process would have been 20,000 years. In other words, during Creation Week in a lump of U^{238} weighing one gram in just one hour some 3×10^9 of that gram would undergo spontaneous fission producing neutrons and fission tracks in the surrounding material. Since these neutrons are all fast neutrons they would be unavailable for sustaining a chain reaction, particularly since their speed then would be 5×10^{11} faster than they are today. Accordingly, though the rate of spontaneous fission would certainly be higher, there would still not be the conditions available for an explosive reaction to occur and the ore body would be unaffected by the process.

POLONIUM HALOS

This is a convenient place to mention the polonium halo problem, though it is not unique to polonium. Robert Gentry has rightly pointed out that there is a problem with the supposed hydrothermal mode of origin.[16] In each case there is no evidence of the radioactive parent that initiated the decay chain in which the halo appears, just the decaying daughter product and those products below it. The conclusion was that the decaying daughter, such as polonium-218, must have been created there in the host minerals (usually micas in granites) virtually instantaneously since no parent element was there.

However, there is another possibility, based on the decay in the speed of light. In Part 3 Section 1 of my monograph I outline how the first-formed metamorphic and igneous rocks would have resulted from super-saturated cool solutions which would have crystallized extremely rapidly. This is my first point. The second point is that with a high value for the speed of light during Creation Week, the radioactive parent was not 'hanging around' for billions or millions of years, for the uranium-238 (in the case of polonium halos) would only have existed in that form for a short period of days as the half-life for that segment of the sequence was only about 3 days. The scenario that this allows is one in which a solution at the point of crystallization initally carrying U^{238}, which is rapidly decaying, crystallized at a certain critical time encapsuling the daughter product and its subsequent decay halo pattern. The scenario suggests that there should be crystallization at a number of such points in the sequence of decay giving rise to the various polonium halos as well as others. Under these circumstances it is possible to argue that these "emanation halos", as they are also called, are evidence for rapid decay of radioactive parents in the sequence and so support the contention that the speed of light was higher in the past.

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RED-SHIFTS AND A COLLAPSING UNIVERSE

A question from Mr L.K. Appleton, Woodridge, Queensland, Australia.

In Barry Setterfield's tape message entitled **Exploring the Stars** he shows the probability of a very 'young' Universe based on the 'disruption' of Galactic clusters. In one case he states that the rate of disruption is 21,000 km/sec, and shows that this could not have been going on for more than perhaps 10,000 years — certainly nothing like millions and millions of years.

This disruption idea seems to CONFLICT with the 'collapsing' view of the whole universe as proposed by Barry in his booklet entitled **The Velocity of Light and the Age of the Universe**, where he says in the summary on page 1 that, '. . .a close scrutiny of the red-shifts reveals that our Universe **must be COLLAPSING in on us, not expanding outward as conventionally assumed from the red-shift data**'.

If the Universe is in fact collapsing then it would seem likely that galactic clusters should not be moving outwards, but rather they should be moving in an opposite direction!

Is there an answer to this apparent conflict?

Barry Setterfield replies. . .

Your difficulty can be traced to the rate of progress of knowledge! C decay can be shown to produce a red-shift (see the article on this subject in this volume). This red-shift has been taken as indicating Universal expansion. However, if it is simply a measure of the amount by which c has decayed, then

the expansion option is no longer valid. Now if the c data ties in with the red-shift data, then what is the Universe doing? We have an absolute reference frame, namely the 3°K background radiation. This shows that our Local Group of galaxies is collapsing towards the Virgo Cluster of galaxies at the rate of about 270 km/sec (S. Weinberg, **The First 3 Minutes**, p. 152 and Hart and Davies in **Nature**, vol. 297, 20th May, 1982, p. 195). Again in the May 1984 edition of the **ASSA Journal**, p. 9, there was a report on the highlights of the last year's observations from the Anglo-Australian telescope. One item stated that the AAT had discovered that "A very populous super-cluster of galaxies has been found to be collapsing under its own gravity. . ." In other words this suggests that the Universe is undergoing gravitational collapse rather than expansion.

Well, what about these clusters of galaxies that seem to be disrupting? The figures for the rate of disruption COME FROM THE RED-SHIFT. In other words, the apparent difference in velocity between one part of a cluster of galaxies and another measured by red-shift differences will be mainly due to the change in the speed of light across the cluster. When this is done, knowing the approximate cluster size, then the disruption anomaly disappears and the cluster, instead of disrupting, is in fact collapsing in on itself as indicated by the above quote. There will undoubtedly be some residual movement between individual members, but the change in c will often cause this to be masked out.

Thus the example that was used on the tape has been rendered invalid as an indication of a young universe. Instead it has given supportive evidence for the degree to which c has changed. However, conventional astronomers are taking the collapse of super-clusters as a sign that they are young anyway, since if they were thousands of millions of years old, that process should have stabilised long, long ago. That it is still occurring indicates a youthful cluster, or as the **ASSA** article states "the growth of such clusters is still occurring in the Universe", and the youth is implicit in such a thought.

EXTRAPOLATION OF THE C DECAY CURVE

A question from Rev. W.P. Gadsby, Armidale, N.S.W., Australia.

I refer to the work of Barry Setterfield on the speed of light.

In the recent publication **The Case Against Evolution: The Case for Creation**, the authors state that

Setterfield has shown that the speed of light has been decreasing over a 300-year period. During this period, the decay in speed has apparently conformed to the equation:

Speed of Light, $c = A \cosec^2(kt)$

where $A = 29972.445$ km/s (the minimum speed of light, reached in AD 1960);
$\quad k = 0.0148957299$ degrees/year;
and $t = $ time elapsed in years (since 4082 BC).

In the publication, **The Velocity of Light and the Age of the Universe**, Setterfield states that in 1960 the value of c ceased to change. In other words, the above equation ceased to apply at that time. Put mathematically, there is a "discontinuity" in the curve at $t = 60 + 4082$ elapsed time.

Now my question is this: if Setterfield is happy to admit a discontinuity at AD 1960, upon what basis does he assume that there have been no discontinuities prior to AD 1675 (when the first measurement of c was made)? If there is no basis for such an assumption, then how secure is the extrapolation (by a factor of **20** times) backward in time to 4082 BC?

For example: it may have been that in 1674, the speed of light had reached a **maximum** before beginning to decay (again)? So instead of
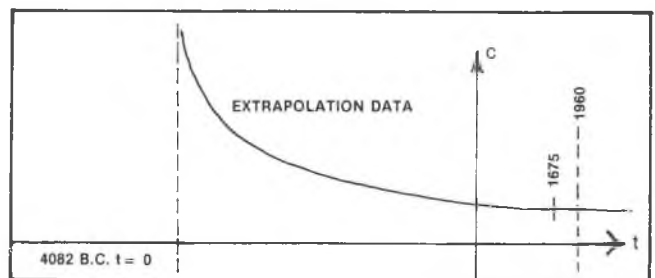
we may have had
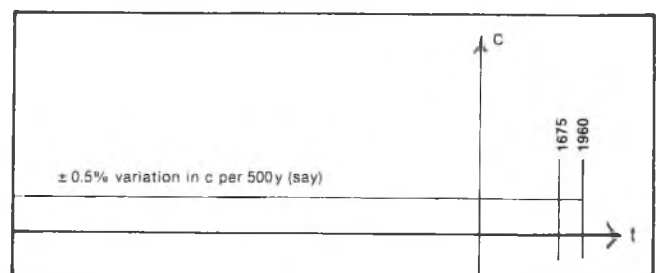
with c oscillating around a fixed value every 500 years (say).

Is there really any evidence in support of Setterfield's **backward** extrapolation of his curve when he admits that we cannot extrapolate it **forward** into the future?