

See Barry Setterfield's 1981 article *The Velocity of Light and the Age of the Universe*. Here he has claimed<sup>r</sup> that there is observational evidence even for a decay in the speed of light, suggesting a Universe possibly no older than some 6000 years (see below). Qld., 1981.  
r) B. Setterfield: *The Velocity of Light and the Age of the Universe*. In *Ex Nihilo*, Sunnybank, /

Wrote Henry Morris in his 1983 booklet *Science, Scripture and the Young Earth*: "Worldwide measurements had to be made and integrated over a considerable period of time, and over the entire globe.... The analysis developed by Dr. Barnes is based on some physics, careful calculations, and solid data."

### **391b. Refutation of neo-catastrophic paleomagnetic light theories**

It is true that several geophysicists have archaeomagnetically established that our planet's dipole moment had indeed been diminishing in strength since the start of the Christian era. But even older archaeomagnetic readings indicate that the dipole moment was (even earlier) increasing in strength.

The uniformitarianistic Neo-Catastrophist Barnes tries to explain the origin of the magnetic field in terms of continuously-decaying electrical currents in the core – based only on experimental measurements taken from but 1835 A.D. onward. This fails, because data show that the dipole moment has not continuously been decreasing from some initially tremendous value.

As Professor Dr. Davis A. Young points out:<sup>s</sup> "In the few millennia before the time of Christ, the Earth's magnetic dipole moment did not have a strength that is substantially greater than now. In fact, the value of the dipole may have been less." Consequently, "Barnes's argument for a young Earth based on magnetic evidence, is completely invalid."

s) D.A. Young: *Christianity and the Age of the Earth*, pp. 123f.

Again, the Old Earth Creationist Dr. Ken Smith has claimed<sup>t</sup> that experiments show only one part of the paleomagnetic field is decreasing. And Barnes's theory ignored the motion of the Earth's liquid core.

t) K. Smith: *Is the Earth a Young Planet?*, Dept. of Maths., Univ. of Queensland, 1985.

Even the Young-Earth and 24-hour formation-day theorist Warren H. Jones himself admits:<sup>u</sup> "The magnetic decay method...is riddled with problems and major inconsistencies. It is based upon uniformitarian logic.... 1984.

u) W.H. Jones: *Controversy over Paleomagnetic Dating*, in *Ministry*, S.D.A., Wash. D.C., Jan.

"It ignores palaeomagnetic and archaeomagnetic data covering the past several thousand years.... It is championed as a convenient way out of the problems to a short chronology that are caused by radiocarbon dating, although it fails to realize that the radiocarbon evidence over the past five thousand years would negate magnetic decay theory."

### **391ba. Barry Setterfield's 'light decay' theory**

In 1981, Barry Setterfield contributed an article (*The Velocity of Light and the Age of the Universe*) to two issues of the Australian neo-catastrophist magazine *Ex Nihilo*.<sup>v</sup> Setterfield's theory is an interesting application of the laws of thermodynamics to what he regards as the decay of light. Australia, Vol. 4 Nos. 1 & 3, 1981.

v) B. Setterfield: *The Velocity of Light and the Age of the Universe*, in *Ex Nihilo*, Sunnybank,/  
According to Setterfield, there has been a systematic decrease in the speed of light since it was measured by Roemer in the late seventeenth century. From certain post-1674 A.D. records of measurements of the speed of light, and with the help of Flinders University's DEC 10 computer, Setterfield constructed a retroactive curve reaching from our own day back through the 1674 A.D. Roemer, and right to the time Setterfield himself considered to be represented by Genesis 1:3 (namely approximately 4000 B.C.).

Claiming that the speed of light six thousand years ago (in 4000 B.C.) was five hundred thousand million times faster than at present, Setterfield concluded light from the furthest part of our galaxy would then have reached our planet within 24 hours. And that light from the very edge of the Universe itself, would reach us in 6000 years.

Setterfield here made at least three rebuttable assumptions. We now list and then analyze them.

First. In *Ex Nihilo*, he posits<sup>w</sup> a coefficient of determination (for the fit of his date to his theoretical curve) of 0.99 recurring. "The DEC 10 computer at Flinders University decided that the published curve had an  $r^2$  value of 1.000 to nine significant figures. I am therefore satisfied that the postulated curve fits the observed data beyond any doubt."

w) *Ibid.*, Vol. 4 No. 2, p. 20.

Second. In *Ex Nihilo*, Setterfield "assumes<sup>x</sup> that the first law of thermodynamics (the law of the conservation of mass-energy) will hold throughout the Universe at any position and time." One wonders whether Setterfield regarded this uniformitarian assumption as especially true of the second law of thermodynamics, and especially whether he believed that both laws were just as operational after the creation of the Universe yet before Adam's fall -- as ever since?

x) *Ibid.*, Vol. 4 No. 3, p. 56.

Third. In *Ex Nihilo*, Setterfield assumes<sup>y</sup> "that light did not begin to decay until the end of the Creation Week" (which latter he presumed lasted but 144 hours). Then, however, Setterfield rather illogically next went on to state that "in one day of decay during Creation Week, it would have decayed the equivalent of  $5 \times 10^{11}$  days of decay now....

y) *Ibid.*, Vol. 4 No. 3, p. 70.

"We will show...that the so-called basement rocks would be expected to have conventional ages ranging from about 2 to 5 billion years. The position, nature and age of these rocks resulted from the uplift and metamorphism on the third day of the Creation Week."

Emphases mine – F.N. Lee. Strangely, Setterfield later argued that energy (but not 'basement rocks'!) is independent of light-speed.

According to the Australian Christian Mathematician Professor Fackerall,<sup>z</sup> "the heart of Setterfield's view is his claim that the coefficient of determination for the fit of the light velocity data to his theoretical curve, is one to nine decimal places." Yet when Fackerall checked this "to fourteen digits," he "found that the coefficient of determination, because a simple parabolic curve was only 0.98634.... In a later issue of *Ex Nihilo*,<sup>a</sup> Setterfield has admitted that a mistake was made in his original calculation."

a) Vol. 4, No. 2, 1981. Fellowship of Evangelical Students, Sydney, 1983, pp. 59-63.

z) E. Fackerall: *The Age of the Astronomical Universe*, in *Interchange 33*, Australian

Professor Fackerall continued (emphases by F.N. Lee): "A comprehensive discussion of Setterfield's data has been given by Bounds (*Towards a Critical Examination of the Historical Basis of the Idea that Light has Slowed Down*),<sup>b</sup> who points out that *inter alia* the value of the speed of light attributed by Setterfield to Roemer in 1675, is seriously in error.... Goldstein, Trusco and Ogburn (in their paper *On the Velocity of Light Three Centuries Ago*), state: 'We conclude that the velocity of light did not differ by 0.5% in 1668-to-1678 from the current value.'  
*has Slowed Down*, in *Interchange*, p. 62.

b) V.E. Bounds: *Towards a Critical Examination of the Historical Basis of the Idea that Light*  
Unfortunately -- Setterfield, entirely without any justification, has changed these two statements into a claim that the speed of light in 1675 was 0.5% higher than the present value.... Because the correct value of the coefficient of determination for the fit of the data to his theoretical curve is 0.98634 and not 0.999999999, because a simple parabolic curve yields a higher coefficient of determination, and in any case because the value that should be used for the speed of light in 1675 is identical to the current value – Setterfield's hypothesis that the speed of light was five hundred thousand million times its present value six thousand years ago, is entirely without foundation....

"Christians will have to take seriously the indications for a very large age of the Universe that come from the argument based on the time that light takes to travel from the distant parts of the Universe." Thus Professor Fackerall.

### **391bb. The ongoing debate about Setterfield's light decay theory**

The 'light decay hypothesis' debate unleashed by Setterfield continued unabated in 1984. Then, in *Ex Nihilo*,<sup>c</sup> Biology Professor D.H. Kenyon of San Francisco State University wrote to Setterfield: "I have repeatedly obtained the value of  $r^2 = 0.986$ , and cannot yet verify your value of 0.98."

c) Vol. 7, No. 1.

Setterfield acknowledged this, and thus became somewhat more elastic as to his estimate of the absolute date for the creation of the universe. Nevertheless, Setterfield still posited a far younger date than that of "up-to-10000-years-ago" allowed by many other Neo-Catastrophists such as Whitcomb and Morris who in their book *The Genesis Flood*<sup>d</sup> arrive at a possible creation date of perhaps even 8807 B.C. *Viz.*, at least "1656 years" between Creation and Noah's Flood; plus an "allowance of 5000 years between the (Noachic) Flood and Abraham"; plus "2167" years from Abraham to Christ; plus 1984 years from Christ till the date of Kenyon's letter (1984 A.D.).

d) Pp. 31 n. & 389 & 478.

Replied Setterfield to Kenyon: "Your estimate of  $r^2$  is perfectly correct! Our latest computer run puts it at 0.9859 or 0.986 to three figures.... This new work has also shown us something else that was not hitherto realised. The oscillation in the  $r^2$  value, and hence the need for filtering, completely disappears with this programme and remains virtually constant" – a uniformitarian assumption? (F.N. Lee)! – "to 4 or 5 decimal places over a wide range of dates. This means that it becomes useless trying to pinpoint the 'best' value of  $r^2$  for an origin-year....

"For 5000 B.C. as the origin-date, the value of  $r^2$  is 0.98588; but the power of the cosec function becomes 2.5817 instead of cosec<sup>2</sup>. Alternatively, for an origin-date of 3500 B.C., the

power becomes 1.5882, and  $r^2$  still remains at 0.98587.... Though, it will be noticed that for the function to be EXACTLY  $\text{cosec}^2$ , the origin-date must be 4166.5 B.C.... The above age for the origin of 5000 B.C. is thus so completely out of touch with real-world observations, that it can be ignored as being far too 'old'.

"Accordingly, we can state that the origin-date for the Universe was less than 5000 B.C.... It can be shown that the origin-date must lie between ABOUT 4500 B.C. (with a radiometric 'age' of  $2.3 \times 10^{10}$  years), and 3900 B.C. (with a radiometric 'age' of  $1.8 \times 10^8$ ). Any shorter than this latter figure, would give rise to naturally-occurring isotopes of shorter  $\frac{1}{2}$ -lives than are actually observed." Emphases mine – F.N. Lee.

In the same issue of *Ex Nihilo*, a 24-hour formation-day Neo-Catastrophist – Dr. R. Drewer from the Seventh-day Adventists' Avondale College – gave his opinion. He asserted that, if as Setterfield alleges, "the rate of radio-active decay would indeed have been faster in the past" – THEN "so also would the rate of all chemical and biological reactions have been proportional to the velocity of light c." Emphases mine – F.N. Lee.

Setterfield replied "that the energy in any system is independent of the speed of light.... Hence it follows that all chemical reactions proceed at a rate that is independent of c."

Theologically, we ourselves (F.N. Lee) would feel this improbable, especially because Genesis 1:3's "light" ('oor or phoos) also implies both heat and energy. Moreover, Setterfield is inconsistent to argue elsewhere that rock-datings are related to light-speed.

Predictably, Dr. Drewer himself then further replied: "Barry Setterfield has not given a satisfactory answer to the problem which I posed concerning reaction rates.... Where Mr. Setterfield has gone astray, is in his argument over binding energies.... If indeed it was harder to form the activated complex in the past, this is the same as saying that the activation energy was higher....

"Mr. Setterfield does not seem to realise the problem he creates in trying to make nuclear decay processes proportional to c while claiming chemical processes are unrelated. In fact, if nuclear processes – e.g. in the Sun, had been faster in the past – then the rate of energy production would also have been faster." Emphases mine – F.N. Lee.

Setterfield, however, then yet further replied. He said: "It is incorrect to state, as Dr. Drewer does, that this is the same as saying that the activation energy was higher."

Finally, Dr. C.F. Gauld wrote to Setterfield: My value of R for your geometrical relationship...is 0.9681, which gives an  $R^2$  (or  $r^2$ ) value of 0.9372 rather than 0.998 as given in the *Ex Nihilo* article. I have checked my calculation, but cannot find any error -- using a computer, or doing it by hand. Your value does seem very high." Emphases mine – F.N. Lee.

In his reply to Dr. Gauld, Setterfield acknowledged: "It does seem that my original computer value of  $r^2$  is a little high.... It may be because the formulation as given in *Ex Nihilo* is incorrect in some aspect and needs correction." Emphases ours – F.N. Lee.

Setterfield went on to reveal his own 'theological' (mis)presuppositions, while admitting his lack of the sufficient time needed to work out even the mathematical corrections required. Theologically, Setterfield questionably assumed: (1) that the first day of Earth's formation-week already started at the beginning of the Universe in Genesis 1:1; (2) that each of the formation-days lasted but 24 hours; (3) that 'decay' only started from the close of Earth's sixth formation-day; and (4) that God subsequently no longer supernaturally sustained His creation.

Said Setterfield: "Once(!) the 1.8 billion integral and observed abundances have been set(!), which fixes(!) the time base(!) for any chosen(!) curve, and hence the approximate(!) time of decay commencement(!) – an approximate creation(!) value can be set from(!) geology and astronomy again(!).... The elements that were formed on(!) the first(!) day of creation week (or the beginning of the Universe's existence for an evolutionist), have a radiometric 'age' of about ten billion 'years.'

"Since(!) the decay from the close of the sixth day till now (God rested on the seventh day and no longer supernaturally sustained His creation) approximates to 1.8 billion 'years' radiometrically – it follows that the value of c during creation week(!) must be such that the radioactive elements 'aged' about (10 billion minus 1.8 billion 'years' =) 8.2 billion 'years.' For(!) those elements to age(!) 8.2 billion 'years' in six literal(!) days, requires(!) the radioactive decay(!) process to be  $(8.2 \times 10^9)/(6 + 365.25)$  faster, =  $4.99 \times 10^{11}$  or about  $5 \times 10^{11}$  faster(!) than now....

"The curve chosen(!) must(!) give an approximate(!) integral of about(!)  $1.8 \times 10^9$  years(!) for the decay(!), and the initial value must(!) be close to  $5 \times 10^{11}$  of c now. In addition, to have any(!) clout mathematically, these values (which fix a creation point, since one gives the value and the other fixes the time position for any chosen curve) must(!) occur on or very close to the asymptote....

"I would be interested to know whether you can generate a curve which meets these requirements, along with the  $r^2$  test. If you do, please let me know, as I do not have the time to devote to this aspect of the problem now." Emphases mine – F.N. Lee.

Brisbane's Dr. Martin Bridgstock maintained in a March 1985 lecture at the University of Queensland that Barry Setterfield himself utilized only about one-quarter of the light-speed data accessible to him, in order to fit those selected by him into his own young-earth creationist theory. Be that as it may, it was nevertheless very clear before Setterfield himself first decided to "generate a curve" on his graph showing his own theory of assumed 'light decay' since 4000 B.C., he had already adopted the [following] beliefs (on premathematical grounds).

"A) that Adam was created no earlier than around 4000 B.C. (a belief not shared even by all his fellow Neo-Catastrophists). B) that the Pre-Adamic formation week since the exnihilation of our planet Earth lasted but 144 hours (not widely held among Bible-believing Theologians). C) that the first formation-day started at the beginning of Genesis 1:1 and not at the beginning of Genesis 1:3 (a belief contrary to the *prima facie* thrust of Genesis chapter one as a whole). And D) that the entire Universe was therefore exnihilated around 4000 years and 144 hours ago – or, just conceivably, "for the function to be  $\text{cosec}^2$ , the origin-date must be 4155.5 B.C."

Only after having made all of these premathematical and unproven (and theologically unlikely) **philosophical** assumptions, did Setterfield then decide to "generate a curve" to illustrate his own personal theory of the assumed 'decay' of light. In then doing so, Setterfield made the yet further assumptions that: **i**, all light-speed measurements since Roemer (in 1675 A.D.) were accurately measured and the records reliably preserved; **ii**, the rate of assumed 'light decay' perceived by Setterfield in **i** above would indeed have run down in a similar pattern especially prior to Roemer all the way back to 4000 B.C. (of which Pre-Roemer light-speed measurements we have absolutely no empirical knowledge); and **iii**, there was no light at all prior to 4000 B.C. (which is somewhat gratuitous, against First John 1:5 *etc.*).

The tentative nature and importance of premathematical religious presuppositions, is even more apparent in the work of the great South African Hindu Mathematician Ved Sewjathan. He in 1984 claimed<sup>e</sup> that Einstein's theories are wrong, because the present speed of light is exceedable – thus granting entry into different Universes!

e) *South African Digest*, September 14 1984, pp. 6 & 21.