matters arising

Turtle drift

SIR,—It occurs to me that the origin of the peculiar migration pattern of the green turtle, *Chelonia mydas* may be otherwise than suggested by Carr and Coleman[1]. They argued that since the early Cainozoic certain turtles have inherited a tendency to swim a particular WNW–ESE path from Brazil to the Ascension Islands, swimming against the prevailing current for about eight weeks. They note, however, that *Chelonia*, which is a herbivorous, frequently seagrass ('turtle grass') eating form, is not recorded before the Miocene. This concurs with my observations[2] on *Thalassia* (turtle grass) and its associated biota which did not succeed in reaching the tropical Americas until the early Miocene. It seems likely that these seagrasses came from the Indo-Pacific through the southern tip of Africa, and drifted passively across to Brazil from West Africa on the equatorial surface current. Therefore seagrass feeding grounds at least, were situated on the eastern side of the Atlantic first. One might infer from this that the herbivorous turtles followed the seagrass biota westwards across the Atlantic (through the midoceanic islands) but returned for the breeding season. If this is so, then the early ancestors of *Chelonia mydas* should be found in Africa or further east.

A second consideration is that the behavioural pattern suggested by Carr and Coleman seems to make little ecological or evolutionary sense (which they have almost admitted). They imply that the home breeding grounds around South America became inexplicably untenable (presumably many millions of years after turtles had become established) so favouring a change in behaviour in these otherwise ultraconservative creatures. The progeny produced by this 'freakish' behaviour were then lucky enough to drift back to the old feeding grounds on the current. Bearing in mind the extremely conservative breeding behaviour of past and present amphibians and primitive reptiles I feel this postulation will need a more thorough explanation.

Would it not be more in keeping with the evidence to postulate the passive drifting of juveniles westwards across the Atlantic (where, after the Palaeogene they would have found plentiful seagrass) followed at breeding time by a homing instinct that leads them eastwards to the midoceanic islands? The seafloor spreading part of their hypothesis would work equally well.

Yours faithfully,

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[1] Carr, A., and Coleman, P. J., *Nature*, **249**, 128 (1974).
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No radioactive silver detectable in silver–uranium ore

SIR, — Lindner *et al.*[1] have reported finding the radioactive silver isotopes ^{108m}Ag and ^{110m}Ag in silver bars of eastern European origin, and have conjectured that the silver may have been mined using nuclear explosives. Boyle[2] has suggested that it was more probable that the radioactive silver had been produced by neutrons from (α, n) reactions and spontaneous fission reactions of uranium in the silver ores. In January 1974, I was able to secure a sample of uraniferous silver ore from a mine at Contact Lake, North West Territories, near Port Radium on Great Bear Lake. The 70 g sample was crushed and ground. The resulting powder was assayed using X-ray fluorescence spectroscopy and was found to contain 6.8% Ag and 0.97% U. Fifty grams of the powder was roasted, treated with HF and H_2SO_4, leached with HNO_3 and the extracted silver was precipitated as the chloride. Four grams of AgCl, corresponding to 3 g of Ag, was counted in a defined geometry on a large, high resolution, low background Ge(Li) detector for 25 h. No silver gamma peaks were detected.

The 25 h background of the detector in the region of the 658 keV ^{110m}Ag γ ray was 110 counts. Using the detection limit[3] of $4.65\sigma_B$, where σ_B is the standard deviation of the background for paired observations, gives a detection limit of 50 counts in the peak.

Lindner *et al.*[1] found that the silver bullion contained 84 pCi of ^{110m}Ag per gram of silver. If this figure is used to calculate the expected number of counts in the same peak, using a 3 g sample of silver, a 25 h counting time, 94% peak abundance (ref. 4), 48% isotopic abundance of the parent isotope, ^{109}Ag (ref. 4), and a measured absolute efficiency of the detector of 2.8% for that energy, then the peak would contain 1.1×10^4 counts. The ratio of the ^{110m}Ag found in the bullion to our detection limit for radiosilver from the Canadian ore is $1.1 \times 10^4/50$, or 220. Therefore it seems that Boyle's suggestion that the radioactive silver found in the bullion by Lindner *et al.* was of natural origin is incorrect.

I thank R. R. Wallace for obtaining the ore sample and G. J. Jarbo for the silver and uranium analyses.

Yours faithfully,

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[2] Boyle, R. W., *Nature*, **243**, 461 (1973).
[3] Adams, F., and Dams, R., *Applied Gamma-Ray Spectrometry*, 233 (Pergamon Press, Oxford, 1970).
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ABO matching in kidney graft survival

SIR,—Joysey *et al.*[1] reported on kidney graft survival in Cambridge with particular reference to the ABO group of the recipient. The data from Birmingham confirm these findings and allow a further breakdown by ABO status of the donor.

A system of computer documentation of transplantation and serological data is being used, which includes the display of survival on a graphical plotter. The data are presented in a direct form, showing the fraction of grafts surviving, rather than as 'actuarial' curves. The graphs, therefore, may show irregularities instead of a smooth descending curve. The advantages and disadvantages of various methods of presenting survival data will be discussed elsewhere.

Excluding second and third grafts, 161 patients were transplanted between May 1968 and January 1974 with cadaveric kidneys. Figure 1*a* shows the survival information in intervals of 3