

ite pteropod shells is shallower than that of the last glacial period. At the present time the compensation level of pteropod shells is at a depth of about 2,000 m, whereas the compensation depth was more than 3,000–4,000 m in the Wisconsin period.

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## Concentrations of Radon-222 in Coal Mines in England and Scotland

In the past few years, a number of measurements have been made of radon-222 concentrations in mines other than uranium mines<sup>1-4</sup>. The values found, expressed in picocuries of radon per litre of air, ranged from 0.2 pCi/l. (a value typical of that occurring in the atmosphere) to several hundred pCi/l., and it was therefore considered worthwhile making similar measurements in various British coal mines. Measurements have been made in twelve mines chosen from the East Midlands, Kent and Scottish coalfields.

Samples of air were obtained from various occupied areas in each mine and then taken to the Radiological Protection Service laboratory for content of radon to be measured. The sample was transferred to a vessel containing a zinc sulphide screen held at a negative potential. The decay of the radon atoms produces positively charged radium-A atoms which are attracted to the screen, and the radon concentration is determined from the number of  $\alpha$ -particles emitted by the radium-A and radium-C' atoms. The method has been described in detail elsewhere<sup>5</sup>. The sampling carried out in the first two mines visited (mines A and B) was repeated after an interval of about 4 months and it was found that, for each mine, the concentration did not vary with location in the mine or

with time by much more than a factor of two. Concentrations of radon in the other coal mines investigated were therefore assessed from a smaller number of occupied areas.

The ranges of radon concentrations found in each of the mines visited are shown in Table 1.

Coalfield	Mine	Range of radon concentrations (pCi/l.)
East Midlands	A	5-12
	B	4-11
	C	2-3
Kent	D	1.4-3
	E	1.6-3
	F	0.8-2
	G	1.3-2
	H	0.9-2
Scotland	I	0.6-1.2
	J	3-14
	K	1.3
	L	1.0-1.7

The median concentration for the twelve mines is about 2 pCi/l., a value very close to that found by Lucas and Gabrysh for Pennsylvanian coal mines<sup>4</sup>.

Concentrations of radon in uranium mines are typically two orders of magnitude greater than the concentrations reported here, and there seems little doubt that uranium miners suffer from an incidence of lung cancer related to their exposure to radon<sup>6</sup>. There is no evidence that concentrations of radon of the magnitude found in British coal mines give rise to an increased incidence of lung cancer. The incidence of lung cancer among British coal miners has been shown to be appreciably lower than the national incidence for men of comparable ages<sup>7,8</sup>.

Measurements of concentrations of radon in other British mines are now being carried out.

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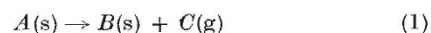
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## Extraction of Meaningful Kinetic Parameters from Thermogravimetric Analysis

MUCH effort is being devoted to thermo-analytical techniques such as thermogravimetric analysis (TGA)<sup>1-3</sup>, differential thermal analysis (DTA)<sup>4-6</sup> and differential enthalpic analysis (DEA)<sup>7</sup>, in order to evaluate kinetic parameters for solid state decompositions of the generic type



It is generally accepted<sup>8,9</sup> that such reactions, which are often characteristic of polymer degradations and the decomposition of inorganic complexes and minerals, begin at certain discrete regions, called nucleus-forming sites,