In Iran, the government Department of the Environment regards such provision as an urgent priority. It began its programme of publishing field guides in 1975 with the production of *The Birds of Iran* (eds Scott, D. A., Hamadani, H. M., & Mirhosseyni, A. A.). Many difficulties were faced in the production of that book. The choice of language (the book is written in Persian) the names used for birds in the country (selection from many local names had to be made) and the art work (illustrations from British and French field guides had to be used due to a lack of suitable indigenous artists) all presented problems. The book which resulted is impressive in its scope and the distribution maps are useful even to the non-Persian speaking visitor, if he is prepared to learn and use arabic numerals.

This year has seen the publication by the Iranian Department of the Environment of *A Guide to the Mammals of Iran* (ed. Harrington, F. A.). This time the text is in English and the art work, which has been splendidly executed, was specifically commissioned and was undertaken by R. S. Robinson. All 148 mammals recorded from Iran, including the tiger and the lion which are now probably extinct there, are described and 112 are illustrated. Iran covers a large range of geographical zones in its span between the Gulf and the Caspian and the arrangement of the book is particularly helpful in grouping species into habitat sections rather than using a strictly taxonomic order. In this respect the *Guide* innovates in a manner which may well be emulated in future western publications in this vein. Harrington's broad experience of the Iranian fauna is evident in the text and his work will undoubtedly pave the way for further studies, particularly on detailed geographical distribution in the country. Work is now underway on the next volume in the series which will deal with reptiles.

The difficulties and the needs of the botanist in Iran are rather different. The high central plateau is rich in endemics and the flora is therefore extremely large. A definitive *Flora Iranica* is still in the course of production, being edited and compiled by K. A. Rochinger at Vienna. At present, therefore, the production of popular field guides must await the full description of the Iranian flora, and new species are constantly being described. A higher priority has been the provision of a scientific publication in which the gradually unfolding Persian taxonomic discoveries can be communicated. In the past, most descriptions of new species, local floristic lists and ecological work have been published in western journals; much taxonomic work has found its way into the *Notes of the Royal Botanical Garden, Edinburgh* for example. Now a new journal has been launched—the *Iranian Journal of Botany*—edited at the Ariamehr Botanical Garden in Tehran. It is evident from the first issue that this will be a most useful source of reference to all who are interested in the flora of the Middle East. Wendelbo provides an annotated check list of Iranian ferns; Eckblad summarised the scant information available concerning the gasteromycetes of Iran; biogeographical implications of newly described species are discussed and a floral list from the important Kavir Protected Region is included. The journal is in English and is lavishly illustrated with colour photographs; it is currently only available directly from the Ariamehr Botanical Gardens.

These efforts of the Iranians to distribute all available information must be highly commended. It must now be seen whether, as in the west, this dissemination results in the encouragement of further work. □

New discontinuity in the Atlantic

from M. Whitfield

ALTHOUGH, from the surface, the oceans may appear as remarkably homogeneous and featureless bodies of water they are in fact made up of an intricate three-dimensional patchwork of individual water masses. These water masses are layered according to their densities which in turn are defined by the salinity (S) and potential or *in situ* temperature (θ) of the component waters. The water masses are therefore most simply identified as clumps of points on a θ/S plot and the relationship between the nutrient (silicate, nitrate, phosphate) and oxygen concentrations and S or θ provide useful additional chemical fingerprints. One of the important tasks of physical and chemical oceanographers is to identify the origins of these bodies of water, to trace their movement through the oceans and to document their eventual decay by mixing with adjacent water masses. Such information is crucial to our understanding of oceanic mixing processes in general and in particular will affect our interpretation of the dispersion of man-made contaminants throughout the oceans.

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A recent paper by Broecker *et al.* (*Deep-Sea Res.* **23,** 1083; 1976) presents the first results of an unusually detailed analysis of water masses throughout the Atlantic and illustrates some of the difficulties involved in unravelling these mixing patterns. They use results from the well-documented GEOSECS cruises which confirm many of the long established features of the Atlantic circulation pattern (Fig. 1). Their data indicate however that the boundary between the North Atlantic Deep Water (NADW, Fig. 1) and the Antarctic Bottom Water (AABW, Fig. 1), as indicated on θ/S plots, is far too sharp to be the result of vertical mixing between these two water bodies. They suggest that yet another water body is sandwiched between these two layers. This water is characterised by a potential temperature of 2 °C (hence the name Two Degree Discontinuity Water, TDDW) and a salinity of 34.9‰ (Fig. 1). Water with these characteristics can be generated by mixing water from the North Atlantic, (Northern Component Water, NCW; 8 parts) with colder, less saline water from the Southern Atlantic (Southern Component Water, SCW; 1 part) which has a higher oxygen content and a lower silica content. TDDW can be traced throughout the Central Atlantic (from 35°N to 33°S) at depths from 4,000 m in the north to 3,200 m in the south. The concentrations of nutrients (phosphate, nitrate and silicate) and oxygen of TDDW in the western basins are consistent with the 8 : 1 mixing ratio. As the TDDW is traced towards the eastern basin the nutrient and oxygen patterns shift in a highly correlated

A hundred years ago

FINNISH papers report that vast masses of smoke are issuing from a mountain adjoining the river Tana, and that the snow in the vicinity has been melted away. The region has hitherto been free from evidences of volcanic activity. The theory has often been advanced that the gradual elevation of the shores of the Gulf of Bothnia is due to volcanic forces, and it is possible that these are finally seeking a vent.

THE royal tigress in the Berlin Zoological Gardens, lately brought forth a litter of two, which she utterly refused to take care of. They were accordingly placed amidst the family of a Newfoundland dog, who welcomed the newcomers warmly and bestows upon them all necessary maternal attentions.

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