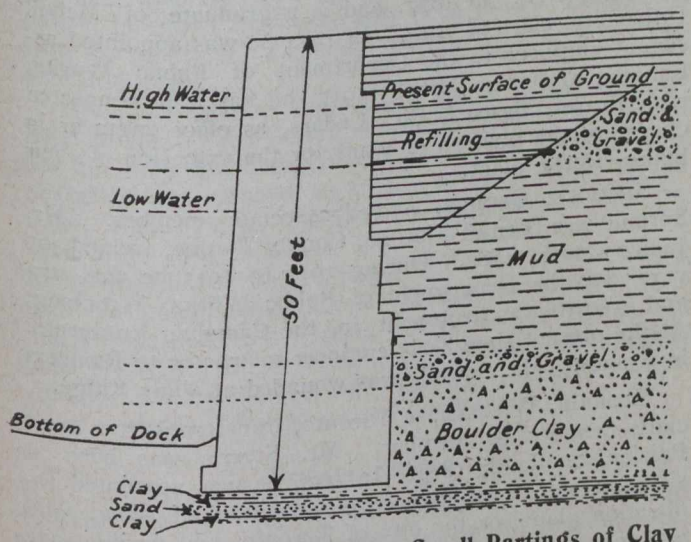
Gasthern Valley, the ravine filled with detritus finished at a depth of 328 feet below the bed of the valley, and consequently the tunnel would be driven through solid rock. Unfortunately, this prediction did not prove true, for when the heading had reached a point 8,000 feet from the portal it struck a pre-glacial valley filled with sand, gravel and water. There was a sudden and violent inburst of these materials, which in a few moments filled up the



Dock Which Failed Due to Two Small Partings of Clay by a Thin Layer of Sand. The Sand Washed Out, Bringing the Clay Surfaces Together and Causing the Dock to Fail

tunnel for a length of over a mile, burying twenty-five workmen and all the drills and other installation beyond any possible hope of recovery. To avoid any further possible eruption of the materials the tunnel was walled up by a 33-foot wall at a point about 5,000 feet from the portal. Borings to a depth of 940 feet below the bed of the valley showed nothing but detritus. It was therefore found necessary to deviate the line and cross the valley further up-stream.

Topography

The making of, interpretation of, or use of topographic maps is almost a daily operation of the engineer. Topography is the expression of geologic structure, or in other words, the surface of the earth as it appears to-day is the resultant of the operations of eroding agencies and the resistance of the rocks, the time of their exposure, the initial position of the surface and the earth movements suffered. The topographer whose duty it is to represent these features on a topographical map can do so correctly only when he comprehends the geologic reasons for them. It is impossible for any topographer, whether equipped with a knowledge of geology or not, to measure the altitude and the size of every little knoll, and to fix on the hillside every little irregularity. He cannot delineate with perfect exactness the degree of slope on one side as contrasted with the degree on the other side of a ravine. There may sometimes be considerable areas which the exigencies of the case will not permit him to fully examine. He may have general data indicating unfailingly the form of a valley, but not detailed positive facts regarding its smaller shapes, or he may know the general shape of a subordinate hill without having measured it on all sides. If the topographer in such cases be also a geologist he is the more likely, in the construction of his map, to fill in these lacking data with correctness and rapidity.

Since river valleys have a beginning and pass through various stages of development, it is important that the engineer recognize in what stage it is in. Narrow and steep-sided valleys cut in a land area of a humid region are said to be young and the territory traversed by them is in its topographic youth. Young streams are usually swift. They cut vertically rather than horizontally and their grade is often interrupted by rapids and falls. At this stage the stream has acquired but few tributaries. Valleys approaching base level develop flats. As these flats widen, and the tributaries increase in number and size, the valley slopes become gentle, and the topography is said to be mature.

Old streams usually have a low-grade and a sluggish current. They erode during floods and deposit their load and fill their channels at other times. Meandering is a characteristic feature of old streams, as illustrated in the Mississippi.

CANADIAN SOCIETY OF CIVIL ENGINEERS ELECTIONS AND TRANSFERS

At a meeting of the Council of the Canadian Society of Civil Engineers held in Montreal on Tuesday, November 27th, the following elections and transfers were announced:

AGGIMAN, JACQUES, of Port Alfred, Quebec, transferred from student to junior member. Mr. Aggiman was born at Constantinople in 1892. He is a graduate of McGill University, class of 1917. In 1916 he was appointed engineer in charge of the extension of St. Lawrence Pulp & Lumber Co.'s mills at Chandler, Que., and in 1917 he had charge of laying the water supply for the town of Port Alfred, and designing and erecting the filter plant. At the present time he is assistant superintendent of the Ha Ha Bay Sulphite Co., Limited, of Port Alfred, Que.

BRADLEY, JAMES HARRISON, of Kingston, Ont., elected associate member. During 1915-16 he was ordnance engineer for the Dominion Bridge Co., in charge of all technical work relating to munition contracts, installation of machines, etc. He is at the present time assistant inspector of shells for the Imperial Ministry of Munitions, Kingston sub-district.

BREMNER, DOUGLAS, of Westmount, Que., transferred from student to associate member. Mr. Bremner was born at Montreal in 1892. He is a graduate of McGill University, class of 1915. In 1915 he became connected with A. F. Byers & Co., in responsible charge of all construction work undertaken by them and in 1916 was elected a director of the company.

BROWN, ERNEST, of Montreal, Que., transferred from associate member to member. Mr. Brown was born at St. Helens, Eng., in 1878, and is a graduate of Victoria University, Eng., obtaining his degree of B.Sc. in 1897. He is at present professor of Applied Mechanics and Hydraulics at McGill University, Montreal.

DESBAILLETS, CHARLES JULES, of Montreal, Que., elected associate member. Mr. Desbaillets was born at Geneva, Switzerland, in 1884. From 1911 to date he has been district engineer to the Canadian Westinghouse Co., Limited, in charge of all engineering work in the province of Quebec and Maritime Provinces. On September 1st, 1917, he commenced duty as manager and chief engineer of public utilities of the city of Sherbrooke, Que.

FERGUSON, ROBERT, of London, Ont., elected associate member. Mr. Ferguson was born in Scotland September 1st, 188 . In 1917 he was appointed chief draftsman and