

The regular occurrence of *Reophax scottii* Chaster, a benthic foraminiferan, in plankton samples from the North Sea

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ABSTRACT—The benthic foraminiferan *Reophax scottii* Chaster, not previously recorded in suspension, is shown to occur regularly in plankton samples taken at 10 m by the Continuous Plankton Recorder in the North Sea. The species' seasonal and geographical distribution is described. It was found mainly in the winter and spring (November to April).

INTRODUCTION

The presence of benthic foraminifera in samples taken in the water column has been reported on only a few occasions (e.g. Murray, 1965; Murray *et al.*, 1982; Williams & Collins, 1985), although this could be due to lack of sampling, rather than real absence. In the course of routine examination of plankton samples taken with the Continuous Plankton Recorder (CPR) in the North Sea and shelf waters around the British Isles, benthic foraminifera have been noted fairly frequently, the most regular of which is *Reophax scottii* Chaster. This is an elongate form with a wall composed of detrital mica plates arranged in an overlapping series; it has an average length of 700 μm (Murray, 1979). It is the purpose of this short note to demonstrate that *R. scottii* occurs regularly in small numbers in the surface waters of the North Sea in winter and spring.

MATERIALS AND METHODS

Since 1948 CPRs have been used in synoptic surveys to determine the abundance and distribution of plankton in the North Sea and the North Atlantic (Edinburgh Oceanographic Laboratory, 1973). They are towed by merchant ships and weather ships at a depth of 10 m over a number of standard routes at monthly intervals. The plankton is filtered by a continuously moving band of bolting silk with a mesh size of 270 μm . The presence of *R. scottii* was noted regularly by two observers between 1964–1986 and only occasionally by others.

RESULTS

The seasonal pattern of occurrence of *R. scottii* observed in CPR samples from 1964–1986 is shown in Fig. 1. The majority of the records were found in the central and western North Sea between 53°N and 59°N from November to April. The species was also

found occasionally in the western English Channel, the Bristol Channel, the Irish Sea, southwest and north of Ireland and north of Scotland. In the western Atlantic, *R. scottii* was found in two CPR samples taken over the shelf southeast of Newfoundland in March 1969 and January 1970. Culver & Buzas (1980), who summarised all published distribution records of foraminifera off the North American Atlantic coast, showed that this species occurred widely between Cape Hatteras and Newfoundland at depths less than 200 m. Although *R. scottii* was found in every month of the year, it was rare between May and August (Fig. 1).

DISCUSSION

R. scottii is a characteristic species of muddy sediments on the inner shelf and is described by Murray (1971) as a 'southern' species. All the specimens found in CPR samples were in shelf waters or very close to the shelf edge. The fact that it is commoner in samples taken during the winter and spring is probably linked to the mixing of the water column by winter storms, causing suspension of benthic material. During the summer there is thermal stratification of the water column and benthic foraminifera are absent from water above the thermocline. The only occurrences of *R. scottii* in the summer months (June to August) were all in the Bristol Channel in 1977; this is probably due to the year-round vertical mixing in this estuary caused by the large tidal range.

Despite its regular appearance in CPR samples taken at 10 m, *R. scottii* has not been reported previously in suspension (J. W. Murray, pers. comm.). It was not one of the benthic foraminifera recorded in the water column of the western English Channel in January 1962 (Murray, 1965) or October 1979 (Murray *et al.*, 1982), nor was it included in the list of benthic foraminifera

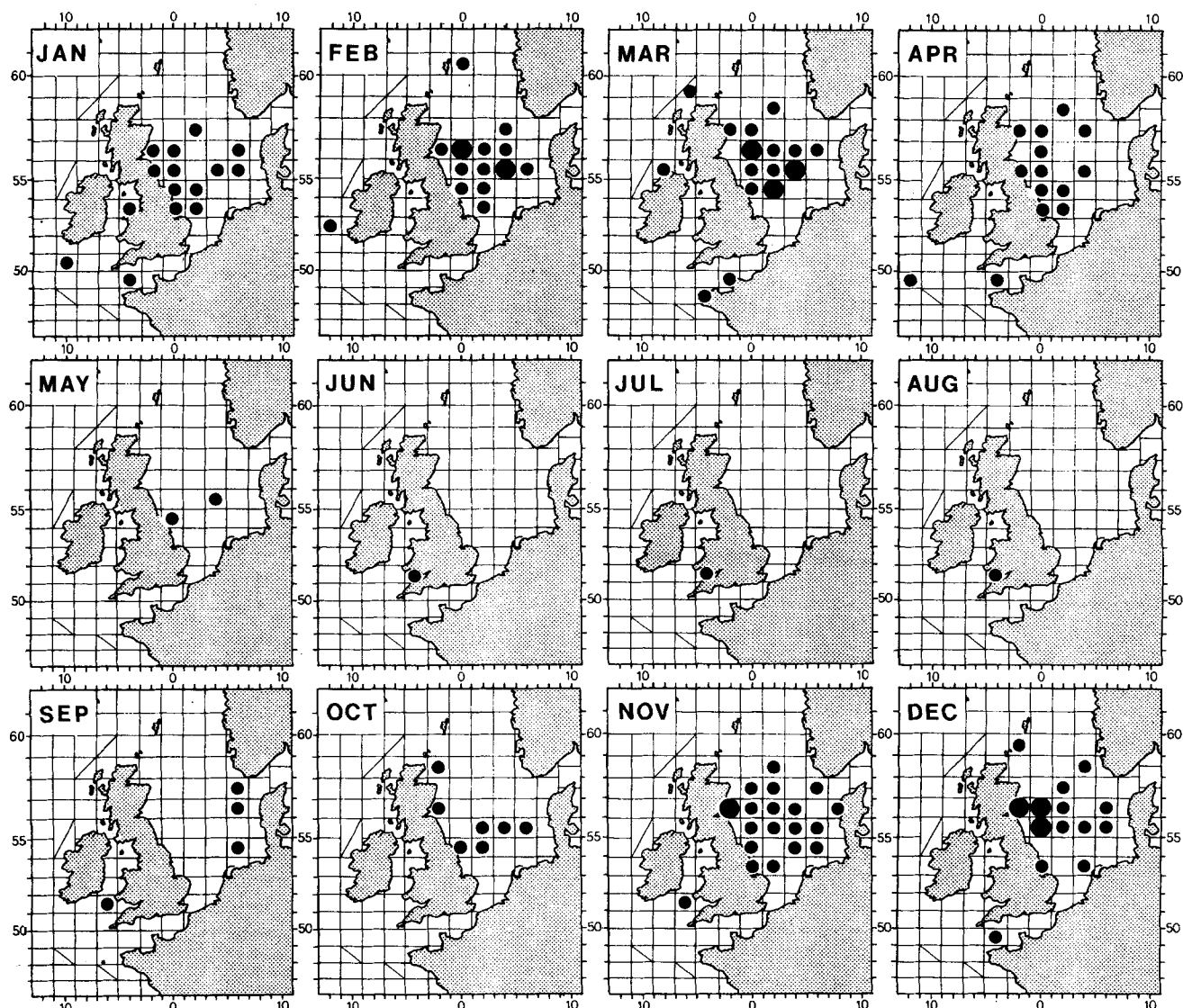


Fig. 1. The monthly distribution of *R. scottii* found in CPR samples in the waters around Britain from 1964–86; small circles = 1–2 records per sampled square, large circles = 3 or more records.

found by Murray in plankton samples taken in the Bristol Channel and Severn estuary in September 1974 (Williams & Collins, 1985).

The results from the CPR show *R. scottii* to occur regularly further north in the North Sea than the northern boundary for southern species given by Murray (1971). Two other recent studies are of interest. Bamber (1984) found *R. scottii* to be abundant in the sediment off Blyth, on the Northumberland coast. Murray (1985) recorded it as an accessory species in the Ekofisk area (56°32'N, 3°13'E) in both living and dead assemblages, but he found it to be rare in the Forties area (57°44'N, 0°54'E). It is probable that all the CPR records would have been of dead forms, since it is very rare for living forms to be thrown into suspension (Murray *et al.*, 1982).

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REFERENCES

- Bamber, R. N. 1984. The benthos of a marine fly-ash dumping ground. *J. mar. biol. Ass. U.K.*, **64**, 211–226.
- Culver, S. J. & Buzas, M. A. 1980. Distribution of Recent benthic Foraminifera off the North American Atlantic coast. *Smithsonian Contr. Mar. Sci.*, **6**, 1–512.
- Edinburgh Oceanographic Laboratory. 1973. Continuous Plankton Records: a plankton atlas of the North Atlantic and North Sea. *Bull. mar. Ecol.*, **7**, 1–174.
- Murray, J. W. 1965. Significance of benthic foraminiferids in plankton samples. *J. Paleont.*, **39**, 156–157.
- Murray, J. W. 1971. *An atlas of British Recent Foraminiferids*. Heinemann Educational Books, London, 274 pp.
- Murray, J. W. 1979. *British nearshore Foraminiferids*. Academic Press, London, 68 pp.
- Murray, J. W. 1985. Recent Foraminifera from the North Sea (Forties and Ekofisk areas) and the continental shelf west of Scotland. *J. micropalaeontol.*, **4**, 117–125.
- Murray, J. W., Sturrock, S. & Weston, J. 1982. Suspended load transport of foraminiferal tests in a tide- and wave-swept sea. *J. foramin. Res.*, **12**, 51–65.
- Williams, R. & Collins, N. R. 1985. *Zooplankton atlas of the Bristol Channel and Severn Estuary*. Natural Environment Research Council, Swindon, 169 pp.