Abrams' formula. The latter is so very revolutionary; while the former is along the lines of present practice, only establishing a more scientific basis for the proportioning of the materials.

The results of Capt. Edwards' tests confirm the popular idea that, in both mortars and concretes, for a condition of maximum strength, there should be sufficient neat cement to coat entirely every particle of aggregate; and in concretes, sufficient mortar to coat every stone. Capt. Edwards has established his claims upon a very scientific basis. A great amount of tedious work was involved in his tests. For instance, he had to count the number of particles in a given quantity of various sands, and in more than one direction his work lay along lines which greatly taxed the patience, the nerves and the eyes. He is to be congratulated upon the results, which appear to be of much value. His paper is not solely confined to theoretical discussion, nor yet to practical tests. It embraces relations between design and construction which are frequently overlooked, and shows clearly how engineers and contractors can apply his method in actual practice. Unless Prof. Abrams' theory supplants that of Capt. Edwards, it is very likely that the materials of nearly all mortars and concretes will be proportioned along the lines suggested by Capt. Edwards rather than by volume, as has been done at least since 1827 and possibly since the "constructive" Roman period. As Prof. A. H. Heath is given credit by Capt. Edwards as being the pioneer or perhaps the originator of his method of proportioning, we would suggest that his method be known as the Heath-Edwards method of proportioning.

"The volume method, as commonly used," says Capt. Edwards, "is not only illogical and unscientific, but also unfair to the development of the true value of the materials entering into the composition of both mortar and concrete. The ideal mortar contains a proportion of cement sufficient to develop the full strength of the particles of sand aggregate; while the ideal concrete contains a mortar component, in itself ideal, which will develop the full strength of the particles of stone aggregate. There should be no place in engineering for guesswork and empiricism whenever scientific determination is possible."

PERSONALS

Sidney M. Johnston, has been appointed temporary city engineer of Stratford, Ont.

F. M. Mahard, superintendent of construction of the American Can Co., Montreal, has resigned to become designing engineer for Monks & Johnson, Boston.

Lieut.-Col. Ibbetson Leonard, of London, Ont., has been awarded the D.S.O. He is a member of the firm of E. Leonard & Sons, boiler and engine makers.

J. A. Burnett, electrical engineer, Grand Trunk Railway System, has received an appointment as technical assistant to the British War Mission, Washington, D.C.

James C. Wardrop, engineer on the staff of the Department of Works, Hamilton, Ont., has resigned, and will in future be associated with F. R. Warren, architect.

Major Graham Bell, financial comptroller of the Department of Railways and Canals, Ottawa, is to supersede A. W. Campbell as Deputy Minister of Railways and Canals.

Hon. C. C. Ballantyne, Minister of Marine and Fisheries, will shortly go to Great Britain to take up naval and other maritime problems with Admiralty and shipping authorities in that country.

L. H. Harza, formerly chief engineer in charge of design and construction of the 20,000-h.p. Canadian hydro-electric development at Sault Ste. Marie, Ont., is now in Jacksonville, Fla., taking charge of the proposed concrete shipyard.

Lieut. A. Rupert Neelands, M.C., who graduated from the University of Toronto in 1906, has been awarded the Military Cross. Previous to enlisting with the Canadian Engineers and serving in France, Lieut. Neelands followed his profession at Port Hammond, B.C.

James, Loudon & Hertzberg, consulting engineers, Toronto, have been appointed on behalf of the Public Works Department of Canada to valuate the equipment formerly used by the Confederation Construction Co. on Contract 3 of the Welland Canal, preparatory to purchase of the equipment by the government.

Lieut. Harold J. Mackenzie, an honor graduate of the University of Toronto, in Applied Science, has been awarded the Military Cross. He enlisted with the Canadian Engineers and after being attached for some time to the training depot at Ottawa, went to France with the 1st Tunnelling Co., Canadian Engineers in July, 1916.

Lieut.-Col. Charles H. Mitchell, of Toronto, was included in the King's birthday honors, being made a Companion of the Bath for services in Italy. Prior to enlistment, Col. Mitchell was senior member of the consulting engineering firm of C. H. & P. H. Mitchell, Toronto. He has held various high positions in the Intelligence Service of the British Army, practically since the beginning of the war, and has been decorated a number of times and frequently mentioned in despatches.

J. R. M. Fairbairn has been appointed chief engineer of the C.P.R'y Co. replacing John G. Sullivan, chief engineer, who is retiring to enter private practice. Mr. Fairbairn was born in Peterborough 45 years ago. He entered the University of Toronto, and graduated in 1893. Following a short private practice in British Columbia, he joined the C.P.R. as a draughtsman at Winnipeg, which position he held for two years. He was then made resident engineer at Place Viger, Montreal; assistant engineer, Toronto; assistant engineer of maintenance of way, Montreal; division engineer, Toronto, and engineer of maintenance of way, Montreal. In February, 1911, he was made assistant chief engineer.

OBITUARIES

Dr. Jasper Douglas, a Canadian, who was for many years president of the board of directors of Phelps, Dodge & Co., copper mine owners, died recently at New York at the age of eighty-one. Dr. Douglas was a graduate in mining at Queen's University and early in his career practiced at Quebec. Since 1875 he had been residing in New York, where he had charge of extensive copper interests. He was a member of the American Institute of Mining Engineers and also of the North of England Mining Engineers' Society.

John H. Kerr, secretary of the Canadian Westinghouse Company, of Hamilton, died on Monday, the 24th ult. Mr. Kerr was a native of Pittsburg, Pa., and had been engaged with the Westinghouse companies for many years. He began with the parent company and also assisted in the organization of the French Westinghouse Company. In 1901, when the British Westinghouse was founded, he went to Manchester to organize the factory system. In 1903, on the formation of the Canadian company, he was transferred to Hamilton.