of internal friction is the same as the angle of repose, and that its value is independent of the pressure. It is suggested that the subject is worthy of further investigation, but that such could hardly be made by a private individual, for the work is tedious, each experiment taking from 24 to 48 hours. Moreover, if the investigation is to be properly carried out, physical and chemical analyses of the clays will be required that could only be made in a well-equipped physical laboratory.

In connection with the earth slides experienced at the Panama Canal, it has been suggested that in clay and shale cuttings there is a critical depth beyond which the sides will not stand, and the author's experiments on clays clearly show that for these this must be the case. Where ϕ is independent of the pressure, the depth of the cutting cannot affect the stability of the slope, but where the angle decreases with the pressure, it is evident that eventually a depth will be reached beyond which its sides will not stand.

This decrease is clearly shown in one experiment on mud, for which the angle for a pressure of 0.25 ton per square foot was 17 degs. — 15 min., which decreased to 2 degs. 10 min. at a pressure of 1.25 tons per square foot, when it was little better than a liquid.

NO ROAD SHOW AT WINNIPEG.

It has been decided not to hold the Canadian and International Road Congress at Winnipeg this year, announced Secretary McNamee at Toronto this week. The first congress was held in Montreal in 1914, the second in Toronto in 1915, the third in Montreal last winter, and it was voted at the third congress that the fourth be held in Winnipeg. Secretary McNamee visited Manitoba recently, and now states that there is no building in that city which could house the exhibits, and that other conditions also make it inadvisable to go west this year. It has not been decided yet just where the congress will be held this year, but Ottawa is now being favorably mentioned.

ANNUAL MEETING, TORONTO BRANCH, CANA-DIAN SOCIETY OF CIVIL ENGINEERS.

The annual meeting for the election of officers for the ensuing year was held at the Engineers' Club on January 11th. Following will be the executive officers for the year:-

Chairman, E. W. Oliver; secretary-treasurer, L. M. Arkley; executive, H. G. Acres, A. H. Harkness, T. T. Black and E. G. Hewson.

G. A. McCarthy, retiring chairman, will also act as a member of the executive.

Reports of the various committees were received. G. A. McCarthy was elected to represent the Toronto branch on the committee of technical society representatives, recently organized to devise means by which ensineers who have not enlisted or undertaken munition work may help in carrying on the war. It was suggested that a committee be appointed by the executive to aid in making members of the branch better acquainted, and the new executive will probably deal favorably with the suggestion.

POINTS OF INTEREST IN CONNECTION WITH SOME CONCRETE BUILDINGS RECENTLY ERECTED IN AND AROUND MONTREAL.

(Continued from page 49.)

In the second half of January, 1914, the weather was very severe, and the top layer of concrete was quite frozen as soon as laid down. The only precautions taken were to heat the sand, stone, and water, and thoroughly clean the forms, tiles and steel with a powerful steam jet. The floor when completed was left without any protection for the balance of the winter. When work was resumed the concrete floor was perfect, and the concrete was harder and better than in similar floors made in very hot weather, when no special precautions are taken to protect the concrete from drying out.

These two buildings represent proof that not only mass concrete but concrete floors from 2 ins. to 4 ins. thick may be made in winter without any other precautions than heating the materials. Any additional protection after the concrete is placed is not necessary, provided the forms will remain until the concrete has set and acquired the necessary strength to carry the imposed loads.

In cases where completion is essential, by a given date, and the forms have to be removed as soon as possible, special arrangements have to be made to cure the concrete during the cold weather. Arrangements of this kind were necessary during the construction in Montreal of a seven-story building, at the corner of St. Lawrence and Duluth Streets. The building was started November 7th, 1913, and possession had to be given on May 1st, 1914. There were about 2,000 yards of rock to excavate. Concreting was not started until the end of December, 1913, and was carried on during the winter season.

The cut-ide walls being also of concrete, the follow-. ing methods were followed :---

Before any concrete was placed the forms for two floors including walls were completed, the upper floor serving as a protection to the lower one. The supports of the upper floor were placed on concrete blocks. A complete hot air heating system was installed in the basement, and during the placing of the concrete, as well as during the curing, a temperature of about 40° F. was maintained in the building. All materials were heated, and the forms as well as all stop joints were thoroughly cleaned with a powerful steam jet. This method was used from beginning to end, and the success was complete. The work was going on day and night, irrespective of the weather, and some of the floors were poured when the outside temperature was about 20° below zero. Test blocks were made on each floor, and left under the same conditions as the floor. Before the forms of a floor were struck, the blocks were investigated. The test blocks as well as the walls and floors showed clearly that in winter the setting of the concrete takes place from the inside to the outside. The heat generated by the chemical process of the setting of the cement probably maintains the inner temperature above the outside temperature, and these conditions are probably more favorable to the setting of the concrete than the ordinary summer conditions, when the outside of the concrete is drying out and setting quicker than the inside. There is also another fact in favor of winter-made concrete and that is the elimination of laitance. This elimination of laitance is more thorough in winter than in summer. In columns poured in winter the laitance on the top will be 2 ins. to 3 ins. thick, whereas in summer on a