VANADIUM AND ITS USE IN WARSHIPS.

J. L. Stuart.

In addition to the use of nickel and cobalt in the strengthening of steel, vanadium is beginning to play a most prominent part, both in strength and ductility. There have been many tests into which this new-found alloy has entered. Vanadium, it is claimed, makes steel free of the gases, oxygen and nitrogen, which are its weaknesses now, and which increase the value of its other elements, such as nickel and chrome. The tensile strength of the mass is increased anywhere from 50 to 500 per cent. In armour plate the resistance is increased 150 per cent. Further than this, the steel which vanadium makes possible can be greatly reduced in weight, thus permitting in warships a greater opportunity for fuel room, and consequently swifter and better armoured cruiser. The American Vanadium Company control a great part of the known supply. The property of the company was discovered by a Peruvian mining engineer in the Cerro de Pasco Mountains of Peru. The mine is about five miles long by two miles wide. The ore is brought to Bridgeville, a few miles out of Pittsburgh, which is reduced and made into ferrules, which are turned over to the steel-makers who desire to use it. Five pounds of vanadium are used to every ton of steel. Large quantities of this new alloy are being used by the big steel industries. It is used in all kinds of forging steels, as well as entering the field of automobile manufacture.

Recently at the Union Steel Castings Company a vanadium steel engine frame required twenty blows from a 5,000 trip or ball-drop from a height of nineteen feet, while a carbon, the regular carbon steel frame—of similar composition, except the one-fifth of one per cent. of vanadium added—required but two blows.

Not only in armour plate is the new steel likely to prove valuable, but also in the new vanadium steel protective dock plate, where it is 269 per cent. stronger than the new plate now in use. It would be a rare gun that would explode or suffer by corrosion when made of vanadium steel. The use of vanadium marks an epoch in offensive and defensive steel for naval warfare, and the steel will enable the ship designer to increase the protective value of the ship without a sacrifice of other qualities.

SUPERVISION OF CONCRETE CONSTRUCTION.

Speaking of the marvellous adaptability of concrete to building construction, Mr. Leonard C. Wason, President of the Aberthaw Construction Company, of Boston, Mass., recently emphasized the absolute necessity of technical knowledge and experience in its use and of the most thorough supervision in connection therewith. He points out that "in the case of the common or careless contractor, the steel setter is usually little better than a poor carpenter, in fact hardly more than an intelligent laborer. Upon him falls the whole duty of setting the steel, often sorting it from the stock pile to get the right sizes. Sometimes he is checked by the foreman; often not. If the job is carelessly handled, it is not inspected and as a consequence this cheap man becomes responsible for one of the most critical features of the entire work.

"In such an organization the mixture of cement is no more intelligent—usually less so. Inaccurate setting of the reinforcement is immediately hidden from sight as the work progresses and poor workmanship in the matter of materials and mixing is not readily revealed. Herein lies the great danger in the use of reinforced concrete, a danger which is always present where an inspector is not employed on the work.

"The ordinary contractor, who does not realize the importance of exact location seems to think that if his steel is merely buried out of sight it is sufficient But the experienced who understands the vital necessity of an accurate setting and mixing delegates men to check one another in the selection and placing of steel. The best contractors also employ engineers whose duty it is to supervise and check all work, thus eliminating the errors which are always certain to occur where cheap and inexperienced labor is relied upon. Where a job is being executed under the supervision of an independent engineer, his inspector ought, and usually does, note the setting of every bar. It is also his duty to see that every batch gets its full amount of cement and is properly mixed.

ENGINEERING SOCIETIES.

ARCHITECTURAL INSTITUTE OF CANADA.—President, A. F. Dunlop, R.C.A., Montreal, Que.; Secretary, Alcide Chaussé, P.O. Box 259, Montreal, Que.

CANADIAN RAILWAY CLUB.—President, L. R. Johnson; Secretary, James Powell, P.O. Box 7, St. Lambert, near Montreal, P.Q.

CANADIAN STREET RAILWAY ASSOCIATION.—President, J. E. Hutcheson, Ottawa; Secretary, Acton Burrows, 157 Bay Street, Toronto.

CANADIAN INDEPENDENT TELEPHONE ASSOCIATION.—President, J. F. Demers, M.D., Levis, Que.; Secretary, F. Page Wilson, Toronto.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—413 Dorchester Street West, Montreal. President, J. Galbraith; Secretary, Prof. C. H. McLeod. Meetings will be held at Society Rooms each Thursday until May 1st, 1908. Annual meeting at Toronto Jan. 28, 29 and 30, 1909.

QUEBEC BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—Chairman, E. A. Hoare; Secretary, P. E. Parent, P.O. Box 115, Quebec. Meetings held twice a month at Room 40, City Hall.

TORONTO BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—96 King Street West, Toronto. Chairman, C. H. Mitchell; Secretary, T. C. Irving, Jr., Traders Bank Building.

MANITOBA BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—Chairman, H. N. Ruttan; Secretary, E. Brydone Jack. Meets first and third Friday of each month, October to April, in University of Manitoba.

ENGINEERS' CLUB OF TORONTO.—96 King Street West. President, J. G. Sing; Secretary, R. B. Wolsey. Meeting every Thursday evening during the fall and winter months.

CANADIAN ELECTRICAL ASSOCIATION.—President, N. W. Ryerson, Niagara Falls; Secretary, T. S. Young, Canadian Electrical News, Toronto.

CANADIAN MINING INSTITUTE.—413 Dorchester Street West, Montreal. President, W. G. Miller, Toronto; Secretary, H. Mortimer-Lamb, Montreal.

CANADIAN CEMENT AND CONCRETE ASSOCIATION.—President, Peter Gillespie, Toronto, Ont.; Vice-President, C. T. Pulfer, London, Ont.; Secretary-Treasurer, Alfred E. Uren, 62 Church Street, Toronto.

NOVA SCOTIA SOCIETY OF ENGINEERS, HALIFAX.—President, J. H. Winfield; Secretary, S. Fenn, Bedford Row, Halifax, N.S.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS (TORONTO BRANCH).—W. H. Eisenbeis, Secretary, 1207 Traders Bank Building.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—29 West 39th Street, New York. President, H. L. Holman; Secretary, Calvin W. Rice.

SOCIETY NOTES.

Nova Scotia Society of Engineers.

At a well-attended meeting of the Nova Scotia Society of Engineers, held on November 17th, 1908, in the Telephone Building on Hollis Street, Halifax, N.S., a paper on "Highway Improvements," by D. McD. Campbell was read. The paper, a valuable one, was discussed by R. McColl, Provincial Engineer; F. W. W. Doane, City Engineer; J. W. McKenzie, Assistant Road Commissioner, and others. At the suggestion of H. Donkin it was decided to continue the discussion at the society's next meeting, to be held on the second Thursday in December.