. . . and geochronological anomalies

MANY papers discussed the application of all the available age methods to igneous, metamorphic and sedimentary rocks from all over the world, ranging in age from ancient to almost modern. Finding the oldest terrestrial rocks is a fashionable and prestigious exercise. J. Barton Jr. (Witwatersrand University) obliged with gneisses from the Limpopo belt of southern Africa which yielded a rubidium–strontium whole rock isochron age of nearly 3.8 billion yr, although the uranium–lead systematics of these rocks are highly complex and gave younger ages. At the other end of the geological time scale, the controversy regarding the age of the KBS-tuff, an important marker horizon in the Plio-Pleistocene succession of Northern Kenya, continues unabated. G. H. Curtis and his collaborators (University of California) favour an age of ~ 1.8 Myr, whereas F. J. Fitch and coworkers, from the Universities of London and Cambridge, favour ~ 2.5 million years. Clearly a tuff nut to crack!

The new and exciting samarium–neodymium age method was thoroughly aired by many workers. The geochemical coherence of parent and daughter forms a sharp contrast to the rubidium–strontium and uranium–lead methods and offers the possibility of tracing crustal evolution in certain geological environments which could wholly or partly disturb rubidium–strontium and uranium–lead systematics.

Geochemistry

On the application of initial strontium, lead and neodymium isotopic ratios to petrogenetic studies of igneous rocks and of the geochemical and temporal evolution of the Earth's continental and oceanic crust, and of the upper mantle, most speakers considered that geochemical heterogeneities have existed in the upper mantle for at least 1 to 2 billion years, as judged from isotopic measurements on oceanic basalts. Another issue, still highly controversial, concerns the origin of calc-alkaline lavas (mostly andesites) at continental margins, such as the west coast of South America. Conflicting interpretations of 'anomalous' isotopic and trace-element compositions were proposed by D. E. James (Carnegie Institution, Washington) and by J. R. Lancelot and colleagues (University of Montpellier and United States Geological Survey, Denver). James favours derivation of andesites by massive subduction and partial melting of vast quantities of sediments of continental origin, whereas Lancelot *et al.* prefer selective sialic contamination with radiogenic strontium of an essentially mantle-derived magma with low $^{87}Sr/^{86}Sr$ ratio during fractional crystallisation of the calc–alkaline liquid. This controversy is closely related to the problem of whether the continental crust grows through geological time, or whether its volume has remained essentially constant. I (S.M.) believe that the bulk of isotopic, geological, geochemical and geophysical evidence very definitely favours continental growth, but both arguments will continue for a long time yet. Nonetheless it is now certain that continental igneous rocks frequently acquire an isotopic imprint of the older continental crust through which they make their way to the surface, and this phenomenon can be used to provide constraints for the age and nature of rocks at depth which are not exposed at the surface at that particular locality. P. N. Taylor and S. Moorbath (University of Oxford) reported that the 3.7 billion yr-old sialic craton of West Greenland appears to underlie only a very small part of the voluminous, extensively exposed 2.9 billion yr-old craton. Furthermore, W. Compston and B. Chappell (Australian National University) believe that they have demonstrated that Precambrian continental material was present in the lower crust of southeastern Australia during the early Palaeozoic, so that crust in this region did not originate solely as new oceanic crust at that time.

On the non-radiogenic stable isotope front, the oxygen isotopes as always offer a wide range of fundamental geological applications. F. J. Longstaffe, H. P. Schwarcz and R. H. McNutt (McMaster University) have shown that up to the onset of partial melting the oxygen isotope ratios of Archaean granitoid gneisses reflect the nature of their protoliths. Fortunately, the conclusions closely parallel those drawn from radiogenic isotope studies. Furthermore, the irrepressible H. P. Taylor, Jr. (Caltech), as usual presenting as many new data as all other workers combined, showed how oxygen isotope ratios vary sympathetically with initial strontium isotope ratios in passing from west to east in the great Peninsular Ranges Batholith of Southern and Baja California, and how this must reflect an increasing crustal component in the petrogenesis of this major rock unit.

This was an important and magnificently organised conference. Those geologists who nowadays still ignore, misunderstand and disbelieve constraints imposed by isotopic and geochronological data very definitely do so at their own peril. □

Presynaptic receptors

from S. Z. Langer

THE classical picture of events at nerve endings and synapses has been modified over the past few years by accumulating evidence for the existence of presynaptic receptors for neurotransmitters, in addition to the classical postsynaptic receptors which mediate the response of the effector organ (in the periphery) or of the postsynaptic neurone (in the central nervous system). The presynaptic receptors, found on the outer surface of the nerve endings from which neurotransmitter is released, are thought to be involved in the modulation of the neurotransmitter release evoked by stimulation, by means of a negative feedback mechanism in which a neurotransmitter regulates its own release.

As U. S. von Euler (Karolinska Institute, Stockholm) pointed out in his opening lecture at the First International Symposium on Presynaptic Receptors*, the first indications of the existence of presynaptic receptors can be traced back as far as 1957 when results on the effects of alpha-adrenoceptor blocking drugs on the stimulation-evoked release of noradrenaline from noradrenergic nerve endings triggered considerable interest (Brown & Gillespie *J. Physiol. Lond.* **138**, 81; 1957). It was not until 1971, however, that the hypothesis was formulated that alpha-adrenoreceptors are present in noradrenergic nerve endings and are involved in negative feedback control of noradrenaline release. Since then evidence for presynaptic receptors in the peripheral and central nervous systems has continued to accumulate (see for reviews Langer *Biochem. Pharmac.* **23**, 1793; 1974; *Br. J. Pharmac.* **60**, 481; 1977; Starke *Rev. Physiol. Biochem. Pharmacol.* **77**, 1; 1977; Westfall *Physiol. Rev.* **57**, 659; 1977).

Evidence for the presynaptic location of the alpha-adrenoceptors that regulate noradrenaline release has been found in the rat heart. In this tissue there is a significant reduction of ^{3}H-dihydroergocryptine binding after de-

* Held in Paris on 22–23 July, 1978.

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