# Creative episodes in a creationist cosmology

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**Intrinsic redshifts of quasars and galaxies result from the initial zero-inertial-mass of new matter ejected from parent galaxies in a grand scheme of creation that occurred during Day 4 of Creation Week. We see it occurring now in the cosmos due to the finite travel-time of light. The mass of this new matter is quantized, which results in an intrinsic redshift as hypothesized by Hoyle, Narlikar and Das. However, their variable mass hypothesis (*VMH*) fails to agree with observations. In a creationist cosmology, agreement may be found by understanding that the underlying structure is the creative process of God and not a naturalistic model. In this case, the origins of the cosmological expansion redshift, and of the intrinsic redshift of quasar sources, may be independent. An empirical analysis is presented to help our understanding—yet a fundamental underlying theory is still needed.**

This paper develops further some ideas of my creationary model related to the astrophysical evidence of quasar ejections from parent galaxies. For an introduction to the topic, the reader should familiarize him/herself with references 1, 2, 3 and 4, as well as Halton Arp's books.[5,6]

As discussed in reference 4 and 7, the Friedmann–Lemaître (F-L) solutions of Einstein's field equations provide the usual basis upon which the redshifts of extra-galactic objects are understood. Those solutions use the Riemannian geometry of the Robertson–Walker metric to calculate their redshifts.

But there is a problem with that picture. Some galaxies have apparent motions (if the Doppler interpretation is applied to their redshifts) that defy the description and often exhibit anomalously large excess redshifts as compared to the central dominant galaxy in the cluster. High redshift quasars have also been shown to be associated with, and even ejected from, lower redshift parent galaxies or an Active Galactic Nucleus (AGN). Therefore their measured redshifts are not in agreement with the Hubble Law; nor are they at such great distances as is generally believed. This paper will take another look at the anomalous quantized redshifts often seen in quasar sources.

### Variable mass hypothesis

In 1974 Hoyle and Narlikar introduced a new type of theory of gravitation,[8] based on Mach's principle,[9] which Narlikar, Das and Arp have advanced further.[10,11] My creationist cosmology is based on the underlying assumption that the *variable mass hypothesis* (*VMH*) embedded in the Hoyle-Narlikar theory is correct. There are several problems with the Hoyle-Narlikar theory, however, the *variable mass hypothesis* is independent of these, and can be extrapolated to a creationary cosmology—providing the mechanism for the creation process during Day 4 of Creation Week.

Over the past 3 to 4 decades a large body of observational evidence has been gathered that points to the possibility that high-redshift quasars are physically associated with low-redshift galaxies. The excess (or anomalous) redshifts of these quasars are unlikely to be either of Doppler or of gravitational origin.[12] Narlikar and Das suggested a new source for this excess redshift,[10] resulting from the accumulation of inertial mass of a newly ejected particle by the ever expanding sphere of gravitational influence of the surrounding matter field.

Narlikar and Das have shown that observed quasar alignments, and redshift bunching around preferred values can be understood within the framework of this new theory. For a detailed discussion of the *variable mass hypothesis* see section III of reference 10. Narlikar and Arp[11] describe a cosmology that is equivalent to the standard F-L cosmology with space curvature constant $k = 0$, i.e. Euclidean space.

Their field equations (see (4) and (5) of reference 11) are conformally invariant, and for mass $m$ = constant, they reduce to those of general relativity. This is the usual relativistic frame. Only when mass $m = 0$ does it depart, creating geometrical singularities, which are the space-time singularities that appear in the general relativistic solutions. The solution of their field equations is found when space-time is Minkowskian,[12] but particle masses uniformly scale with epoch according to the relation:

$$m = \chi t^2, \tag{1}$$

where $\chi$ is a constant, proportional to the number density of co-moving particles in the reference frame centred on the earth with spherical coordinates $(r,\theta,\phi)$. Thus the constant $\chi$ measures the magnitude of the inertia at some space-time point that is influenced by all particles in its past light cone, in other words, its past sphere of influence. The parameter $\chi$ implicitly involves a coupling (not stated here, see equation (7) of ref. 10.) so (1) is dimensionally correct.

This means their cosmology, developed around the *VMH*, is based on a flat space-time, in which light from extra-galactic sources suffers no spectral shift resulting from space-time expansion. In the following I will also consider *the redshift resulting from the VMH* to be independent of any spatial expansion. Thus the *origins* of the anomalous redshifts found in quasar spectra and the cosmological expansion redshifts found in galaxy spectra are potentially *unrelated*.

Given the radial coordinate of a galaxy is $r$, with an observer at $r = 0$. A light-ray leaving the source at $t = t_0 - r/c$ reaches the observer at $t_0$ (where $c$ is the speed of light in a vacuum). Since $m$ scales as $t^2$ and the emitted wavelengths scale inversely to mass, they derive the redshift ($z$) due to this process:

$$1 + z = \frac{t_0^2}{\left(t_0 - \frac{r}{c}\right)^2}, \quad (2)$$

which is the consequence of the systematic increase of the particle mass with epoch $t$.

Rearranging (2) for $r/c << t_0$, we get:

$$1 + z \approx 1 + \frac{2r}{ct_0} = 1 + \frac{H_0}{c} r, \quad (3)$$

which is what Fred Hoyle showed in 1972 following the same line of thinking.

## Quasar redshifts

Assuming a galaxy G and quasar Q are both at great distance from the observer it follows that:

$$1 + z_G = \frac{t_0^2}{\left(t_0 - \frac{r}{c}\right)^2}, \text{ and } 1 + z_Q = \frac{t_0^2}{\left(t_0 - \frac{r}{c} - t_1\right)^2}, \quad (4a,b)$$

where $t_1$ is the time measured in the galaxy frame when the new matter was created in the quasar. This means the galaxy's world-line (at $t = 0$) crossed the $m = 0$ hypersurface before the quasar did (at $t = t_1$), which was created through the ejection from the active nucleus of its parent galaxy.

Rearranging (4a) we get:

$$1 - \frac{r}{ct_0} = \frac{1}{\sqrt{1 + z_G}}. \quad (5)$$

If we define an intrinsic redshift according to the time of creation of matter, relative to the current epoch, we find:

$$1 - \frac{t_1}{t_0} = \frac{1}{\sqrt{1 + z_i}}. \quad (6)$$

Substituting (5) and (6) into (4b) results in:

$$1 + z_Q = \left\{ \frac{1}{\sqrt{1 + z_G}} - 1 + \frac{1}{\sqrt{1 + z_i}} \right\}^{-2}. \quad (7)$$

Now following the line of Hoyle, Burbidge and Narlikar, (reference 13 and references therein) the observed relationship between the galaxy and quasar redshifts has been observationally determined to be in the form:

$$(1 + z_Q) = (1 + z_i)(1 + z_G), \quad (8)$$

neglecting the small additional Doppler motions.[1]

There has been some controversy regarding the validity of the associations of quasars with low-redshift galaxies, which is assumed by the above equations, as discussed at length in reference 1.

By re-arranging (7) it can be made to fit the form of (8) but with an additional function, $F$, hence:

$$(1 + z_Q) = (1 + z_i)(1 + z_G) F(z_i, z_G). \quad (9)$$

The function $F(z_i, z_G)$ is not insignificant and cannot be neglected to make the theory fit the relationship indicated by the observations, shown by (8). So it would seem that, though the *VMH* model has been successful in some areas, it doesn't fit the observed data (eg. table 23.1 (p.335) of ref. 13). See also figure 1 of ref. 1. The inconsistency arises in trying to get (1) to generate a redshift equation (2).

The Machian concept that produces (1) assumes a three dimensional flat space and that a growing sphere of gravitational influence expands at the constant speed of light. The surface area of a sphere like this, centred on the source of new matter, grows as the radial distance squared. Therefore we'd expect the mass to grow as time squared. This is similar to the origin of inverse-square laws of luminosity and gravitation.

Thus, it is reasonable to assume the exponent in (2) is the number '2' and furthermore it does approximate to the Hubble Law in (3). It may still be correct in some limit where (4a) applies to observations. But if the metric is wrong, then for times $t_1$ close to $t_0$ (i.e. soon after creation) the form of (4b) may be wrong. Could it be that this is because it too, like the big bang model, is based on an incorrect starting assumption—namely that the universe is both isotropic and homogeneous?

A creationary cosmology is fundamentally different—among other things, the starting assumption is a finite bounded inhomogeneous, yet isotropic universe. During Day 4 of Creation Week the space-time curvature may have been very large near the sources of ejection and hence the metric there would not produce a time-squared dependence. At this stage we may only speculate what form that took and in this paper it is only discussed qualitatively. A quantitative theory is needed, however since these creation ejection events were due to a supernatural process, it is possible that the correct theory may be outside the realm of natural law.

## Quantization of redshift

One of the observations driving these hypotheses is the quantization of the redshifts in the light from quasars. Since my previous paper on this subject[1] another quantization scheme has been suggested by Bell.[14] Bell does not find the same scheme as Karlsson,[15–17] but he does support the ejection of new matter (according to the *VMH*) and intrinsic redshifts.

## Galaxy redshifts

Low-redshift galaxies have also been shown to have

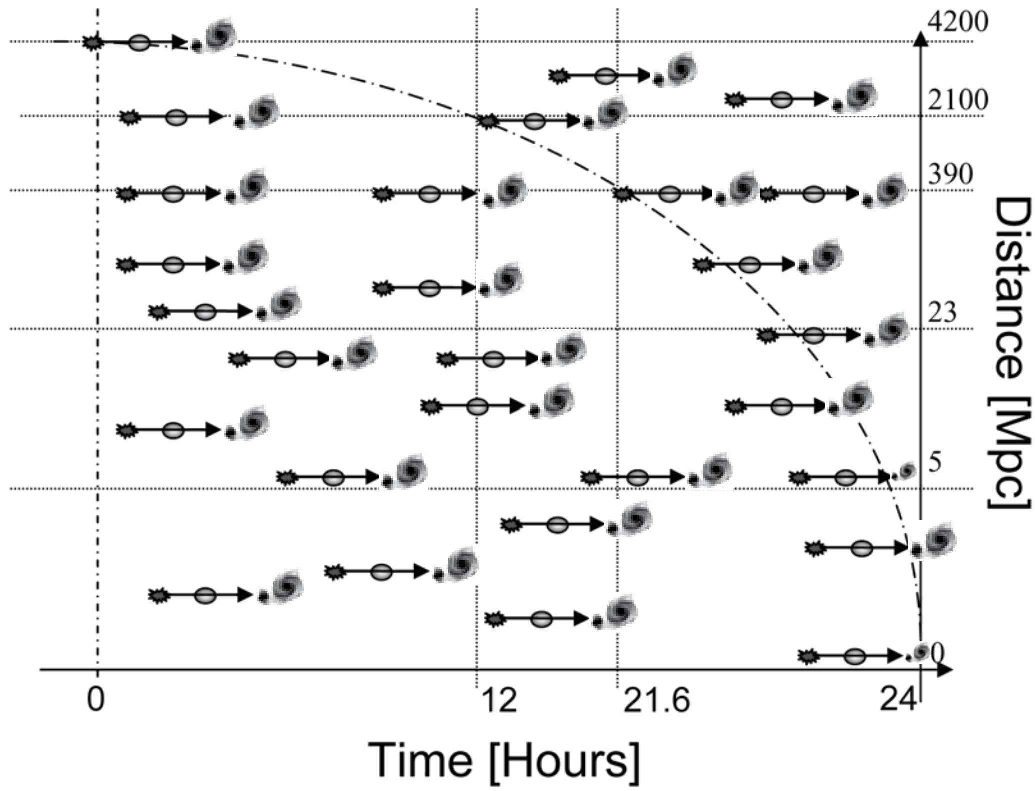


***Figure 1.*** *A simplified schematic representing some key features of the creation model timeline of Day 4. Distance is in Mpc on a base 10 logarithmic scale and time is in hours on a linear scale. The objects represent ejection episodes where a quasar is ejected from a parent galaxy. The quasar subsequently evolves into a galaxy over about 300 million astronomical years, which is about half an hour or 2% of Day 4. The lengths of the arrows are exaggerated and should be 0.5 hours (by Earth clocks) long. Millions of such episodes occurred during Day 4.*

quantization in their shifted light spectrums. Tifft and Cocke[18] proposed an interval of $c\Delta z \sim 72$ km s$^{-1}$, while Guthrie and Napier[19] show a further quantization of $c\Delta z \sim 37.5$ km s$^{-1}$. Taken by itself this would seem to indicate, regardless of the redshift mechanism, that we the observers must be centred on a universal distribution of galaxies arranged in shells with regular discrete intervals between layers.[20]

Narlikar and Arp state:

> 'On the large scale the universe could not be expanding in shells because the likelihood of our being at the exact center of all these shells is vanishingly small. On the small scale any large number of peculiar velocities appreciably larger than ±37 km s$^{-1}$ would wash out the observed quantisation.'[21]

They see the issue clearly enough, but discount the creationary solution because it's simply not on their radar. They do raise a good point though—for the quantization to be a mere distance induced redshift due to expansion of the cosmos then *local motions must be very small*. This tends to argue against the quantization being caused by Hubble flow or cosmological expansion. Narlikar and Arp use this line of argument as further evidence that the anomalous redshifts seen in galaxies, as well as much higher redshift sources, is of some intrinsic origin related to the *VMH*.

Observations of close quasar-galaxy associations fit equation (8) not (9). Considering that our creationist cosmology describes a finite bounded universe we need to account for any gravitational redshifts or blueshifts as well as for cosmological expansion. In reference 4, I considered the various possibilities, and my conclusion is that we must look at each contribution to the observed redshifts as independent of the other. I believe we can make a piecewise construction of the contributions as they may mostly be due to independent mechanisms. At least any intrinsic redshift can be considered independent of cosmological and Doppler contributions to the total redshift.

These are the four contributions to the redshift of an extragalactic source:

- a Doppler ($z_D$) induced redshift or blueshift, resulting from very small local motions for galaxies. In the case of ejected quasars the velocities are much higher, but in these the Doppler shifts seem to be such that $|z_D| < 0.1$ or 10% of the speed of light.
- a gravitational redshift or blueshift ($z_{grav}$) which is not observable against the much larger cosmological expansion redshift ($z_{exp}$) as discussed in reference 4.

The gravitational redshift or blueshift is a natural result of the finite matter distribution of the universe.

- a cosmological expansion redshift that arises because of the actions of God spreading out the fabric of space itself. A redshift results because of the difference in scale size of the universe between the times of emission and reception of the light.
- an intrinsic redshift component ($z_i$) seen in both galaxies and quasar like objects. This component can only be red because there were no galaxies created before ours on Day 4. It is suggested that $z_i$ is the result of a difference in the time of creation of the new matter ejected from the centres of parent galaxies and the time of the observer. Therefore the first created galaxies, including our galaxy, that were initially spread out at the beginning of Day 4 would exhibit zero, or near zero, intrinsic redshift.

We can write an equation relating the measured quasar redshift to four quantities:

$$(1+z_Q) = (1+z_i)(1+z_D)(1+z_{exp})(1-z_{grav}) \,. \quad (10)$$

All 'z's are positive and the minus sign appears with $z_{grav}$ because it is assumed that there is a blueshift inside the potential well of a finite universe. In this relation $z_{grav}$ is small and can usually be neglected or incorporated into the cosmological component ($z_{exp}$). In fact, in our galactocentric universe there is no way to directly observe the gravitational blueshift because it is masked by the Hubble Law expansion redshift.

The creationist cosmology I propose is that the cosmological term ($z_{exp}$) applies to all objects in the universe. However, in general, we can only rely on the measured redshifts to be cosmological in the large central (to a cluster) elliptical galaxies and large spirals from which we may or may not see ejection phenomena. They are generally, but not always, low redshift. These were the original created galaxies, from early on Day 4 which were spread out as the Lord stretched out the heavens. These galaxies should have zero intrinsic redshift, as only if they were of secondary origin would they have an intrinsic component due to *VMH*.

## Quantized mass

If the creation of new matter only occurred during Creation Week, specifically on Day 4 for the heavenly bodies, and if the anomalous galaxy and quasar redshifts are the result of those events, then a creationary cosmology is needed to interpret them correctly. Following this line of thinking, let us assume that the fundamental assumption is correct, i.e. mass starts out initially with zero inertial mass and grows in time. Let us empirically follow this from the data and see where it leads us.

We know that the observed quantized redshifts of quasars are determined by normal redshift measurements—spectral lines in the laboratory are compared with identified spectral lines in the emission or absorption spectra of these extra-galactic sources. Therefore we conclude that all lines are shifted by the same amount—it is not dispersive.

Consider the energy levels in the hydrogen atom.[22] Spectral lines are the result of transitions in the atom between quantum-mechanically allowed states. The energy of absorption or emission is:

$$E = \frac{1}{2} m_e c^2 \alpha^2 \left\{ \frac{1}{n_j^2} - \frac{1}{n_k^2} \right\} \qquad (n_j < n_k), \qquad (11)$$

where $n_j$ and $n_k$ are the principal quantum numbers for the *j*th and *k*th states. The parameter $m_e$ is the presently measured mass of the electron, *c* is the speed of light and α is the fine-structure constant. The latter can be considered to modify the speed of the electron in the atom to become $c\alpha$.

If an atom is ionised from its ground state then (11) becomes:

$$E\,(\text{ionization}) = \frac{1}{2} m_e c^2 \alpha^2 \left\{ \frac{1}{1} - \frac{1}{\infty} \right\} = \frac{1}{2} m_e c^2 \alpha^2 , \qquad (12)$$

where $n_j = 1$ and $n_k = \infty$. The current laboratory value for E(ionisation) is 13.6 eV. Now suppose that the electron mass started (at creation) with zero mass. From (12) we can relate the change in energy of ionisation to the change in mass as:

$$\frac{\Delta E}{E} = \frac{\Delta m_e}{m_e} = \frac{\Delta \nu}{\nu} , \qquad (13)$$

where ν is the frequency of a photon required to ionise the atom. Therefore we can relate the emitted[23] photon energy ($E'$) to that measured in the lab ($E_L$) by:

$$\frac{E'}{E_L} = \frac{\nu'}{\nu_L} = \left( \frac{\lambda'}{\lambda_L} \right)^{-1} = \frac{1}{1+z_i} \qquad (14)$$

where λ is the photon wavelength. Parameters with the *L* subscript are local laboratory measured values. The primed parameters are from the source. The parameter $z_i$ is the intrinsic redshift related to this process. It follows from (12) and (14) that:

$$E' = \frac{1}{2} c^2 \alpha^2 \left( \frac{m_e}{1+z_i} \right) \qquad (15)$$

In this model both *c* and α are constants over all time and space. The electron mass (bracketed in (15)), and all particle masses, as a result, are dependent on redshift $z_i$. More precisely, a redshift $z_i$ can be predicted from the electron mass at the time of emission or absorption of photons. As $z_i \to \infty$ the electron mass $m_e/(1+z_i) \to 0$, which is our starting hypothesis. This means newly created matter is very easily ionised and this is consistent with the creation of hot balls of plasma from which everything else arises.

The plasma would initially be protons and electrons, but they would have enough kinetic energy to fuse to neutrons and higher-numbered nuclides. As heavier elements are

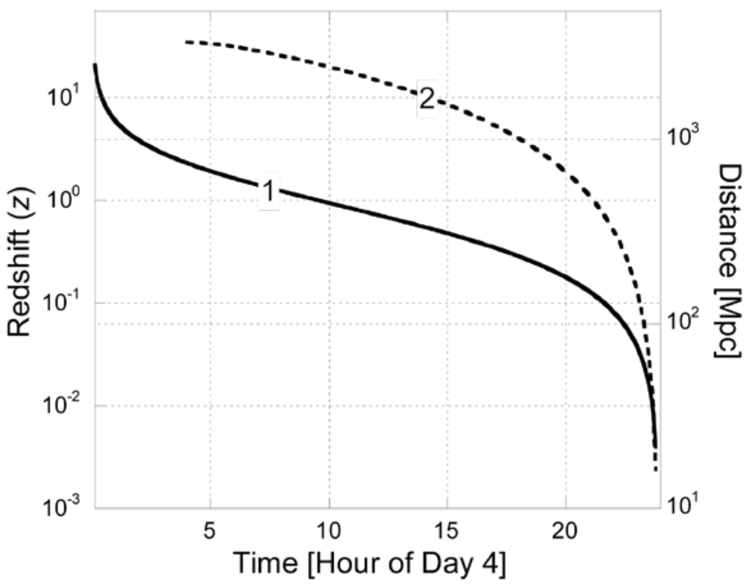


***Figure 2.*** *Curve 1 is the cosmological or expansion redshift (z) of extra-galactic sources as a function of the hour of Day 4. Curve 2 is the look back distance in Mpc as a function of the hour of Day 4. So the highest redshift galaxies with z > 5 were created near the beginning of Day 4. Curve 2 is equivalent to the broken line in fig. 1.*

built and the quasars evolve towards normal matter, the emission and absorption energy levels are all shifted by the factor $(1+z_i)^{-1}$.

This mechanism, even though it occurs during Creation Week, need not violate the conservation of energy or momentum. As the inertial mass of the electron/nucleons grow the kinetic energy of the ejected fireball is converted to mass and potential energy. With conservation of linear momentum, the potential energy of the system compensates for the change in kinetic energy, which will depend on $z_i$. As a result, the objects slow their exit from the parent galaxy as proposed by Arp. This is consistent with observations that show quasars with lower redshifts systematically farther from the parent source. See figure 4 in ref.1.

An underlying theory is still needed to describe mass quantization on subatomic scales and at energy scales only seen in astrophysical sources. However, working from the observed data, some empirical understanding may be gained. Following Karlsson,[15–17] let us assume the redshifts are quantized as:

$$1+z_i = \exp(0.2054\,\eta - 0.1477) \qquad (16)$$

where $\eta$ is a positive integer. Therefore the photons resulting from ionization, or any atomic transition in the plasma, must have energies determined by:

$$E' = E_L \exp(-0.2054\,\eta)\,. \qquad (17)$$

Since exp(0.1477) is constant in (16) it has been incorporated into $E_L$ so that $E_L$ = 13.6 eV when the index $\eta$ = 0. From ionisation energy of the hydrogen plasma we can determine the temperature, assuming the usual three degrees of freedom for the ions. Therefore $E' = kT$, where $k$ is Boltzmann's constant and $T$ the temperature in kelvin [K].

The index required to yield the initial plasma temperature, which was deduced from the expansion of space in reference 7, is $\eta$ = 12 where the temperature is about 9,000 K. This is equivalent to an ionization energy of 1.156 eV, which means the maximum value of the quantized redshift in the initial fireball corresponds to this value. From (16) it follows that $z_{12}$ = 9.15. This doesn't mean that particle masses don't begin at higher quantization numbers (i.e. lower masses) in creation ejection events but it was the value in the initial plasma that came into equilibrium with space over the available time (possibly billions of astronomical years) before creation of galaxies occurred.

We have been talking about creation events from active galactic nuclei in all regions across the cosmos. But we also must remember that during Day 4, God was spreading out the heavens and creating galaxies in that process.[24] We are still seeing a lot of this in the cosmos now.

The quantization in (17) is much too coarse to reflect the very fine scale seen by Tifft and Cocke[18] and Napier and Guthrie[25], which forms the basis of Humphreys' paper.[20] But what if the source photon energy quantization has additional fine structure not indicated by the quantization scheme of (16)? There could be additional structure and this scheme is not the whole picture. See reference 14.

Perhaps the quantization of the light from galaxies (as seen by Tifft *et al.*) is the result of an entirely different mechanism? One has been suggested by Oliveira, who derives spherical harmonic equations relating intrinsic redshift to curvature of space, based on Carmeli's solution to general relativity.[26] Oliveira's equations for an expanding universe are consistent with Humphreys' model, creating a bunching of galaxies at preferred distances from a centre, resulting from the expansion of space.

The 70 $\mu$K fluctuations in the CMB temperature maps[27] would mean 0.2 K fluctuations at creation if they originated in the early plasma. Thus, I don't consider such fluctuations of any significance, but I contend that they result from other causes unrelated to the initial creation process. See discussions in references 27 and 28. The observed fluctuations we now see are artefacts of the environments the photons have passed through on their way to Earth.

In this cosmology we consider that a time-dilating event was supernaturally imposed on the universe during Day 4 of Creation Week.[3] This had the effect of dilating the 24 hours of a single creation day by a factor[29] $\Sigma \approx 4.63 \times 10^{12}$. (The value of $\Sigma$ is determined below.) This means the 24 hours of Day 4, measured by Earth clocks, lasted for about 13 billion years as measured by astronomical clocks.[30]

### Creation episodes

This model sees the visible universe structured similarly to Arp's universe,[31] but with galaxies in superclusters centred on our galaxy. The creation period lasted the whole of Day 4, at the same time that the Lord stretched out the heavens. The maximum redshift in this model is $z_{exp} \sim 3300$, but that was when the initial plasma was created. It is not known exactly at what redshift the first galaxies actually formed. But from observations, there may not be so many galaxies beyond $z_{exp} \sim 5$.

No doubt selection effects, resulting from extinction can be the cause of the low galaxy counts at high redshift. However, it may also be argued that the few higher redshifts claimed for galaxies are misinterpretations as they are identified from quasar or AGN spectra, and that a sizeable component of those redshifts are also intrinsic.

In fact, since most galaxies are not much more distant than 1 Gpc,[32] we would not expect to find large numbers of galaxies with expansion redshifts ($z_{exp}$) > 1, which would place them above 2.5 Gpc, depending on the specifics of the model applied.[30] Very faint galaxies have shown up in Hubble deep field images, however, this doesn't necessarily mean that they are universally more distant, but only that they are very dim, which may also mean that they are small. The distance must be determined independently of their redshift to have a verification of their Hubble-redshift distances.

The arrangement and locations of extragalactic objects in the universe is very different in this cosmology than in the big bang inflationary cosmologies, due to the different assumptions regarding the validity of the Hubble Law distances. Many observations that give cosmological redshift determinations for 'distant' galaxies are, in fact, flawed by the big bang paradigm under which all redshifts are interpreted.[33,34] I am not suggesting that the Hubble law doesn't work, but in the case where intrinsic redshifts exist, a method must be found that can separate the various components.

***'Many observations that give cosmological redshift determinations for 'distant' galaxies are, in fact, flawed by the big bang paradigm under which all redshifts are interpreted.'***

In an earth-centred creation model the visual horizon may be quite different to that in the F-L cosmologies. Because our universe is finite, limits can result from the fact that the light has all but been extinguished due to loss of luminosity with expansion, or even the first light has not yet arrived. Also if the first creation events occurred near Earth before much expansion happened, as my model proposes, then the light from those events has passed Earth already and can never be seen.

Assuming time-dilation during Days 1–3, as well as Day 4, the radiation from the initial plasma would have filled the universe for at least 10 billion years by astronomical clocks. Thus at the beginning of Day 4 it is stretched by spatial expansion from a strongly curved state to the current flat space, shifting all the 'relic' radiation into the microwave band. Thus we might expect a very rapid decrease in galactic population density past a certain cosmological or expansion redshift.

However, mature[35] galaxies (first created ones) as well as highly disrupted galaxies (ejecting galaxies) should be seen out to the greatest redshifts possible. The big bang postulates an era where no galaxies had yet formed. In this model that would necessarily be before Day 4, into Day 3. Also we would expect to find large elliptical and spheroidal galaxies early in the universe[36] as these may be the first parents in a chain of ejections, or simply the first created ones.

In any case what we can see is a string of creative episodes (with galaxies at different stages) from high redshift to low redshift, with the events closest to Earth at low redshift. During Day 4 on Earth, time passed at least a trillion times slower than it did in the cosmos. This allowed light from the galaxies as far as 14 billion light-years to get to Earth in 24 hours. For very distant objects we see light now which is only a fraction older than the first light—i.e. the light from the moment of first creation.

We also see a process of creation occurring over a period of time. Astronomical observations indicate we are seeing creative processes that extend over hundreds of millions of apparent years, suggesting the period for a creation episode is about 3 hundred million years, by astronomical clocks.

Figure 1 is a simplified schematic, representing some key features of the events of Day 4. I have sketched a plot of Earth time against distance to give the reader an idea of the proposed process. The Virgo Supercluster is around 10–100 Mpc distant. The broken curve is the time we observe events when looking back into the cosmos, due to the finite speed of light. The further back the event, the earlier in Day 4 the event occurred.

On the left hand side are events we cannot see happening anymore as the light has passed us. We can only see the aftermath of those creation events.

On the right hand side are events that we have not yet seen but will see as the light arrives.

The broken line represents the events we are seeing now, which occurred approximately 6,000 years ago—Earth time, during Day 4.

6,000 years, when expressed as a fraction of 13.7 billion years (the length of Day 4 in astronomical years), is only $4.38 \times 10^{-7}$. Therefore we can neglect its contribution to these calculations. Only when we consider our galaxy does it become significant. The creation episodes are represented in the figure by the objects which eject quasars (circles) which then evolve into galaxies over a period of about 300 million astronomical years. That represents 2% of the total duration of Day 4 or about half-an-hour. The arrows should be about half an hour long by Earth clocks. Many millions of creation episodes occurred all during the Day but we are limited in what we can now see. In the case of very near objects we see only the mature result of the creation process. However, at nearly all distances, we should still see some creation activity as indicated by the broken line.

The earth timescale ($t_{forward}$) measured from the creation, can be related to the source galaxy redshift through:

$$t_{forward} = \frac{2\tau}{\Sigma}\frac{1}{1+(1+z)^2}, \qquad (18)$$

where $t_{forward} = 0$ when $z \to \infty$, $t_{forward} = 24$ hours when $z = 4.37 \times 10^{-7}$. Equation (18) has been determined from Carmeli's cosmology,[37] but divided by the time-dilation factor Σ. For a cosmic timescale (astronomical time) set $\Sigma = 1$. For the earth timescale the value of Σ can be determined by solving (18) for $t_{forward} = 24$ hours at a distance from Earth of 6,000 light-years where $z = 4.37 \times 10^{-7}$, which results from the Hubble law for small z (i.e. $z = r/c\tau$ where $\tau = 4 \times 10^{17}$ s). This yields $\Sigma \approx 4.63 \times 10^{12}$. The parameter $t_{forward}$ measures time since the beginning of the expansion, which I assume was the beginning of Day 4. Using this, it follows from (18) that we can plot redshift *z* as a function of the hour of Day 4. See curve 1 in figure 2. According to this model, after the Fourth day the time-dilation mechanism was turned off and the light of distance sources continues the journey over the last 6,000 plus years.

A look-back-distance ($d_{lookback}$) scale can then be determined from the relation:

$$d_{lookback} = c\tau \frac{\sinh\left(\frac{(1+z)^2-1}{(1+z)^2+1}\sqrt{1-\Omega_0(1+z)^3}\right)}{\sqrt{1-\Omega_0(1+z)^3}}\ \text{Mpc}, \qquad (19)$$

taken from equation (4) of reference 38, which was determined from Carmelian cosmology. Here the leading scale factor is $c\tau = 4070$ Mpc, which is determined from a Hubble constant in the limit of zero distance and gravity of $h = 73.5$ km/s-Mpc. The local matter density was assumed as $\Omega_0 = 0.023$.[39] Combining equations (18) and (19), we can determine the look back distance ($d_{lookback}$) as a function of the hour of Day 4 ($t_{lookback}$). This is shown in curve 2 of figure 2.

Table 1 gives a few values for cosmological distances in Mpc. For example, at 4,200 Mpc (= 4.2 Gpc or about 13.7 billion light-years) we are seeing the very beginning of Day 4. At 2,100 Mpc we are seeing 50% into Day 4 or about the 12th hour. At 5 Mpc most of the light of the creation events have passed us. We can only see the very last minute, which will last 16 million years. And at 0.1 Mpc or about 300 thousand light-years (the scale to the Magellanic clouds just beyond our galaxy) we are only seeing the last 2 seconds of Day 4.

***Table 1.*** *Look-back into Day 4 of Creation Week*

| Distance [Mpc][40] | 4,200 | 2,100 | 1,010 | 390 | 23 | 5 | 0.1 |
|---|---|---|---|---|---|---|---|
| Hour of creation | 0 | 12 | 18 | 21.6 | 23.76 | 23.976 | 23.9976 |

## Conclusion

The Hoyle-Narlikar *variable mass hypothesis* is a possible explanation for the creation of new matter through galaxy or quasar ejections from other galaxies, which also results in a quantized intrinsic redshift component. This may have been part of the Lord's creation process on Day 4 of Creation Week. However, an underlying theory has not been developed to explain the physical events. The case of the ionization of hydrogen is studied since most of the early universe was filled with hydrogen and, it is suggested, ionised to 9,000 K. This means an initial intrinsic redshift of 9.15 for the first created plasma. Expansion then followed with the creation in episodes of galaxies ejecting galaxies during Day 4. It is suggested that one episode lasted about 300 million astronomical years, or about half an earth hour during Creation Week, based on astronomical observations. Many millions of such events occurred during creation Day 4 and we are now seeing back into Day 4 the further out into space we look. Under this model, any events seen farther from Earth than around 6,000 light-years must have occurred during Day 4.

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22. Hydrogen is the simplest atom and it is assumed that God started His creation process with a plasma of protons and electrons.
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40. This distance may need to be modified by the correct value of the time-dilation factor Σ.

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