Table 1

Track No. on figs.	Dept of Mines and Tech. Surv. or Project Magnet No.	Height (ft.)	Position of points marked by circles	
1	*PM* 008	11,000	60° 01′ N.	029° 00′ W.
2	*PM* 89	10,000	57° 33′	033° 00′
3	*DS* 20 (*B*)	9,000–11,000	57° 02′	033° 08′
4	*PM* 73	7,000	53° 02′	035° 40′
5	*DS* 23 (*B*)	8,000–10,000	53° 10′	035° 12′
6	*DS* 13 (*A*)	9,000	52° 25′	029° 25′
7	*PM* 106	15,100	47° 24′	027° 20′
8	*PM* 109	7,000–9,100	39° 08′	030° 03′
9	*PM* 76	9,000	34° 38′	036° 20′
10	*PM* 114	8,000–10,000	31° 56′	040° 24′

Note.—Project Magnet lines marked *PM*, Department of Mines and Technical Survey lines marked *DS*.

The tracks of the flights are shown in Fig. 1, in relation to the approximate position of the central part of the Mid-Atlantic Ridge. This has been plotted from the map prepared by Heezen *et al.*[2] and from the British Admiralty Chart 1904. Track 8 is to the west of the Azores and track 7 passes over the Ridge at about 47° N. Two flights, 4 and 5, are close together and were made independently by Project Magnet and by the Department of Mines and Technical Surveys respectively.

Profiles of the total field along these tracks are shown in Fig. 2. There is a regional trend which has not been removed. The observations have been plotted against longitude and the points which lie on the dotted centre line of Fig. 2 correspond to the circles on the tracks of Fig. 1. There are peaks on the profiles of tracks 1–5 between 60° N. and 53° N., on track 8 at 39° N. and on track 10 at 32° N., and these vary in size from about 200 gammas to 800 gammas. The peaks on the profiles of tracks 1 to 5 and track 10, and one of the peaks of track 8 lie on or close to the central part of the Ridge. A flight adjacent to track 8, which is not shown, also has more than one peak on its profile in the area to the west of the Azores. There are no peaks on tracks 6 and 7 at 52° 25′ N. and 47° 24′ N. respectively. The peaks of tracks 4 and 5 are separated by several kilometres.

These results suggest that a magnetic anomaly is associated with some parts, but not all, of the central portion of the Mid-Atlantic Ridge, which agrees with the observations made by Ewing and others[1] and by Hill[3]. The apparent lack of coincidence of the peaks of the profiles with the exact centre of the Ridge is unlikely to be significant in view of the uncertainties in navigation.

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[1] Ewing, M., Heezen, B. C., and Hirshman, J., Comm. No. 110, *Assoc. Seismol. Assoc. Gen. U.G.G.I.*, Toronto (1957).

[2] Heezen, B. C., Tharp, M., and Ewing, M., *Spec. Paper* 65, Geol. Soc. Amer. (1959).

[3] Hill, M. N., *Deep-Sea Res.*, **6**, 193 (1960).

OCEANOGRAPHY

Origin of Drift-logs on the Beaches of Hawaii

PACIFIC ocean currents can carry objects to the Hawaiian Islands not only from North America, but also from Western Pacific islands and perhaps from the mainland of Asia. This is our conclusion from a recent examination of logs that have drifted to beaches of all the main Hawaiian Islands.

We were stimulated to pursue this investigation by the forester's interest in the species and forest areas represented in these logs, but we have learned that our findings may interest oceanographers, botanists, and others concerned with the part that ocean currents have played in the development of the Islands.

Most of the logs were from the west coast of North America: Douglas fir, western red cedar, and redwood were most frequent (Table 1). The origin of some of these could be pinpointed by checking brands placed on the logs by west coast timber companies. But some logs were of species native to such far-away places as the Philippines, Japan, and Malaya.

Table 1. SPECIES, NUMBER, AND ORIGIN OF LOGS FOUND ON THE BEACHES OF HAWAII

Species	Common name	No. examined	Probable origin
Pseudotsuga menziesii	Douglas fir	75	W. North America*
Thuja plicata	Western red cedar	27	W. North America
Sequoia sempervirens	Redwood	25	California
Abies spp.	True fir	7	W. North America
Tsuga heterophylla	Western hemlock	4	W. North America†
Chamaecyparis lawsoniana	Port Orford cedar	4	W. North America
Pinus monticola	Western white pine	2	W. North America
Picea sitchensis	Sitka spruce	1	W. North America
Quercus sp.	Oak (red)	1	W. North America
Populus sp.	Cottonwood	1	W. North America
Shorea spp.	Several 'Philippine mahoganies'	6	Philippines
Parashorea bagtikan	'White Lauan'	1	Philippines
Cercidiphyllum japonicum	Kadsura	1	Japan
Dryobalanops sp.	Kapur	1	Malaya, Borneo or Sumatra
Melia sp.	—	1	Philippines or S.-W. Pacific‡
Agathis sp.	—	1	Philippines or S.-W. Pacific
Albizzia sp.	—	1	Philippines or S.-W. Pacific‡
Podocarpus sp.	—	1	S.-W. Pacific or Chile
Cybistax donnell-smithii	Primavera	1	Central America‡

* Five logs carried brand from Gold River, Vancouver Island, British Columbia.
† One log carried brand from Coos Bay, Oregon.
‡ Possibly of Hawaiian origin.

It is quite certain that none of the logs listed in Table 1 arrived other than by drifting. The only logs Hawaii imports are monkey-pod (*Samanea saman*) from Fiji, and her forests grow only a few of the species listed. In all but three cases, Hawaiian forest trees could not produce logs as large as those found. Wood identification of the lesser known species was provided by the U.S. Forest Products Laboratory, at Madison, Wisconsin.

Since logs float very low in the water, they should be little influenced by wind action. The movement of drift logs is therefore probably due almost entirely to ocean currents.

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PHYSICS

Multiple-beam 'Transmission-like' Fizeau Fringes in the Reflexion Interference System

MULTIPLE reflexions between close, nearly parallel surfaces of high reflectivity give rise to the well-known sharpened Fizeau fringes of equal thickness[1]. For two surfaces of equal reflectivity R and equal transmittivity T, neglecting absorption, the successive interfering beams in the transmitted system have intensities $T^2, R^2T^2, R^4T^2 \dots = T^2(1, R^2, R^4, \dots)$. For the reflected system the intensities are $R, RT^2, R^2T^2 \dots = R, RT^2(1, R^2, R^4, \dots)$. As shown by Tolansky, the Airy summation of the corresponding amplitudes is valid for non-parallel plates provided certain conditions are met, and we thus obtain the intensity distribution of the transmitted and reflected fringe systems. It is found that, except for the term R