point or omitting some of the lowest weight points, or both, did not yield least-squares solutions significantly different than those of Eqs. 2 and 3.

Mercury's heliocentric distances were not the same during the times of the three superior conjunctions we observed. If Mercury behaved as a blackbody, the differences in the observed T_B values near the three superior conjunctions would have been $\lesssim$ 40°K, a value unfortunately much smaller than the scatter in the data.

Kaftan-Kassim and Kellermann (*3*) have reported 19-mm observations of Mercury made during February and March 1966. Their fit of Eq. 1 yielded

$$T_B = 288\ (\pm\ 17) + 75\ (\pm\ 13)\cos\ [i + 38\ \text{deg}\ (\pm\ 6\ \text{deg})]\ °\text{K} \qquad (4)$$

Using our computing procedure, which differs from theirs, we obtained the following fit to their data:

$$T_B = 294\ (\pm\ 6) + 80\ (\pm\ 8)\cos\ [i + 34\ \text{deg}\ (\pm\ 3\ \text{deg})]\ °\text{K} \qquad (5)$$

The standard errors are indicated.

Both fits to the 19-mm data are in good agreement with the fits to both the 1966 and 1965/1966 3.4-mm data. This good agreement would be puzzling if Mercury behaved at all like the moon. Gary (*4*) has applied to Mercury a horizontally homogeneous, single-layer, thermally independent model that is reasonably consistent with lunar observations. On the basis of the 19-mm Mercury data (which is more precise than the 3.4-mm data) the model predicts a 3.4-mm phase amplitude of 170 ± 15 °K and a phase lag of 16 ± 3 arc degrees; these values are, respectively, much greater than and somewhat less than the observed 3.4-mm values. But Mercury's large orbital eccentricity and the fact that its rotation period is two-thirds of its orbital period suggest that we should not expect Mercury's radio emission to be like that of the moon. A more complex model will be necessary to predict how dissimilar the two Mercury phase curves should be.

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5. This work was supported by the U.S. Air Force under contract No. AF 04(695)-1001. R.A.S. was supported in part by the Jet Propulsion Laboratory, California Institute of Technology, Pasadena, under NASA contract No. NAS 7-100. Only through the efforts of G. G. Berry, T. T. Mori, and W. A. Johnson in maintaining and improving the Space Radio Systems Facility equipment has it been possible to carry out the extensive observations necessary to obtain these results.
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Knoll and Sediment Drift near Hudson Canyon

Abstract. *A parallel-bedded accumulation of sediments forms a low ridge on the upcurrent side of a partially moated knoll. These sediments were deposited beneath a southwestward-flowing current where it is locally decelerated by the obstructing knoll.*

A newly discovered knoll (*1*) protruding 1000 m above the continental rise off the eastern United States represents the top of a huge peak that has been gradually buried by several kilometers of sediments (Fig. 1) (*2*). A ridge, 30 km long, 5 km wide, and 40 meters high, lying parallel to the regional isobaths, trends northeastward from the knoll to the natural levee of Hudson

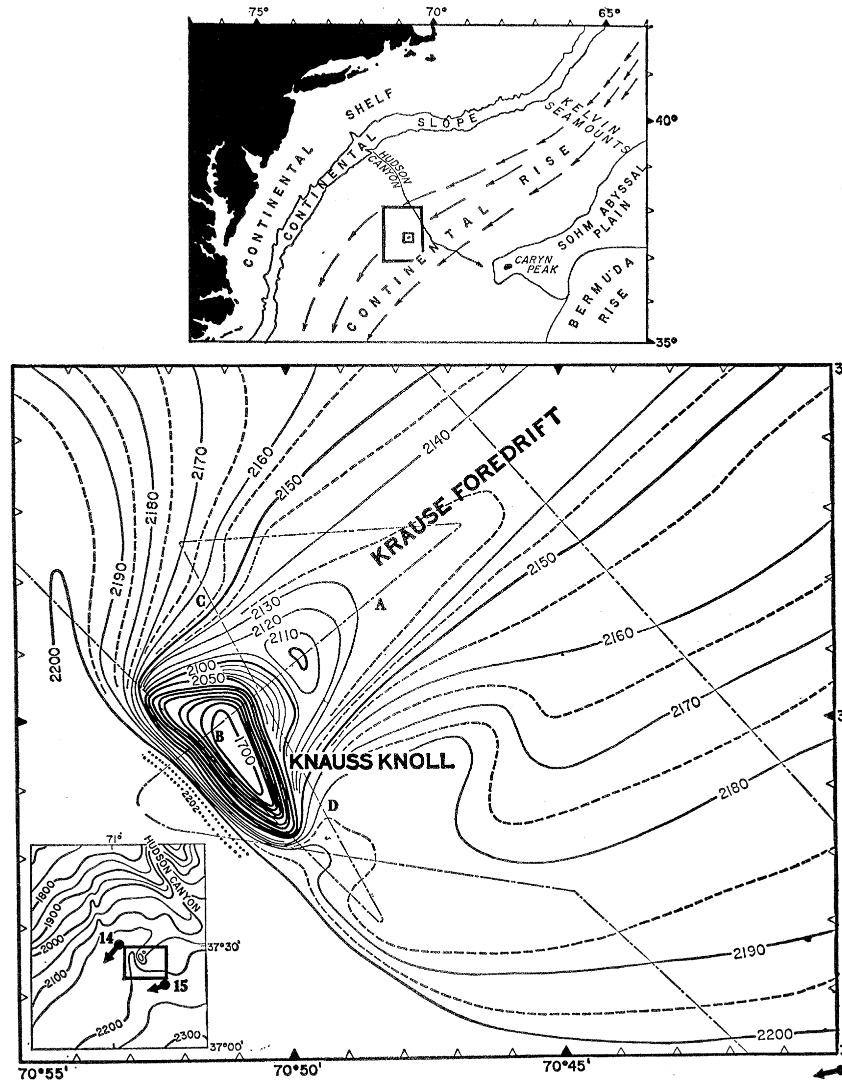

Fig. 1. A knoll on the continental rise of the eastern United States; contours in standard echo-sounding units of 1:400 seconds travel time. Numbers *14* and *15* (inset) refer to bottom photographs; arrows indicate direction of current inferred from scour marks. Profiles illustrated in Fig. 2 are indicated by *A*, *B*, *C*, and *D*.

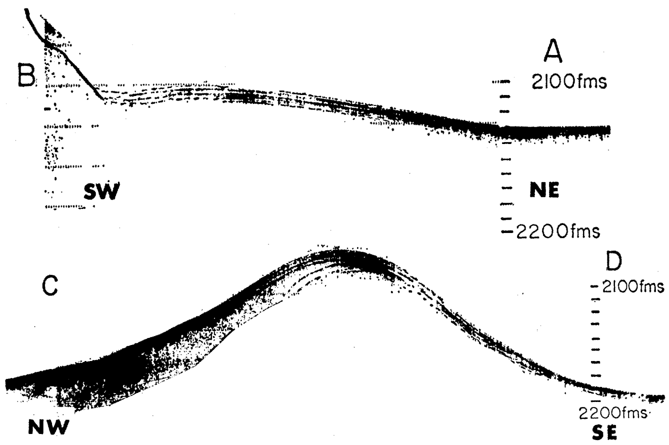

Fig. 2 (above). Echograms (at 12 kc/sec) of the parallel-bedded subbottom layers. (Top) Profiles along the axis of the northeastern fore drift; note the thickening of subbottom layers on approaching the knoll. (Botton) Profile perpendicular to the northeastern fore drift.

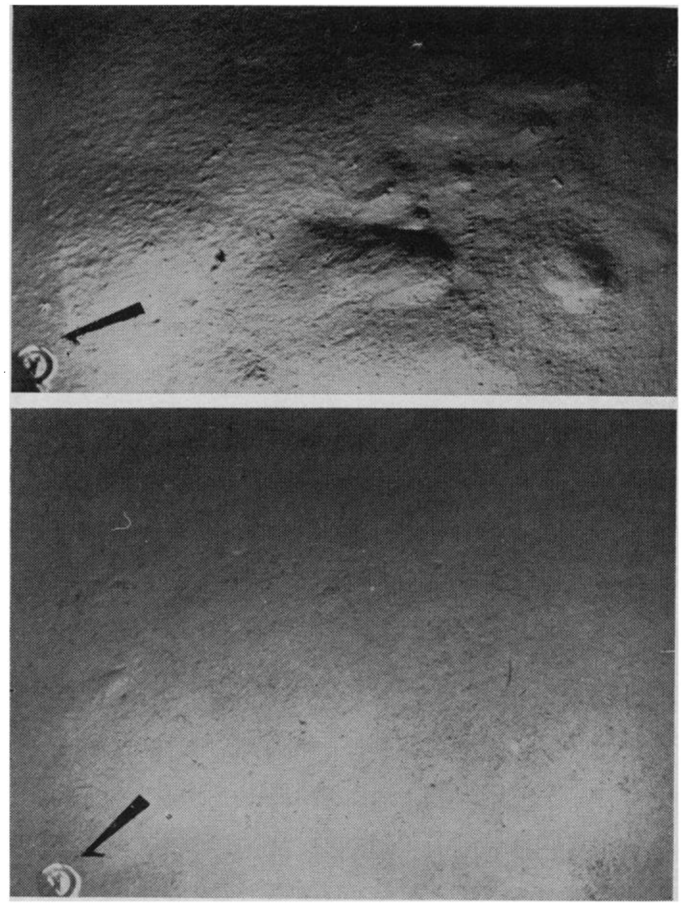

Fig. 3 (right). Current lineations on the continental rise; compass diameter, 9 cm. (Top) Current-scoured sand and lutite bottom, large mounds; current direction, west-southwest (37°20.1'N,70°36'W; 3985 m). (Bottom) Current-smoothed sand and lutite bottom, small mounds; current lineations, current direction, southwest (37°31'N,70°59'W; 4060 m).

Canyon. Relatively more rapid and more tranquil deposition on this ridge than on adjacent parts of the continental rise is suggested by the parallel-bedded subbottom layers which thicken beneath the crest of the ridge (see Fig. 2).

The knoll is at least partially surrounded by a moat. Although the southwestern depression cannot be distinguished from a submarine channel, a moat is clearly present on the northeast and southeast sides.

The moats around seamounts in the eastern Atlantic and throughout the Pacific have been generally ascribed to the isostatic sinking of the seamounts subsequent to the volcanic or tectonic events that created the peaks (*3*). Moated or partially moated knolls have been found in Canary Passage (*4*), beneath the Mediterranean Undercurrent off Gibraltar (*5*), on Crozet Plateau (*6*), and in other widely separated areas of obvious bottom-current activity. Heezen and Johnson (*4*) concluded that, at least in the case of smaller peaks, scour and drift of sediments due to current activity are the most reasonable explanations of the moats.

Current lineations at two locations near the newly discovered knoll (Fig. 3) indicate appreciable southwestward transport of sediments by the contour-following Western Boundary Undercurrent (*7*). The moat and the sediment drift northeast of it apparently result from obstruction and deflection of Western Boundary Undercurrent by the knoll. The fore drift apparently is accumulating beneath waters decelerated upcurrent of the obstructing knoll, while the moat is scoured by near-bottom waters accelerated in their flow around the knoll. In the waters overlying the obstruction, a Taylor column of dead water (*8*) or a slow cyclonic eddy (*9*) may provide tranquil conditions that permit a greater fallout of sediment; only slightly greater deposition under tranquil conditions near the knoll would suffice to account for the drift, which may have taken millions of years to develop. We do not know whether a lee drift exists, for our survey did not extend southwestward of the knoll.

Observation of sediment-capped hills situated in the midst of a thinly veiled basement topography (*10*) suggests that increased deposition near prominent hills may be a common phenomenon. Detailed surveys of other knolls and seamounts are needed so that one may ascertain the relative importance of these effects of deep-sea currents in the development of submarine physiography.

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