

- New York, 1963), p. 292; B. P. Halpern, R. A. Bernard, M. R. Kare, *J. Gen. Physiol.* **45**, 681 (1962); C. J. Duncan, *Physiol. Zool.* **35**, 120 (1962); M. J. Fregly, *Endocrinology* **71**, 683 (1962).
7. Quality judgments change with concentration. See E. Dzendolet and H. Meiselman, *Percept. Psychophysiol.* **2**, 29 (1967).
 8. The strength of the conditioned avoidance depends on the induced motivation which we have not independently measured. However, we have established boundary conditions on the motivation, namely, the rats must strongly reject the PCS at the conditioning concentration (mean consumption score less than 15 percent) but show no reduction in water intake. The high licking rates of all animals during the conditioning session should yield similar motivational levels. See R. W. Schaeffer, E. L. Hunt, D. J. Kimeldorf, *Psychol. Rep.* **17**, 359 (1968). For all testing sessions, rats which failed to maintain a high water drinking rate were excluded.
 9. D. I. Mastofsky, Ed., *Stimulus Generalization* (Stanford Univ. Press, Stanford, Calif., 1965).
 10. Generalization threshold is taken as a narrow concentration range within which qualitative similarity of a solution with the PCS is lost. This concentration range may or may not correspond to the detection threshold. See M. A. Amerine, R. M. Pangborn, E. B. Roessler, *Principles of Sensory Evaluation of Food* (Academic Press, New York, 1965), p. 53. For sodium saccharin, *ibid.*, p. 86.
 11. R. W. Moncrieff, *The Chemical Senses* (Wiley, New York, 1951); H. Stone, in *Olfaction and Taste*, T. Hayashi, Ed. (Pergamon, New York, 1967), p. 289.
 12. Novelty is not an absolute requirement for radiation-induced avoidance. See J. Garcia and R. A. Koelling, *Rad. Res.* **7**, 439 (1967).
 13. Partially supported by AEC-AR(30-1)-2147 and NIH-NB-06945.
- 20 June 1968

Crescentic Landforms along the Atlantic Coast of the United States

Dolan and Ferm (1) suggest a geometric relation between groups of crescentic coastal landforms along the Atlantic coast of the United States. According to them the various groups or orders range from beach cusplets through beach cusps, storm cusps, giant cusps, secondary capes, the Carolina Capes and Cape Kennedy, and Cape Hatteras to the southern tip of Florida and finally to 90° of latitude. The suggested relation is that the tip-to-tip spacing of each successively larger group increases by a power of 10. Shallow-water deformation by waves and associated inshore current cells are stated to be factors governing the three smallest groups of features, while it is inferred that the larger groups reflect regional control by a series of secondary rotational cells that develop along the western edge of the Gulf Stream.

We believe that the report (1) errs on two related points, and that on a

third and more important point it deserves to be seriously questioned. The erroneous related points are made in connection with the speculation that the Carolina Capes, Cape Kennedy, and larger orders of coastal landforms may reflect regional control established by a series of secondary cells that develop off the Gulf Stream. These speculations ignore two facts:

1) Cape Fear and Cape Kennedy are known to be controlled by geologic structures. In the case of Cape Fear, the controlling structure, Cape Fear Arch, is one of the largest and most obvious features on geologic maps of the southeastern United States.

2) From what is known from study of the Gulf Stream in the open ocean (2), there is no suggestion of regularity of eddies off its western edge such as one would expect if these eddies were to control evenly spaced coastal landforms. If regularity of inshore eddies does exist, it would be more plausible to ascribe this regularity to control by the Carolina Capes rather than to attribute these topographic features to such regularity.

The final and most important point on which the report must be questioned is the power-of-10 relation in size between successive orders of crescentic features. The authors' (1) Fig. 2 clearly implies marked discontinuities between the smaller size groups. No crescentic landforms having tip-to-tip spacings of 2 to 8 m, 25 to 70 m, 120 to 700 m, or 1200 to 8000 m are reported. In our experience, and apparently in that of Cloud (3) and of the many workers to whom he refers, this striking size distribution has been missed.

Let us assume for the moment that Dolan and Ferm's relation (1) does exist. Readers should ask what would its implications be regarding the statement that shallow-water deformation by waves and associated inshore current cells govern the first three orders of these features. There are no discontinuities in wind energy or duration, or in fetch over which winds blow from storm centers to points at which day-to-day wind conditions are encountered. The factors that control inshore waves and currents range through continuous spectra that could hardly be manifested by a series of landforms of discontinuous size distribution.

It seems to us that the conclusion of Dolan and Ferm (1) regarding a power-of-10 size relation between successive orders of crescentic features was based on an unhappy coincidence of observations insufficient in number or in their distribution in time, and that the conclusion is invalid.

M. M. BALL

A. C. NEUMANN

*Institute of Marine Sciences,
University of Miami,
Miami, Florida 33149*

References

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- 14 May 1968

The point of our report [*Science* **159**, 627 (1968)] appears to have been missed by Ball and Newmann. Our summary read:

The central questions regarding the origin of these features are: (i) Do the features reflect and are they controlled by interacting processes, including both planetary currents and shoaling and breaking waves? (ii) *Are these interacting processes continuous in nature?* [The italics are added.]

Questions concerning the origin of landforms are commonly subject to debate, especially when the topic is as diffuse as coastline landforms along the margins of a continent. Possible explanations are surely more numerous than those we mentioned; our object was not to offer a definitive explanation of the origin of coastline landforms, but rather to observe relations between form and chronology and to raise questions about these relations.

As for their mention of "unhappy coincidence," we can only reiterate that our total number of observations was 750, that most were made along the Outer Banks of North Carolina, and that the modes came out approximately as shown. Whether our finding was happy or unhappy, or a coincidence, can be determined only by further sampling.

ROBERT DOLAN

*Department of Geography, University
of Virginia, Charlottesville*

JOHN C. FERM

*Department of Geology, Louisiana
State University, Baton Rouge*

4 June 1968