

CORRESPONDENCE

Hurricane damage

SIR — Not only did hurricane Allen select many small island countries, it did so while affecting their capitals the least. Of the nine island countries directly affected by the hurricane before it struck the Central and North American mainland, seven were most seriously affected in areas which did not include the capital city; Barbados, St Vincent, St Lucia, Dominican Republic, Cuba, Jamaica and the Cayman Islands. In nearly all cases, statements of the hurricane's effects issued from the capitals were qualified by references to isolated areas or "the interior" from which reports had not yet been received, but with the expectation that when they were, figures of dead and damage would rise significantly.

When serious hurricanes occur in provincial and rural areas which are normally remote and inaccessible, the degree of local self-reliance and local self-government may determine the capacity for recovery. Dependence on central national government, usually the case, will only function effectively through country-wide communications systems. It is systems of communication, however, which often suffer most significant hurricane damage, quickly isolating provincial and rural areas from the capital, and from each other. Trees fall, blocking roads and causing telephone and electric power cables to be severed, cable poles and radio antennas to collapse and power supplies to fail. Telephone, radio and telex systems become inoperable, and airports close. Roads are destroyed by sea erosion and landslide, and travel by boat is impossible or extremely dangerous until gales have subsided.

The development of international and regional precautions is principally based on improved international communications systems, but effective precautions have to be implemented and undertaken within and by each country. Effective readiness will depend on political will, personal commitment, local understanding and infrastructural resources. Certainly, improvements to inter-island and international communications are needed, but until more efficient national assessments of disaster impact, and consequential needs, are developed through improved national communication of all kinds, there will be little effective use, in disaster, of the improvements to international communications that are being scheduled. More importantly, the present incoming warnings of hurricanes, whilst receivable by governments in the capitals, may not be available to local communities. Ultimately, effective communication facilitates further decision, action or undertaking, which will be the quicker only if administrative and infrastructural resources are upgraded to enable appropriate responses.

Field research from the University of Bath, supported by the Leverhulme Trust, undertaken in two countries (one of them in the Caribbean) has shown the smallest countries to suffer the greatest national scale, as distinct from magnitude, of disaster damage, and hurricane Allen has seemingly selected many Caribbean small countries for reiteration. Provincial districts are more vulnerable to hurricane damage in terms of damage distribution, than the urban centres. Hurricane Allen has not only selected many of

the smallest and poorest countries of the Caribbean, on which to inflict itself, but also the most rural and poorest of those countries. In their experience of hurricane Allen these areas have made manifest a double vulnerability which identifies a need for improved preparedness against such eventualities and greater self-reliance before many more hurricanes have passed.

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AChE uses

SIR — We would like to comment on an advertisement from the US Army in the September 11th edition of *Nature* (p. xxxiii) calling for scientists in the genetic engineering field to submit proposals to "clone" the gene for the human enzyme acetylcholinesterase. Isolating the gene for the enzyme and cloning it in bacteria using genetic engineering techniques will allow large quantities of pure acetylcholinesterase to be prepared for the first time. The US Army may have a number of uses for the enzyme in mind: as an antidote to nerve gases for soldiers in battle, as a test for other antidotes and as a test for the effectiveness of new nerve gas weapons. Many workers in the genetic engineering area see the potential for developing this biotechnology into the basis for an ecologically sound and highly energy efficient industry of the future producing useful products. We deplore the signs that the military/industrial powers are moving into the field to distort the technology into the manufacture of commodities of war.

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Willberforce no ape

SIR — Wrangham's publication (*Nature* 18 September)¹ of the hitherto unknown verses of Willberforce is interesting and valuable. Unfortunately he repeats the story that Willberforce played into Huxley's hands, and Huxley scored a great victory. Neither of the two journalists present thought he had. Nor did Joseph Hooker, writing to Darwin the following evening; he thought that Huxley had done well but that it was he, Hooker, who had made the case for darwinism². Lyell thought so too³.

Willberforce was not an obscurantist. In his review of the *Origins of Species* he was at pains to emphasize that Darwin's theory should be judged only on scientific grounds⁴. Willberforce allows that Darwin's theory could be true, and "if Mr Darwin can . . . demonstrate to us our fungular descent, we shall dismiss our pride, and avow, with the characteristic humility of philosophy, our unsuspected cousinship with the mushrooms" (ref. 4, p. 231). Willberforce objected that Darwin had not, in 1860, made out his case, and that there were serious difficulties, in view of the known stability of species, in supposing

that one species could be transmuted into another.

These were serious scientific arguments, worthy of a vice-president of the British Association. Darwin acknowledged their cogency⁵. It was not really until the 1940s that they were adequately answered. Although now we can say with confidence that Darwin was right and Willberforce wrong, Willberforce was not being wrong-headed. On the evidence available at the time, his was a perfectly reasonable position to take, and the one taken by most scientists⁶.

It is doubtful that Willberforce asked Huxley whether he was descended from an ape. It makes a good story, but Willberforce had used the *first* person plural in his review, and the use of the first person is borne out by Willberforce's biography and one — admittedly late — account⁷. What Willberforce may have asked Huxley in the second person is where he drew the line between human descendants and ape-like ancestors, if, as was generally admitted, the offspring was of the same species as the parents⁸. It is an instance of the Sorites fallacy, of which biologists are impatient, but which has been much discussed by logicians in recent years. Huxley, however, was ready to answer the question he had not been asked. Three months earlier, in the April issue of the *Westminster Review*, he had accused the critics of Darwin of making him out to be no better than an ape himself, and since Willberforce was now criticizing him for being a darwinian, he must be calling him an ape too.

Willberforce was, as Wrangham says, both honest enough to see the force of the arguments in favour of evolution and sensitive to some of its implications — not so much theological as human. In 1860 genetic arguments were being adduced in the United States in defence of slavery, and Willberforce had in his review a witty passage about the colour prejudices of ants, who always have black ants as their slaves (ref. 4, p. 253-254). Evolutionary arguments could be used — in our century have been used — to justify the degradation of man. Willberforce realized, as these verses show, that a theory's being uncomfortable does not preclude its being true, but that its being true does not prevent its being uncomfortable.

One other moral may be drawn. Science cannot flourish without scientific controversy, and in every scientific controversy most of the views canvassed will ultimately be shown to be wrong. Nobody holds it against Einstein that he confessed himself unable to believe in a dice-playing God. Why is not equal charity extended to Willberforce's contribution to the British Association?

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1. Wrangham, R.W. *Nature* 287, 192 (1980).
2. Huxley, L. *Life and Letters of Sir Joseph Dalton Hooker* Vol. i, 525-527 (1918).
3. Mrs Lyell, *Life of Sir Charles Lyell* Vol. ii, 335 (1881).
4. Willberforce, S. *Q. Rev.* 180, 256 (1860).
5. Darwin, F. *Life and Letters of Charles Darwin* Vol. ii, 324-325 (1888).
6. Carter, G.S. *A Hundred Years of Evolution*, 70 (1957); *The Athenaeum*, 1707, 19 (1860).
7. Willberforce, R.G. *Life of Bishop Willberforce* Vol. ii, 451 (1881); Tuckwell, W. *Reminiscences of Oxford*, 51-52 (1900); but see Fawcett, H. *Macmillan's* 111, 14, 88 (1860).
8. Huxley, L. *Life and Letters of Thomas Henry Huxley* Vol. i, 185, quoting Vernon Harcourt.