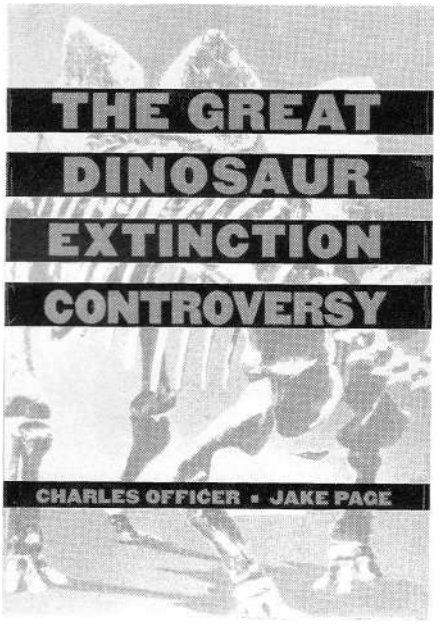
stars and so on were not really created on that day, but only 'appeared' from behind a previous thick covering of cloud. The Rossists do this, of course, because their presuppositions require them to remain at all times in step with the conclusions of cosmic evolutionary teaching, particularly the 'big bang' theory. In these cosmologies, the stars, including the Sun, must have existed a long time before the Earth. Yet this is most emphatically not what Genesis teaches — according to the Hebrew, the light-bearers were created on the fourth day (as all Bible translators realise).

In summary, a worthwhile book, if somewhat 'meaty' at times, by a trained and competent theologian/ exegete. It is particularly suitable for those who wish to either reassure themselves that Genesis really does mean to tell us what common-sense has always indicated, or to refute the specious arguments of theistic evolutionists or 'progressive creationists' who claim otherwise.

The Great Dinosaur Extinction Controversy

by Charles Officer and Jake Page
Helix Books, Massachusetts

Reviewed by Carl Wieland



The idea that a massive impact from outer space was responsible for the extinction of the dinosaurs is now very firmly entrenched in the public imagination. This book, written entirely from an evolutionary/long-age viewpoint, makes a fairly overwhelming case that, even within that evolutionary framework, the impact-extinction hypothesis is a complete 'non-starter'.

Officer is a geologist; Page is a science writer who was once the editor of **The Skeptical Inquirer.** Good, for a change, to see Skeptics being sceptical of something within their own camp, I thought.

I must admit, however, that even as a creationist I wondered how they would deal with all the apparent evidence for impact-extinction with which I had become familiar through the mainstream 'general' science journals.

It has been presented so convincingly within their framework; the 'impact which wiped out the dinosaurs' is nowadays referred to in passing, as fact rather than hypothesis.

In that which follows, terms like 'Cretaceous' and 'Tertiary' need clarification. The reviewer shares with the book's authors the usage of these terms as valid categorisations of correlated rock layers containing characteristic fossil assemblages in a particular sequence. Thus, 'Tertiary' rock was deposited on top of 'Cretaceous'. Obviously, I do not share the belief that these layers represent vast ages of deposition. We can agree with evolutionists that there is a time sequence involved here as one traces the layers in the geologic column from bottom to top. However, organisms entering or leaving the record are regarded somewhat differently. Thus, when the authors of this book refer to periods of 'extinction', it needs to be understood that in the short-age framework, this is merely acknowledging the fact that, above a certain point, no further such creatures are found buried.[1]

The discussion here also requires no assumption about where in the sequence of layers one locates the Flood/post-Flood boundary, something still the subject of healthy creationist controversy.

THE BACKGROUND TO THE IDEA

In the late 1970s, geologist Walter Alvarez found a thin layer of clay in Italy at the boundary between Cretaceous and Tertiary. This is known as the K-T boundary (K for Cretaceous, also known as the Chalk, which in German = *Kreide).*

This clay turned out to have 9.4 parts per billion of a rare element called iridium. Although this is a tiny amount, it is about 300 times more than what is normally found in earth strata. Iridium (along with other elements such as osmium) is rare on Earth but common in extra-terrestrial objects.

Walter Alvarez made his father Luis a co-author of the original paper. The fact that the elder Alvarez was a Nobel prize winning physicist certainly did the hypothesis no harm, adding some of the prestige associated with the 'hard' or exact' sciences.

Discoveries of similar iridium enrichment at the K-T boundary in other parts of the world soon followed. Then grains of 'shocked quartz', said

to be associated with large impacts, were found in the appropriate places to further cement the idea. Similar finds were made at other levels in the fossil record where there appeared to have been a major extinction, and a huge bandwagon had begun to roll.

The popular press relies on major, frequently published, technical (but non-specialist) journals such as **Science** and **Nature** for most of its 'science' information. These seemed full of enthusiasm for impact-extinction, and the authors maintain that they failed to properly inform their readership of the many refutations in **specialist** publications. A run through the relevant headlines in **Science** would make it hard to believe that any more than a small minority of scientists had any doubts about the impact-extinction hypothesis, yet two separate surveys among various relevant specialities show that only a small minority ever accepted it! However, the momentum became irresistible. Some scientists claimed that anyone who didn't support it was likely to experience negative effects on their careers or funding.

MORE APPARENT EVIDENCE

In 1984, palaeontologists David Raup and Jack Sepkoski caused a stir with their paper analysing extinctions in the fossil record and showing recurring peaks every 26 million years. By now, the impact hypothesis had more or less convinced people that there was an impact-extinction event in end-Cretaceous times, and again in the Eocene. These two extinction peaks matched their 26 million year 'period'. In other words, Raup and Sepkoski appeared to have shown that every 26 million years or so on the evolutionists' time-scale, huge numbers of species were wiped out, presumably from extra-terrestrial catastrophic causes. Again, **Science** and **Nature** went 'to town' in publishing speculation as to what sort of extra-terrestrial 'clock' might be causing such periodicity.

A companion star to the Sun was hypothesised, quickly dubbed the 'Death Star'. The theory proposed that this star circulated in an orbit which brought it, every 26 million years or so, into the Oort cloud of comets. (This is a [thus far imaginary] shell of comets which evolutionists and long-agers insist must be there in order to explain how come we still have comets when they break up so quickly.) Some of these comets are then knocked into another orbit, causing them to collide with Earth. This completely imaginary star, also called Nemesis after the Greek goddess of vengeance, made it to the front cover of **Time,** and even into **Reader's Digest.**

Finally, in the 1990s, it seemed as if the 'smoking gun' had been discovered — the Chicxulub crater, a circular structure of some 200 km diameter on Mexico's Yucatan peninsula.

REASONS FOR ITS IMMENSE POPULARITY

In addition to the apparent evidence, there are powerful psycho-social reasons why the theory was adopted so quickly and vigorously. And why, according to the authors, the substantial contrary evidence was given short shrift.

First, there is the ever-present fascination with dinosaurs and the 'mystery' of their disappearance. Those thinking in an evolutionary framework believe in an 'age of dinosaurs' followed by an 'age of no dinosaurs', in effect, so the obvious question is 'what happened'?[2] People like mysteries, but they like to see them eventually solved. Impact provided what seemed like such a neat, clean, simple solution.

Next, the enhanced environmental awareness of our age, coupled with prophecies of impending doom for mankind. Here was something with an appropriately apocalyptic, doomsday flavour. If this could happen to the dinosaurs, was this not a foretaste of our own demise?[3]

Also, it fitted nicely with the now-popular 'punctuated equilibrium' model of evolution in staccato mode. Here was a stark example of the sort of 'creative crisis' which could fuel major bursts of evolutionary change.

Further, by capturing the public imagination, the impact-extinction hypothesis generated a new source of funding for a host of related projects, not the least being 'sentinel watches' in astronomy, on the lookout for a re-run of the alleged 'K-T catastrophe'.

The authors show that even at the time of the heyday of the impact hypothesis, only a tiny minority of palaeontologists actually believed it. So why didn't we hear more from the doubters? We've already mentioned the pressure from mass opinion, and it was interesting to read of one prominent scientist who published opinions contrary to the impact hypothesis, resulting in his career actually being threatened.[4]

Another powerful social effect which may have been at least as significant in making dissenters reluctant to publish was the popularity (and political significance) of Carl Sagan's 'nuclear winter' hypothesis. This was the notion that global nuclear war would throw up so much dust into the atmosphere, along with smoke and ash from uncontrolled wildfires, that much of the Sun's heat would be blocked from reaching the Earth. The resultant 'big freeze' could wipe out everyone who had not been killed in the initial impacts, if only from hunger due to crop failures.

The same sorts of consequences were being postulated as the reasons why asteroid impact at the K-T boundary led to major extinction. Thus, people who had serious scientific reservations about at least this part of the Alvarez hypothesis were reluctant to voice these, in case it put them at odds with the anti-nuclear war movement. The book documents how at least one scientist deliberately suppressed his personal uneasiness with the scientific validity of the impact hypothesis in order not to undermine a clearly worthwhile cause, namely scientists' opposition to nuclear war.

The Sagan scenario was also the likely inspiration for some wild extrapolation concerning the finding of minute amounts of carbon black at some of the K-T sites. Impactors enthusiastically claimed this as evidence of global wildfires. These were linked to impact by postulating that the world's forests had been 'freeze-dried' by the 'nuclear winter' effect, then set alight by lightning as the skies cleared.

EVIDENCE AGAINST THE IMPACT-EXTINCTION HYPOTHESIS

Fossils decline gradually

Some of the strongest contrary evidence presented by Officer and Page comes from careful analyses of the types of fossils found as the end of the Cretaceous is approached. In several sites, there is a gradual decline in the number and variety of dinosaur fossils — hardly consistent with the impact hypothesis. However, it is interesting to note in passing that a creation/Flood framework would have much more difficulty dealing with a global pattern of uniform sharp 'cut-off at the K-T boundary, rather than a blurry picture, which appears to be the reality.

Survival of light-sensitive species

Within their framework, 50 per cent of all species went extinct at the end of the Cretaceous. This included shallow-water organisms. Yet some of the shallow-water organisms which **survived** were of a type which require uninterrupted light, thus discounting the 'Sun blacked out by a dust cloud' scenario.

'Extinctions' not correlated with crater 'dates'

Using evolutionary assumptions, it was not possible to find correlations between the times of major extinctions and the geological 'dates' assigned to the Earth's known impact craters. Some of these known craters are huge, yet show no sign of being associated with major 'extinctions' in the fossil record. Note in passing how a creationist would have no apparent reason to suspect correlations between impact craters and the layers at which certain fossils cease to be buried in abundance.

Analogous events fail to support

The huge 1883 eruption of Krakatoa, which nearly obliterated an island, was heard over 3,000 miles away. The resultant effects of the ejecta on sunlight dropped the average mid-summer temperature in the US the following year by 7°F, causing widespread crop failure. There was even worse havoc and famine in Europe. Not only was it not followed by any global extinctions, there is evidence of an eruption in the past some 400 times greater than Krakatoa. There are no associated extinctions in the fossil record. Granted, the Alvarez hypothesis postulated something about a thousand times greater than the Krakatoa eruption, but why would there be absolutely no effect at all for something which was 40 per cent as powerful as something which is supposed to have wiped out half the species on Earth?

Iridium enrichment spread out too much

One study by another researcher examined the original clay at the site in Gubbio, Italy, which started all the excitement. Enhanced iridium levels are found above the layer in question, spanning a depth which, according to the whole method of long-age reasoning, covers around half a million years! This makes sense if the enrichment came from a long-drawn-out period of volcanism.[5]

The shocked quartz

Grains of quartz may, under the microscope, appear to have planar deformation features. These are sometimes called 'shocklamellae', but since they are not always caused by shock deformation, it is a term which can mislead. They may be caused by impact, by volcanism, or by prolonged pressure from tectonic activity, such as when one rock grinds against another. Certain types are more commonly associated with impact, others more commonly with volcanic activity. There was a brief flurry of finds of a thin layer of these 'impact' grain types in North America, but not associated with any widescale extinction (other than at most a local one). There was an alleged impact crater associated with these for a while, but it went out of favour with further studies. Moreover, in other parts of the world, the deformed quartz associated with iridium anomalies at the K-T boundary is found in much more diffuse layers, and is of the type more commonly associated with volcanism.

The Death Star theory dies

I recall at the time of publication of the Raup-Sepkoski hypothesis being challenged in public about their findings. The reason is clear; since creationists regard most of the fossil record as being the record of the Flood, 'extinctions' simply mean points above which there are no more such fossils found buried. There would therefore be no reason to expect any periodicity to such 'extinctions'.

However, when one takes a closer look at the Raup-Sepkoski analysis, one sees that the 26 million years was simply an **average** of the distance between peaks! Also, the authors point to a devastating critique in **Nature** which showed that the data could merely be a statistical aberration. The item pointed out that any such data using their starting assumptions would have built into it a pseudo-periodicity very close to that claimed.

Iridium not correlated either

Overall, there is simply no correlation of iridium anomalies with most of these 'periods of great extinction'. Furthermore, of the known impact craters that have been studied, only one, in Australia, is associated with increased concentrations of iridium in the soil.

Volcanic eruptions are now known unquestionably to raise iridium levels. The 1983 eruption of Kilauea in Hawaii registered iridium levels within airborne particles of 630 ppb, which is some 11,500 times the concentration in Hawaiian volcanic rocks.

Interestingly, the further away one went from the eruption, the higher the iridium levels in the soils. Apparently, iridium preferentially binds to the finer particles, which are airborne for greater distances.

SIGNS OF DESPERATION

By the time all the above had come to light, the faltering hypothesis needed shoring up, so multiple impacts were proposed, say Officer and Page. However, this involved a switch to comets, not asteroids. The problem is that comets are not very rich in iridium at all.

It was instructive (especially to one involved in the creation/evolution controversy) to note the way in which, after this mini-paradigm had gained sufficient momentum, the trendy theory was driving the interpretation of evidence, even in the face of accumulating counter-evidence.

For example, at a certain stage, the still-popular idea was being slowly overwhelmed by the accumulating evidence that most of the iridium was caused by the volcanism of the Deccan traps (almost unimaginably huge outpourings of lava at a site in India). Lo and behold, say the authors, it was then postulated that an impact caused the Deccan traps volcanism! However, not only is this geophysically ridiculous, if one remains consistent within their framework, the Deccan traps would have started erupting hundreds of thousands of years before the postulated K-T event!

The authors highlight a number of instances in which 'new geology' was invented to shore up the impact-extinction idea. For example, a 1990 **Nature** article suggested that a layer of rocks in Cuba was an 'ejecta blanket' from a massive impact, despite the fact that no-one had ever seen such a consequence from impact. Subsequent studies refuted the notion, but the ball kept on rolling.

That still leaves us with the matter of the Chicxulub crater, a circular structure of some 200 km diameter on Mexico's Yucatan peninsula. Was this not supposed to be the irrefutable 'smoking gun' for the impact hypothesis? That was certainly the impression I had gained from the mainstream science journals, with even quite recent references to it as if it were everyday common knowledge. The chapter in Officer and Page's book is, however, headed 'The Missing Crater'. By now I was not totally surprised to find that here again the mainstream science journals had been blindly following a bandwagon. Chicxulub, which has been studied by gravity and magnetic surveys, has also had a number of oil wells drilled into it. The geology revealed by these borehole data totally rules out the idea that Chicxulub is an impact crater. This quote from the book's p. 156, taken secondarily from **Geology Today,** tells the story:

> ***'The non-excavating impact:*** *.... It's probably true to say that . . . most Earth scientists have come to accept that an asteroid impact directly or indirectly did for the dinosaurs and other species 65 million years ago, if only because they've been beaten into submission by the endless barrage of propaganda in its favour. And the word that's been in their ears constantly for the past few years is "Chicxulub" .... But wait — hear the other side first. . .'*

The excerpt then refers to a 1994 paper by Meyerhoff *et al.* in **Geology,** vol. 22, p 3, which points out that

(i) There is obvious volcanism interspersed in the layers
(ii) There is no sign of any sort of impact melt sheet,
(iii) An asteroid large enough to make such a crater would have blasted out all the Upper Cretaceous sediments within the structure. *'They are still there; ergo, no impact.'*

THE AUTHORS' OWN IDEAS

Officer and Page, as evolutionists, would feel under compulsion to put forward some sort of alternative hypothesis for dinosaur extinction. However, they point out that in a complex world, there may be no one, simple cause. Many causes are already available to them within their framework, if allowed to work in combination. For example, increased competition from mammals, changing sea-levels, and gradual climate change. The latter may have been due to the effects of the huge amounts of lava released while forming the aforementioned flood basalts known as the Deccan traps. Here more than one million cubic kilometres of lava was released, and there were other sites around the world erupting at about the same point within the geological column.

Note in passing that this has been a significant point raised within the Flood/post-Flood boundary controversy.[6] The huge amount of volcanism would have released massive amounts of $C0_2$ into the air, causing global warming. The sulphur dioxide released would have contributed to acid rain, and the chlorine would have depleted the ozone layer, thus increasing UV radiation would have severely affected the global ecology.[7]

OTHER ISSUES

The book offers a few forays into the history of such ideas as continental drift, the geological column, radiometric dating and the age of the Earth; and some useful background 'brush-up' on comets and meteors. While not surprised to see the usual ridicule of Archbishop Ussher's 4004 BC age for the Earth, it was disappointing to see the authors' historical sloppiness in saying that Ussher assigned creation to 'exactly 9 a.m. on Sunday October 26'. Ussher was a much maligned man; a formidable scholar of repute, he used

sound Biblical reasoning, coupled with deductive logic, to come up with his suggested date of October 23 (not 26).[8] The *'9* a.m.' comes from Bishop Lightfoot, not Ussher, as this book claims.

There is even a little passing dig at Fred Hoyle's now passe theory about the *Archaeopteryx* fossils being clever fakes.

CONCLUSION

The authors make a compelling case, without emotive overkill, for their thesis that the dinosaur-extinction-by-impact hypothesis is wrong. And furthermore, that it is a classic case of what some philosophers have called *'pathologicalscience'*, not Unlike the cold fusion fiasco. Leaning on the philosopher Imre Lakatos, they refer to the Alvarez hypothesis as, among other things, a *'degenerating research program'*. Such are characterised by an absence of stunning new discoveries on the basis of the theory, *ad hoc* explanations in the face of criticism, and ignoring facts to fit with preconceptions. One wishes that these authors could see how closely evolution fits their Lakatian prescription.

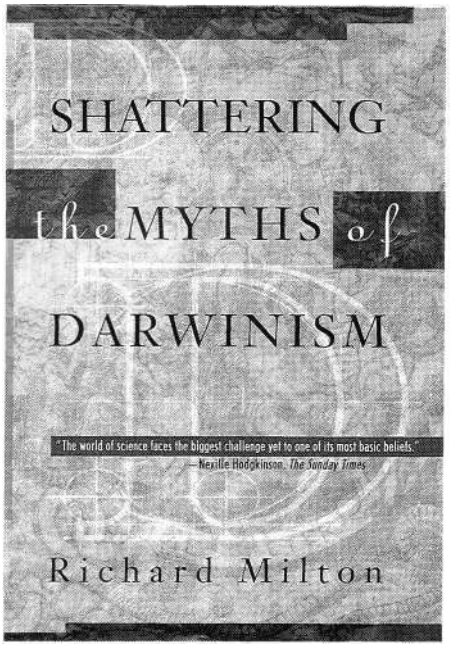
REFERENCES

1. Thus, the absence of coelacanth fossils above a particular layer would not lead a creationist to declare that creature absolutely, definitely extinct. So there is no 'egg on face' when the same fish is later found alive and well in the present day.
2. The Biblical framework of history has no such difficulty. Dinosaur populations were severely reduced by the Flood. Since the Curse on creation, death and extinction are 'no big deal'. Creatures become extinct continually, especially through human activity, so dinosaur extinction is not only no big deal, but there is no compulsion to look for one, universal answer. One type of dinosaur may have died out from a completely different set of causes to another type.
3. The authors' calculations here are interesting, though of course skewed by long-age assumptions: The chance of a major strike by an object more than 2 km wide in the next hundred years is 1:10,000, but when you take into account that it is more probable than not that it will hit the sea, the chances of an asteroid wiping out a major city anywhere in the world, let alone the whole human population, shrinks extremely dramatically, in spite of the tsunami generated.
4. While reading about this, I wished I could put it under the noses of certain opponents who scoff at the idea that creationists, as pariahs to establishment science, have difficulty breaking down prejudice and entrenched opinion.
5. In addition, there are other elements present which make sense if all this was from a volcanic eruption. The impact theorists have an out here, in that these other items could have resulted if the impact was into oceanic crust. But then they are in a catch-22, since much of the alleged evidence for impact comes from shocked quartz, and quartz is not found in oceanic sediments.
6. Garner, P., 1996. Continental flood basalts indicate a pre-Mesozoic Flood/post-Flood boundary. **CEN Tech. J., 10(1):1**14-127.
7. Note that the US-Australian creationist school of thought in the Flood boundary controversy would have the Deccan traps largely erupting during the Flood, so avoiding the problems to the Flood survivors caused by volcanism on such an unimaginable scale. Especially within a short time-scale; evolutionists believe these traps represent some 400,000 years of eruption. See also: Holt, R. D., 1996. Evidence for a Late Cainozoic Flood/post-Flood boundary. **CEN Tech. J.,** 10(1):128-167.
8. See: Pierce, L., 1998. The forgotten Archbishop. **Creation Ex Nihilo, 20(2):** 42-43.

Shattering the Myths of Darwinism

by Richard Milton
Park Street Press, Rochester, Vermont

Reviewed by Carl Wieland



This is an upgrade of Milton's first foray into anti-evolutionism, originally called **The Facts of Life,** with the current title as a sub-heading. Milton is an agnostic science writer who, like Denton and others, was not coming at this issue from the standpoint of belief in the Bible. Unlike the others, he was not afraid to be sceptical about issues such as the age of the Earth.

I recall being pleased that such a book was in existence. Coming from an agnostic, it would likely be more acceptable in non-creationist circles, and might even make secular newspaper reviews — which it did, here and there. Nevertheless, we chose at the time not to promote this book. Among the reasons was that it was recycling some creationist arguments that had been left behind a long time ago, and would not add anything new to what was in our existing range of 'ammunition' (unlike Denton and others).

This is in many ways a better book, though not sufficiently different to change my mind about being on the book tables at *Answers in Genesis* seminars. I would be delighted of course if it sells well at other outlets.

This time he seems to have been 'stung' by many of the criticisms, and protests strongly that he is not a closet creationist. He makes it clear that he does not *'think the earth is only a few thousand years old'*. But he says there