

How new technology put a coelacanth among the heirs of Piltdown Man

Sir— Biology has endured a long history of fakes, ranging from Piltdown Man to feathered dinosaurs. Often meticulously crafted, these frauds were not always easy to detect.

Fortunately, technology has provided an arsenal of forensic tools that help reveal such fakery. But now digital imagery and powerful, simple-to-use photo-editing software present a new opportunity for scientific forgery. In the hands of a skilled user, this software can be used to produce almost imperceptibly altered fake photographs¹.

Fortunately, the Séret, Pouyaud and Serre image² (purporting to show a coelacanth captured in the Bay of Pangandaran off southern Java in 1995) does not fall into this category. It is clearly an altered copy of a photograph of a live coelacanth taken by M.V.E. on 30 July 1998 off Manado Tua and printed in *Nature* soon afterwards³.

While we would not be surprised if coelacanths turned up elsewhere in Indonesian waters, Pangandaran does not seem to be a likely location. Unlike the steep volcanic slopes of Manado Tua and the Comoro Islands, where populations of coelacanths are known, Pangandaran is a shallow, muddy bay.

Interviews with local Pangandaran fishermen and both the current and the 1995 chief officers of the Pangandaran Fisheries Department, by M.V.E. and scientists from the Indonesian Institute of Sciences, revealed no evidence of past coelacanth catches and no familiarity with the fish. Neither were the fishermen or fish vendors familiar with two common 'indicator species' of potential coelacanth habitat: deep-water snappers (*Etelis* spp.) or the oilfish (*Ruvettus pretiosus*).

This is not surprising, as the fisheries in the Pangandaran area consist primarily of shallow, level-bottom trawlers and open-water pelagic purse seines and longlines, with no evidence of the deep-water fishing gear that typically results in coelacanth bycatches.

Much has been made of the nationalistic animosity that has tainted the saga of the coelacanth. In our opinion, nationalism plays no role in good science, and is irrelevant in chance discoveries such as that of the Indonesian coelacanth. As scientists it is our responsibility to study and conserve. The Indonesians and Comorans are rightfully proud of efforts in their two countries to preserve these rare and very special fish. What

pride can we in the western scientific community take in this affair?

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1. Hayden, J. E. *J. Biocommunication* 27, 11–19 (2000).
2. McCabe, H. & Wright, J. *Nature* 406, 114 (2000).
3. Erdmann, M. V., Caldwell, R. L. & Moosa, M. K. *Nature* 395, 335 (1998).

Assessors' odd listings don't inspire confidence

Sir— The assessment of research in Spanish universities, and the (lack of) consideration of scientific qualifications in appointing tenured faculty members have been the subject of commentary in *Nature* on several occasions^{1–8}. Commendably, the Catalanian government has now published a proposal for assessing individual research performance in social sciences and humanities (www.gencat.es/dursi/sisav.htm). This has been drafted by a panel of experts and faculty members, who have been holding meetings since 1997.

The proposal includes a four-category ranking of journals in psychology and related fields (www.gencat.es/dursi/sisav_i_12.htm). The top category reportedly includes top-quality international journals with the highest impact indices in their fields, whereas the bottom category includes journals lacking a rigorous peer-review process.

Notably missing are journals such as *Nature*, *Science*, *Vision Research*, *Visual Neuroscience*, *Spatial Vision* or the *Proceedings of the National Academy of Sciences*, to name but a few — although the top category includes the hitherto-unknown "Nature Neuropsychology". Also in the top category is "Journal of Experimental Psychology Human" while the bottom category lists "Journal Experimental Perception Performance". One wonders whether the genuine *Journal of Experimental Psychology: Human Perception and Performance* would have fallen into the top or bottom category if it did appear.

Again, the top category contains "Journal of Experimental Psychology Learning", whereas "Journal Experimental Psychology Learning Memory Cognition" only makes it into the bottom category. Where would *Journal of Experimental Psychology: Learning, Memory and Cognition* have appeared?

The second-best category includes "Applied Psychology Measurement", whereas the real *Applied Psychological Measurement* is in the bottom category. There are myriad cases of this type.

As a psychologist who has always wished for research performance to be judged on the basis of well-pondered information, I can only hope that the ultimate ranking of journals will be made by strict adherence to

relevant criteria, and by a panel that shows evidence of knowing what journals exist.

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1. *Nature* 396, 709 (1998).
2. Bosch, X. *Nature* 396, 712 (1998).
3. Escartin, J. *Nature* 401, 112 (1999).
4. Bosch, X. *Nature* 401, 419 (1999).
5. Bosch, X. *Nature* 402, 848 (1999).
6. *Nature* 404, 211 (2000).
7. Mira-Pérez, J. *Nature* 404, 222 (2000).
8. Bosch, X. *Nature* 404, 425 (2000).

Reductionism should be clarified, not dismissed

Sir— John Ziman, reviewing Norman Levitt's book *Prometheus Bedeviled* (*Nature* 404, 811; 2000) calls reductionism a "busted flush". But what is reductionism? Molecular biologists in particular tend to be accused of it, but they do not hold the naive view that complex structures and processes are just sums of their parts, with the implication that one can neglect what are sometimes called 'emergent properties'. Biochemists and molecular biologists are now preoccupied with macromolecular complexes, trying with some success to explain how their amazing activities emerge from molecular interactions.

What the so-called biological reductionists believe is that it is possible in principle to explain (not usually predict) the interactions within complex systems in terms of the universal principles of chemistry and physics. There is nothing to show that this kind of reductionism is wrong.

It does not imply that the molecular analysis is going to be easy. Evolution has produced systems of infernal complexity, and molecular biologists analyse them as best they can, in the belief that even partial knowledge is worth having. Of course, for many practical purposes one has to rely on generalizations at more superficial or, if one prefers, higher levels, leaving deeper analysis for the future. Some people hope for the emergence of new laws of physics that will simplify complex systems, although it is difficult for most of us to believe that this will ever happen. The other means of escape from the hard work of molecular analysis is vitalism, nowadays more implicit than overt: the feeling that the molecules of life must be imbued with some essence that science cannot reach.

Arguments about reductionism would be more valuable if there were greater clarity about what it is, and what its critics would like to have instead.

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