instant with any degree of certainty. As a result of this uncertainty of prediction, it is necessary, in all planning for the conservation and development of water resources, to adopt a method that assumes that future variations will follow the same general pattern as past variations. This method involves as its cardinal principle, the systematic collection and compilation of all data pertaining to water supply for sufficient periods of time to cover the variations that are likely to occur. Among the more important of these data are records of precipitation, temperature, evaporation and run-off. The longer the periods over which a knowledge of the variation of these phenomena has been obtained, the more accurately can the future supplies be predicted. This aspect of our water resources is in sharp contrast to the appraisal of many of the other natural resources. The results of the careful measurement of forest, mineral and land resources of an area provide an index of its natural wealth which usually requires only occasional repetition of the surveys to maintain and improve the accuracy of that inventory.

Well, of course, the appraisal of the water resources in a quantitative fashion, the surface water, requires the obtaining of continuous records of the flow or of the water level or both for a substantial period of time, in order that the record may be of real value for proper water use planning.

Now, also in this paper which I believe has been handed around, there is a section on regional variations in run-off and, of course, in a country the size of Canada that is a matter of particular interest, since in certain of our coastal areas the amount of run-off can be excessive. Certainly the amount of precipitation can be excessive. Whereas in some areas of the country, notably portions of southern Alberta and southern Saskatchewan, there at the present time really is not enough water available for the maximum or optimum development of the other resources, notably the land.

Mr. Patterson has given you a brief summary history on the growth of the water resources branch and I do not propose to speak on that part of his paper. I would like to draw your attention to some of the factors that are involved in the arrangement and maintenance of stream flow stations.

You will find a reference to this at page 76 of the paper that has been distributed.

As an illustration of the work involved in the operation and maintenance of the hydrometric survey, let us take the example of determination of the flow of a river. The first step is to make a reconnaissance survey of that reach of the river in the vicinity of the location where the flow information is necessary. This may be accomplished by boat, but frequently involves foot travel. On a river in its natural state, there is normally a definite relationship between the level or height of the water at any given point and the flow or amount of water passing that point. Where this relationship exists, it is possible to define it by making a series of measurements of the flow at different river levels. It is necessary, therefore, on the reconnaissance or first trip to the river, to select the best possible location for a gauge which will indicate the level or height of the river, and a cross-section of the river where accurate measurements may be made. Once these have been selected, the engineer must decide on the particular type of gauge to be built and also on the equipment for measuring the flow.

Illustration of some of the methods used on our large rivers is shown on the paper which has been distributed. Also there are illustrations of miscellaneous equipment and structures on the large piece of cardboard we have over on the wall. We will leave that there, available for anyone to look at it.

Mr. KINDT: Are these measurements made during the whole twelve months of the year?

Mr. MCLEOD: Yes; not necessarily every month in every location, but it is one feature of the water resources survey which is very different from a