



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Branch of Isotope Geology (MS 18)
345 Middlefield Road
Menlo Park, California 94025

November 7, 1977

Dr. George H. Balazs
University of Hawaii at Manoa
Hawaii Institute of Marine Biology
P. O. Box 1346, Coconut Island
Kaneohe, Hawaii 96744

Dear Dr. Balazs:

I trust that your visit to Necker Island was as enjoyable as mine. I hope you follow through with your intended publication on the condition of the archeological remains. It will be an important contribution. Although those sorts of observations would be best recorded by an archeologist, it is most important that they be recorded by someone. Too often we pass up valuable opportunities because it is not our field of expertise--and the observations never get made!

It is probably not possible to definitely attribute the rock slide on the northeast side of Flagpole Hill to faulting. Rock and debris slides are a natural phenomenon on cliffs and steep slopes. Often, the lava flows that are contributing material to the slide are slightly more fractured at the slide location than elsewhere. Undercutting of the source flow(s) by erosion of softer material beneath may also be a contributing factor. From the way you describe the color of the rock, I would hazard a guess that the slide was probably catastrophic, but it could have happened simply because the face of certain lava flows passed an initial point in their stability at that place in the cliff.

Like Dr. Emory, I saw no evidence of faulting on Necker, but the island is only a small subaerial remnant of a huge volcanic structure more than 100 km in diameter at its base. Activity on a large fault anywhere on that structure could cause tremors on the island. Although there is no bathymetric evidence of such a fault that I know of, it is still a possibility that cannot be precluded. Such a shock could trigger a rock slide but is not a necessary condition for a rock slide to occur.

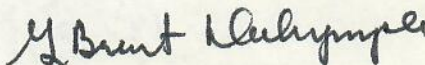
Other possible causes for tipping of the stone uprights are thermal expansion and contraction of the uprights themselves and of the supporting stones, and expansion and contraction of the soil due to wetting and drying. These mechanisms can move surprisingly large amounts of material. In fact, next to man, they could be the principle reason for toppling of the uprights. High winter storm winds are another contributing agency to consider. Repeated buffeting by gusty winds might loosen the uprights and eventually topple them. You might check the weather records at French Frigates Shoal to see what kinds of winds occur on Necker during the winter.

It might be worthwhile to establish some precisely located photographic stations that could be reoccupied yearly during one of Gene Kridler's semiannual visits there. This could provide a valuable record for future study of the sites. out

One final observation is the comment on p. 15 of your manuscript concerning the evidence of recent volcanic activity on Necker. The position given in Macdonald and Abbot (1970) would place the activity nearly 20 miles east of the base of Necker Volcano and nowhere near an existing seamount. Perhaps the location is wrong, but as given the activity could not apply to Necker.

Hope this information will be of some use to you. I have enclosed a reprint of a paper concerning Necker that might interest you. Please keep me in mind when your report on the Necker archeological sites is ready for distribution.

Sincerely,



G. Brent Dalrymple
Geologist

Encl.



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Geologic Division
Branch of Isotope Geology
345 Middlefield Road, Menlo Park, California 94025

December 22, 1977

Dr. George H. Balazs
University of Hawaii at Manoa
Hawaii Institute of Marine Biology
P.O. Box 1346, Coconut Island
Kameohe, Hawaii 96744

Dear Dr. Balazs:

Thank you for the various articles and especially the copy of your delightful book on the wildlife of the Leeward Islands. My oldest teenage daughter is very enthusiastic about birds and sealife, and latched onto your book quite quickly.

After looking at the color photo you sent, I am convinced that the white patch on the slope is a natural phenomenon. It appears to me that the white material is highly altered and is covered by a mantle or cap of either cemented slope wash or a very thin lava flow. The altered material could be either talus of lava flows. In either case, it is probably quite soft and forms a small unstable cliff that sloughs off as the harder cap is eroded. Some close-up color photos might help clear this up. Of particular interest would be the contact (and 2-3 feet both sides) of the white material with the lava flows in the cliff, and several of the cap rock. I have marked several suggested places on the enclosed copy of your photo. As for the reported eruption near Necker, I am skeptical. Everything we know about the origin of Hawaiian volcanoes suggests that eruptions do not occur that far away from the active end of the chain. Likewise, as far as we know, the volcanoes scattered at "random" about the central Pacific formed at or very near the East Pacific Rise and should not be active now. As for the underwater pinnacle, navigation charts are purposely conservative, i.e., if there is even the slightest chance that a hazard exists, it will be shown and once put on a C & GS chart may stay there forever. They do not necessarily depict the best available bathymetry. If the TOWNSEND CROMWELL and the EASY RIDER have searched for and failed to find it, then it probably doesn't exist. I doubt if a bottom sample would do much good unless the pinnacle could be located and a sample collected from there.

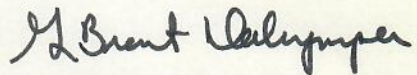
The best person to contact about water analyses would be Dan Davis of the Geological Survey in Honolulu. His office is on Ward street, if I remember correctly. I would bet that the contamination is from bird droppings.

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SOURCE

Necker contains no unusual minerals as far as I know, and that type of basalt usually does not introduce much in the way of contaminating minerals into ground water.

Have a Merry Christmas and a Happy New Year.

Sincerely,

A handwritten signature in cursive script that reads "G. Brent Dalrymple". The signature is written in dark ink and is positioned above the printed name.

G. Brent Dalrymple

