Correspondence

Comments on articles appearing in the magazine are always welcome, and should be addressed to the editor in whose section the article appears.

Science and the Bible

I found all the articles in the May Special Issue interesting in their differing ways. Several writers drew attention to assumptions and lapses of logic made in scientific arguments, and this is a proper thing to do. Indeed, it is an essential part of the scientific endeavour, and goes on continually in scientific journals. Without it, science would stagnate and there would not have been the extraordinary increase of understanding of nature that has occurred in the last four hundred or so years.

But, if we are going to join in this criticism, we must also be prepared for whatever case we are presenting to be analysed in like manner. With the accumulating evidence for an old earth and very old universe, I am thinking particularly of arguments put forward for interpreting Genesis 1 as requiring that all God's creative works took place within six consecutive days some 6,000 years ago, which I shall call the 'literal' view.

One line of argument for the latter view is that the evidence for the old view is unreliable. The examination of Carbon 14 dating in the article "Calibrated radiocarbon dating" is an example. And, yes, there is a wide margin of error in relation to that method. But other radioactive isotopes, such as uranium and thorium, with half-lives of hundreds and thousands of millions of years, are also used and yield very old ages for some deposits, including those without fossils. Again, for various reasons, the margins of error are wide, so it is possible that the ages are overestimated. But, for example, to bring the estimated ages of the oldest Cambrian rocks (around six hundred million years) anywhere near 6,000 years would require an accumulated error of enormous magnitude, which seems highly unlikely to say the least. It would be equivalent to reducing a Carbon 14 dating of 6,000 years to around twenty-two days.

Another way of dealing with the evidence for an old earth is to claim that there are ways of explaining it compatible with the literal view. The article, "What happened to the dinosaurs?", provides an example in the hypothesis that the fossils of dinosaurs were produced by the Flood. In the section of the article that deals with this there are at least seven assumptions, the first five indicated by the word "could", for which there is neither scientific nor Biblical evidence.

To be consistent, the hypothesis has to apply to all other fossils and all rock strata, including those without fossils. However, in some places (for example, the Grand Canyon) the strata are a mile deep, and there is no evidence that they were, or could have been, all laid down in the space of less than a year. There are also clear demarcations in terms of the kinds of fossils in different strata (see Brother Fowler's article, "Interpreting the fossil record", in the same issue), and again, there is no satisfactory explanation of how this could have occurred in one flood.

There is also the assumption that dinosaurs were in the Ark, I suppose interpreting the "every" of Genesis 7:14 as universal and absolute. The problem of the space they would take up is obviated by the further assumption that they would be young and small. But again, to be consistent, the large number of other relevant extinct species would have to be included, thereby exacerbating the problems of space and deposition of waste enormously. And where is the scientific evidence that all animals can go into a "dormant state", as suggested? Nor is there any suggestion of a miracle to this effect in the text. Indeed, the reference to food in 6:21 runs counter to it.

A third line that is followed is to claim that there is actual evidence which specifically supports the literal view. The same article again provides an example in the evidence brought forward for the coexistence of man and the dinosaurs—one set of supposed human footprints, and legends from pagan nations. But what credence can we attach to such flimsy evidence compared with the otherwise complete absence of human remains alongside the fossils of dinosaurs and other extinct species?

Other isolated evidence is sometimes presented, such as the shallow depth of dust on the moon, but such phenomena are relatively few in number compared with the mass of evidence

pointing to an old earth. A few exceptions are not automatically grounds for throwing out a theory supported otherwise by a large body of evidence. With almost every well-supported theory there are phenomena that do not appear to fit in. In time they may be brought in by the discovery of special factors or by the theory being modified in detail but not in principle. It is comparatively rare for exceptions to result in such a theory being completely discarded. The trend over time is towards theories which, in principle, become more and more firmly established, as with the age of the earth and universe.

Because of the continuing accumulation of evidence for an old earth and a very old universe, another view has become more prominent among adherents of the literal view, namely that God created the earth and the universe with 'an appearance of age'; that is, that on examination the earth appears to be much older than it really is. This was referred to in the opening article, "Framed by the Word of God: An introduction", and at the end of the article, "Calibrated radiocarbon dating" (p. 209). I suggest that this is altogether too facile a view, and has some disturbing implications.

Note first that it acknowledges that there *is* an appearance of age, which is tantamount to admitting that the mass of scientific evidence supports this view. As pointed out in a couple of articles, Brother Thomas, who as a doctor was a scientist, accepted the evidence in his day, and so much more has accumulated over the last 150 years. Why, if God created the earth only 6,000 years ago, did He not do it in such a way that when man began to investigate it, the evidence unearthed pointed unequivocally in *that* direction? Surely He could have done so? And likewise for the universe.

Secondly, the 'appearance of age' idea implies that God made things this way deliberately. Now it seems to be generally accepted that Romans 1:20 is teaching us that we can learn something about the Creator from examining His creation. But what is it saying about God if He deliberately created the earth and universe in such a way that when some of His creatures examine them they inevitably come to false conclusions?

Consider the following example of how false such conclusions could be. To account for the fact that, if the distant galaxies were created only 6,000 years ago, light emitted by them would not yet have reached us, it is argued that God could have put light between the galaxies and the earth at the same time. But this would mean that this light which we see today has only come from a maximum distance of 6,000 light years, instead of the vastly greater distances at which the galaxies exist. It follows that this light would not actually have come from anything. The large number of special phenomena, such as supernovae, apparently observed in these distant galaxies, would never actually have occurred. They, and indeed the observed states of the galaxies themselves, would be nothing other than illusions. Can we really believe that the God we worship would place such a mass of false information in the light which astronomers observe today?

Adam is sometimes brought forward as the paradigm for creation 'with an appearance of age'. This could engage me for several more paragraphs. Suffice it to say here that we do not know the details of how the first man was created, and we cannot actually observe him or any relic of him as we can the earth and the universe. So we are in no position to propose hypotheses about his creation and generalise them to the whole of Creation. He may be an exception.

If we find the evidence for an old earth and universe compelling, is there a way of looking at Genesis 1 which maintains the integrity of Scripture and science? Brother Nicholls, in "What happened to the dinosaurs?", while preferring the literal view of Genesis 1, mentioned two views, but they have serious flaws (p. 190). There are three others, proposed by Christadelphians, which are rather more plausible, and, I think, worth debating:

- Six days of revelation, in *Believing the Bible*, Alfred Norris (around 1950)
- Six days of fiat, in *Creation and Evolution*, Alan Hayward (1985)
- Six days of drama, in *A Drama of Creation*, Alan Fowler (1996).

In conclusion, consider the lessons to be learned from Galileo and the denunciation of his theories by the Catholic Church. Prior to the hypotheses of Copernicus, which Galileo developed, it was commonly believed that the earth was stationary and the sun moved across the sky. There are over fifty verses in Scripture 'given by the inspiration of God' which support this view, using such phrases as 'the rising' and 'the going down' of the sun; referring to the sun, unusually, as 'standing still' and 'going backward'; likening the sun to a strong man running a race; and, perhaps most significantly, saying

(in Ecclesiastes 1:5), the sun "hasteth to his place where he arose".

There is not a hint in Scripture that these statements were understood in any other way than at their face value, corresponding with the beliefs of other ancient nations. And, contrary to what our senses tell us, the only reason why we do not now take them literally can be summed up in one word—science; in particular, the theories of men such as Copernicus and Galileo. All of us are prepared to reject a literal understanding of over fifty Scriptural statements concerning a natural phenomenon. Nor is it a sufficient answer to the questions this raises to say that the language is simply describing how things appeared to men and women. By hindsight we now know that that is so, but it is also an admission that these descriptions themselves are not literally true.

The lesson from Galileo is, therefore, that we should be wary of accepting any Scriptural statements about the natural world as necessarily literally true, even though believed to be so for many generations. We should be prepared for the possibility that accumulating evidence from science may require us to view those statements in a different light. And the lesson from the Catholic Church in its attitude to Galileo is that those among us who hold to a Creation in six literal consecutive days of twenty-four hours 6,000 years ago should be wary of making heretics of those who do not share their view.

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I read with interest the article by Brother Alan Fowler, "Interpreting the fossil record", in the recent *Testimony* Special Issue, *Science and the Bible*. The author appears to interpret God's revelation of Creation in terms of the geological errors of orthodox geology. I believe, however, and proffer some of my reasons below, that the commonly accepted geological column with its assignments of ages and biological populations is far from established fact, and should in no way influence belief away from a literal six days of Creation.

Such use of evolutionary theory is made in interpreting geological data. The geological column (which does not, incidentally, exist complete in any part of the world) has been constructed by comparing rock sequences of segments of the column in different parts of the world, and creating alignments where those sequences have similarities. As with any calibration exercise of this kind (see Brother John Watts' article in the same issue on the difficulties of calibrating radiocarbon dating), piecing together the geological column is accompanied by many uncertainties.

The evolutionary geologist therefore uses his 'knowledge' of evolution to assign a particular layer or sequence of layers to a particular geological era. Use is made of 'index fossils'—fossils of creatures whose stage of evolutionary development is 'known' on the evolutionary scale—to attribute an age or geological era to the particular layer of rock which contains that fossil. That life has evolved from simple to complex over vast periods of time is the assumption used in the ordering of rocks with this method. Clearly, if evolution has not occurred, the method has no validity whatsoever, and the ordering of rock strata in this way is similarly spurious. The ideal way of ordering rock strata is by dating samples of rock to give definitive ages to sequential layers of rock. There are, of course, numerous methods which have been used for dating both rocks and the fossils they contain; ages of great antiquity are generally quoted to accompany 'important' fossil finds.

Most dating methods are based on the uranium 238:lead method, in which the ratio of uranium content to lead content (the uranium decay product) is calculated. This is the method from which the supposed age of the earth, 4.5 billion years, is derived. However, the uranium:lead method is fatally flawed. The most significant weaknesses in the method are:

1. Uranium leaching (uranium salts are soluble and will be eluted from a rock by rainwater in preference to lead salts), which leads to artificially high dates;
2. An alternative decay pathway described relatively recently and known as 'neutron capture', in which uranium 238 'short circuits' to lead, thus forming lead much more rapidly than by classical decay reactions; this again skews results towards high date values.

There is no reliable method by which rocks and the fossils they contain can be dated. Dates placed alongside the geological column in popular texts are therefore no more than guesswork. There are reasons for thinking that, rather than having taken millions of years to form, the rock formations we can observe today were formed relatively quickly, not by gentle sedimentation, but by periods of cataclysmic geological upheaval in the earth's history. Rapid burial is the only