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A CAMERA FOR PRODUCING ONE-DIMENSIONAL REDUCTION IN NARROW RECORDS¹

By

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Many instruments yield long, narrow records which are of an awkward shape for reproduction. In the course of work under Navy contract NObs-2083, numerous fathograms were obtained which showed the diurnal movements of the "deep scattering layer." This layer is believed to be of planktonic origin (J. B. Hersey and H. B. Moore, 1948).² The part of the fathogram which includes the scattering layer is about two inches deep, while a day's record is three feet long. The instrument described here combines photographic reproduction, which is preferable in this case, with the desired change in the ratios of the vertical and horizontal scales. Similar records appear likely to be of use to geologists in studying long stretches of the ocean bottom.

The paper record is wound by a toothed drum under a lucite sheet which fills the field of a 5 x 4-inch film in a camera (Fig. 1). There is a light-tight case from the camera lens to the lucite sheet, the part of this next to the lens being fixed, the rest being mounted on a vertically-sliding carriage. Close to the lucite, the case narrows to an adjustable horizontal slit one millimeter in diameter. Two 100-watt lamps are mounted on the carriage in housings which concentrate the light on the part of the fathogram opposite the slit. The carriage slides on vertical guides, and is slowly lowered by a suspending string. This string is unwound from a smaller drum fixed on the same axle on which the record-driving drum rotates. The ratios of the diameters of these drums is so chosen that, as the slit descends and scans the length of the lucite sheet, a little over three feet of fathogram is drawn past it.

Fig. 2A shows a normal photograph of a day's fathogram, reduced to reproducible size. Fig. 2B shows the same length of this record as reproduced by the slit camera, but with only the upper part containing the scattering layer included. Not only are the details of the diurnal migration of the layer much clearer in the latter, but also the distortion produced by the slope and curvature of the vertical coordinates is much reduced. Details of lettering on the original are,

¹ Contribution No. 448 from Woods Hole Oceanographic Institution.

² Progress report on scattering layer observations in the Atlantic Ocean, *Trans. Amer. geophys. Un.*, 29 (3): 341-354, 1948.

of course, lost in the contraction, but a label fixed to the lucite sheet may be included in the negative if desired.

While no new principle is involved in the apparatus, it is proving so useful that a description appears justified. It could readily be modified to take other types of records, or to produce any desired degree of contraction.

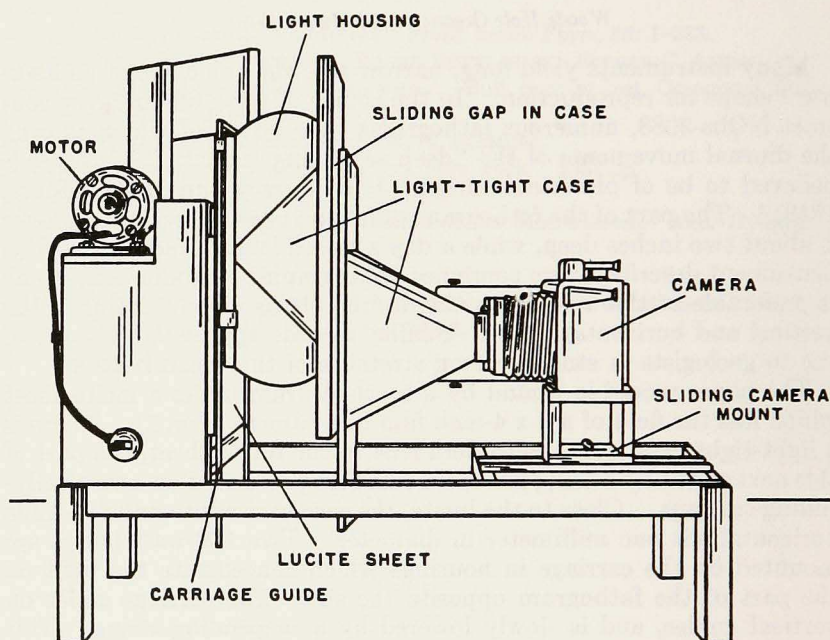
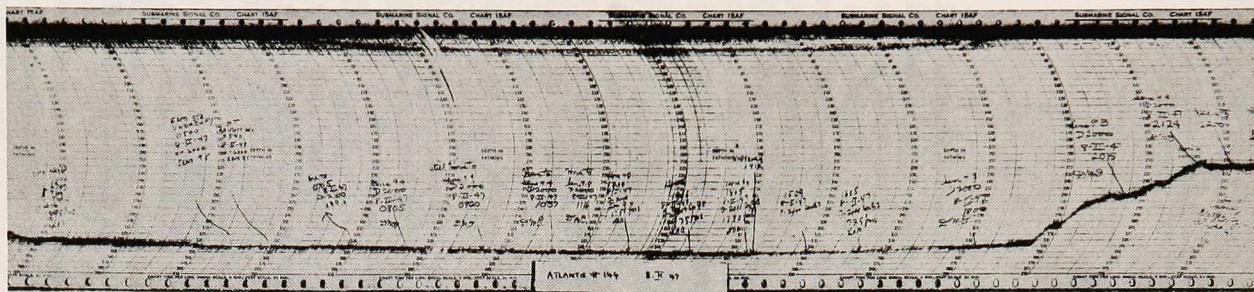
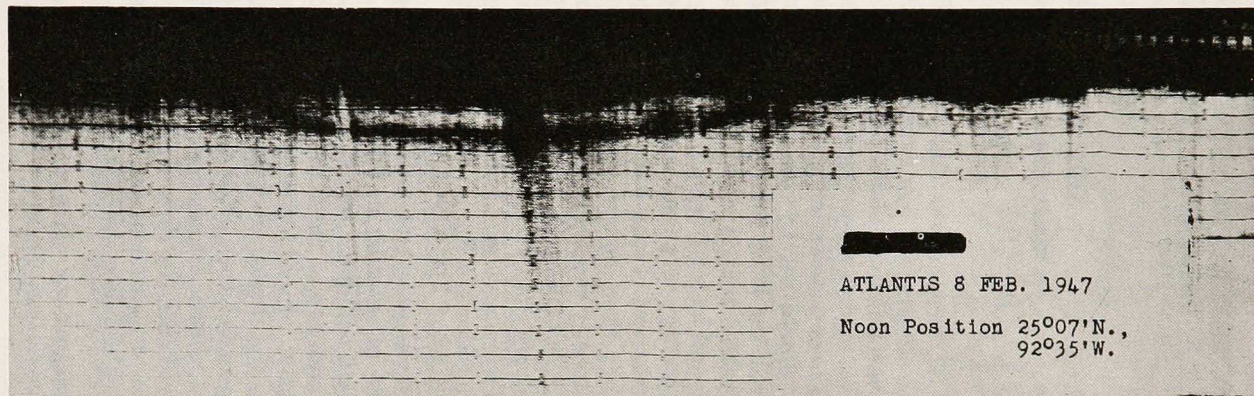


Figure 1. Elevation of camera.



A



B

Figure 2A. Fathometer trace with normal dimensions, X 1/5. 2B. Upper part of above fathometer trace reproduced with slit camera.