

Mauna Kea best for new telescope?

SIR — A recent leading article in *Nature* (17 February, p.561) exposes the bad choice of original site for the Isaac Newton Telescope and this prompts me to draw attention to a likely mistake which could be made in locating the proposed UK millimetre-wave telescope. Mauna Kea in Hawaii appears to be the site now favoured but until the real properties of this site and its competitors are sufficiently investigated this choice should be questioned.

Millimetre waves are appreciably absorbed by water vapour and high altitude sites are chosen to minimize water amounts. However, measurements at several high sites, including Mauna Kea, have shown that the actual absorption can be higher than is predicted from the known amounts of water. While there is general agreement on the existence of an excess absorption, the nature and cause of it are controversial. But there is little doubt that the additional atmospheric phenomenon can, in some conditions, become the dominant factor in reducing atmospheric transparency to millimetre waves and this would be a serious impediment to would-be observers.

The UK millimetre-wave telescope project was started in the late 1960s following the discovery of a galactic carbon monoxide. I recall being asked by J.F. Hosie, then in charge of astronomy at the Science Research Council, if, when I joined the council's Appleton Laboratory in 1972, I would be willing to have a major involvement in the project because funding had been agreed and delay in building was giving him concern. In the event the then director of Appleton Laboratory, the late J. Saxton, took personal charge of the project and I was not involved. I did, however, persist in stressing the need for site evaluation and a 3-week measurement programme at Mauna Kea was agreed. The findings, reported in *Nature*¹, confirmed that Mauna Kea could be afflicted by excess absorption. They also gave indications that the source of the extra absorption was localized in the vicinity of the observatory.

I became convinced that there was a strong scientific case for investigating as an alternative the properties of desert sites at medium altitude, notably Kitt Peak. The succeeding director of Appleton Laboratory, F.H. Horner, refused to support this and comparison of maritime and desert sites has yet to be done. Failure to provide a rational basis of choice for siting a multi-million pound installation seems to be irresponsible. Whether the telescope should be built at all 12 years or more after it was conceived is questionable, but if the vested interests in it prevail, the taxpayer has a right to expect from the scientific community that all reasonable steps have been taken to prevent a second fiasco in locating a major astronomical facility. There can surely no longer be any hurry to

complete the millimetre-wave telescope — it still has 10 years to go to match the time taken to complete the Isaac Newton Telescope.

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No delay on LEP

SIR — We were greatly surprised, at the French Ministry of Research and Industry, by your news item "Delay at Geneva", in the 10 February issue of *Nature* (p.459).

Talking about LEP, you state that "instead of final approval coming from the French constitutional court in the spring, as expected, it might not arrive before the end of the year". This assertion is completely wrong: the Conseil d'Etat (not the Constitutional Court, which has nothing to do with such problems) will be in possession of all documents shortly and approval is expected within a few weeks, using a procedure of emergency. The decree of "Déclaration d'Utilité Publique" will be signed immediately after by the prime minister.

Of course, the installation of such a large device as LEP may cause some trouble — and also bring some advantages — to the inhabitants of the Pays de Gex. This is why, in our country, very serious procedures have to be gone through before approval can be given, the most important ones being the "Etude d'Impact" and the "Enquête publique". So far all these procedures have taken place according to the law, without significant departure from the time limits predicted a year ago. If the construction of LEP is subject to delay, it will not be because of the approval procedure.

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No to astrology

SIR — In seeking to defend astrology¹ Richard A. Batchelor makes several errors.

He offers spurious accuracy to the pseudoscience by noting that astrology is "based upon a unique permutation of 10 planet positions \times 12 zodiac signs \times 12 'houses' calculated from birth time, birth date and place". He does not even mention the myriad disagreements between astrologers about the nature and import of the various houses and planetary aspects, nor that the most commonly used systems deprive whole nations of any astrological destiny by virtue of having no houses in which to place their guiding planets².

He further asserts that astrology's credibility lies in "empirical evidence". The most thorough review of which I am aware³ indicates that the vast majority of actual studies find no evidence whatever in

favour of astrology. J.H. Nelson's oft-cited work on planetary alignments and radio-wave propagation⁴ is mentioned favourably. But the demonstrated correlation is the product of a simple statistical error^{5,6}, a discovery that has been widely published⁷.

Batchelor's jibe about the sixteenth century church reminds me of Stephen Jay Gould's remark⁸, "a man does not attain the status of Galileo merely because he is persecuted; he must also be right".

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Tackling homology

SIR — In entitling their article "Functionally homologous cell cycle control genes in budding and fission yeast", Beach *et al.* (*Nature* 23/30 December 1982, p.706) erred in their usage of the term homology. Such usage reflects a common confusion about the relationship between function and homology. Their finding that the *cdc 2* gene of *Schizosaccharomyces pombe* and the *cdc 28* gene of *S. cerevisiae* perform similar functions indicates only that they serve functionally analogous roles. The authors' further contention that the genes and molecular mechanisms controlling the initiation of mitosis in *S. pombe* and *S. cerevisiae* were highly conservative through evolution, and thus homologous, is an entirely different issue. In failing to keep their study of function separate from their speculation on phylogenetic similarities, the authors used the unpalatable phrase "functionally homologous".

If similarity of function is accepted as a criterion for the determination of homology, the term will cease to be of use to biology as it will no longer differentiate between characters inherited from a common ancestor and those which arise from convergent evolution. Furthermore, to describe the relationship between the *cdc 2* gene and the *cdc 28* gene as one which lacks "sequence homology" but is "functionally homologous" implies that these are different "kinds" of homology. Qualifying homology in such a fashion is like describing the wings of all the flying creatures in the animal kingdom as "functional homologues". In some instances they would be homologous, in others not; but function would never have anything to do with it.

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