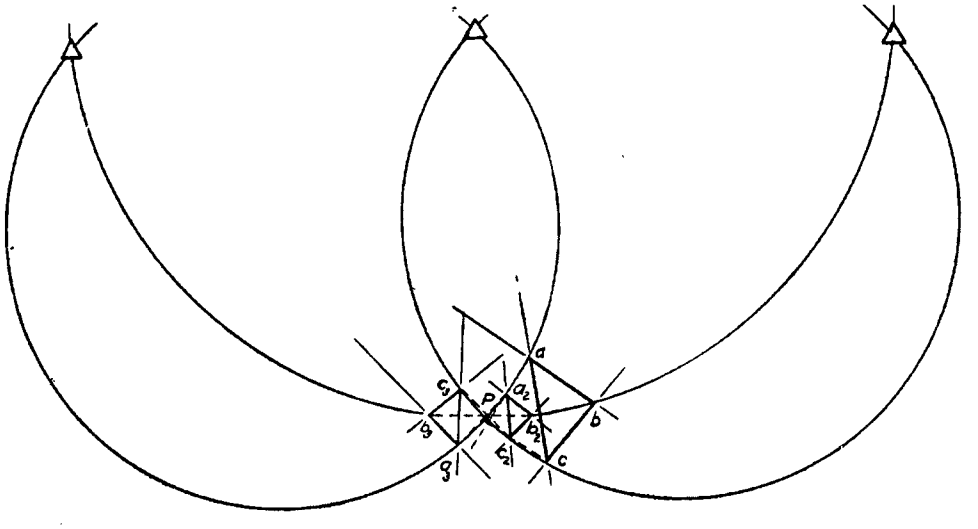
cated in the figure. If the similar vertices are connected as indicated by the dashed lines, the intersection of the lines will be a very close approximation to the point *P*. In case the change in orientation of the table is such that the triangle falls on the other side of the point, *P* as a_3, b_3, c_3, the triangle of error will be a reflection of the first, but as before, the similar vertices when connected will locate the position of the true point *P*. In the former case the determination by the intersection of the lines connecting the vertices will give a point outside the circles, while in the latter it will give a point inside, due to the position of the chords with relation to the arcs of the true loci. In actual practice the point determined by this method is usually so close to the true point *P*, that little or no difference can be detected, especially if the first orientation is close to the true, as is usually the case when a declinatoire is used to obtain approximate orientation. Many topographers use the method outlined in the *Topographic Manual*, p. 58, which is that the point sought is on the same side of all resection lines as the observer faces the station, and the distance of the point sought from the resection line is proportional to the distance of the point occupied from the control station through which the resection line was drawn.



Other topographers sketch short arcs of the three circles through the respective vertices of the triangle of error and thus arrive in a similar manner at the point sought. These three circles are shown in the figure below, and with a little practice it is easy to picture the approximate direction of the arcs from the first triangle of error accurately enough so that the second attempt usually gives correct orientation and position. Aluminium mounted sheets have eliminated the most serious trouble in taking three point fixes — distortion of the old linen mounted sheets.

A UNIQUE BROKEN BASE METHOD.

by

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(Reproduced from the *Field Engineers Bulletin*, No. 9, Washington, December 1936, page 101).

In carrying forward a scheme of triangulation it is often desirable to introduce a base where, due to topographic characteristics of the country, no suitable site can be found. In such cases recourse may be had to a broken base measured in detached sections as shown in the accompanying figure.

In the example shown, *AG* is a line of the main scheme of the triangulation. The lines *AB*, *BC*, *DE* and *FG* were readily measurable but the topography prevented the measurement of the lines *CD* and *EF*. However, the base was measured and the different points connected by triangulation as shown. The least square adjustment of the base net insured the closing of the triangles and the accord of lengths when computed from the various measured sections. The line *AG* was then held as a base in the adjustment of the main scheme.

Such a type of base may well be used in several cases. Two such cases become at once apparent. First, where the triangulation is being extended up a river and has reached a point where the river is narrow and winding and figures necessarily have become weak. The chief of party feels the need of an adequate check on his length but finds no site where he can measure a full size continuous base. However, there may be numerous possibilities if he resorts to the method outlined above. He may find it possible to measure part on one side of the stream and part on the other. The second case is where the triangulation is advancing from island to island, as for example in some parts of Alaska. It may be possible to measure part of the base on one island and part on another.

In making use of this type of base the following precautions should be observed:

1. It should be used only as a last resort. If it is at all possible to measure the base in the orthodox manner, that should be done unless the time and expense factors render it prohibitive.

2. Care should be taken to secure expansion through good figures. Angles should be measured with extreme accuracy. The value of the measured base may be lost through weak expansion or poor observing.

3. The total length measured should at least be equal to the length of the expanded base. For example, in the figure, $AB + BC + DE + FG$ should exceed AG in length.

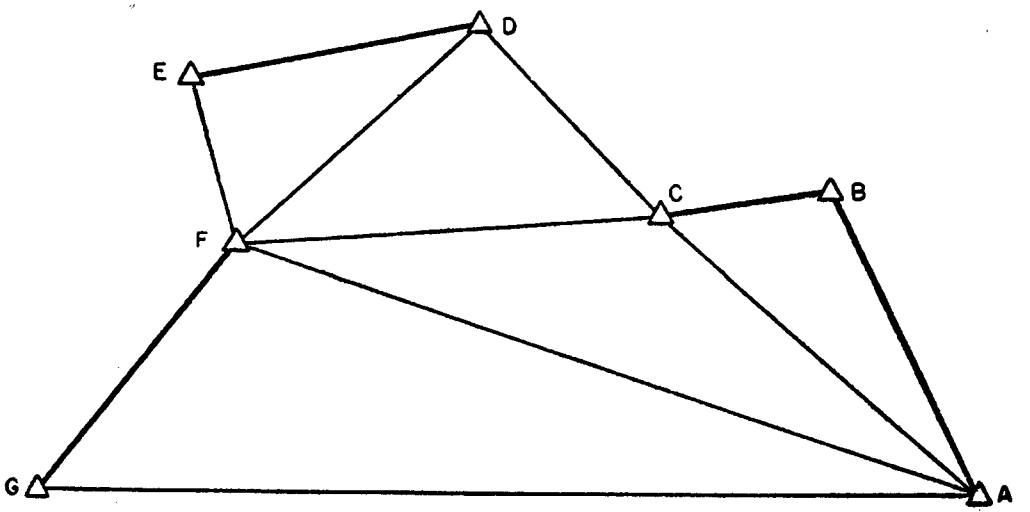

Figure.

FIELD METHOD OF CHANGING SCALE OF TOPOGRAPHIC FEATURES.

by

WARREN L. MOORE.

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Hydrographic field parties often find it necessary to change the scale of the shore line, etc. of a plane-table or aerial photo topographic sheet before using it for boat or smooth sheets. The process described here has several advantages over the method of