

Comments on One Creationist's Palaeontology: A Reply

DR JOHN LESLIE and DR ANDREW SNELLING

We are grateful to Dr Kurt Wise for his helpful critique of the discussion of the fossil record in Leslie's paper on cellular metabolism.¹ Creation science can only benefit from this kind of self-correcting interchange.

However, a word of caution is necessary. While we applaud Wise's effort to express himself exactly (we **must** write what we mean and mean what we write), we maintain that by perhaps being overzealously pedantic he may have caused potentially hurtful misunderstandings. We feel that he should have taken into account the vein in which the original discussion of the fossil record was made in a minor part of a major paper. This is not to excuse any lack of exact expression, or any misrepresentation of punctuated equilibrium and evolutionary theory — just a plea for a better understanding of the context in which the comments were made. Wise may not realize that the comments in that paper do reflect the perception of many 'lay' scientists (that is, scientists trained in other disciplines) of what punctuated equilibrium and evolutionary theory are. If their perception is wrong, and Wise is saying it is, then this is of course lamentable and deplorable. We would respectfully suggest, however, that the blame may in fact lie with the specialists who have obviously failed to communicate to their fellow scientists exactly what their theories are, and are not. Yet it is obvious, particularly as no doubt Wise is correct in many of his criticisms, that 'lay' scientists will have to be more careful to thoroughly understand their specialist brothers.

LIVING FOSSILS

Wise's comments on the Table of living fossils are useful and his corrections helpful. We do not doubt that in the strict sense of exactness he is right. However, the Table was constructed by consulting the literature, so the writers consulted stand to be corrected too.

Yet by being pedantic, Wise may have missed a main thrust of the creationist argument with regard to living fossils. To be sure, *Neopilina galathea* does not have a fossil record, but do the differences between it and other members of the genus *Neopilina* constitute variation within a 'Genesis kind' (or microevolution, for want of a better term), or does each species within the genus repre-

sent a separate 'Genesis kind'? If the answer is that the living species *Neopilina galathea* represents the end-product (today's sole representative or the sole survivor) of variation within a 'Genesis kind', then *N. galathea* is a living fossil, since the other members of the genus who are found in the fossil record (unlike *N. galathea*) are genetically linked to it within the same 'Genesis kind'. Surely this is the point creationists are making with respect to living fossils — there has been no macroevolution within the genus with time, in spite of the morphological change seen in the fossil record. It isn't just a matter of change, but the nature of that change. However, if Wise means that only the genus *Neopilina* should have been listed as the 'living fossil', then his point is taken.

The Table in the paper was inappropriately headed 'Animals and Plants that have not changed morphologically' and this has obviously generated the confusion and misinformation. Wise has highlighted this, and the point that was really trying to be made, when he recognizes that the genus *Lingula* is a living fossil although within that genus there has been morphological change with time. It is also regrettable that inaccurate times of first appearance were listed in the Table, but we can only submit the excuse that these were the data in the references consulted.

PUNCTUATED EQUILIBRIUM

If one accepts two assumptions, then punctuated equilibrium becomes testable (even verified):—

- (1) Given organisms with different traits (morphologic, genetic) greater than that expected from simple variation are found in different stratigraphic layers, one might assume progenic relationships if the similarities are 'substantial' enough to meet one's arbitrary criteria; and
- (2) The stratigraphic layers were largely sequentially laid down over separate distinct and long periods of time.

We simply do not accept these non-verifiable assumptions, and we feel that neither does Wise. At least Wise admits that 'the proponents of punctuated equilibrium have been largely responsible for the confusion about what punctuated equilibrium is', so creationists can

hardly be blamed for being confused and/or misrepresenting it.

In the first instance, we would counter Wise's accusation of an inaccurate understanding of the theory of punctuated equilibrium by pointing out that what was reported was gleaned from the literature! That Goldschmidt promoted the 'hopeful monster' concept can hardly be in dispute, and even Wise reiterates this. As Gould points out:

*'He (Goldschmidt) broke sharply with the synthetic theory, however, in arguing that new species arise abruptly by discontinuous variation, or macromutation. He admitted that the vast majority of macromutations (for example, two-headed turtles and two-legged sheep) could only be viewed as disastrous — these he called "monsters." But, Goldschmidt went on, every once in a while a discontinuous macromutation might, by sheer good fortune, adapt an organism to a new mode of life, a "hopeful monster" in his terminology. Macroevolution proceeds by the rare success of these hopeful monsters, not by continuous small changes within populations.'*²

Next, we need to realize that how one views what is meant by 'change is rapid and extensive' may in fact be a matter of semantics — an evolutionist would regard changes over a period of 500,000 years as geologically 'rapid', but we, and no doubt Wise, would call such changes slow indeed. Gould even uses this term 'rapid':

*'As a Darwinian, I wish to defend Goldschmidt's postulate that macroevolution is not simply microevolution extrapolated and that major structural transitions can occur rapidly without a smooth series of intermediate stages.'*³

So what does Gould mean by 'rapid'?

'In his infamous book of 1940, Goldschmidt specifically invokes rate genes as the makers of hopeful monsters: "This basis is furnished by the existence of mutants producing monstrosities of the required type and the knowledge of embryonic determination, which permits a small rate change in early embryonic processes to produce a large effect embodying considerable parts of the organism."

In my own, strongly biased opinion, the problem of reconciling evident discontinuity in macroevolution with Darwinism is largely solved by the observation that small changes early in embryology accumulate through growth to yield profound differences among adults. Prolong the high prenatal rate of brain growth into early childhood and a monkey's brain moves towards human size. . . .

Indeed, if we do not invoke discontinuous change by small alteration in rates of development, I do not see how most major evolutionary transitions can be accomplished at all.⁴

This might not be as dramatic as a bird hatching out of a reptile egg, but Gould is talking about an adult giving

birth to an offspring that grows up to yield 'profound differences' as an adult, which is the rapid change of one generation (though not Goldschmidt's 'hopeful monster' *per se*).

SPECIES AND VARIATION

It is clear that Wise is correct in his claim that in the strict sense punctuated equilibrium is an observation of the fossil record. That is, most species do show limited to no morphological change throughout a long stratigraphic range ('stasis'), and most species 'appear' and 'disappear' 'suddenly' in the stratigraphic record, lacking morphological intermediates with any other species. However, all this is meaningless to any concept of macroevolution, whether punctuated equilibrium or gradualism, if the stratigraphic layers were nearly all laid down at the one time (during the Flood). In any stratigraphic sequence, any morphological differences between fossils within the layers have nothing to do with any evolutionary changes, since the organisms in question all lived, died and were buried, at essentially the same time — they were contemporaries, not ancestors. Perhaps all that such an occurrence would indicate is that the Flood waters had caused morphological sifting (or sorting) to occur.

Yet to an evolutionist this stratigraphic sequence would give the appearance of morphological changes between the fossils with time, as he sees it. However, if we are only talking about species variation between stratigraphic layers, then one could argue that this demonstrates microevolution, but it would hardly be 'proof' of macroevolution. This presupposes that what is meant by a species has been clearly defined, and here Wise presumably has adopted the definition of the evolutionary taxonomist. But in the creationist's view, the whole question of what constitutes a species must be reassessed in terms of the created 'kinds' of Genesis chapter 1, yet such a rigorous reassessment has so far not been forthcoming and remains a pressing need if a credible creationist biology is to emerge. (It should be noted that evolutionary taxonomy is also in a state of flux.)

Now any statement about morphological changes between fossils in a stratigraphic sequence assumes that the organisms concerned are/were related, but this may not be true. Very often, unless one has the living organisms to study one cannot be certain about establishing 'relatedness' between them, particularly in the present context of inferring that one organism has changed into another and so is thus presumably related by ancestry. (It's even difficult to establish relatedness amongst living organisms, which of course is one of the problems confronting creationists in their efforts to rigorously determine the boundaries between the created 'kinds'.) So how does one know which morphological changes constitute a transition between species, or whether such changes in reality only reflect variation within a created 'kind'? And

furthermore, if this is so, what morphological differences between a fossil and a living organism would disqualify the latter from being a living fossil when otherwise they are deemed by all to be related apart from those differences? Again we may be only dealing with variation in a created 'kind', which can be quite broad. The range of variability in some human features, for instance (e.g. the shape of the jaw arch), is greater than the variation of the same features between humans and apes, so if such should be the case between a fossil and a living organism, then even though they were morphologically different they would still be of the same species and the latter would have to be recognized as a living fossil. In other words, appearances can be deceiving, particularly with the often fragmentary nature of the fossil evidence.

The abrupt appearance and disappearance of most species in the fossil record have been variously interpreted by evolutionists in pursuit of explanations for mechanisms of what they believe are changes that have occurred between species with time. Wise has highlighted Mayr's peripheral isolate theory of allopatric speciation as the most popular explanation amongst evolutionary biologists of speciation. Such a view diverges from that of Goldschmidt (and Gould), even though Mayr's theory is not incompatible with punctuated equilibrium in the strict sense. Rather than a dramatic one generation change that is a 'big jump', Mayr suggests that changes bringing about new species are small in each generation ('small jumps') and that the complete process takes a few thousand or tens of thousands of years, still rapid in an evolutionary/conventional geological sense. But, whether one talks about one 'big jump' or many 'small jumps' over a short time, within a small population, such transitions are not unequivocally demonstrable in the stratigraphic or fossil record. So if one 'big jump' appears the same as many 'small jumps', given the evolutionary timetable, then the changes interpreted from the fossil record cannot arbitrate in one's choice of mechanism. In any case, the answer to the central question of the 1980 Chicago Conference —whether the mechanisms underlying microevolution can be extrapolated to explain the phenomena of macroevolution —was a clear, No.⁵ This is exactly Wise's point — 'this genetic aspect of punctuated equilibrium ... is most difficult to test.' Indeed, it is impossible to test in the past (in spite of attempts to infer it from the fossil record) and it is ever difficult to show in present organisms, there being very little data that empirically tests speciation.

EVOLUTIONARY THEORY — 'DIRECTION' AND GIANTISM?

Wise takes issue with the comment '*... if life arose from simple organic compounds to single-celled and then multicellular organisms that there would be a corresponding increase in both complexity and size* [of fossil

plants and animals]' and suggests that it falls short of an accurate understanding of evolutionary theory. Initially Wise admits that on one level the statement is correct, since '*if man evolved from molecules then the net change has been one of an increase in size and complexity*', but then he goes on to insist that '*evolutionary theory does not predict the direction of change at any speciation event*'. While we do not doubt that this latter statement on face value is true, Wise has managed to confuse the only issue being raised in the original comment (the 'one level' Wise acknowledges to be correct) by this hair-splitting approach. Regardless of the non-directionality of evolution at the speciation level, the net change is/has been a net increase in size and complexity, and that is an observation of the fossil record, otherwise (according to evolutionary theory) we would not be here.

In conclusion, Wise then suggests that '*Leslie also implies that the overwhelming percentage of plants and animals show giantism in the fossil record.*' This was certainly not the intention and it is unfortunate that Wise read this implication into the text. It was said that '*there are giant forms of many animals, plants and possibly men,*' and this was preceded by the comment '*the fossil record reveals many contradictions to this concept*' of simple to complex and smaller to larger. Thus by implication the point that was being communicated is that the giant fossil forms of animals and plants are these contradictions to the general trend in the fossil record, not the '*overwhelming percentage*' of Wise's imputation.

We can thus agree with Wise when he says:

'The truth is that it is probably only a minority that show this. Most organisms show no change at all, and many others show the opposite. . . . Amongst extinct groups the most consistent change in the fossil record is that of an increase in the size of representatives of a group with higher stratigraphic position.'

In other words, there has been a net increase in size with time if the fossil record is interpreted as a succession of 'ages', which is of course the point that was made before.

However, here is where confusion has entered the discussion from both sides because of the lack of clarification of details. Wise certainly agrees with us that there is giantism in the fossil record. If it had been more correctly stated in Leslie's paper that by animals was meant land (air-breathing) animals, then Wise would also agree that many (not all or the overwhelming percentage of) extant land (air-breathing) animals do have giant relatives in the fossil record. This is particularly so amongst Australia's marsupials and monotremes. Thus, while Wise quite correctly has said that '*the truth is that it is probably only a minority that show this* (giantism in the fossil record),' he (understandably) has not taken into account that because most fossils, probably about 95% (Wise's estimate⁶), are marine creatures, this fact 'skews the sample', so to speak, when one talks of 'animals' and really means just the land (air-breathing) animals (proba-

bly less than half the remaining 5% by number in the fossil record). Thus, if we ignore the marine creatures and just compare the extant land (air-breathing) animals with their fossil counterparts, then the record of giantism amongst the latter is significant to us as creationists. Many creationists have suggested⁷ that giantism amongst fossil land (air-breathing) animals reflects different, more conducive, atmospheric conditions prior to the Flood (due to the 'waters above'), their extant descendants being diminished by the harsher post-Flood conditions.

Note that this ignores the relative stratigraphic positions of fossil organisms. Thus, it may be equally true to say that 'the fossil record shows an increasing size trend with time' and 'the fossil record shows that on average pre-Flood land animals were larger than their present-day counterparts'. The lack of any real contradiction is because the former statement looks at their distribution within the fossil record, the latter does not. (It may be objected that the former statement depends on the fossil record being interpreted in the traditional way, and thus contradicts any statements dependent on the truth of the global Flood. However, Flood sequences are also, strictly speaking, a time sequence, albeit brief, in that the lower ones were laid down before the upper.) Wise was being technically correct in highlighting the former type of point, yet without further explanation such a comment risked giving the wrong impression to the non-specialist.

A PLEA

While we very much appreciate Kurt Wise's comments, since they have corrected misconceptions and misrepresentations that were inadvertently made, and have positively contributed to our understanding of punctuated equilibrium and the fossil record, in closing we would like to make one plea. Because of Wise's background, knowledge and experience with the fossil record and with taxonomy, could we suggest that he would make a further invaluable contribution to the creationist viewpoint by writing detailed papers on subjects such as the stratigraphic distribution of fossils and living fossils, and variation and the taxonomy of the created 'kinds'. In fairness to him, we know that such is his intention, so we look forward to his valuable input.

REFERENCES

1. Leslie, John G., 1986. Mutations and design in cellular metabolism. *EN Tech. J.*, 2:17–52 (pp. 47–49).
2. Gould, Stephen J., 1977. The return of hopeful monsters. *Natural History*, 86(6):22–30 (p. 22).
3. Gould, Ref. 2, p. 24.
4. Gould, Ref. 2, p. 30.
5. Lewin, Roger, 1980. Evolutionary theory under fire. *Science*, 210 (4472):883–887.
6. Wise, Kurt P., 1988. The Flood and the fossil record. Informal talk given at the Institute for Creation Research, San Diego (USA) on August 17, 1988.
7. For example, Beasley, Greg, 1990. Pre-Flood giantism: a key to the interpretation of fossil hominids and hominoids. *EN Tech. J.*, 4:5–55.