

The President proposes to increase the Corps of Engineers by 15 companies. At least 50 additional engineer officers will be required for this force, so it seems probable that civilian engineers may obtain some of these commissions. In the army as a whole about 2,000 additional commissioned officers will be required, and the logical candidates for these commissions, according to what engineering societies are being told, are the younger graduates from the engineering schools.

Moreover it is proposed to build up a volunteer army of 400,000 part-time men, to be raised in groups of 133,000 a year for a period of three years. A large number of volunteer officers will be required for these troops, as well as 750 permanent officers to train them; and here again the technical graduate and engineer are likely to come to the front. It has been publicly stated by responsible army officers that every technical graduate with an elementary knowledge of military science is a potential army officer.

As to the methods by which military training for both regular and reserve officers is to be imparted, three schemes are proposed by the Secretary of War in his annual report. One is to organize a certain number of cadet companies to be attached to the regular army units. These cadets will receive special pay and will engage to serve one year with the cadet corps and five years in the reserve army corps. Their year in the cadet corps will consist of intensive training in all positions in the company from private to commissioned officer. A second scheme is to reorganize the military departments of the various colleges and universities under the direction of army officers, so as to make them in effect officers' training schools. The third method is to commission present officers of the National Guard, technical graduates of military training, civil engineers, railway men and others. It is also proposed to increase the capacity of the Military Academy at West Point to 770 students, which is 146 more than at present.

Additional training for reserve officers may be given in connection with the training of the Continental army or by their assignment for service with the regular army. Officers and men of the reserve force will receive pay on the same basis as the regular army for the time actually occupied in the service.

Repugnant as war and destruction are to every peace-loving American, they are doubly so to the engineer who has ever clung tenaciously to Telford's definition of engineering as "directing the great sources of power in nature for the use and convenience of man." The folly of diverting those sources of power to the destruction of life and property is perhaps more keenly appreciated by the engineer than by any other professional man, for the engineer spends his life in the design and execution of structures for preserving and safeguarding life and property—for such purpose indeed in the last analysis are sewers, water-works, bridges and nearly every other engineering structure which could be named.

Nevertheless engineers well understand that in the event of actual war, engineers everywhere will have to assume great responsibilities. In the European war the pioneers and the miners and sappers have become the main reliance of the advanced troops. The frontiers of belligerent European countries have been converted into practically continuous lines of trenches under the direction of engineer officers. The engineers charged with

the maintenance and operation of lines of transport and communication are as essential to the military operations as the men behind the guns. On the other hand there are engineer troops whose service is wholly destructive; bridges, railways, tunnels, roads, etc., must be demolished behind a retreating army.

If a preponderance of sound public sentiment is for preparedness, engineers will be ready to respond to the patriotic duties asked of them. The military training they receive will have value anyway. Col. William M. Black, Corps of Engineers, U. S. A., has said that the chief fault to be found with civilian engineers in military work is the lack of a sense of proportion—a tendency to give more time and weight to methods and refinement than expediency justifies. For instance, in military topography the engineer must learn to sacrifice a certain amount of accuracy to speed, and yet retain a high degree of accuracy in the essentials for which the topographic survey is to serve. In other words the study of military engineering ought to cultivate judgment, prompt decision, discrimination and foresight—all excellent qualities for any engineer, civil or military, to possess.

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Chicago's City Council Orders Railway Electrification

The publication of the report by the Chicago Association of Commerce Commission demonstrating that the electrification of the railways of Chicago is financially impracticable was promptly responded to by the City Council, which on Dec. 6 by a unanimous vote directed its Railway Terminals Committee to prepare such ordinances as would bring about the adoption of electric traction by the steam railways entering the city.

This action is of interest as showing the opinion of scientific investigation held by the average Chicago alderman. Opinions, however, whether held by individuals in their private capacity or as public officials, cannot alter facts. It may be easy to pass an ordinance obliging railway corporations to do certain things. It is quite another thing, however, to cause these things actually to be done.

By way of illustration, in certain cities of the Northwest the street-railway companies are by the terms of their franchise obliged to pave the space between and alongside their rails. As a result of the competition of jitney busses and private automobiles, however, these railway companies have abandoned all their paving work. When the city authorities order the companies to do what they have agreed to do, the companies reply that they haven't the money to do the work and are unable to get the money!

The question whether the railways entering Chicago shall spend in the neighborhood of \$250,000,000 on electrification of their terminals because the aldermen of Chicago order the work done is a question a great deal broader than a mere conflict of authority between a city and certain railways, and a great deal broader than the interests of Chicago alone. Before the railways could borrow the huge sum of money involved in such an electrification they would have to gain the approval of the State Public Utility Commission and very likely of the Interstate Commerce Commission. The rights of many thousands of stockholders and bondholders are involved and the rights of communities in remote states. If the railways were to strain their financial resources to raise this great

sum and spend it on work yielding no financial return, it would seriously affect their ability to make needed improvements on other parts of their system possibly a thousand miles distant. It might be an important factor in making necessary an increase in passenger and freight rates. It is certain that the courts which may pass upon this matter will investigate very carefully the scientific and engineering facts in connection with it, even though the aldermen of Chicago may choose to ignore them.

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Edison Fire Report Available

A year ago last week the engineering world was shocked by the news of the partial destruction by fire of the reinforced-concrete buildings at the manufacturing plant of Thomas A. Edison, Inc., at West Orange, N. J. The first reports that went out were indeed disconcerting, for it appeared that the previously accepted high reputation of concrete as a fire resistant had been seriously affected. Later news and views showed that the damage was largely to the contents of the buildings and that the whole catastrophe was mainly due to an almost childish disregard of the first principles of fire protection. The behavior of the concrete buildings under extreme conflagration conditions, however, was so interesting and in some cases so surprising that a thorough expert investigation of the fire and its effects was imperative.

Several such investigations were made, among them being the one conducted by a special committee of the American Concrete Institute, the primary results of which were announced at the annual meeting of the institute last February. It was not until last month, however, that the full report of the committee was made public in the "Journal" of the American Concrete Institute, dated August, 1915. This report comprises over a hundred octavo pages, fully illustrated with views and drawings, and contains in addition to the findings of the committee the discussions at last February's meeting and a complete story of the remarkably effective repairs of the buildings and the tests of the repaired sections.

The Edison fire was capable of teaching people more things about concrete and fire protection than any one textbook ever published. The American Concrete Institute and the members of its committee are to be congratulated in the way in which they rose to the occasion in translating these capabilities into certainty. With a generous distribution of this report among engineers and building owners, the public estimation of reinforced-concrete construction will be raised instead of lowered by the Edison fire.

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Planning City Improvements

The careful planning of municipal improvements for years to come is notable by its absence in American cities. It is true that single improvements, particularly water-works and sewerage systems, are so planned in a fair number of cities, but this is far from universal. Beyond these two kinds of public works there is very little systematic planning, and still less execution of such plans as are made. A comprehensive program of municipal improvements for a period of years is almost unknown this side the Atlantic.

That engineers appreciate the value of a municipal program there is no doubt, but comparatively few of

them, in or out of city offices, have a clear vision of planning for the future. Fewer still have the courage to urge in season and out of season that their vision should be realized.

It is a pleasure to read in the very first number of "The Bulletin" of the St. Paul Society of Civil Engineers these words:

When is St. Paul going to plan its future requirements? As little as \$10,000 a year spent now in planning future extensions of sewerage, water-supply, streets, boulevards and bridges in a methodical and comprehensive way will save the next generation many times this amount, without considering the resulting chaotic condition that will be left as a legacy to future councils, city planners and engineers, if it is not done.

It is to be hoped that having struck so true a note in its first issue "The Bulletin" will never tire of sounding it, with such variations as will prevent monotony.

It is hardly necessary to add that the present seems to be an exceptionally good time to plan engineering works—not alone for cities—for winter is at hand and in some quarters construction is at low tide for other than seasonal reasons. Neither the rigors of winter nor the industrial exigencies of the period are such as to militate against careful planning for the future, both for individual classes of city work and for all the multifarious needs of the modern city.

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Architects Have a Monopoly of Building Construction

Readers of *Engineering News* will recall the successful fight waged by the structural engineers of Illinois to obtain the right to construct buildings, which under a previously enacted law was granted as a monopoly to the architects. Some such movement will apparently have to be started in Michigan, for engineers who undertake work in that state on any form of construction may run foul of a new law just passed. According to the letter of this new statute, any structure which has a foundation, walls and roof is a building, and any person engaged in the business of drawing plans and specifications for such structures is an architect and must have a license from a state board in order to engage in such work.

As the contributor who sends the information regarding this new law points out on another page, under this broad definition water-works, filter plants, standpipes, pumping stations and a large variety of other engineering structures are buildings, and any engineer who makes a business of drawing plans and specifications for them is by the law declared to be an architect. It can readily be understood, however, that the board of examiners provided for by the act are not likely to license as an architect anyone who does not conform to their artistic ideals.

It is a curious illustration of the crude way in which important legislation is often drafted that after making the sweeping provision above recited, the framers of the law added a section which is almost equally sweeping in permitting any person, firm or corporation to make plans or specifications or supervise the work on any building to be constructed by said person, firm or corporation.

As this section reads, any building contractor can put up buildings without paying any attention to licensed architects, which is about the last thing the architectural profession desires. Furthermore, it would seem to permit an owner to hire, as a salaried employee, an unlicensed architect to design his building.