

Children judge by the length

SIR—McGonigle in *News and Views*¹ refers to Piaget in support of the statement: "Asked to determine which of two rows of objects has 'more', four-year-old children tend to base their judgement on the shape of the set, selecting the more extended row and thus appearing to treat discontinuous quantities as continuous ones."

My recent research² questions whether the children are in fact treating the set as continuous. When three- and four-year-olds were provided with a number display while they counted the two rows, they correctly chose the shorter, more numerous row as having 'more'. The number display helps the children remember not only the number sequence but also how many objects were in each set.

Counting provides a less tangible cue to number than does a perceptual cue of length. When children select the longer row inappropriately, it may not be because they are treating the quantity as continuous: they may understand the discontinuous nature of the set but judge their own counting as a less reliable source of information about number than their judgement of length. Increasing the reliability of their counting by providing a visual aid increases the use of counting as a cue to judging number. Similarly, if children are provided with feedback showing them that counting is a more reliable cue to number than is length of row, they spontaneously start to count more often³.

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Iridium, impacts and para-volcanism

SIR—If the iridium (Ir) anomaly reported¹ at about the Permian-Triassic boundary proves reproducible, it will provide another sort of evidence against the hypothesis that the Ir anomaly at the Cretaceous-Palaeogene boundary is due to an impact of an extraterrestrial body.

These two boundaries are at, or very close to, the culmination of what may be the two (or two of the three) largest regressions of the sea since at least the early Palaeozoic, each regression lasting several million years². If it is difficult to accept a coincidence in one case, the difficulty is squared for both cases together. With the reported finding by Kyte of no detectable anomalies after the Cretaceous in one core^{3,4}, although with a moderately high threshold of detectability, these two cases are the only ones known where Ir anomalies are presumably more than re-

gional. [The Permian-Triassic section sampled is in the only region known to have a more or less complete sequence, so the greater geographic extent of the anomaly must remain only a plausible hypothesis; nevertheless this anomaly is not known to be absent anywhere. The late Devonian Ir anomaly⁵ was concentrated by a blue-green alga and can be compared to the very much greater concentration reported⁷ in a kerogen in the early Late Permian Kupferschiefer. Another study of the Late Devonian elsewhere found no Ir anomaly (ref. 8, quoted in ref. 9).]

Obviously an impact could not have caused a regression which long preceded it in time, although it might somehow trigger an extended transgression. It is, though, conceivable that unusual paravolcanic activity could be coupled to a regression, although I know of no mechanism for either the coupling or (if one centre is involved) for the widespread distribution of ejecta.

I thank F.T. Kyte for comments.

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The fall of the Grand Menhir

SIR—Bahn¹ has alerted us to the recent discovery by Le Roux² that the capstone of the passage grave of La Table des Marchands at Locmariaquer in Brittany and a capstone of the dolmen at Gavrinis fit together and were once part of a single menhir which, when joined to another apparently related granite fragment used as a capstone in the long tumulus of 'er-Vinglé', north of Le Grand Menhir Brisé, would have stood about 14 m high, 3.7 m wide and 0.8 m thick and weighed about 100 tons. Carved decorations on the Gavrinis capstone include a *hache-charrue* (axe-plough, or hafted axe with a loop on the back of the haft), of which E. Shee Twohig states there are only five known examples³ including the one found by Minot⁴ on the Grand Menhir Brise, which lies broken in four fragments near Table des Marchands.

If we accept the authenticity and interpretation of the carving on the Grand Menhir Brisé as a *hache-charrue*, Le Roux's discovery requires reconsideration of previous suggestions as to the date and

function of the Grand Menhir, including the one made by A. S. Thom and me in 1980⁵ that the Grand Menhir, over 20 m long, was originally quarried, shaped, transported and erected to serve as a universal foresight, standing above the horizon when viewed from any direction, and may have been used by its erectors as a lunar observatory to predict eclipses. Taking into account changes in the obliquity of the ecliptic and the location of existing structures which could have been used as backsights, we suggested a possible date of erection of about 3700 BP. We concluded that the Grand Menhir probably fell either due to seismic activity or to a very powerful wind and lightning explosion at an unknown date prior to AD 1483.

It has been estimated that the dolmen at Gavrinis may have been constructed about 5200 to 5000 BP^{1,2}. Thus, the Gavrinis-Locmariaquer menhir probably was shaped and raised at least 5,000 years ago.

In view of Le Roux's new discovery, it is possible that the Grand Menhir was shaped and raised about the same time as the Gavrinis-Locmariaquer menhir or earlier, and may have been felled by the same force that felled the Gavrinis-Locmariaquer menhir. However, if the Grand Menhir fell at the time of the fall of the Gavrinis-Locmariaquer menhir, why were only fragments of the latter menhir reused as capstones in the construction of burial chambers, and the fragments of the Grand Menhir left undisturbed? Perhaps the answer is that the Grand Menhir fell sometime after the fall of the Gavrinis-Locmariaquer menhir and after the period of chamber tomb construction at Locmariaquer and its vicinity.

Is there a connection between the Gavrinis-Locmariaquer menhir and the Grand Menhir? It is possible that the erectors of the Gavrinis-Locmariaquer menhir had intended it to stand above the horizon when viewed from all directions and found it to not be high enough. They may have then erected the Grand Menhir sufficiently high for that purpose.

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Powers of ten wrongly expressed—Corrigendum

In this piece of Scientific Correspondence (by C. Liébecq, *Nature* **314**, 586; 1985) the last-but-one line should read: 'right-hand side equation (2) by 10⁶ (not 10³ as printed).