some one else's work or from some older specification, without due regard to whether the class of materials is the present market classification or whether obtainable except at a very much increased price.

Considerable misunderstanding between the engineer and contractor is also caused by over-estimating. Often severe loss may result from quantities over-estimated in the specification, because a decided disparity there affects various overhead charges that must be distributed in order to make up a contract bid on the unit price basis.

Payment for extras is another rock upon which the engineer and contractor very often split. In many cases the contractor will go ahead and put in extra work without proper authority; so that, although performing legitimate service, he is unable to compel payment therefor. The only really fair way to cover this point is a cost plus 10 per cent. proposition for authorized or necessary extra work, including in the cost the overhead expenses, which apply as much to labor and plant on extra work as to any other part of the job.

Over and above all, however, the personal disposition of the engineer in charge is an important consideration. If too arbitrary and disagreeable, it is more than likely that contractors will come to know him and to arrange their bids so as to protect themselves, with the result that the work may cost more than similar work carried out under another engineer. On the other hand, through too great a degree of obliging laxity, an engineer can sometimes cause the owner equally serious losses if the contractor be not thoroughly reputable.

THE HALIFAX DISASTER

To the city of Halifax, in its great disaster, the practical sympathy of the entire Dominion is extended. While the organization and work of national reconstruction is proceeding, the immediate task of relief is well in hand. Halifax will not be allowed to want or to appeal in vain. Every province will do its share in helping to mitigate suffering, to provide the immediate necessities, and to rebuild the devastated portion of that historic city.

To those States, municipalities, and other organizations in the neighboring republic, and to Congress, the Dominion expresses thanks for the assistance which they rendered so quickly. In a manner which typifies the splendid spirit of our neighbors, relief trains and ships were on their way to Halifax before even the advice of their despatch.

The explosion of the munition ship in Halifax harbor may not have been due to German machinations. At the same time, many will believe, after reading the evidence at the Kaltschmidt trial at Detroit, that we cannot afford to allow enemy aliens much freedom of movement in this country. The testimony of one of the witnesses was that Kaltschmidt had conspired to blow up munition ships in New York harbor in 1915. At another German agency trial at Concord, N.C., a witness stated he had told United States Secretary Daniels of a plot to burn the Parliament Buildings at Ottawa four weeks before it occurred, and told him also just how it was to be done. If the Halifax disaster be devoid of Hun devilment, yet it reminds us of the dangers which war brings to a belligerent country even though distant from the battlefields. One of those dangers is the German agency system on this continent, headed by cut-throat ambassadors, criminal diplomats and lawless gangsters.

PERSONALS

Lieut. H. C. MacKendrick, a forestry student of Toronto University, year 1918, has just returned from France suffering from the effects of gas poisoning.

Lieut.-Col. C. H. Mitchell, C.M.G., D.S.O., of Toronto, who has been at the head of the Intelligence Department of the Second British Army in France, has been transferred to a similar position with the British staff in Italy.

Prof. E. A. Stone has received an offer from the new Chinese Government University of Engineering in North China, of the chair in engineering. Prof. Stone holds the chair in structural engineering and bridges at Queen's University, Kingston, Ont.

EVAPORATION FROM WATER SURFACES

(Continued from page 516)

about 3,400 ft. from the laboratory. The same general atmospheric and other conditions existed in both places. The area of the lake was 17 acres. From the data obtained the following rules were deduced:

1. Evaporation data from tanks 2 ft. or greater in depth, preferably circular, set in the ground so that a metal rim not over 3 ins. wide is all that projects above the surface, and in which tanks the water is kept approximately at the ground-level, are most applicable for extension to large open-water surfaces.

2. Data on such tanks may be extended to large open-water surfaces that are under the same conditions of wind, air-temperature, and relative humidity by multiplying the evaporation-depth from a

Tank	2 ft. diam.	by	0.77
Tank	4 ft. diam.	by	0.84
Tank	6 ft. diam.	by	0.90
Tank	9 ft. diam.	by	0.98
Tank	12 ft. diam.	by	0.99

The second part of the investigation related to the rate of evaporation from stream-beds when no water flows on the surface. Samples were taken of sand and gravel from stream-beds in different Western States. These were placed in tanks in which the water-table was kept at a given distance from the surface, and the rate of evaporation determined. The relation between these rates of evaporation and the rate from a water surface under similar conditions is shown in Fig. 2.

Similar experiments were made using the soil at the laboratory site in place of river sand and gravel. The mechanical analysis of this soil was as follows: Fine gravel, diam. 1 to 2 mm., 2.3 per cent.; coarse sand, 0.5 to 1 mm., 6.2 per cent.; medium sand, 0.25 to 0.5 mm., 4.5 per cent.; fine sand, 0.1 to 0.25 mm., 34.8 per cent.; very fine sand, 0.05 to 0.1 mm., 20.5 per cent.; silt, 0.005 to 0.05 mm., 15.8 per cent.; clay, less than 0.005 mm. diam., 15.8 per cent. Taking the rate of evaporation from a tank 2 ft. diam. with the water 2.75 ft. deep as 100, the corresponding rates for the soil for different distances of the water-table from the ground-surfaces was as follows: 4 ins., 88.2; 16 ins., 79.8; 28 ins., 62.4; 38 ins., 33; 43 ins., 7.63; 50.5 ins., 7.24. No explanation is given for the break between the 38-in. and the 43-in. depth. Fig. 3 shows the relation between the depth to the water-table and the proportion of moisture in the top 4 ins. of the laboratory soil.