The Age of Light
&
The Shape of the Universe

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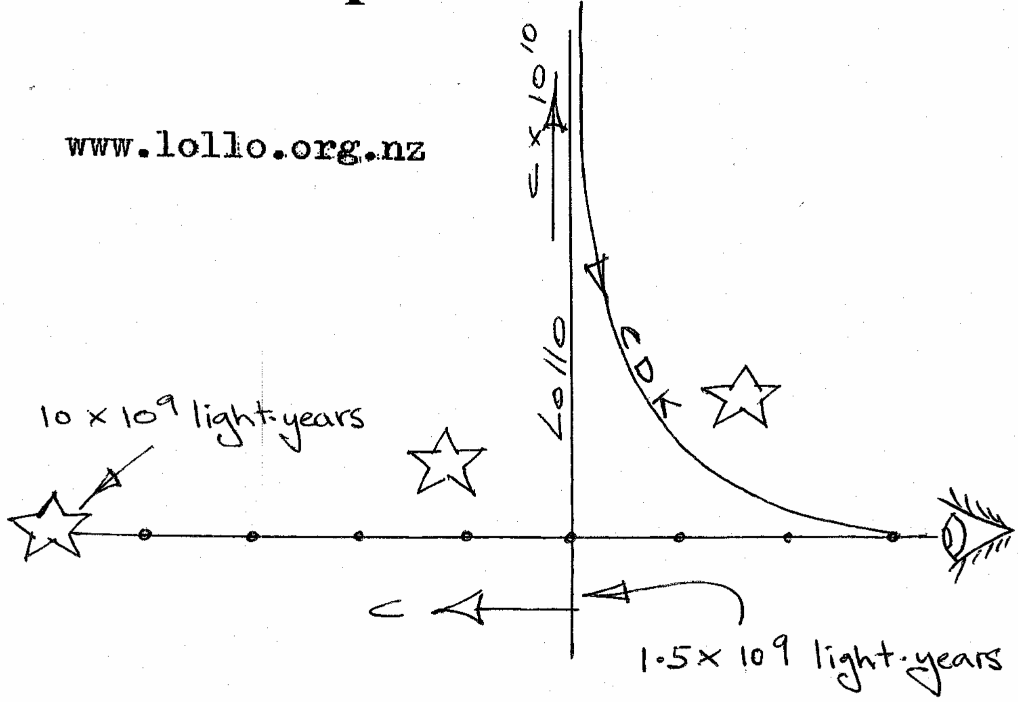

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13/9/04

The Age of Light – has the speed of light fallen from c x 10^{10} in the past?
(Ten billion times faster)

<u>Historically:</u>

In 1675 Roemer (or Von Romer) measured light speed as 200,000 miles per second. The mathematics is quite interesting, and a photocopy from a textbook of 1869 is attached. The diameter of the Earth's orbit is given as 192,000,000 miles. And the observed delay in the eclipses of moons of Jupiter is given as 960 seconds at the farthest part of Earth's orbit from Jupiter.

$$c = \frac{192{,}000{,}000 \text{ mi}}{960 \text{ sec}} = 200{,}000 \text{ mi/sec}$$

It must have been one of the easier parts of the whole determination of light speed!
200,000 mi/hour = 321,800 km/second (about).

Now by 1869 the writer says that more exact calculations give 192,500 mi/sec = 309,730 km/second (about)

By 1925, according to Chambers's Encyclopaedia, the speed of light, by all determinations, averaged is 300,574 km/sec

And today, light speed is given as some 299,792 km/sec

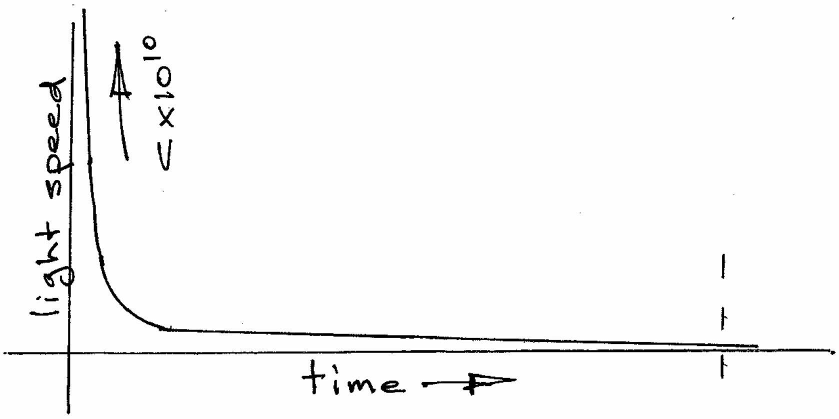
Note that this is around 10,000 km/sec less than the speed of light (converted to km) for 1869.

Now if we just take the figures as read, the light speed of 1675 was 7.34% faster than that of today.
(22,008 km/sec slower today)

It would seem that there may indeed be a case for CDK
(Speed of light decay)

Troitsky, a Russian scientist, has suggested c x 10^{10} in the past.

The CDK curve is represented thus:



(approx) 6222 years ago (4219 B.C.) 2004 A.D.

The speed of light is seen to diminish rapidly and then to lose velocity less rapidly as time goes on.

This work has been done by Barry Setterfield and others, but has been strongly opposed.

However, it does offer an explanation for mature galaxies at 10^{10} or so light years out in space. The light was originally very very much faster.
The "Look back" time is only 6223 years (or so)

Light speed was not firmly given a definite figure until quite recently. There was heated debate on dropping light speed in the 1930`s.

Now the rate of radioactive decay is dependent upon light speed. The faster the speed of light, the faster the rate of radioactive decay.

So if today, light speed is measured by atomic clocks, it will not be seen to be decreasing. Any drop in light speed will be matched by the slowing atomic clocks.

Zircon Crystals -- Uranium Decay
-- Helium retention.

The 1.5 billion years worth of decay of Uranium in the Zircon crystal is used to give dates for granite. If the speed of light was faster in the past, this amount of decay could have been achieved in only 6000 or so years.

Interestingly, the Helium (a product of Uranium decay) that remains in the crystal would not be there if the radioactive decay had taken 1.5 billion years. The Helium moves out at a determinable rate, and shows that the decay has only taken thousands of years.
A previously high speed of light ($cx10^{10}$) would explain this apparent dilemma.

An objection might well be raised at this point. It could be argued, that if the speed of light was very fast in the past, ALL the radioactive substances would have "fizzled away" in very rapid time. And this is a very reasonable objection.

I believe that the reason all radioactive material did not "fizzle away" the moment, or from the moment it was formed, is that no radioactive material was formed.

When speaking on the subject on the subject recently, I pointed to the existence of polonium radio halos in the granite. (the work of Dr Robert Gentry). Either the audience had to accept instantaneous formation , or they had to allow that radioactivity had begun after the granite was formed.

I called the audience's attention to the "Francis Filament", a mature string of 37 galaxies at the edge of the universe (Announced to American Astro-Soc Jan 7th 2004). I pointed out that all that would be expected 10 billion years back (which is the conventional "look back" time) would be young "proto galaxies". I then showed from historical rates of c, Uranium decay in Zircon, and polonium radio halos in granite, that there was a good case for $cx10^{10}$ in the past.

I proposed that the light itself (which is all that we have to examine anyway!) could not be older than some 6223 years. I did not challenge the overall conventional age of the universe. Just the age of the light from the Francis Filament.

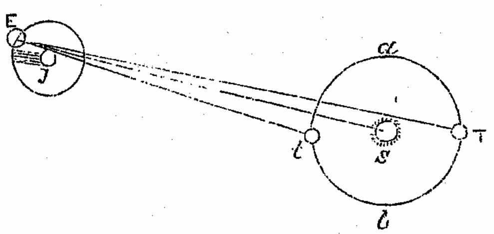
I did however, point out that radioactivity and the sudden rapid fall in light speed were probably concurrent. So that all radiometric dates had to fit within the proposed 6223 year period.
The radiometric dating could no longer be used to calculate billions of years if light was $cx10^{10}$ in the past and had fallen in speed 6222 years ago.

Buckmaster's Physics Text 1869

other the air communicates its vibrations to the ear. This theory has been ably maintained by Euler and Descartes. Almost all the leading principles regarding light may, however, be explained by either theory. Both assume the existence of a subtle fluid or ether, and the influence of luminous bodies. In both theories light must be considered as a material body, possessed of certain well-defined properties.

The velocity of light was first determined by Von Romer, a Swedish astronomer, in 1675, by observations on the satellites of Jupiter. This planet is surrounded by several satellites, or moons, which revolve about it in certain definite times. As they pass behind the planet they disappear to an observer on the earth, or, in other words, they undergo an eclipse. The earth revolves in an orbit about the sun, and in its revolution is at one point 192 millions of miles nearer to Jupiter than when it is in the most distant part of its orbit. Suppose a table, calculated by an astronomer at the time when the earth is nearest to Jupiter, ignoring the fact just mentioned, showing for six months the exact time when a particular satellite would be eclipsed. In the space of six months from that time the earth, in its revolution, has arrived at a point in its orbit 192 millions of miles more remote from Jupiter than when the table was calculated; and it would be found that the eclipse of the satellite would occur 960 seconds later than the calculated time. This is explained by the fact that the light has to pass over a greater space than when the earth was in that part of its orbit nearest to the planet; and if it requires 960 seconds, or 16 minutes, to move over 192 millions of miles, it will require one second to pass over 200,000 miles. When the earth in six months arrives at its former position, or 192 millions of miles nearer to Jupiter, the eclipse will occur 16 minutes earlier, or at the exact time calculated for that point previously. The velocity of light may, therefore, be assumed as 200,000 miles per second; but more exact calculations give 192,500 miles per second. A reference to the following diagram (*Fig.* 5) will make the illustration much clearer :—

FIG. 5.

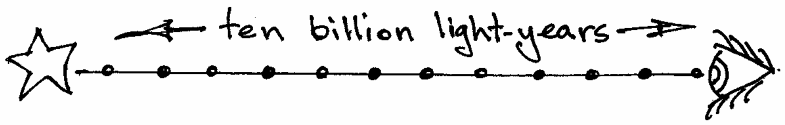


Let *S* represent the sun, and *a b* the earth's orbit; T and *t* the position of the earth at the opposite points of its orbit. *J* represents Jupiter, and E its moon or satellite, about to be eclipsed by passing within the shadow of the planet. Now the commencement or termination of an eclipse is the instant of time when the satellite enters or emerges from the shadow of the plane. If the transmission of light were instantaneous, it is evident that an observer at T, the most remote part of the earth's orbit, would see the eclipse begin and end at the same time as an observer at *t*, the part of the earth's orbit nearest to Jupiter. This, however, is not the case. The observer at T sees the eclipse 960 seconds later than the observer at *t*; and as the distance between these two points is 192 millions of miles, we have the velocity of light in one second $\frac{192,000,000}{960} = 200,000$.

Reflection of Light.—When the rays of light

The Shape of the Universe. 13/09/2004

Let us assume that the speed of light has fallen, from an original cx10^{10} (ten billion times faster). What sort of universe would we expect to find? What effects would we see within the Universe? Consider the diagram below.



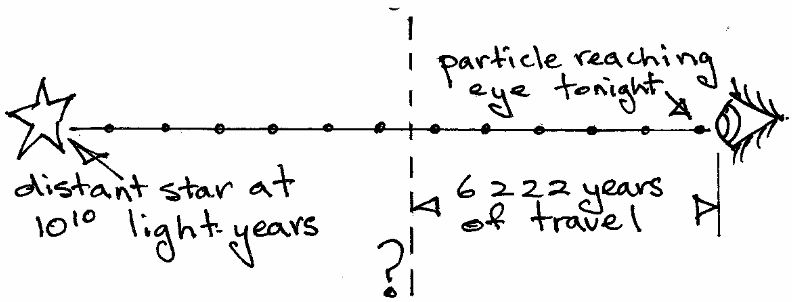
Light is travelling from the star to the eye of an observer on earth. At the original speed of light proposed by Troitsky, ten billion times faster, the light will reach the observer's eye within one year. But today, the light from the star will take ten billion years to reach us.
Imagine that the "particles" of light are like a line of cars on a highway. They all slow down together as the speed of light has fallen over the past 6222 years. (SPACING MAINTAINED)
Imagine again the "particles" as the frames in an old motion picture film. The filmstrip is running at one ten billionth of its original speed. To all intents & purposes, the motion of every thing at a distance is stopped. A clock on the star, viewed on the filmstrip from that star, would appear to be almost stationary. The hands would not move any perceptible amount! Every 300 years the hand marking the seconds would move on by 1 second!!!

60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day
365 days = 1 year

60 x 60 x 24 x 365	=	31536000 seconds per year
	=	3.1536×10^{7} seconds per year
times 300 years	=	$300 \times 3.156 \times 10^{7}$
	=	10×10^{9} seconds each 300 years

This lack of movement in the second hand of a "clock" would show up as a lack of rotational speed, say, in a galaxy.

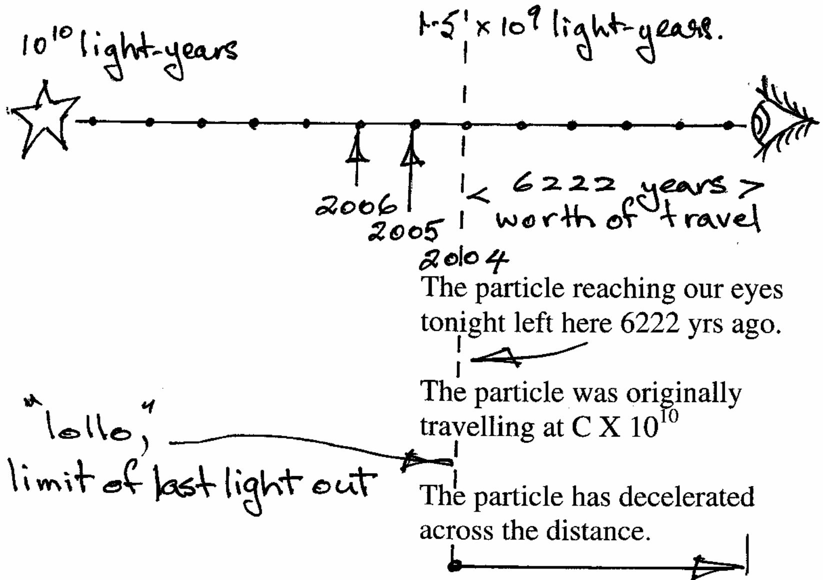
A question that can be asked, is: "Where did that particle of light come from, that reached our eyes tonight, over the last 6222 years?" Because, the light reaching our eyes tonight is "old film". That light was on its way when the speed of light fell. How far has that particle travelled? Is there a simple way to calculate this? Consider the diagram.



The vertical dashed line with the question mark is the point in space from which that particle travelled. That particle, reaching our eyes tonight, from very distant stars, must have been on its way at $cx10^{10}$ when the speed of light fell. So that the light from very distant stars is always fully – decelerated light. The particles were originally travelling at $cx10^{10}$.

Let us consider again the Zircon crystal. The Uranium decay shows that 1.5×10^9 years worth of decay has occurred over the last approx 6222years. Recall that the rate of radioactive decay is directly dependent upon the speed of light. The faster the speed of light the faster the decay and so on. And let us think of this uranium decay as a measure of the "work done" by means of the "average" light speed over 6222 years. (At 2004)
If there is 1.5 billion years worth of decay, then there is 1.5 billion years worth of light travel – at today's rate of c.

So that particle that reaches our eyes tonight has travelled 1.5 billion light years since the speed of light fell.
The particle from that same star, that reaches our eyes this time next year will have travelled 1.5 billion and <u>one</u> light years. Let us consider the diagram below.

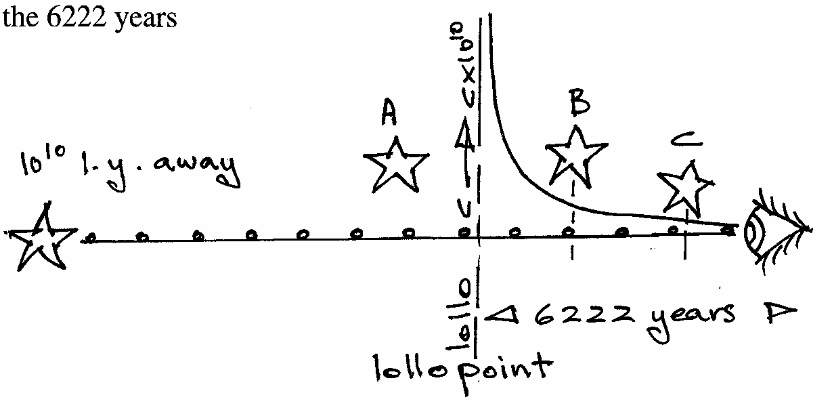


The vertical dashed line I have called the "Lollo" point, short for "limit of last light out"

Consider that the particles shown in the diagram above are spaced at 1 light-year apart. All the particles across the 10^{10} light years distance are assumed to be equally spaced. So in another year, the particle of light labelled 2005 will have reached us from 1 light year further out. And in 2006 the next particle of light will reach us from yet another light- year further out. Thus the "lollo" point is moving out at the speed of light.

For distant stars, the light particles reaching our eyes are "fully decelerated" particles. And are coming from a point 1.5 billion light years out, to reach our eyes tonight.
And this "lollo" point is moving <u>out</u> with the speed of light.

Let us consider the diagram below where the CDK curve is laid over the diagram to show the deceleration of a light particle over the 6222 years



Consider the case of Star "A", beyond the "lollo" point. The light from Star "A" will be fully decelerated light. The light will be decelerated in the same way, to the same degree, as the star shown out at 10^{10} light years distant.

The lollo point is moving out at the speed of light. Is the amount of deceleration of the light particle connected to observed red shifts? If this is so, then the red shift will not be a good indicator of distance. Because the "image" at the lollo point may be mistaken for the object at greater distance. The distance from the eye to the "lollo" point is only 15% of the distance to the far star at 10^{10} light years out.

Consider the case of Star "B", within the "Lollo" point. If the CDK curve represents the deceleration of particles, then the particle of light from Star "B", reaching us tonight, is <u>not fully</u> decelerated. But it is partly decelerated. Let us suppose that the particle of light from Star "B" has travelled for 1000years. But it has travelled much more than 1000 light-years.Consider that light from Star "C", reaching us tonight, left in 1869. The speed of light in 1869 was given as 309,700 km/sec (192,500mi/sec).

The speed of light today is some 299,792km/sec – 10,000km/sec less. So in135 years the particle of light has travelled more than 135 light-years of distance. It is somewhat decelerated since it left Star C. It is less decelerated than the particle of light from Star "B".

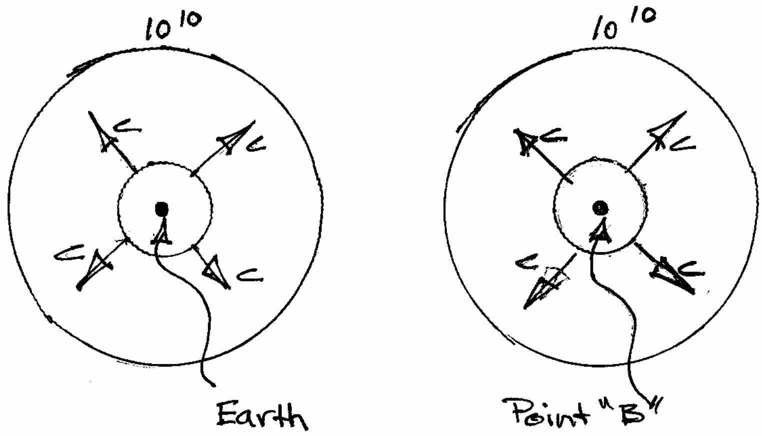
The further out the light source is, the more decelerated the light particles are – up to the "lollo" point, when all light sources beyond are equally decelerated. Whether the distant light sources, beyond the "lollo" point are 2×10^9 light years or 10×10^9 light years distant, the amount of deceleration is the same.

Note that "clocks" will increasingly slow as we observe light sources farther out towards the lollo point. Then, at lollo and beyond, "clocks" are slowed ten billion times.

All light reaching us cannot be much over 6222 years old, and some months, from the most distant sources at the limits of the visible universe. (1.5×10^{10} 1.y.???)
From the most distant (10^{10}) Stars to the "lollo" point represents 10.2 months of travel at $c \times 10^{10}$. From the "lollo" point to our eyes is 6222 years of travel. (85% of 1 year is 10.2 months)
MATURE GALAXIES WILL BE SEEN AT THE FAR EDGE OF THE VISIBLE UNIVERSE.

The "lollo Sphere" – the Earth's centrality in the Universe.

The lollo points from all distant sources all around us form a sphere with the Earth at the centre. All around the Earth, at about 1.5×10^9 light years out, the lollo points are moving out at the speed of light. Whether the light sources are just over 1.5×10^9 light years, or are at 10^{10} light years, they would appear to move out, all around the Earth at the speed of light. Thus, the Universe to 10^{10} out would seem to be receding, equally, at light speed, with the Earth central.



Consider the diagrams above. In the left hand diagram, the Earth is at the centre of the visible universe, which seems to be expanding at the speed of light. It is really, perhaps, the lollo points receding back.
In the right hand diagram, point B represents any other place in the Universe. Point B is also the centre of an expanding lollo sphere.
Any point in the Universe will appear to be the centre of an expanding, visible, universe "bounded" at 10^{10} light years (of the order of 10^{10})

The centre of the Universe will appear to be anywhere and everywhere. All points in the Universe are the centre of expansion of the "lollo" sphere at that point.

The "centre" of the apparently "expanding" Universe is <u>everywhere.</u>