

upon the active practice of his profession, and for the next two years was engaged in the expert examination of mining properties, and in carrying out metallurgical tests. During the last seven years he has been engaged in general engineering, his time having been occupied in field work in copper and lead, in hydraulic mining, in the mining and milling of gold, and in work on iron, steel and coal. In his several positions he has frequently had control of from 800 to 1,500 or more employees. Dr. Porter's testimonials speak of him in the very highest terms, and all agree in the opinion that he is a man of unusual ability as an organizer and as an inspirer of enthusiasm in others, that he possesses a natural talent for arrangement and classification, which extends not only to material things, but to ideas and mental concepts. He is a man of wide reading and diversified tastes, is singularly lucid in explanation, and successful in imparting information.

HERBERT W. UMNEY.

H. W. Umney, the newly-appointed assistant Professor of Civil Engineering, is an associate member of the Institution of Civil Engineers (Eng.), and of the Institution of Mechanical Engineers (Eng.). After spending six years in the Dulwich College, he studied for three years at the City of London College, under Professor Adams, M. Inst. C. E., obtaining a first-class honor certificate at the City of Guilds of London Institute examination in engineering, as well as a science and art honors certificate in machine construction, etc. Subsequently he took the complete engineering course at the Yorkshire College of Victoria University, and secured the first place in the examinations, obtaining the prizes and a special certificate of honor. Mr. Umney's qualifications as an hydraulic engineer may be estimated from the fact that for three years he was articled with R. Waygood & Co. (hydraulic engineers), of London, Eng., passing through the different shops and the drawing office. He was also in the employment of Middleton & Co., hydraulic engineers, and was afterwards made assistant general manager of offices and works to the Pickerings of Stockton-on-Tees, where he had complete control of the hydraulic department. At the time of his appointment to the vacant post in McGill University, he was engaged with Stothert & Pitt, manufacturers of high-class harbor and dock machinery. Mr. Umney is an able speaker, has given several courses of lectures as lecturer on engineering to the Yorkshire County Council, and is the author of several original papers.

HENRY F. ARMSTRONG.

Mr. Armstrong, after serving an apprenticeship to the teaching profession, obtained a Queen's scholarship, and entered the South Wales Training College, where he remained for two years and was then placed in the first division. For the following two and a half years he was second master in a large Higher Grade School in Leeds, and his work, especially in drawing, was most successful. As a result, he obtained from the Education Department what is known as the "Experience Parchment." Mr. Armstrong then spent three years in the Art Training Schools, South Kensington, where, as an art master, he was elected to the training class out of a large number of candidates from different parts of Great Britain. He was appointed a teacher of art work and a lecturer in geometry and perspective in the Leeds School of Art, and was then engaged by Professor Cusack as a lecturer in his college in the city of London, where he had charge of geometry, perspective,

freehand drawing, modelling and shading. Mr. Armstrong is the author of a text book on solid geometry and orthographical projection, which has been very warmly received by the teaching profession of Great Britain, and has already been adopted in most of the colleges and other institutions in which this subject is being taught. Mr. Armstrong's natural genius for art and aptitude for teaching will greatly strengthen the drawing department of the university.

THE RAPID EVOLUTION OF ENGINEERING.*

The essential characteristic of the engineer is the scientific habit of observation, deduction, and experiment. Exercised *per se* in the natural world, the resultant would be discovery, pure and simple; combined with the conception of adaptation to human needs, it becomes creative. The engineer may not necessarily be an investigator, but he must be quick to understand the investigator's work, and interpret it in terms of useful application and practical service.

Mr. Clarke, in a brief summary, suggests the many highly-specialized branches into which the profession is now divided. Apart from military engineering, he distinguishes "structural, mechanical, electrical, metallurgical, hydraulic, mining, agricultural, chemical, sanitary, municipal, highway, and railway engineering. These classes are again sub-divided; as hydraulic engineering into canal, harbor, water-supply, power, storage, and irrigation engineering; or railway engineering into bridge, foundation, track, signaling, locomotive, and car engineering." All these he would include under the one general head of civil engineering, abandoning the restricted and at the same time indefinite sense in which this term is generally understood, and returning to the primary sense which it bore when the entire profession had but two departments—"Military" and "Civil." This almost overwhelming catalogue suggests the rapid expansion and specialization which has taken place under the influence of modern tendencies, and the radical change involved to older members, as well as to those just entering the work. We have been passing through an era of extraordinarily rapid change, no doubt often bearing hard upon those whose lack of equipment or of adaptiveness prevents them from continuously adjusting themselves to a rapidly-changing environment.

Like many other lines, engineering is becoming "commercialized" as well as specialized. Much of the work which formerly sought the individual now goes to large construction companies; but the increased facilities and economies attending the new method lead to more and larger undertakings. And the net result is a demand for still higher skill and more workers. Railroad construction may diminish, but railway operation absorbs even more engineering talent for its maintenance of way, its shops, its signals, and its superintendence. The final settlement of boundaries takes away the occupation of the once important surveyor, but the growing municipality requires a score for its public works and private buildings.

And the end is not yet—nay, this is but the beginning. The tendency of the future will be steadily toward a broader and more diversified extension of the work of the engineer. The profession has better openings now than it ever had before, but he who builds his career within its lines must lay his foundations broad

* Extracts from President Thomas Curtis Clarke's address before the annual convention of the American Society of Civil Engineers, at San Francisco, on June 30th.