

correspondence

Science with public appeal

SIR,—I think your criticism of the BBC's programme, *The Key to the Universe* (3 February, page 393) was unfair to say the least. Nigel Calder did not make any "fundamental mistakes", especially in underestimating the serious mindedness of the audience. Indeed his refreshing attitude encourages the public to take a greater interest in science—we would soon fall asleep (at least I would) if the programme was presented in the way you implied in the article. These two-hour programmes are occasional: they are not the same as *Horizon* and they add a new look to the debate.

I think you are making the fundamental error by assuming that "the uninitiated 99.9% of the audience can only have been thoroughly confused . . .". I did not find the order in which the programme was presented at all confusing. Your leader writer should watch it again as a member of the public and not as a cynical critic.

G. MARKS

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SIR—In your editorial, "That was the weak force, that was" (3 February 1977), you make a strong criticism of Nigel Calder's two-hour BBC2 brain-teaser, "The Key to the Universe." You ask, in effect, not only whether it was worth the resources devoted to it, but also whether it might not contribute to the further alienation of many people from science.

These are important questions to which we have no answer. In this regard the BBC fails us entirely. We are not told how much in financial terms such a two-hour programme costs; we do not know whether the key criterion of 'worth' may not be measured solely by audience ratings; and we are completely in the dark about the effect of such programmes on the general viewing audience. That Calder's book of the same title is high in the *Sunday Times* best-seller list tells us nothing about the TV programme except that it surely helps to sell the book.

The non-scientists with whom I watched the programme confessed that apart from the presentation of the 'black holes,' they were baffled. I found the jargon familiar, but I disagreed with some of Calder's emphases. I think he made too much of the tentative, of the as-yet unaccepted, as

in Salam's exposition for example. In that sense, it was difficult to distinguish the 'real' from the 'unreal.'

I have said before that the populariser of science, as he functions today, cannot disseminate the subtle ideas of science; that these really cannot be understood without hard, disciplined effort. We need a research programme on this thesis. The BBC (and ITV) might consider funding that part of it concerned with the presentation of science on TV and radio. Such a proposal concerns the key question of what the presenters of science are really providing, not only in terms of good, entertaining viewing, but also in their contribution to general understanding *en route* to involving the public in decision-making about the use and impact of science in everyday life.

MAURICE GOLDSMITH

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Tidal energy

SIR—Your leading article (10 February 1977) refers to the 'severe defect' of the periodicity of the tides being not always in phase with the daily load cycle, but nearly 40% of our electrical energy is used for space and water heating where the 'defect' is not at all severe. The use of blocks of tidal energy produced in regular and predictable amounts, both in time and quantity, is now perfectly feasible in the British system, and as installed capacity increases (if indeed it does increase), will become easier rather than harder to absorb. This is without the addition of any further pumped-storage capacity.

The reasons why the French have not proceeded with the Iles de Chausey scheme have nothing to do with the foregoing point, since La Rance incorporates a pumped-storage capability to provide power capacity in phase with peak-demand—if that is what the operators require. (Incidentally La Rance is presently using peaking system energy to pump on those occasions when so doing produces more energy overall.) The reasons are both economic and oceanographic, since the inclusion of sophisticated pumped-storage facilities made La Rance so expensive as to discourage further investment in tidal energy, coupled with fears that a much larger scheme might

have reduced the tidal range.

The defects of pumped-storage in estuarial schemes are primarily cost, since such facilities can be provided more cheaply on land (as at Ffestiniog or Dinorwic) or underground, and secondly because the important function of system spinning reserve is unavailable from a tidal pumped-storage plant without loss of available energy. The arguments are all developed in the technical literature and it behoves your leader writer to give it more than a cursory examination before committing himself to a particular solution.

The proposed Severn scheme your article describes is one of at least six proposals made in the last few years, all of which deserve examination in the light of system requirements. It will do the cause of tidal energy no good if a scientific journal of your reputation appears to be prejudging the solution to what is a most complex problem.

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Geothermal electricity

SIR—Recent studies of potential UK geothermal heat sources (for example, Oxburgh *Nature* 262, 526; 1976) have been virtually unanimous in stating that temperatures greater than 200 °C would be required from sources intended for electricity generation. A report produced by Patscentre International has shown that, contrary to this general view, it may well be possible to accept a much lower temperature limit. If it can be combined with a fossil-fuel source in an existing or purpose-built power station, geothermal heat in the temperature range of 100–200 °C could be economically used for electricity generation.

In modern steam plants most of the feedwater heat is supplied by low-

Correction

A bad telephone line helped to produce three errors in the article 'Give us a call, says NASA' (10 March, page 112). The Viking chief project scientist is Dr Gerald A. Soffen, not Dr Soffes; the Kyoto meeting will be in the first week of April, not in June, and will be organised by the International Society for the Study of the Origin of Life; and the Tel Aviv meeting in June is the COSPAR and not the pulsar meeting. Sorry.