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Postscript

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To prepare a full summary of the comments on the papers and the final discussion has proved too difficult, but it can already be seen to have added considerable momentum to international approaches to the problems of ocean circulation and of monitoring and predicting its variability. In particular, the discussion advanced the development of ideas on the theoretical basis and feasibility of a mid-ocean experiment to study the quasi-geostrophic eddies (or planetary waves) which we now believe to dominate the velocity field in mid ocean, and which, like the large-scale disturbances in the atmosphere, appear to be an essential part of the general circulation. The observations are still few, and the theoretical work in an early stage of development, but the evidence, and the analogy with the corresponding atmospheric problem, clearly justify a major effort requiring the cooperation and challenging the resources of some of the most advanced laboratories.

The discussion converged on the relative advantages of intense dynamical study of a small region during the lifetime of one or two eddies, and of more statistical approaches using widely spaced measuring buoys over a long period. The most urgent need seemed to be for observational data that can be used in the mathematical models now being developed of the medium-scale processes.

The discussion is still going on, and groups of specialists including many of those who took part in the Royal Society discussion, are considering the design of a mid-ocean dynamics experiment (m.o.d.e.). They have now settled for a basic study, both observational and theoretical, known as m.o.d.e. 1. It will include experimental work in a 2° square of ocean southwest of Bermuda, designed specifically to study geostrophic eddies (intermediate-scale, low-frequency motions) in mid-ocean, and their role in the general circulation of the oceans. Combined Eulerian and Lagrangian approaches, with multiple floats, moored current meters and a variety of bottom-mounted instruments, will be used to obtain basic information sufficient to map several eddies and to diagnose their dynamics.