suggesting that it can be rooted along the guinea-pig lineage supporting the polyphyly of Rodentia. Following their four-taxon method of analysis using two rodent suborders, a reference order and an outgroup, the same root as found by them is supported by our second analysis, with either reference order although by only one extra mutation apiece (*b* in the figure). The presence of statistical support for the eutherian orders implies that greater support for a root will be forthcoming when a more closely related outgroup is used. Comparable sequence data for a metatherian or edentate are therefore expected to provide a robust solution for the location of the root, and thereby a better test of rodent polyphyly.

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Naming of the species

SIR — This is an appeal to molecular biologists presenting phylogenetic trees, in particular, that they give for each organism studied its genus and class (for example *Crepis*: Angiospermae), and not just its generic initial and specific name (as is done all too often nowadays). When we now read of *C. elegans*, *C. eugametos*, *D. discoideum*, *D. melanogaster*, *E. grandis*, *E. coli*, *H. haemophilus* and *H. sapiens*, not everyone can tell which are worms, flies, ferns, algae or bacteria. Details of species and strain should be presented in a table or in footnotes: not all conspecific individuals are genetically identical.

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Lack's solution?

SIR — David Lack's paper¹ on the evolution of clutch size is one of the classics of evolutionary ecology. The Science Citation Index lists 398 references for the years 1985–89 to either this paper or Lack's book², which brought his ideas to a wider audience. Yet Lack's key insights on clutch size are indistinguishable from those of the unknown British ornithologist Eric B. Dunlop, published 34 years earlier³.

The nub of the hypothesis about optimal clutch size, which has become known as "Lack's solution"⁴, is that there is a trade-off between the number of eggs laid and the prospects of survival of individual chicks. If a bird lays too few eggs, it will leave few breeding offspring, yet if it lays too many, each young will receive too little food to have a good chance of survival. Thus there should be an intermediate clutch size which will maximize fitness. The greatest insight is that by laying fewer eggs a parent might leave more surviving offspring. Did Dunlop publish these insights? The answer is clear: he did. He was astonished at the frequency of starvation amongst late-hatching nestlings within broods of the rook, and this led him to make general comments about the many species of birds in which the starvation of late-hatching nestlings is common³.

... Now, if fewer eggs had been deposited and only the young hatched which would eventually have a reasonable chance of being reared, it would be greatly to the advantage of the individuals involved, for all the food brought by the parents would be divided amongst vigorous offspring and these would all receive a larger share than if there were more mouths to be fed, therefore these young would have a much better start in the world than those reared where there were young to be fed unprofitably and to some extent at the expense of the older nestlings. The adults also would benefit, for they would in all probability be relieved to a certain extent in their search for food, and yet would easily provide a larger amount for each individual of the smaller number of young.

This being so, it is clear that a reduction in the number of eggs laid would be of great value in such cases...

Dunlop then argues that in some species of Sulidae (gannets and boobies) a clutch of one has evolved from a clutch of two. Dunlop's prescience in the field of evolutionary ecology was thus as extraordinary as was the length of his sentences. But his life was short, as he was killed in the First World War at the age of 30, an acceptable excuse for not pursuing his ideas.

So should the idea of an optimal clutch size be called 'Dunlop's solu-

tion'? Perhaps, but such an historical retread may be unwelcome to the many evolutionary ecologists who have taken inspiration from Lack's work.

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Unpredictable earthquakes

SIR — In his commentary article¹, Geller stated that "the Japanese earthquake prediction plan (JEPP) has achieved no significant progress. Even now, no consensus exists on whether earthquake prediction is possible" and "Empirical earthquake prediction seems to have come to a dead end." The JEPP was established in 1965. Since then I believe that significant progress has been made in developing prediction technology and in earthquake research in general. The JEPP has been of great importance to related solid Earth sciences, particularly to seismology.

There have been many domestic and international meetings where significant progress in earthquake prediction research has been reported^{2–4}. Some earthquakes have actually been successfully predicted. Short-term prediction for the M7.0 Izu-Oshima earthquake in 1978 was issued by the Japan Meteorological Agency 1.5 hours before the event⁵.

There is a clear consensus that the state of the art in predicting earthquakes has progressed to the level that short-term prediction for a great interplate earthquake, the so called Tokai earthquake, can probably be made using the present instrumental networks, although neither the current state of knowledge nor the distribution of instrumentation permits useful prediction on a routine basis except for this earthquake. Precursors to an earthquake do not always occur but are very complex in their dynamics. Thus the practical approach to prediction is thought to be stochastic.

The JEPP emphasizes the observation of crustal activity over a long period of time. There have been many new discoveries of precursory phenomena of earthquakes. We found more than 10 different types of precursors to the 1978 Izu-Oshima event and to the 1989 seismo-volcanic activities, including an M5.5 earthquake and a volcanic eruption off the Izu peninsula. These included geochemical, geodetic, geoelectromagnetic and seismological anomalies. A proposed magma intrusion model quan-