engineer in the ways already mentioned. Instruction in a subject so vital to the civil engineer preparing for highway work should not be limited to textbook and classroom.

To meet the demand for men trained in special phases of highway work a few civil engineering departments have established laboratory courses for the testing of stone and brick for use in road building together with laboratory courses in the examination of bituminous materials. The value to the engineer of a knowledge of road building materials cannot be questioned, but the addition of specialized laboratory courses of this character to the undergraduate civil engineering curriculum is open to serious objections for several reasons. To make place for them, some subject of greater value must either be omitted or curtailed. A comparatively small percentage of the students in each class care to specialize in highway work. The greatest value resulting from a special course in testing lies in the student's ability to interpret the results obtained and to apply them in a practical manner to the choice of materials for definite purposes. To be able to judge of the fitness of materials upon the basis of laboratory tests requires highly specialized instruction and the expenditure of more time than a properly balanced undergraduate course can afford. Evidence is increasing that special applications of civil engineering should be reserved for graduate study when the limitations incident to undergraduate curricula can be avoided.

Modern textbooks on highway engineering devote considerable space to bituminous materials and the usual laboratory methods employed for their examination. In case the instructor in undergraduate work wishes his students to supplement their knowledge of bituminous materials by further study, the suggestion is offered that the department of industrial chemistry, if one exists, may be willing to co-operate in providing a course of lectures illustrated by apparatus and samples of materials.

In weighing the merits of laboratory courses which seem to be essential to the training of men who are to devote their energies to highway engineering, educators should not overlook the fact that studies of a different character, such as economics, accounting and the elements of business law may prove of more value in the development of future administrative officers of highway departments than a first-hand knowledge of testing materials.

In conclusion, it may be well to observe that members of this association may perform a real service by pointing out to a partially informed public the fact that our civil engineering schools are equipped to give students the fundamental training in civil engineering necessary for them to develop into capable highway engineers. Young men will avail themselves of the facilities which the schools offer as soon as positions in highway engineering are adequately compensated and the blighting limitations of residence qualifications and political influences are removed.

It is believed that the Cauvery dam, in the South of India, in the province of Mysore, when completed, will be one of the largest in the world. It will be 8,900 ft. long, and 124 ft. high. The total area covered by the lake that has been heaped up behind the dam approximates to about 43 square miles; while 17 villages have been submerged thereby, the population of which was nearly 10,000. The first stage of the reservoir, with the weir 80 ft. high, is expected to be completed by the end of the current year, the final stage being taken in hand later. It will be remembered that the original Cauvery power scheme was the first of its kind to be undertaken in India, transmitting current to the Kolar gold fields 90 miles away.

FILTER PLANT DESIGNED FOR ST. HYACINTHE.

IN an article on "Water Filtration Experience," which was published in *The Canadian Engineer*, issues of December 21st and 28th, 1916, H. G. Hunter, resident engineer at Montreal for the New York Continental Jewell Filtration Co., stated that he considered it better practice to house the entire area of the filter beds. He also referred to the desirability of making pipe galleries as accessible as possible.

Mr. Hunter has forwarded two tracings which illustrate these points. These are reproduced herewith. This plant has never been built, the drawings having been made merely as a suggestion for St. Hyacinthe, P.Q. Tenders for a plant at St. Hyacinthe will probably be asked for this spring.

Mr. Hunter states in a letter to *The Canadian Engineer* that this proposed plant for St. Hyacinthe is the best example known to him "of a plant with the filters located all to one side of the pipe gallery. This design also embodies the feature that I believe desirable in this climate, of covering the entire filter and operating room with the building; it also features the straight-flow coagulating basin without baffles.

"The pipe gallery in this plant is very accessible, it being possible to travel the length of the pipe gallery without interruption. The gallery also has windows which would give proper light and ventilation. The coagulated water from the coagulating basin is taken directly on to the back of the filters without being conveyed through long pipe lines or flumes, it being desirable to deliver the water to the filters with the least possible disturbance.

"Another point about this particular design is that it is truly a plan of a complete filtration plant; that is to say, it carries all of the accessories to a filter plant and provides space for them; notably, the wash water pump and air blower, the chemical storage room and chemical tanks. It does not provide a pumping station for low-lift pumping machinery. As stated in my paper, it is sometimes necessary to provide space for this, intending to convey the meaning that rightly the low-lift pumping station is work entirely aside from the design of a filter plant.

"In other words, all as above stated, I believe that this design for St. Hyacinthe covers all of the points mentioned in my paper as being desirable to feature in the design of a filtration plant."

JAPANESE SHIPBUILDING.

The Japanese government is considering the question of reducing the national assistance extended to shipbuilding. The assistance hitherto given was afforded so opportunely that when the great war broke out in Europe and many ships were diverted from commercial to naval purposes by the belligerents, Japanese shipowners made great profits. The highly remunerative freight rates earned by ships have been even a greater stimulus to the growth of Japanese shipping than the government subsidies granted. This growth has, however, resulted in a heavy increase in the amount which the government is now called upon to pay shipbuilders. In 1914 these payments amounted to $815,000, in 1916 they were $1,561,000, and this year they are expected to be about $2,900,000. It is not surprising, accordingly, that the Japanese treasury is casting about for some relief.

Henry Ford, president of the Ford Motor Co., has been permitted to proceed with the construction of a $12,000,000 smelter on the Detroit River, near Detroit.