

Reply

CLIVE E. DORMAN

Department of Geological Sciences, San Diego State University, San Diego, California

11 May 1987

I am grateful to Reason and Steyn (1988) for pointing out the application of Miles' (1977) article to internal solitary waves in the California marine layer (Dorman, 1985). This provides a much more appealing theoretical explanation for the arresting of progression at Cape Mendocino. However, much more detailed measurements are needed to make a critical test of the role of diffraction in halting internal solitary waves at Cape Mendocino.

This theory could be applied to Point Conception in southern California where the coast makes an even greater bend of around 90 degrees. The conditions for complete diffraction and wave arresting are more severe here than at Cape Mendocino. As noted in Dorman (1985), wavelike events in the marine layer do not seem to go around this bend either. In addition, the opposing mean winds are even weaker off central California, making it highly unlikely that the mean opposing winds are greater than the wave phase speed. The Miles dif-

fraction theory seems to supply the most satisfying explanation for this case too.

Dorman (1987) has suggested that progressive gravity current-like features also exist in the California marine layer and are much more common than internal solitary Kelvin waves. Frequently, these gravity current events are temporarily arrested at bends in the coast before moving on. As solitary waves and gravity currents share some rather similar dynamics, one has the intuitive feeling that diffraction could be an important mechanism for briefly interrupting gravity current progression around bends in the coast.

REFERENCES

- Dorman, C. E., 1985: Evidence of Kelvin waves in California's marine layer and related eddy generation. *Mon. Wea. Rev.*, **113**, 827-839.
- , 1987: Possible role of gravity currents in Northern California's coastal summer wind reversals. *J. Geophys. Res.*, **92**, 1497-1506.
- Miles, J. W., 1977: Diffraction of solitary waves. *Z. Angew. Math. Phys.*, **28**, 889-902.
- Reason, C. J. C., and D. G. Steyn, 1988: Diffraction of solitary Kelvin waves at Cape Mendocino. *Mon. Wea. Rev.*, **116**, 804-805.

Corresponding author address: Dr. Clive E. Dorman, Dept. of Geological Sciences, San Diego State University, San Diego, CA 92182.