To-day the great weakness of our schools of Applied Science is their failure to actually apply science, is their failure to make mathematics, mechanics, physics and chemistry lend themselves, in the hands of the engineer, for the working out of the problems of the every day. Too wide a gap exists between the problems of the college hall and the practical problems of the world. So much time is devoted to pure science and so little to its practical application that the young student acquires a wrong conception of the value of what he has learned and begins to minimize what he has to learn. No better institution than a well-equipped testing laboratory could be suggested to assist in familiarizing the student with some of the practical work of the engineer, to encourage research work in the technical colleges, and to aid the engineer in securing reliable information of action of his materials of construction under various conditions. The present seems to be a most convenient time to impress the necessity of such laboratories. New building materials are being introduced, materials that have not been tested. New designs are being employed, designs that have not been tried by long use nor developed after repeated experiments in the testing-room. The engineering societies and engineers' clubs could not do better than at once make arrangements to memoralize the Government or Governments on this matter.

## LABOR.

Along with the scarcity of capital which has recently affected a large part of the commercial world is a shortage in the supply of labor. This shortage of labor is a result of great industrial activity almost everywhere; but it is also due in part to the fact that more large projects than usual are also upon the carpet. For example, to begin close at home, the construction of the Grand Trunk Pacific and the Canadian Northern, together with the extensions of the Canadian Pacific and the Great Northern, mean the addition of 6,000 to 8,000 miles to the railway mileage of this continent. These various railway enterprises would probably employ 50,000 men, if that many could be got.

In the United States extensive additions are planned to many railway systems; and in New York State especially heavy industrial work is planned, such as tunnels and subways. There is the great barge canal through the State, to cost $100,000,000, and the conduit already begun to bring water into the city of New York from the Catskill Mountains at a cost of $150,000,000. These of themselves will employ many thousands, perhaps tens of thousands, of workpeople. The Panama Canal, too, is said to require 40,000 men as a steady working force.

Outside of America, the rebuilding of the Siberian railway causes demand for Asiatic labor, and in Africa the Cape-to-Cairo railway will for years make drafts on labor for construction purposes. And in the mines of the Transvaal, whence the coolies are now being taken, other laborers in large numbers, will have to be substituted.

Never before, says the Outlook, has the premium on muscle been so great as it is to-day in the labor marts of the world, with the result that labor has found that it can to a great extent dictate terms as to hours and remuneration. Besides, there lately appeared in a Government report an estimate that labor, in some instances at any rate, is to-day only about three-fourths as efficient as it was a few years ago. This, of course, is a considerable factor in estimating numbers of laborers required. An editorial in the Iron Age of October last said: "There is an increasing lack of efficiency in labor, marked by a lessened output and by lowered quality." And, it is added, the great increase in the volume of business is to blame for this by increasing the disposition towards slip-shod work. Indeed, as has been said, "the increasing cost of unskilled labor and its decreasing effectiveness present the economic problem of the times." It is not easy to say how far this lessened efficiency of the average laborer is at the present time keeping back industrial and transportation enterprise.

## UNIVERSITY OF MANITOBA ENGINEERING DEPARTMENT.

We have just received a syllabus of the course in Civil Engineering and the preliminary course in Electrical Engineering given by the University of Manitoba.

The University of Manitoba was established in 1877, and has the sole power to confer Degrees in Arts, Law, and Medicine, and it is fair to presume that it will be the sole power conferring degrees in Engineering.

During the last few years the Canadian universities have found this department of Applied Science the most popular, and it is not to be wondered at that Manitoba should add such a department to their university. The engineering problems of the West demand scientifically trained engineers. During the past couple of years the demand for university trained men has been great. Manitoba is preparing to do her part in meeting the demand.

Those interested in the educational training of embryo engineers and those interested in educational methods would do well to become familiar with the syllabus of courses offered by Manitoba. A new college would not be expected to offer many courses nor a large variety of options, but one would expect to see in courses outlined the trend of modern ideas and methods along educational lines. The courses have no doubt been prepared after much discussion, and it is, indeed, refreshing to find several departures from the path outlined by the older colleges.

In the first year two hours a week are devoted to English. This is as it should be. The successful engineer must have a ready command of pure English, and must be able to express himself in clear, forceful English. In other Canadian universities the students in Applied Science have not an opportunity to devote any time to the study of our national language.

In the second year a course of lectures in Logic is contemplated. Logic, the science of correct thinking. Is there any reason why logic should not receive a large place in such a course?

In the third year two hours a week are given to Economics and Political Economy. Of all the professions, none are more intimately connected with the industrial progress of the country than engineering. The engineer, to make the most of his opportunities, must study carefully the relation of supply and demand. Taxation and transportation are subjects he must be familiar with: the one he cannot escape; the other is his to solve. Finance and labor go hand in hand with constructive engineering.

In the fourth year one hour a week is given to Engineering Law. The engineer is not a lawyer, nor does he care to be; yet he is a fortunate engineer who knows something of law as it relates to the engineer's powers and responsibilities.

The four additions to the usual college course in Engineering are wise and necessary. Manitobans are to be congratulated that, in addition to the usual studies in pure and applied mathematics, mechanics, physics, and chemistry they have a University Board with courage enough to venture into new fields.

**Q. E. D.**

**Confidence + Economy = Prosperity.**
**Speculation—Common sense = Poverty.**
**Optimism × Speculation = Panic.**
**Extravagance ÷ Need = Sense.**