The above solution may appear a bit too formidable for field use, but a very small amount of practice has proven that it can be done easily in three minutes of time. This method of computing signal heights makes it unnecessary to get on the intermediate point for instrument work, and as the maximum verticals taken are to the top of the obstruction, no separate measurement or guessing of tree heights or building heights need be made.

Of course, there are types of country where these methods will be of little use, but it will very rarely occur where at least a modified form of one or all of these methods cannot be employed to advantage.

DETERMINATION OF OFFSHORE POSITION BY SEXTANT ALTITUDE OF MOUNTAIN PEAK.

(From an article by SANFORD L. CLUETT,
published in the *United States Naval Institute Proceedings*, Annapolis, Nov. 1935, p. 1665)

The formula for determining the distance of a mountain peak that lies beyond the horizon is simple; but its solution is too tedious to make it of practical navigational value.

In the March, 1933, issue (page 397) of the U. S. Naval Institute Proceedings, Lieutenant-Commander A. F. FRANCE, U. S. Navy, gives a practical solution of the problem which is taken up to-day Mr. Sanford L. CLUETT.

Let D = distance in nautical miles from observer to top of mountain,
h = height of eye above sea, in feet,
m = observed angle in minutes of arc between horizon and distant peak,
H = height of mountain, in feet,
R = mean radius of the earth (taken at 20,890,590 ft.),
c = coefficient of terrestrial refraction (taken at 0.07269).

But light has a curved trajectory which, within the limits of this problem, may be considered the arc of a circle whose radius we will call R_r. Furthemore $\frac{R}{R_r} = 2c$.

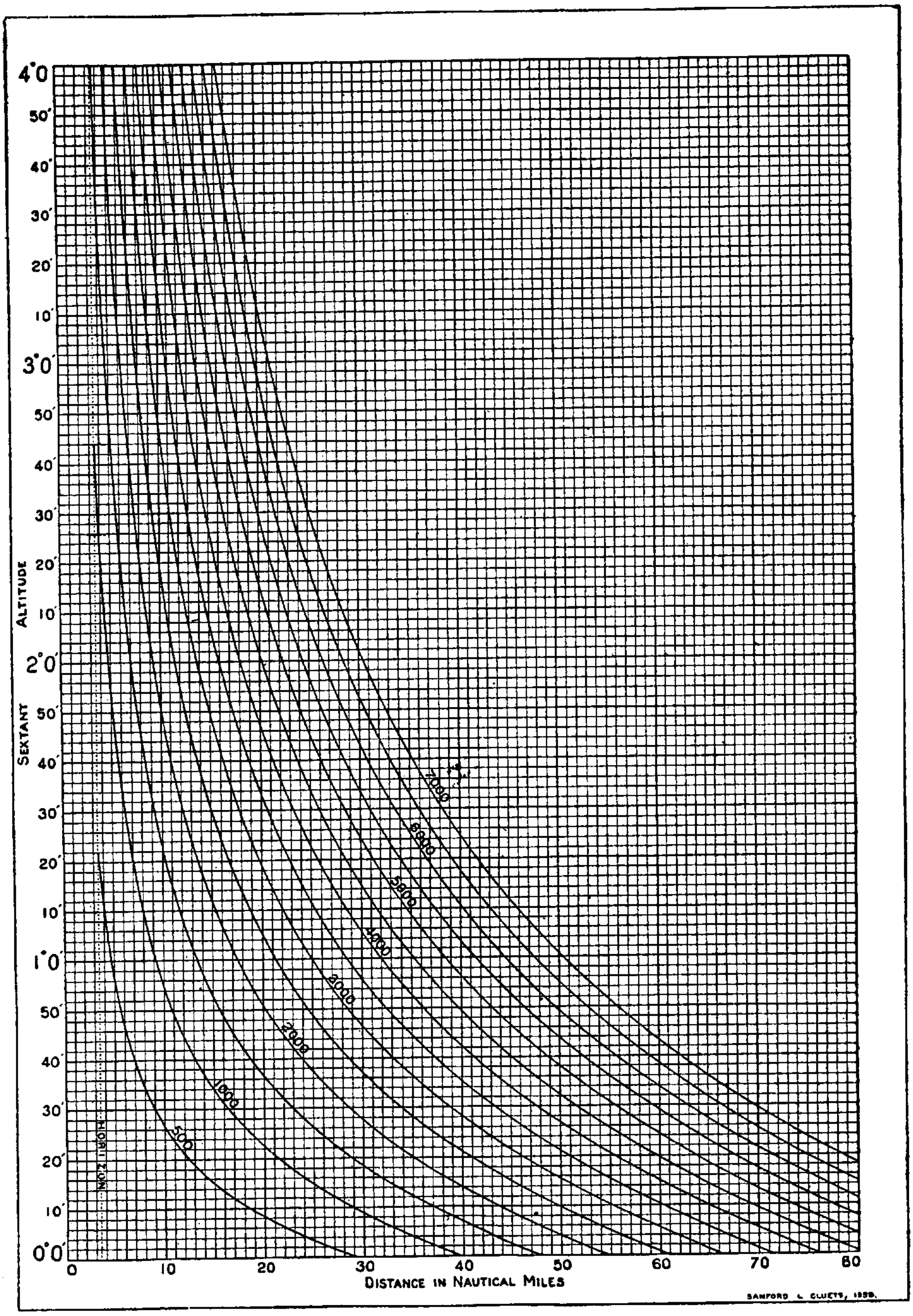
It may easily be established that the general relationship which interconnects the above quantities is the following :

$$O = D^2 + D\ (m\ 2.339 - 2.30\sqrt{h}) - 1.3225\ H + 1.3225\ h.$$

This is the general equation from which graphs may be easily constructed for any height of eye and for any height of mountain.

While the accompanying graph is computed for height of eye of 9 feet, it may be used with sufficient accuracy for any height of eye between 6 feet and 16 feet without entailing graph reading errors greater than 1 mile.

When height of eye is 9 feet, under normal atmospheric conditions the graph is correct to within 0.2 miles.



CALCULATED FOR HEIGHT OF EYE 9 FEET
(Height of eye 6–16 feet, maximum error 1 mile.)