

## Australian deserts defended

SIR—Kenneth Mellanby has recently expressed his views on conservation issues in Australia (*Nature* 325, 112; 1987). By appearing in *Nature*, these views might be given greater credence than they perhaps deserve; although Mellanby is entitled to his opinions, certain statements in his article cannot be left unchallenged.

In late 1986, the federal government did nominate Stage 2 of Kakadu National Park for inscription on the World Heritage List. At the last moment, this nomination was temporarily withdrawn although not as a result of representations from the Northern Territory Government or its lobbyists but as a consequence of legal action taken in the federal court by a mining company.

Mellanby apparently finds much of the landscape of the Northern Territory either "boring" or "dull" — scarcely an objective assessment, nor one universally shared. No doubt many people do find deserts boring; nevertheless, they offer landscapes that others find of peculiar beauty while the biological diversity and the adaptations of the biota to the environment are of considerable interest to both pure and applied scientists. To suggest that eucalypt forests (although technically many of the eucalypt communities in the Northern Territory are woodland) are uniform and dull is to view them with remarkably unperceptive eyes. These ecosystems, which, with the exception of limited areas of eucalypt savanna in Timor and Papua New Guinea, are uniquely Australian and support a great diversity of organisms. A first fleeting glance might suggest a degree of uniformity but anyone who takes the time to look more closely cannot but be impressed by the variety and complexity of these communities. To have described Stage 2 of Kakadu as "the most boring national park in the world" is a greater reflection on the writer than on the area.

Natural properties submitted for inclusion on the World Heritage List are judged against four criteria, of which Professor Mellanby selectively quotes from one only. The full criteria say such properties must:

(i) be outstanding examples representing the major stages of the earth's evolutionary history. This category would include sites which represent the major 'eras' of geological history such as 'the age of reptiles' where the development of the planet's natural diversity can well be demonstrated and such as the 'ice age' where early man and his environment underwent major changes; or

(ii) be outstanding examples representing significant ongoing geological processes, biological evolution and man's interaction with his natural en-

vironment. As distinct from the periods of the Earth's development, this focuses upon ongoing processes in the development of communities of plants and animals, land-forms and marine and fresh water bodies. This category would include for example (a) as geological processes, glaciation and volcanism, (b) as biological evolution, examples of biomes such as tropical rainforests, deserts and tundra, (c) as interaction between man and his natural environment, terraced agricultural landscapes; or

(iii) contain unique, rare or superlative natural phenomena, formations or features or areas of exceptional natural beauty, such as superlative examples of the most important ecosystems to man, natural features (for instance, rivers, mountains, waterfalls), spectacles represented by great concentrations of animals, sweeping vistas covered by natural vegetation and exceptional combinations of natural and cultural elements; or

(iv) be habitats where populations of rare or endangered species of plants and animals still survive. This category would include those ecosystems in which concentrations of plants and animals of universal interest and significance are found.

(From Nomination form for inclusion of properties on the World Heritage List.)

It is interesting to note that under criterion (ii) "boring" deserts could be considered, while under criterion (iii) Stage 2 of Kakadu certainly offers "sweeping vistas covered by natural vegetation" even if much of it is "dull and uniform" eucalypt communities. I am not aware of the details of the federal government nomination of Kakadu Stage 2. Nomination in itself does not guarantee inscription on the list; nominations are subject to a detailed refereeing process as well as examination at the World Heritage Committee itself. When it comes to assessment of natural beauty, then decisions are bound to be subjective; although one would expect the committee to be impartial, its members would not necessarily show the same biases as Mellanby. In judging nominations against other criteria, more objective assessment is possible.

The nomination of Stage 2 of Kakadu has become part of a political agenda that goes far beyond concern for environmental matters. However, it is not possible to dismiss the case for nomination out of hand as being a mere political ploy.

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## Rem overdose

SIR—The communication by R. Russell-Jones on "Cancer risk assessments in light of Chernobyl" (*Nature* 323, 585; 1986) continues the rapid calculations made following the disaster. It also is technically incorrect as well as misleading. Presumably the 400,000 rem (4,000 Sv) quoted are the product of the mean "dose" (more accurately "dose equivalent") and the number of people (that is, the collective dose equivalent in "man-rem"), and the UK population might over the next five years perhaps receive an average of 10 mrem. This would be a mere two per cent of the natural background dose.

Having been a member of the BEIR III Committee, I know very well that we stated that the effects of background radiation are unknown and that we refused to provide any risk estimates for doses that are less than 10 rem.

Although there are fairly firm scientific reasons for believing that there is proportionality between dose and genetic effects, this so-called 'linear hypothesis' lacks any substantial justification in the case of radiation carcinogenesis and seems in fact most dubious in view of the complexity of the process. It may possibly serve as a crude estimate of the risk attendant to maximum permissible radiation doses but extrapolations by many orders of magnitude, whether made by Russell-Jones or others, are scientifically indefensible.

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## The calchemists

SIR—The increasing use of computers to simulate the properties of chemical entities has led to an unnecessary proliferation of new scientific terms that are unpleasant on the ear. For example, "drug design by computer-based molecular docking", or "molecular dynamics calculations of bulk properties of..." or "computer graphics simulation of solvent-protein interactions" or "computer-generated electrostatic surface representations", are far too latinized to use in normal conversation. I propose that we replace such uses by the historically more suitable term "calchemy" and its derivatives "calchemic", "calchemistry", "biocalchemistry", and begin to raise funds for the formation of new academic departments.

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