purpose to honor Professor Richards brings honor to all who participate in the preparation of this book. Whether for his matchless contribution to the teaching and training of youth in the fields of mining engineering and metallurgy; or for his splendid achievements in the specialty he has made his own—the mechanical concentration of ores; or for his loyal services to the American Institute of Mining and Metallurgical Engineers; or for his fine qualities of character, rugged simplicity, generosity and kindness, we hail him a gentleman without a peer, loved and admired by all who know him.

Professor Richards was born August 26, 1844, at Gardiner, Maine. From thirteen to eighteen years of age, young Richards attended school in England, the last two years at Wellington College in Surrey, between Southampton and London. Returning to America in 1862 he went to Exeter Academy and in 1865, learning that William Barton Rogers was starting a scientific school in Boston, he did not hesitate a single day in deciding to enter the new Massachusetts Institute of Technology. Thus he became and has continued ever since a part of that notable educational institution as student, instructor, Professor of Mining and Metallurgy, and Professor Emeritus. Today, in his ninety-first year he is No. 1 alumnus and holds the unmatched record of seventy years of uninterrupted service in the great cause of engineering education and character building.

Scarcely less notable are the services rendered by Professor Richards to the A.I.M.E., of which he became a member in 1873 at the age of twenty-nine. Always active in its affairs, he was Vice President in 1879–1880, President in 1886, and was elected to Honorary Membership in 1911. He has continued to support at all times and with unflagging zeal the social and technical aspects of the organization over a period of sixty-two years. The records enumerate no less than a score of technical papers published in the TRANSACTIONS. The first one, read at the Boston meeting in 1873 and published with Volume I of the TRANSACTIONS, dealt with the Laboratories of Mining and Metallurgy at M.I.T. The last paper deals with Ore Dressing Improvements, read at the Butte meeting in August, 1913. The degree of Doctor of Laws was conferred upon him in 1909 by the University of Missouri, and in 1915 he was awarded the Gold Medal of the Mining and Metallurgical Society of

America for distinguished services in the advancement of the art of ore dressing.

When Richards was a student, there were no laboratories of mining and metallurgy at Massachusetts Institute of Technology or, so far as known, at any other school in the world. Two years later, in the summer of 1870, he joined a party of professors and students, twenty in all, headed by President Runkle, who visited various mining districts in Colorado, Utah, Nevada and California. Suitable machinery for a laboratory was purchased and to Richards was now assigned the task of founding the laboratory and installing the equipment. Accordingly, upon his return to Boston, he went abroad and visited the famous German mining schools at Freiberg and Clausthal and the concentrating mills near by. More than ever, he became convinced of the importance of laboratory equipment for teaching and, in planning the new laboratories in Boston, which were ready for use in 1872, Professor Richards applied new ideas which proved highly successful. He went abroad again in 1876 to visit the tin mines and concentrating mills in Cornwall, the lead districts in North Wales and Scotland, and the lead mines and plants at Mechernich, Germany.

The fundamental idea, which differed from anything that had heretofore been done in laboratory practice, was to combine in the machines and furnaces: (1) size that would match full-scale machines in the quality and character of their work; (2) usefulness, secured by modification of the machines so that the final record showed weights, analyses and a strict account of all products; (3) adaptation to teaching, whereby it was possible to operate the machines under different conditions with changes subject to the will of the student; (4) adaptation to research or testing. A great amount of research has always been done by Professor Richards in these laboratories, not alone because of the service he was able to render the profession, but for the dignity thereby lent to the work of the student.

The outstanding contributions by Professor Richards to engineering literature comprise the Treatise on Ore Dressing (four volumes) and the Textbook of Ore Dressing, both finally completed in 1909. It was in 1893 that R. P. Rothwell, then editor of the *Engineering and Mining Journal*, urged Professor Richards to write a book on ore dressing. Richards thought a year to experiment, a year to visit the plants, and a year to write the book would see the undertaking finished, but he found that there was so much that he did not know, and which nobody else knew, that he began experimenting concurrently with the searching of literature and in 1895 he set out to visit mills. Accompanied by secretaries, he made an extended trip through the mining districts of the Western States. He was wonderfully fitted and equipped by experience to do this work. The development of the experimental laboratories,

the early years spent in solving elementary problems, and the later years in fixing the fundamentals of research, prepared him for the work he was now undertaking.

Professor Richards was the first to create the system of mining and metallurgical instruction with the aid of a laboratory, equipped with working machines, wherein the students were taught to execute the lessons of the lecture room; and thus blazed a trail in technical education which other teachers were glad to follow, which now they have converted into a broad, well-marked road. For this, if for nothing else, Professor Richards is entitled to the thanks of the profession.

But in his own specialty—ore dressing, or the mechanical concentration of ores—he has rendered service of equally altruistic character and far broader scope. He has been a developer of principles in an art that was destined to become of premier importance, a codifier of its rules, and the exponent of both theory and practice in a field that was practically uncharted. His monumental treatise on ore dressing was not only the first of such scope in the English language but for many years it was the only one.

The name of Robert Hallowell Richards is known wherever men hoist crude ore out of the mines and dump it into mill bins. He possesses a thousand disciples among the men trained under his guidance and from him they learned not only things mining and metallurgical, to which he gave so much enthusiasm, but guidance of the heart and soul. We salute him for nobility of character, for nobility of service unselfishly rendered, for nobility of attainment in his profession and for nobility of years—may he long continue to enjoy the love and esteem of a host of loyal friends.

W. SPENCER HUTCHINSON.

CAMBRIDGE, MASS.
November 27, 1934.