FISHING STATION SURVEY IN THE GULF OF ST. LAWRENCE.

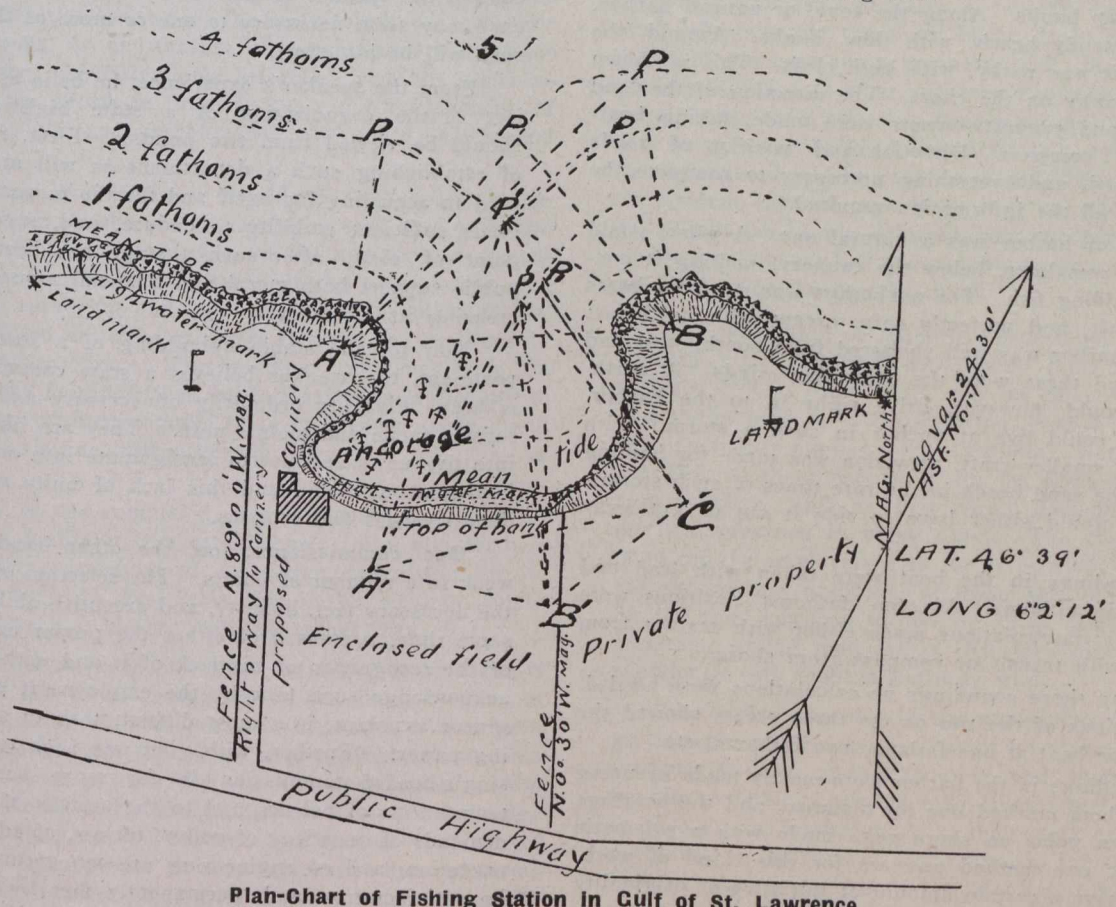
By J. A. Macdonald.

The accompanying map and text is interesting from the viewpoint of the methods employed in making the survey.

The survey was made, among others, for a fish-canning company, who have in operation a hundred or more canneries, situated at various points on the shores of the Gulf St. Lawrence.

The company are continually establishing new fishing stations and closing others as business warrants.

Before establishing a station at any new point they usually have a careful survey made of the shore: shelter for boats, large or small, ownership of property rights, accessibility to a public road and railway, survey of the fishing grounds, showing distance from shore of the various depths of water, or "fathoms deep," and distance from shore or harbor of the various fishing grounds, as herring, lobster, salmon, etc. In order to obtain all this information requires an expert hydrographic survey of the harbor or cove, and this is really what this is.



Plan-Chart of Fishing Station in Gulf of St. Lawrence.

In the map the methods of measuring the depths of water in order to be plotted are shown by the dotted lines.

Two methods of ascertaining the contour or fathom depths were used, involving the use of both the transit and sextant.

In the one case the angles were read by transits on the shore—two transits one at each end of the base line AB—and in the other case by reading the angles with a sextant in the boat on the water. This later method is known as the "Three Point Method."

Let A′ B′ C′ be the three shore points, being defined by the two distances A′ B′ and B′ C′ and the angle of B′. Let the two angles at P′ be measured at the point P′. The problem then is to find the distance A′ P′ and C′ P′.

There is an analytical solution for this which, however, does not seldom need to have to be performed. It involves a good deal of figuring. The angles at P′ and the angle B′ are known, but the angles P′ A′ B′ and P′ C′ B′ are unknown. However, the formula gives:—

$$\cot. P' A' B' = \cot. R \left(\frac{A' B' \sin P'}{B' C' \sin P' \cos R} + 1 \right),$$

$$\text{when } R = 360° - B' P' C' + B' P' A' + A' B' C'.$$

I repeat that it is seldom necessary to use this analytical formula, though it is well to use it once in a while as a check, and should be used in all hydrographic surveys of this kind.

The so-called mechanical solution is simple and rapid by using a three-armed protractor. It is the common method of plotting soundings when two sextant angles have been read from the sounding boat.

The angles in this case were laid off graphically on tracing paper by lines of indefinite length, and this laid on the plot and shifted in position until the three radial lines coincide with the three stations on the ground, A′ B′ and C′, when their intersection marks the point, P′, of observation. This is a most ready method of plotting such observations when no three-armed protractor is available.

By this method only one observer is required in locating the soundings, and no time is lost in changing stations, and the party are all together, and there is not likely to be any misunderstandings in regard to the work.

The other method here shown, two angles read on shore, two instruments are required, one at A and one at B on shore, and the angles subtended by the other fixed point and the boat P, as A B P and B A P, be read by both instruments. When a sounding is taken, the intersection of