

other meteorological instruments. Various methods were used in measuring differences of time, such as stop watches and chronographs. Most of these required the presence of an observer at each post, and telephone communication between the posts. The following method, however, did not require the posts to be manned, and electrical connection with the central station only, was necessary:—

At each post was installed a microphone similar to a telephone receiver. The vibrations caused by sound waves oscillated a disk in this apparatus, making and breaking an electrical circuit momentarily. The wire of the circuit was led to the central station. Here a loop of the wire was suspended between the poles of a permanent horse-shoe magnet. On this loop was attached a mirror about the size of a pinhead. This was illuminated by an electric lamp and reflected a ray of light onto a strip of sensitized photographic paper, which was moved by clockwork.

Use of the Microphone

So long as no current passed through the wire, the ray of light traced a straight line. When, however, the microphone was disturbed by sound waves, the loop of wire momentarily assumed the properties of a magnet and was deflected by the attraction and repulsion of the poles of the permanent magnet, and an irregular zigzag line on the paper was produced. The records of three or more posts were made simultaneously on the same strip of paper.

To make it possible to measure the difference of time, another microphone was connected to a tuning fork which vibrated exactly 50 times in a second, and consequently, traced a continuous saw tooth line with points registering one-fiftieth second. The resulting record is shown diagrammatically in Fig. 2. An observer well in front of the posts was stationed to notify the operator by telephone to start the apparatus at the plotting office. As soon as a gun report was recorded, the sensitized paper was developed and the differences of time scaled. The map location was then obtained by interpretation between the plotted hyperbolas on the board.

Canadian Corps Survey Section

In March, 1918, Canadians who had been attached to English units were recalled to the corps, and a Canadian Corps Survey Section was formed. Previously there had been a force of draughtsmen and a few topographers connected with the Intelligence Branch. These were incorporated in the Corps Survey Section. A flash-spotting group was organized. There was no sound-ranging group in the Canadian unit. Among the personnel were some provincial land surveyors, members of the staff of the Geological Survey and other technical branches of the Dominion government, besides the following Dominion land surveyors: D. McCluskey, A. W. Fletcher, A. M. Perry, O. Inkster and E. W. Berry. Mr. Inkster was awarded a military medal for gallant work under shell fire.

The city solicitor of Hull, Que., has advised the city council that the municipality is liable to a fine of \$100,000 for its refusal to install the mechanical water filtration plant ordered two years ago by the provincial board of health.

W. W. Pearce, business administrator of the Board of Education, Toronto, is receiving applications for the position of chief draughtsman, the board having refused to ratify a previous appointment. Only duly qualified architects will be considered for the position.

In debate on the bill introduced in the Alberta legislature under the auspices of the "Association of Professional Engineers of Alberta," Attorney-General Boyle, of that province, stated that in his opinion the bill is "a dangerous effort" to gather into one group all the branches of practical science. He thought that the engineers should confine themselves at first to legislation governing strictly civil engineering practice, and said that later, "when experience has proven such legislation practicable and desirable," that it could be enlarged to include other engineers.

ALBERTA'S BITUMINOUS SANDS

SYDNEY C. ELLS, of the Department of Mines, Ottawa, addressed the Ottawa Branch of the Engineering Institute last Thursday evening, on the bituminous sand deposits in Alberta. The investigation of these deposits was carried out under the supervision of Mr. Ells. Practically all the deposits, he said, are held as government land, and no individuals or companies have any mineral rights.

The deposits are 300 miles from the nearest railway. The chief work accomplished to date is the detailed topographical mapping of 85 sq. mi., and an extensive series of analyses of the sands, based upon samples obtained with core drills.

In order to demonstrate the possibilities of these deposits, Mr. Ells built in Edmonton demonstration areas of three standard types of asphalt surfaces, namely, sheet asphalt, bitulithic and bituminous concrete. The work was completed in 1915, said Mr. Ells, and the pavements are still in perfect condition. For the shipment of 60 tons of bituminous sands from McMurray to Edmonton, 23 teams broke a road of 240 miles to McMurray in the winter of 1915, and hauled out the entire shipment.

Even with the promised railway facilities, freight charges will be high on the bituminous sand, said Mr. Ells, unless the bitumen can be separated from the sand. While considerable research had been done in this connection, further work is necessary before it can be definitely stated that such separation is commercially feasible.

Mr. Ells was not enthusiastic about the outlook for the commercial distillation of the bituminous sands, although such distillation has been accomplished in the laboratory, obtaining fractions ranging from gasoline to heavy oils.

SASKATCHEWAN WATER SUPPLY COUNCIL

AT the first meeting of the Saskatchewan Water Supply Advisory Council, held last Friday in Moose Jaw, Maj. McPherson, chairman of the Local Government Board of Saskatchewan, presided. Other members present included City Commissioner Mackie, of Moose Jaw; City Commissioner Thornton, of Regina; City Commissioner Yorath, of Saskatoon; H. B. Blake, engineer of water supply for the C.N.R.; and G. C. Dunn, engineer of construction for the G.T.P. Thomas Lees, who represents the C.P.R. on the council, was unable to attend.

Letters were drafted to be sent to all municipalities included in the proposed scheme, requesting that data be furnished regarding the water requirements at present, and the estimated maximum requirements in five years and ten years.

A consulting engineer from some other province will be asked to examine any scheme that the council may formulate. Should the consulting engineer approve of the council's scheme, it will then be voted upon by the people, after which legislation will have to be secured, enabling construction.

After discussion as to rates that would have to be charged for the water, Maj. McPherson stated that the water would be wholesaled to each municipality, and that it could be disposed of to individual consumers upon any basis which the individual municipality might establish.

Questioned regarding the extent of the area to be covered by the scheme, Maj. McPherson replied that it is not intended to include Weyburn and Estevan in the original scheme, but the possibility of extending the pipe line to those municipalities would be kept in view.

Commissioner Mackie and Mr. Dunn were of opinion that the pipe line should be large enough to supply the needs of the municipalities for the next 10 years. A discussion followed regarding the kind of pipe that should be used.

A town planning expert will be engaged by the directors of the Canadian National Exhibition, Toronto, to prepare a plan for the future development of the exhibition grounds.