increased (by increasing the current) so that the thermal contribution is negligible.

The method is less suitable for use on very large specimens, first because the size of the constant current source required becomes excessive and second because the change in potential is dependent on the change in (a/W) and hence becomes less sensitive to absolute crack extension as W increases.

We believe that additional instrumentation of this or a similar nature is essential if progress is to be made in the development of the COD approach to fracture toughness assessment. It must be accepted that as general yielding is approached in the regime of mixed mode or plane-stress failure, the simple instrumentation used for plane-strain fracture toughness testing is no longer adequate.

We thank Dr G. S. Lane, BR Engineering Research Division, for performing the fractographic work.

J. Davies
D. F. Cannon
R. J. Allen

British Railways Board Research Department,
Engineering Division,
London Road,
Derby.

Received November 17; revised December 5, 1969.

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Occurrence of Indium in Seawater and some Marine Sediments

Little is known about the occurrence of indium in the marine environment. Shaw[1] succeeded in detecting it at concentrations between 0·06 and 0·28 p.p.m. in four of the eleven marine sediments that he examined. No figures seem to have been published yet for the occurrence of the element in seawater, although Baric and Branica[2] have deduced from polarographic studies of saturated solutions of indium in seawater medium that its concentration should be 10^{-10} M. We have determined indium at four depths in the water column at Discovery Station 6917 (23° 00′ N, 18° 42′ W, depth 3,100 m). 'Millipore' filtration (0·45 μm) and preliminary concentration of the indium (by means of chelating ion exchange[3]) were carried out at sea immediately after the samples had been collected. The recovered indium was purified by anion exchange using 'Dowex *AG*2–X8' and then irradiated with thermal neutrons at a flux of 5×10^{12} neutrons cm^{-2} s^{-1} for four weeks. The irradiated sample was taken up in concentrated hydrochloric acid, equilibrated with 15 mg of inert indium as carrier and submitted to a twelve stage radiochemical separation to free the ^{114}In from other radioactive species. Indium was converted to its oxinate for determination of the chemical yield (~60 per cent) and for β-counting. The identity of the separated ^{114}In activity was confirmed by measurement of the half-life, plotting an aluminium absorption curve, and by γ-spectrometry. The concentrations of indium found at depths of 2, 500, 1,000 and 2,000 m were $0{\cdot}31 \pm 0{\cdot}02$, $0{\cdot}12 \pm 0{\cdot}01$, $0{\cdot}10 \pm 0{\cdot}01$ and $0{\cdot}11 \pm 0{\cdot}01$ ng/l. respectively. These concentrations are of the order of a hundred times less than those predicted by Baric and Branica[2]. Neutron activation analysis was also used to determine indium in three deep sea sediments

Table 1. OCCURRENCE OF INDIUM IN DEEP SEA SEDIMENTS

Sediment type	Sample No.	Lat.	Long.	Depth (m)	Indium p.p.m.
Argillaceous	Lamont A172–19	24° 35′ N	64° 02′ W	5,395	0·074
Calcareous ooze	Navado J.4	37° 22′ N	38° 47′ W	3,721	0·023
Diatom ooze	Discovery WS203	62° 56′ S	59° 50′ W	949	0·12

(Table 1). The concentration of indium found in the argillaceous sediment is identical with that found by Shaw[1] in a red clay from the Equatorial Pacific. He was, however, unable to detect indium in a siliceous ooze or in a calcareous ooze.

A. D. Matthews
J. P. Riley

Department of Oceanography,
University of Liverpool,
PO Box 147, Liverpool L69 3BX.

Received January 19, 1970.

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Late Maastrichtian Nannoplankton Provinces

It has been known for some time that there was a sharp differentiation of late Maastrichtian faunal provinces with respect to planktonic foraminifera. Axelrod[1] has presented evidence that this was also the case with some terrestrial megaphyta, for he found a rather abrupt southward shift for the coniferous vegetation of the northern hemisphere during this time. Before this provincialism was discovered, serious problems were encountered in long-range correlation by planktonic foraminifera, because the two late Maastrichtian species, *Abathomphalus mayaroensis* and *Racemiguembelina fructicosa*, are both restricted to the tropics (Fig. 1: *A. mayaroensis* is extremely rare in the two northernmost occurrences (Denmark and Sweden) shown).

Associated with the planktonic foraminifera in marine sediments are skeletal remains of minute planktonic calcareous algae, usually referred to as the calcareous nannoplankton, which are used for age determination of the sediments—especially in small deep sea samples—and on which a detailed zonation is based.

It was at first thought that late Maastrichtian nannofossils were more cosmopolitan than the foraminifera and could eventually be used for correlation in areas

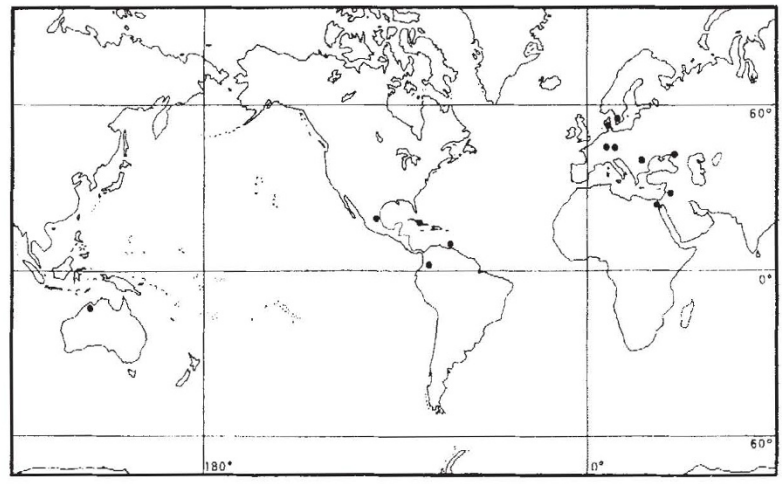

Fig. 1. Occurrences of *Abathomphalus mayaroensis* and/or *Racemiguembelina fructicosa* in the Upper Maastrichtian.