HIGH CONTRACT PRICES SHOULD LEAD NEITHER TO POSTPONEMENT NOR TO DAY LABOR*

IT is difficult to realize that the cost of road and street construction has doubled in five years. Consequently, when contractors bid twcie as high as in 1914, there is a strong inclination to reject all bids. In some cases this leads to postponement of the work till next year. In other cases it leads to construction by day labor. Whichever of these two courses is adopted there will be regret. Wages are rising and prices of materials show no sign of falling. Hence, contract prices are apt to be higher next year than now.

Work done by day labor is rarely done as cheaply as by contract. Usually, day labor work on roads costs fully 25% more than if done by contract; and not infrequently the cost is double. Men working for a city, county or state simply will not exert themselves as when working for an individual. The editor travels extensively, and wherever he on a day labor job. It is sophistical reasoning, but you can from a "contract gang" at sight. The typical "contract gang" shows far more energy than the typical "day labor gang."

It is frequently said that "day labor work" would always be as efficient as contract work if good managers were in charge, but this is not true. Whoever has been superintendent or foreman over construction forces, both day labor and contract gangs, knows that it is usually impracticable to get a day labor gang to work as vigorously as a contract gang.

"The State is rich. Don't break your back saving a few cents for the State." "Who put the governor in his soft job? Your votes and mine. Well, the governor appointed the commission; the commission appointed the engineers, and they appointed the foremen. So every last Jack of them owes his job to our votes. Why should we sweat more than the men who owe their jobs to us?" Such is the reasoning of the man that wields the shovel or runs the engine on a day labor job. It is sophistical reasoning, but you can no more convince him of his error than you can persuade a Hindoo that the system of caste is grossly uneconomic.

*From "Engineering and Contracting," Chicago.

ELECTRICITY AND CIVILIZATION

IN connection with the value of water powers, the "Electrical World," of New York, commenting on remarks by Dr. George Otis Smith, Director of the United States Geological Survey, states that, in the long run, the utilization of water power means the saving of human energy for purposes to which power-driven machinery is not yet adapted. The mere change from steam power to water power is not only significant of lower costs in manufacturing and of the saving of the earth's stored fuel for its more important uses, but it relieves the labor necessary in mining the coal and the still greater burden of transporting it.

Every water power harnessed and displacing steam power implies, therefore, a great band of laborers in the mine and on the railways freed from this particular necessity of toil, for other and more useful work. Now that the price of labor has risen beyond the wildest dreams of a few years ago, we are approaching an era when, wherever possible, human energy will be replaced by mechanical or electrical power.

If we are to attain a condition of production that will give us a chance of successful competition in the world's market, it must be through the most determined efforts at cheap power production and all possible saving in the field of human labor. The great power enterprises of the present day give opportunities such as have not yet been realized.—By Leo G. Denis, writing in "Conservation," published by the Commission of Conservation, Ottawa.

ADVISORY BOARD TO DOMINION HIGHWAYS BRANCH CONFERS WITH PROVINCIAL OFFICIALS

OFFICIALS from various provinces met the Advisory Board of the Highways Branch, Department of Railways and Canals, last week at Ottawa, and discussed how the $20,000,000 federal aid should be spent.

Copies of the form to be used in applying for aid, which had been prepared by A. W. Campbell, the head of the Highways Branch, were submitted to and approved by the provincial representatives, and other regulations were also discussed.

Those present from the various provinces were: Nova Scotia, Hon. H. H. Wickwire and Chief Engineer J. W. Roland; New Brunswick, Chief Engineer B. M. Hill; Ontario, W. A. McLean, Deputy Minister of Highways; Quebec, B. Michaud, Deputy Minister, and G. Henry, Chief Engineer; Manitoba, Alex. McGillivray, Chief of the Good Roads Branch; Saskatchewan, Hon. S. J. Latta, Minister of Roads, and his deputy, H. S. Carpenter; British Columbia, A. E. Forman, Chief Engineer, Public Works Department.

The advisory board, of which Hon. J. D. Reid, Minister of Railways and Canals, is chairman, is composed of C. A. Magrath, Ottawa; J. P. Mullarkey, Montreal; and R. Home Smith, Toronto.

RESULTS OF TESTS OF WIRE ROPE

IN "Technologic Paper No. 121," published by the U. S. Bureau of Standards, J. H. Griffith and J. G. Bragg present the results of tests on 275 wire ropes submitted by United States manufacturers to fulfill the specifications framed by the Isthmian Canal Commission in 1912. The samples were selected by government inspectors for acceptance tests of material to be used at the Canal Zone. The following review of the paper appears in "Mechanical Engineering," of New York:—

The ropes ranged in diameter from ¼ to 1½ in., a few being of larger diameters up to 3¼ in. Over half the specimens were plow and crucible cast-steel hoisting rope of 6 and 8 strands, 19 wires each. The remainder were galvanized steel guy rope and iron tiller ropes of 6 strands 7 wires, and 6 strands 42 wires, respectively.

The investigation was made primarily to determine the tensile strengths of the ropes. Much of the experimentation was of a supplementary character—to determine the general laws of construction of the rope as the basis of the interpretation of their physical behavior under stress. A comparative analysis was made of the chemical constituents of steel, rope fibers and lubricants of plow ropes submitted by different manufacturers.

The wires at the ends of specimens were "frayed out" to form a "broom." These were inserted into molds, into which molten zinc was poured so as to form conical sockets for connection to the testing machines. Most of the tensile tests were made on a 600,000-lbs. Olsen testing machine, the ropes of large diameters being tested on the 1,200,000-lbs. Emery machine. Stress-strain measurements were made on over half the specimens. Numerous tests of individual wires were conducted in tensile, bending and torsion machines. The strengths of the cables were studied in connection with their modes of construction, the strengths of their component wires and the types of fractures which were presented.

The homologous linear dimensions of the strands, wires and fiber cores were found to vary in direct proportion to the diameters of the ropes. The diameters of the strands and fiber cores were generally ⅓ the diameter of the rope. The mean pitch or lay of the strands was 7½ diameters. The mean lay of the wire was 2¾ diameters. The mean diameter of the wires was expressed by the equation:—

$$d = KD/(N+3)$$

where d = diameter of wires
D = diameter of rope