The Origin of the Universe: A Creationist Evaluation of Current Scientific Theories

A.W. (BILL) MEHLERT

ABSTRACT

For many centuries people have pondered the purpose and meaning (if any) of the Solar System and the Universe, and what role human beings may have in the overall scheme of things. Since the rise of materialistic science in the last couple of centuries, the concept of a 'supernatural' Creator has faded among scientific ranks and attempts have been made to produce cosmological theories and models which explain the Universe on a purely naturalistic basis. It is proposed to broadly examine and evaluate their relevance in the light of current scientific knowledge.

OUTLINE OF THIS PAPER

(1) Introduction and General Overview
(2) Evidence and Arguments Supportive of:
  (a) The Steady State Models
  (b) The Big Bang Model
(3) Evidence and Arguments Adverse to the Above Models
(4) The Mystery of Creation
(5) Summary and Conclusions

INTRODUCTION AND GENERAL OVERVIEW

Until the rise of modern science in the last few centuries, most people with a Christian, Jewish, or Islamic background held to the Old Testament view of a supernatural creation by an all-powerful Supreme Being who brought the heavens and the Earth into existence in the not too distant past, and the purpose of which was intimately connected with human beings, beginning with the first man and woman Adam and Eve.

As science began to move more and more to the position that all things could be explained within a naturalistic framework, such things as the age of the Earth and the Universe began to be questioned. With the appearance of uniformitarian geology in the early 19th century, many scientists became convinced that the biblical account was incorrect. The question then was — if not God, how and when?

Of course materialistic hypotheses are not new, they go back to the ancient pagans and to Greek philosophy. However, 19th and 20th century models have become quite sophisticated, especially with the appearance of the theory of relativity and quantum physics.

The net result has been that most people have either dropped their religious beliefs altogether or have compromised by reducing the Genesis account to myth or allegory. The major factor in this long process has been the education system from primary or elementary school right through to college and university where no other alternatives are permitted. By the time the student has passed through the system, he/she has been exposed to only one set of allowed considerations — the mechanistic models, and this has been reinforced by almost the entire media establishment. It is therefore a source of wonderment that despite this massive one-sided assault, so many students 'survive' and still hold to the literal biblical stance.

It is consequently of vital importance that the 20th century secular models be carefully scrutinized to establish just how dependable they are in respect of empirical, logical and theoretical support; the health and general state of society is in the balance because the general behaviour and outlook of the citizenry is influenced in many ways by the ruling philosophy of life and origins.

Basically there are two primary logical foundations from which to begin:–

(1) Either the Universe has always existed and always will, or
(2) The Universe came into being at a definite point in the past, with or without a creator being involved.

There are some variations in each view but these are really the only choices. The first, propounded by such authorities as Hoyle, Gold and Bondi in the late 1940s is known as the Eternal or Steady State theory, and in its original form proffered the idea of continuous creation of matter to balance the expansion of the Universe.[1] Other models such as that of Hobson posited an eternal but static Universe of finite dimensions, that is, a self-regenerating, non-expanding cosmos.[2,3]

The second type of theory is usually known as the Big Bang or Standard Model, and is presently in general favour with the scientific community. It does not allow for any sort of supernatural activity, and it has had a checkered history of ups and downs since the time of Gamow in the 1940s.

There are a number of observations and theoretical calculations which can be interpreted as being either favourable to, or inconsistent with, either model and it is proposed to examine these considerations in non-technical language suitable for readers with a moderate knowledge of the subject.

MODERN COSMOLOGICAL MODELS

(a) The Steady State Eternal Universe Theories

(i) The Continuous Creation Theory

The name of Sir Fred Hoyle, the noted British astronomer and astrophysicist, has been associated with the Continuous Creation theory on and off for nearly five decades. First proposed in the late 1940s, the theory had considerable scientific support until the discovery in the mid-sixties by Penzias and Wilson, of the uniform background microwave radiation, which allegedly is an 'afterglow' of the original big bang explosion which initiated the Universe.[4] This background radiation had been predicted earlier as being a 'leftover' from the extremely high temperatures when the 'universe' was only 300,000 years old. The discovery seemed to confirm the Big Bang hypothesis and to detract from the Eternal Universe model, although the original predictions were not very close to the actual detected temperature of 2.736°K (Kelvin).

Hoyle, Gold and Bondi had considered that the idea of a definite starting time for the cosmos was philosophically unappealing, and they began to search for a method which would avoid any sudden appearance of matter. Gold and Bondi originally teamed up in this project, and Hoyle later joined them. They came up with the Continuous Creation model and looked for observational evidence which would be consistent with it.[5]

Among the major problems of the Hoyle model was how to have an eternally expanding Universe which should have vanished from sight infinitely long ago, and the answer provided was that matter was being continually and spontaneously 'created' to balance the outward-flying galaxies, thus leaving the average density of matter unchanged. The amount suggested was about one hydrogen atom per 100 cubic metres of space per year.

The Steady State Universe was proposed to have always existed with no beginning nor end, and thus it avoided the consequences of the Second Law of Thermodynamics by which all things eventually come to a state of total equilibrium, that is, a state of maximum entropy. When Hoyle joined Gold and Bondi in the project, they produced the concept of a 'creation field' — an important theoretical aspect whereby tiny, but undetectable units of matter appeared in exact proportion to the amount disappearing 'over the horizon'.

The discovery of the microwave background radiation and its apparent confirmation of the opposing Big Bang theory caused Hoyle to largely abandon the diffused continuous creation idea, but it has recently surfaced again in a modified form.

As Hoyle has always remained skeptical of the big bang, he formed a new team in the 1980s which came up with a slightly different proposition — rather than diffused and continuous creation of matter, it now originates in more localised 'creative events' or explosions. Regions of the Universe which already contain dense matter have a strong gravity field, which can give birth to large amounts of 'new' matter. A paper was produced by the team which calls the modified theory the 'Quasi Steady State' model.[6]

According to Hoyle, Burbidge, Narlikar, Arp and Wickramasinghe, a series of large but local creation events occurred about 10 to 15 bya (billion years ago) in our part of the Universe, which disrupted other potential creation centres, thus ending the episode of large creation events.

These alleged smaller events have produced such powerful energy centres as quasars and radio-galaxies, and the modified theory is now said to account for the microwave background radiation of about 2.736 °K, just above absolute zero. According to Hoyle *et al.*, these creation events cause gravity waves which would buffet nearby stars and affect the periods of rapidly spinning pulsars; this buffeting may be detected in the future by suitable instruments, hopefully confirming the theory. The authors believe that most modern astronomers are 'blocked' by a fixation with Big Bang cosmology.[7]

Narlikar asserts that the Modified Steady State model can explain the puzzling red-shifts of certain quasars, whereby the light from many of these mysterious objects shifts far more to the red end of the spectrum than should be the case. He believes that quasars are newly created hydrogen atoms which are ejected *en masse* from older galaxies in a process of mini-creation, but as we shall see, there is also a major difficulty to be overcome; none has been detected with a blue-shift, that is, if ejected toward us, a shift to the blue end of the spectrum would be ex-

pected.

(ii) The Unified Quantum Field Theory

Of considerably more interest is the Static model developed by Hobson.[8,9] This British physicist, a graduate of Rugby College, has come up with a very sophisticated theory of an eternal but non-expanding Universe which, in effect, 'feeds' on itself and requires no mysterious continuous creation of matter. He proposes a cosmos in which quanta of energy are absorbed by an all-pervasive gravity field. According to Hobson this absorption during the travel of the photons through space lowers their energy, thus producing a red-shift proportional to the distance it travels. Thus the farther away the light source, the more sharply the shift will be to the red end of the spectrum (the longer wave, low energy end).

This is not quite the same thing as the 'tired light' concept whereby the photon loses energy indiscriminately, which then 'disappears' into the empty void of an expanding Universe and is not returned as matter, although the energy loss would still show up as a red-shift.

The Hobson model is based on his alleged discovery of the smallest indivisible particle or entity, which is indestructible — the fundamental particle of the Universe. The Universe is seen also as being divided into an all pervasive gravity field and material mass (matter). His Universe therefore has finite mass, finite energy and finite size. In short his concept is of an enormous perpetual motion machine.

Hobson proposes that light and heat are 'disturbances' of the primary gravity field, and as the photons travel across the Universe they are absorbed and re-emitted at a longer wavelength, thus lowering the energy in any quantum of energy radiation, and he believes this is confirmed by the red recession. This is a one-way action; the radiation 'restores' (or 'flows' into) the gravity field. The Universe does not return gravity energy. The loss of radiation energy to the ubiquitous gravity field is indicated by the shift to the longer wavelength and is linear with distance, and the absorbed radiation feeds back into matter. In this way Hobson believes the Second Law is thereby nullified, but as we shall see in due course it is not so easily evaded.

According to Hobson's model most of the absorbed energy is re-created as matter inside large 'gravity centres' such as stars and galaxies, because these bodies attract most of the radiated energy, and in this respect there is a strong resemblance to the later Hoyle *et al.* theory mentioned above. As 'new' matter is radiated away from a gravity centre it will be absorbed somewhere else and new gravity centres will form, with the travel path being dictated by the gravity field. Hobson claims that the basic energy unit will always travel at the speed of light and that the gravity field between, for example, Earth and Sun consists of quanta joined end to end. In effect, this 'gravity field' carries the heat radiation from the Sun to the Earth.

Dr Hobson claims that his theory has three basic foundations:–

(1) Energy cannot be created or destroyed (the First Law);
(2) Energy exists; and
(3) Therefore energy has always existed.

Thus the Universe must also have always existed.[10] Further,

> *'Something which already exists, (that is, a quantum of energy) cannot be reduced to nothing and something cannot be made or created out of nothing'*.[11]

Although many quantum physicists would nowadays reject some of these claims, I accept a few with important qualifications, which shall be raised in due course.

Hobson therefore rejects the other theories, such as the Hoyle model and the current Big Bang. He also rejects the Second Law and the 'heat death' of all matter as 'incorrect and impossible'.[12]

Space precludes more than the barest outline of the Hobson Unified Quantum Field theory, but I believe it is fair to say that the model has more going for it than the Hoyle model, although there are some similarities. Only a minority of modern experts would currently support a no-beginning, no-end Universe, although there are some important names in the ranks of that minority. Most are strongly in favour of a definite beginning for the cosmos, so we shall now proceed to the current ruling paradigm.

(b) The Big Bang Model

The idea of a no-beginning, no-end cosmos is not appealing to most scientists, especially when a definite starting point is backed up by what appear to be supportive, observable data.[13] As humans are (usually) fairly logical creatures, we find it difficult to conceive of a never-ending, eternal condition — how can it be that 'something' never had a beginning? This seems to conflict with what we see all around — the tree grows from a seed, a builder constructs a house, the fire produces the smoke. Therefore 'something' or 'somebody' must have started it all (the long-debated cause and effect idea).

Briefly, the Universe is supposed to have begun with a super explosion of enormously-compressed matter, which suddenly 'appeared' and began expanding at an unimaginable rate, thus developing over ten or twenty billion years into the Universe we see today, and which is still expanding. It appears to be supported by the following:

(a) The progressive red-shift can readily be interpreted as expansion. (The effect is somewhat similar to the sound of a train whistle lowering in pitch as it races away from us.) Therefore we can extrapolate back in time to a central starting point 10–20 bya.
(b) The Universe appears to be bathed in a uniform wash of microwave radiation which was roughly predicted by Gamow, Alpher and Herman in the 1940s in an early Big Bang model. This radiation, equivalent to that given off by a black body at about 2.73 °K, supposedly reflects a very early period when matter and radiation 'decoupled' about 300,000 years after the

big bang itself. This temperature level is just above absolute zero and is about equal to that of liquid helium.

(c) The amount of helium found in the Universe is pretty close to what was predicted by theory, and which would have been formed at extremely high temperatures in the initial big bang.

(d) The red-shift seems to indicate a great deal of 'ageing' — that is, the light from the farthest-away galaxies must have taken billions of years to reach us.

The obvious question is — how did it all start, and was there a First Cause? For many years this question was avoided by most scientists — one had to accept either a 'natural' singularity (an event outside the laws of physics), or that the whole thing was the result of a creative act by a Supreme Being. Neither was very appealing to science. It would seem that there is no scientific answer in respect of whence came the primeval atom or 'cosmic egg', but more recently attempts have been made to explain it all in a purely naturalistic framework.

John Gribbin of Britain attempted to summarize such a scenario in 1986. Until recently most astrophysicists believed that a singularity was required to bring about the sudden appearance of matter, an apparently inexplicable occurrence. Yet Dr Gribbin tells us that,

> '. . . *particles can be created out of nothing at all . . . under certain conditions'*.

He cites Wesson of Canada who has been studying how

> '. . . *matter might suddenly appear in large quantities in accordance with the known laws of* (quantum) *physics . . .*' (emphasis added).[14]

This could eliminate the embarrassment of a singularity or a 'natural' miracle, but the idea is highly speculative.

In the same place Gribbin goes on to talk of

> *'negative pressures which act like a tension between particles, trying to pull them together'*,

and,

> *'By allowing pressure to be negative it is possible to remove the requirement of a singularity ... if pressure is both negative and large (in a negative sense), then matter is produced.'*

Along the same lines, this concept is explored in some depth by Adelaide University's Paul Davies, who works in the field of quantum physics.[15] Of course we are dealing here with pure mathematics; formulae and equations which seem to lie outside what ordinary folk would call common sense or logic.

One of the more significant chapters in Davies' book is entitled **Can the Universe Create Itself?**, where he explores the intriguing concept of a self-creating Universe.[16] Usually scientists try to avoid the field of metaphysics, but over the last decade or two many are becoming interested in the field of First Causes, which would seem to lie outside the competence of science.

Professor Davies, before entering into the question seriously, reminds us of the Second Law of Thermodynamics and its vital position in modern science.[17] According to the Standard Model, if the matter in the Universe were spread uniformly, it must have been infinitely compressed at the 'first' moment into a single point, the 'cosmic egg'. This point is referred to as a singularity, in fact, a 'space-time' singularity, and he says that here the laws of physics break down. He goes on to say that space and time both came into existence with the big bang, and that there was no 'before' prior to the event.[18]

In the same place he states that,

> '. . . *if one insists on a reason for the big bang, then this reason must lie beyond physics.'*

Shortly after, Davies acknowledges that scientists have been faced with a stark choice — infinitely old or an abrupt origin of time-space,[19] and he makes the intriguing comment:

> *'What was overlooked was a third possibility; that time can be bounded in the past yet not come into existence abruptly as a singularity.'*

This is 'allowed' via a

> '. . . *tiny loophole called quantum mechanics which provides a subtle way for us to circumvent the origin of the Universe problem. If a way can be found to permit the Universe to come into existence from nothing as the result of a quantum fluctuation, then no laws of physics would be violated'* (emphasis added).[20]

An integral part of the type of model favoured by Davies and others is the so-called 'uncertainty principle', also known as the 'indeterminacy principle'. The theory of quantum mechanics states that it is impossible to simultaneously specify the precise position and momentum of a particle such as an electron. One has to be able to accurately measure the present position and velocity of a particle in order to predict its future velocity and position. Light of a short wavelength must be employed to measure the particle's precise position. However, a quantum of such light disturbs the particle under investigation and changes its velocity in a way which cannot be predicted.

Therefore the more accurately one tries to measure the position of the particle, the less accurately one can measure its velocity, and vice versa. According to the theory of quantum mechanics, particles therefore no longer have separate or well-defined positions and velocities, but in fact have a 'quantum state' which allegedly is a combination of position and velocity. In other words, we are back again to the question of the properties of particles. One might ask — is matter real, or is it some sort of 'disturbance'? We are faced here with one of the great mysteries of matter and the Universe; a mystery which cannot be fully resolved with our present knowledge. Any detailed discussion of the uncertainty principle is here out of the question — it would necessitate several pages of very detailed, technical examination which only a relative handful of physicists would understand, and in any case the matter is not fully settled. For instance, Eric Lerner is not at all impressed by this way of thinking. He comments

that,

> *'In the quantum world the fundamental idea of rationality — that of cause and effect — no longer holds. Events can occur without cause, a particle can simply pop into and out of existence magically, and if it is possible for electrons to pop into existence without cause, why wouldn't a whole universe pop into existence without cause.'*[21]

On the next page Lerner refers to this way of thinking:–

> *'This retreat from reality to mathematical irrationality.'*

So far there does not appear to be any particular physical observation which could confirm such highly speculative theoretical models — it involves the extrapolation of the theory of subatomic particles to the macro-world of the Universe, a process called quantum cosmology, and it really depends on whether or not there **was** a big bang in the first place. The proponents of quantum cosmology may simply be begging the question. How does one test such a concept? It may or may not be consistent with the Big Bang theory with all its subsidiary hypotheses, but it cannot be tested.

EVIDENCE AND ARGUMENTS ADVERSE TO THESE MODELS

(a) The Steady State Models

(i) The Continuous Creation Theory

As stated above, the original Hoyle/Bondi/Gold model of continuous creation in an eternal and expanding Universe was abandoned in 1965, following the discovery of the uniform cosmic background radiation, which not only was not predicted by Hoyle *el al.*, but actually favoured the Big Bang model. Yet it is clear that Hoyle himself never accepted the latter theory either.[22]

In later years Hoyle was joined by other astrophysicists such as Arp, Burbidge and Narlikar, who produced a variant of the original theory in the later 1980s and early 1990s. One of the most important new angles is an attempt to account for this background radiation in a more plausible fashion than does the Big Bang model. The new modified theory posits that small metallic 'needles' or 'whiskers' one millimetre in length by one micrometre wide have formed in large numbers in the expanding envelopes of matter surrounding supernovae.

They believe there is some concrete evidence for this idea — the spectrum of the Crab Nebula pulsar (the relic of a supernova explosion) shows a 'dip' in the range of wavelengths in the 30 micrometres to ten centimetre band, which are the right wavelengths expected for such iron 'needles' to absorb radiation. As radiation pressure forces these needles further out into intergalactic space, such particles could erase any underlying unevenness in the radiation from space.[23]

According to Narlikar, these needles absorb and re-emit starlight at just the right wavelength to wipe out any underlying unevennesses in the microwave radiation, thus presenting what appears to be a very isotropic (uniform) radiation.[24]

Of course, this again is almost 100 percent theoretical speculation, and has already been dismissed by Peebles of Princeton who stated to Croswell:

> *'. . . they haven't done their homework on how difficult it would be within their model to fit the measured thermal spectrum and high degree of isotropy* (uniformity) *of the microwave background.'*[25]

Peebles, a big bang enthusiast, is correct, but it doesn't do much for his theory either — the high degree of isotropy to which he refers seems to be unfavourable for the big bang.

The idea of 'local' creation events previously described, as proposed by Hoyle *et al.*, is also purely theoretical and is based on the belief that quasars (quasistellar objects) consist of material ejected from old galaxies. These ejections or explosions are the local events allegedly bringing 'new' matter into being. However, it must be remembered that at the time of writing nobody knows for sure just what quasars really are. According to Croswell they are still an enigma, although he personally is attracted to the idea that they are the result of colliding galaxies.[26]

One can see the contrast between the modified version of continuous creation and the original model whereby tiny amounts of new particles appeared literally from nowhere, diffused throughout space, yet once again it begs the question of the origin of matter.

At least Dr Narlikar is frank enough to admit:

> *'Our alternative cosmological scenario does not claim to be the last word but it deserves further critical appraisal as an alternative to the big bang.'*[27]

Paul Davies makes the interesting comment that by abolishing the big bang, scientists had removed the need for any supernatural explanation — there was no need for a creator and no need for any divine intervention.[28] (He was referring to the popularity of eternal Universe theories back in the 1950s.) Such a comment is very revealing as it throws much doubt on the supposed non-bias and objectivity of many scientists. Why should it concern them whether there was a creator or not?

(ii) The Unified Quantum Field Theory

This theory of Victor Hobson seems more appealing in some ways than both the Hoyle *et al.* models — at least at first glance. Hobson's model plausibly explains the red recession better than the others and, I may add, better than does the Standard Big Bang theory, where we find all sorts of problems with the puzzling quasars.

It does not require continuous creation of matter from nowhere and it posits a finite non-expanding Universe. Its most serious flaw lies in the field of thermodynamics, where at first sight it seems to contradict the established Law of increasing entropy. Before examining this aspect let us

examine the question of First Cause. On the problem of beginnings Hobson says:

> *'Energy has always existed because it exists now and energy cannot be created or destroyed.'*[29]

In another place he claims energy cannot be made or created out of nothing.[30] Now this is true in our present cosmos, but it is circular reasoning to claim this is an argument that the Universe is eternal (and therefore uncreated). Because, if created, this implies a beginning in time for not only matter/energy, but the physical law of its conservation; that is, miraculous creation cannot be excluded on the basis of present physical laws.

It is also apparent that even if the Universe has been so created by God, the rest of his case is not necessarily rendered invalid. His 'static Universe' could still be finite in size, non-expanding and eternal into the future so long as God wills, and also it is perfectly possible that the cosmos could not exist without God; that is, that in effect, God could sustain it from micro-second to micro-second. (Note that this is in full accord with the New Testament — Hebrews 1:3.)

With respect to the matter of increasing entropy, it is clear that his model allows that individual stars and galaxies would die (total heat death). Therefore, if the Universe is infinitely old and non-expanding, the heavens should be filled with innumerable 'dead' objects, which does not appear to be the case. This would seem to give support to the possibility that the energy which sustains the Universe as a whole must therefore come from 'outside'. His claim that the Second Law was null and void was consequently incorrect, at least as it pertained to his Unified Field Theory.

(Here it is pointed out that the supposed 95% of so-called missing matter [to be discussed later] cannot be attributed to invisible stars and galaxies in a state of maximum entropy, because if the cosmos was infinitely old, and if only a single star suffered heat death per year, then the number of such dead stars would also be infinite.)

In view of these serious objections, Dr Hobson's case for an eternal Universe feeding on itself by the absorption of heat and light photons by the gravity field therefore faces a massive contradiction which he was not able to overcome. His argument that the red recession is mainly due to distance and not expansion is correct, as I hope to demonstrate in the next section.

We are faced with only three alternatives:–

(a) The Universe originated spontaneously at a past point of time (a singularity) and has continued to expand. This origin was either a supernatural miracle, or it came into being by a quantum fluctuation in accordance with supposed known laws of physics.
(b) The Universe has always existed and always will; or
(c) An external, eternally-existing Power created the Universe, and sustains it moment to moment; whether expanding now, expanded in the past (not necessarily from a point), or always static.

To the reasoning human mind all three are really incomprehensible in the light of experience and logic, because we do not know all there is to know, yet one of them **must** be correct. Therefore, which 'miracle' we accept and believe must rest on other evidence.

The final theory to consider is the popular scenario of the day.

(b) The Ruling Paradigm — the Big Bang Model

Theories about such a model have been around for many decades, and the big bang has not been seriously challenged, except for the period from about 1948 to 1965 when the Continuous Creation model attained almost equal status.

When the Big Bang again took the ascendancy in 1965 it was supported by three main lines of evidence —the red recession indicating expansion from an infinitely compressed cosmic 'egg'; the uniform microwave background radiation; and the amount of helium in the cosmos, which is about what theorists had estimated should have formed during the initial explosion, and the apparent ageing of the Universe.

The question to be posed is whether or not only a big bang could have produced these features. Could there be other explanations? It is a fact that while the great majority of experts insist on the validity of the Big Bang model, a significant number of other qualified scientists do not, and minorities have often proved to be right in the long run.

(i) The Red Recession

The well-known shift of normal light to the red or long wavelength end of the spectrum **can** undoubtedly be an effect produced by a light source moving away from us. It seems also true that the further away the light source is, the more the red-shift, which seems to indicate the more rapidly that source is moving away. (However, there could be an element of circular reasoning here, because distance is often estimated by the degree of the red-shift involved.) Recall the fading pitch of a train whistle as it races away from us. Conversely, light from objects moving toward us is shifted to the blue or short wavelength end, just as the pitch of the train whistle rises as it speeds toward us.

Thus when astronomers found that some distant galaxies and quasars exhibited much higher red-shifts than did those 'nearer', they reasoned that the more distant objects were receding at much higher velocities, apparently confirming expansion. According to relativity theory the expansion of the Universe stretches both space and the light coming toward us, thus displacing the light to the low frequency end of the spectrum.

The relation between the degree of red-shift and distance is determined by the value of the Hubble constant, which states that the velocity of recession is proportional to the distance of the light source — the recession velocity of a galaxy divided by its distance. Thus a galaxy at a

distance, say 50 megaparsecs, appears to be receding at a speed of 5,000 km per second. (One megaparsec equals the distance light travels in 3.26 million years. Thirty megaparsecs would equal approximately 100 million light years.)

A galaxy at 500 megaparsecs (1.6 billion light years) would be moving away at 50,000 km per second. (There has been much dispute recently about the true value of the Hubble constant, and some experts have revised it down considerably.)

In recent years quasars have been found with a red-shift as high as 4.01 at an interpreted distance of 16 billion light years —just about as old as the Universe is supposed to be. Another displayed a shift of 2.2, indicating a recession velocity 82% of the speed of light.[31]

In 1988 a galaxy known as 0902+34 was recorded at a distance of 12–14 billion light years.[32] By comparison, the nearest galaxy cluster Virgo is 78 million light years distant, and the galaxy cluster in Hydra, fifty times more distant, is almost four billion light years away and receding at about 38,000 miles a second. Globular cluster NGC288 comes in with an estimated age of 15 billion years.[33]

A supercluster of galaxies has also just been located at a distance of about 10 billion light years, which poses serious questions about how such a huge structure could have formed so quickly after the big bang.[34]

Two problems arise — the speed of recession and the discovery of huge superclusters of galaxies, and what is called the Great Wall, so soon after the alleged big bang itself.[35]

Cowen tells of the finding of these huge distant objects which are linked gravitationally in patterns which stretch across the heavens as wide as half a billion light years.[36] Huge galactic structures like this at the visible edge of the Universe, that is, virtually at the 'beginning' of time, seem to be incompatible with Big Bang theory, as they should take much longer to form than is available under the Big Bang model. Some cover as much as one-quarter to one-third of the diameter of the Universe.

> *'There is simply no way to form these structures in less than 20 billion years',*

says Lerner.[37] This most serious problem is also acknowledged by Riordan and Schramm,[38] posing a major difficulty for the Big Bang model.

Croswell also comments on this aspect. He writes:

> '. . . *cosmologists will have their work cut out trying to explain how such large objects arose so soon after the big bang.'*[39]

He then goes on to say:

> *'Finding such objects at record-breaking distances challenges the idea that most of the Universe is made of cold dark matter . . . the presence of two superclusters so soon after the big bang could completely destroy the model which is already in big trouble.'*

Rowan-Robinson describes the new map of deepest space as

> '. . . *revealing disturbing discrepancies in the standard model of cosmology.'*[40]

The obvious question therefore is this — is the red-shift a reliable guide to distance **and** velocity, or are there reasonable alternative interpretations of the phenomenon? If there are good alternatives, what will it mean for Big Bang cosmology?

To begin, let us first examine some very puzzling and anomalous cases, where the red recession does not appear to have any connection at all with velocity, and in fact appears grossly contradictory.

It has now been established beyond reasonable doubt that there are a number of quasars either attached to, or very close to, certain galaxies, which yield very different red-shifts from those galaxies. Yet if they are indeed very close neighbours, the red-shifts should be almost identical. Says Narlikar:

> *'What makes Arp's findings so worrying is the large difference in the red shifts of these linked objects.'*[41]

According to Narlikar's paper, the quasar Markarian 205 is twelve times farther away from us than the bright galaxy NGC4319, because that's what the degree of red-shift indicates compared to the very different shift of NGC4319. Yet the two objects are linked by a bridge of stars. The connecting luminous filament has been proved beyond doubt. The recessional velocity of the galaxy is 1,700 km per second, while that of the connected quasar is 21,000 km per second.

This is just one of quite a number of cases which are now well-known. Narlikar says of these many cases:

> *'Either the links are spurious or Hubble's law needs a rethink . . .'.*[42]

On the next page he writes:

> '. . . *if the red shift of a quasar is not entirely due to the expansion of the Universe, it cannot be used as the basis for asserting evolution'* (of stars, galaxies etc.).

Narlikar puts the red-shift down to a theory of gravity developed by himself and Hoyle:–

> '. . . *a hydrogen atom of young* (new) *matter will have a smaller inertial mass and so its spectral lines will be shifted to the red compared with those of an old hydrogen atom measured in the laboratory.'*[43]

Because of these cases, Krisciunas and Yenne make the following comment:

> '. . . *not all astronomers believe that the red shifts of quasars are necessarily due to the general expansion of the Universe . . . Unfortunately there is as yet no sound physical explanation for discordant red shifts*',[44]

and in the same place Arp suggests that quasars are ejected by galaxies, but if this is true, why do not some nearby galaxies that have ejected quasars toward us

> *'have blue shifted spectral lines?'*

John Gribbin comments:

> '. . . *any suggestion that the simple interpretation of the red shift might be wrong or at least incomplete, sends shivers down the spines of conventional cosmologists'*.[45]

On the following page he says:

> *'Because we see more distant galaxies as they were long ago, ... we see them in a state corresponding to an earlier phase of* (their) *evolution, more red shifted and* ***get the illusion*** *that the Universe is expanding.'* (Emphasis added.)

This very real possibility has been overlooked in the past.

We see therefore that the expansion of the Universe has by no means been proved, and consequently the big bang itself must remain in considerable doubt.

William Tifft's recent research is pertinent to the question of expansion. An astronomer at the University of Arizona, Tifft has been collecting cosmological data since the early 1970s which suggests that the Universe is not expanding. His conclusions are based on data concerning the red-shift — if a galaxy's light is red-shifted **only** by the expansion of space as in the Big Bang model, then obviously the degree of shift would depend on its distance (velocity), regardless of which type of galaxy it is.

However, Tifft's observations over 20 years have convinced him that red-shift depends on the **type** of galaxy which emits the light. Spiral galaxies have higher shifts than elliptical galaxies **in the same cluster.** Also, dim galaxies exhibit higher red-shifts than bright ones. Further, the degree of the shift seems to change over time — according to his ten-year study. Tifft interprets this as evidence that the farthest-away galaxies exhibit a high shift, **not** because they are receding at very high speeds, but because their light, emitted long ago, is only now reaching us. Nearer galaxies' light reaches us in much less time, thus showing their true age via a smaller red-shift.

This very significant degree of change has occurred in only ten years of observation, thus indicating that if there is any 'evolution' of galaxies, it is occurring much more rapidly than we have been led to believe, and therefore the Universe may be much younger than previously thought. Needless to say, Tifft's findings are not popular with other orthodox cosmologists, as is stated in the article:–

> *'If the Universe isn't expanding, there would be no reason to believe it began with a big bang . . .'*,

says author Dava Sobel.[46]

(ii) Gravity and 'Clumpiness'

One of the assumptions of the Standard Model is that gravity is the dominant force in shaping the Universe, and another is that the cosmos is smooth, with the distribution of matter everywhere much the same, at least on the larger scale. With the discovery of distant giant objects like the Great Wall (chains of galaxies very early in the history of the Universe), the second assumption is clearly in error. How can a 'smooth' explosion from the cosmic egg result in such huge lumpy structures? Nobody knows, but the theorists won't abandon it because most experts are very reluctant to drop a flawed theory, the reason being that there are no 'natural' alternatives.

Peterson concedes this:

> *'But there's no good, viable alternative to the big bang'*.[47]

There are a few, however, such as plasma physicists like Alfven and Peratt, who believe that rather than gravity being mainly responsible for the 'clumpiness' observed in space, vast magnetic vortices exist which draw plasma together to eventually form planets, stars and clusters of galaxies. They claim that huge electric currents and magnetic filaments exist and are carried by the diffuse plasma threads spread throughout the Universe. Such filaments could explain why the Sun's rotation is so slow — if only gravity were involved the Sun should be rotating at a much more rapid rate.

(Plasma consists of hot, electrically conducting gases and forms much of the Universe. Plasma cosmologists envisage a Universe crisscrossed by vast electrical currents and powerful magnetic fields, and such plasma can be studied in the laboratory.) In 1984 electromagnetic filaments 100 light years long were observed near the centre of our own galaxy, the Milky Way.[48]

(iii) Microwave Radiation

Until recently it was considered that the strength of the microwave background may not vary by more than about 0.01% or one part in 10,000.[49] Stephen Hawking says,

> '. . . *this* (radiation) *never varies by more than one part in 10,000 . . .'*,[50]

and quite clearly he did not think even this was enough to account for the clumpiness of the Universe, yet astronomers have claimed the recent COBE discovery of a far smaller variation of only 30 millionths of a degree K (about one part in 100,000) fits well with Big Bang theory.[51] Lately however, Hawking himself has had a reversal of opinion, telling science reporter Russ Sampson that these tiny variations do confirm the theory.[52] But on the same page Sampson reports his own skepticism. He asked cosmologist Don Page the same question. Page, who studied under Hawking, disagrees with his mentor's optimism — the evidence was not conclusive enough.

The search for minute differences in the radiation has been intense for over 20 years, yet when the COBE satellite detected some regions of the sky where the microwaves were an incredibly small 30 millionths of a degree warmer or cooler than average in different parts of the sky, some experts went overboard. Joseph Silk said of this almost imperceptible difference:

> *'They've found the missing link'*.[53]

But according to Riordan and Schramm, variations of **no smaller** than one part in 10,000 are required:

> *'These ripples . . . are* ***far smaller*** *than those neces-*

sary to trigger gravitational collapse . . . (yet) *the compact structures we witness in all directions tell us that such collapses occurred almost everywhere. What is wrong here?'* (emphasis added).[54]

Rowan-Robinson also agrees that any 'hot spots' (anisotropies) with variations of less than one part in 10,000 are too smooth:

'The remarkable smoothness of this radiation shows that . . . the normal, baryonic matter and radiation were uniform to at least one part in 10,000. From such a smooth state, there is simply not time for gravity to have assembled the galaxies and clusters we see today.'[55]

If one part in 10,000 is too small, how can one part in 100,000 be sufficient?

Even with these new measurements it is still necessary to look for dark matter to bolster the theory, but as it stands the new COBE discovery is far too minute to help, despite the general optimism. It seems that many experts are grabbing at straws. The 30 millionths of a degree Kelvin in variation is simply not enough, because even the one part in 10,000 would only 'work' if there were indeed massive amounts of the mysterious dark matter around, **and** then only if it behaved in the way required by the theorists. Recent reports published in the popular news press that Australian astronomers have discovered some large, dark objects, remain to be confirmed.[56] In any case, there would have to be immense numbers of such dark stars or planets to meet the requirements of the theory.

It should also be obvious that under **any** of the cosmological models, there will be some 'dead' stars somewhere in the Universe, but such objects have already been taken into calculations. There is still a lack of sufficient mass, and the above reports have not stirred much professional interest.

There are a number of other authorities who seem rather unenthusiastic, or who reject any variations smaller than one part in 10,000 as being totally inadequate. Some experts say that other factors can cause such variations — Flam,[57,58] Peterson,[59,60] Ruthen,[61] Suplee,[62] Humphreys,[63] Arp *et al*.,[64] Powell,[65] Spergel and Turok,[66] Stroh,[67] Peebles *et al*.,[68] Partridge,[69] Riordan and Schramm,[70] Gribbin,[71] and Hawking,[72] although almost all are still firmly wedded to the big bang, even if that requires many sub-theories to hold it up. Even Steven Weinberg, the author of **The First Three Minutes**, seems less than enthusiastic.[73] Marcus Chown expresses considerable doubts about the importance of the COBE findings,[74] as does Gary Taubes.[75]

The COBE findings are considerably short of unanimous acceptance; Wieland reports that some observers considered it a *'cause of some alarm'* that the media had called the discovery, '*. . . proof that we now know how the Universe began . . .*'.[76] He also cites evidence indicating that neither the sub-theory of inflation nor the dark matter hypothesis has any true independent support outside the cosmological arena for which they were invented, and that those with alternative theories to the big bang will probably be able to claim the new data as support for their theories also.

(iv) Radiation, Gravity and Dark Matter

Apart from there being insufficient time in which to build enormous structures like the Great Wall so close to 'big bang time' (about a billion years after the alleged explosion), there is another problem. There has not been enough time for a sufficient number of stars to 'die', or for anywhere enough black holes to form. According to Riordan and Schramm, even if we count in these objects, plus the possible dust clouds allegedly surrounding the galaxies, this leaves the cosmologists still well short of the required mass — about 90% short, in fact.[77] In the same place they continue:

'To reach the critical density requires not only that the ***great majority*** *of matter in the Universe be dark: it must also be some* ***new and strange kind*** *of matter, very different from the familiar* (material) *making up the* (Universe) . . . (This) *is one of the deepest mysteries confronting science today.'* (Emphasis added.)

Lerner says that because of basic flaws in the assumptions and calculations regarding gravity and matter, there is simply

'*. . . no room for dark matter . . . what you see in the universe is what there is . . .*'.[78]

In any case, Hawking writes that even if we add up the masses of all the stars in the heavens, **plus** the inferred presence of unseen dark matter between the galaxies (dust, dying stars, planets, etc.), we still have only about one tenth of the required amount.[79] On the same page Professor Hawking resorts to an appeal for possible 'other forms' of matter which have so far not been detected. This seems to be a clear case of grasping at straws.

The cause of the tiny microwave temperature differences is allegedly very small fluctuations or hot spots (anisotropies) which supposedly arose as radiation and matter 'decoupled' not long after the big bang. Over the years the theorists have lowered the required level of variations from five parts in a thousand to one in a thousand, but by 1979 it was

'*. . . clear that . . . the game could not continue since there was no anisotropy at even one part in 10,000, and every theory required more than that'* (emphasis Lerner's).[80]

Gravity can only account for the construction of heavenly objects with a diameter of about 30 million light years, but the recently-discovered superclusters are up to 12 and 15 times larger than that.[81] According to Lerner such huge objects would require about 100 billion years or more, five to ten times longer than the presently estimated age of the Universe.

Alfven points out that Big Bang theorists try to extrapolate the origin of the Universe from mathematical theories.[82] Tully's comment is:

'It's disturbing to see that there is a need for a new theory every time there's a new observation.'[83]

All sub-theories (cold dark matter, hot dark matter, etc.) are loaded with unsolved problems. Chris Lampton says concerning the alleged missing mass:

'Obviously it is not ordinary matter. It does not emit light or any kind of detectable radiation . . . (neither) *does it absorb light . . . it is effectively invisible . . .'*.[84]

Black holes, neutrinos, bizarre 'new' particles, dark-material haloes around spiral galaxies, and various other exotic candidates have been advanced hopefully. At present there are only endless difficulties, but instead of looking for alternative answers, they stick to the big bang and continually try to make facts fit to theory, instead of allowing actualities to dictate the theory.[85,86,87]

I have lost count of all the *ad hoc* 'explanations' invented to account for the discrepancies, but as every good scientist knows, each such supporting sub-theory invented to save a primary theory lowers the scientific status of that theory. The Big Bang is troubled — the header to Croswell's article reads:

'But modern astronomers may need the cosmological constant to save the big bang'.[88]

It should be noted that Croswell's paper was published a year **after** the COBE discovery.

Dressier has expressed grave concern about both the hot dark matter (HDM) and the cold dark matter (CDM) models; he says both are virtually out of the running.[89] Flam fully agrees; both models have been 'hard hit',[90] while Schramm calls the HDM model, *'. . . the kind of theory that needs two tooth fairies'*.[91] The CDM theory is now described by Peterson as *'. . . in deep trouble'*,[92] while Flam says it is *'. . . proven wrong'*;[93] Davis *et al.* says it *'. . . has suffered recent setbacks'*,[94] and Powell's comment is, *'Cold dark matter is dead'*.[95] Because of all these problems Alfven rejects all Big Bang ideas and has been looking at eternal Universe theories, the only model available if one denies any possibility of supernatural creation, but as we have already seen, that alternative is as studded with apparently fatal flaws as is the big bang.

(v) Light Elements

Another line of support for the Big Bang was its ability to account for the amount of helium in the cosmos. According to research carried out, the big bang would have produced the observed quantity, given certain assumptions, but these findings have been challenged. About 25% of the Universe consists of helium, but at current production rates only one or two percent of the hydrogen in stars would have burned to helium even if the Universe was 20 billion years old. The rest, it is claimed, must have come from processes in the primordial explosion, but according to Lerner, the extra helium was caused by shock waves produced by filaments of spiral arms surrounding first generation stars as they 'sliced' through the plasma. The smaller stars expel their outer layers — pure helium, while heavier elements remain in their inner cores. The Alfven/Peratt model also produces the right amounts of helium and heavier elements. Lerner says:

'There is simply no need for a big bang to produce any of these elements.'[96]

Croswell reports that Hoyle, Burbidge and Narlikar also reject the big bang production of helium and other light elements on similar grounds to Lerner's.[97] While the majority of experts would still back the Big Bang model, despite its many drawbacks, a significant minority of important scientists finds little of value in it and have gone in other directions.

(vi) Other Anomalies

Besides the objections already raised, there are some other big hurdles for the Standard Model which we shall only briefly consider.

The dispute over the value of the Hubble constant is still raging — on this depends the supposed time of the big bang itself, ranging presently from 10 to 20 bya.[98–101]

There are also a number of stars which seem to be much older than the Universe itself! For example, the globular cluster M13 is estimated to be older than the Universe, which is a complete contradiction. Croswell says of these clusters:

'There are only two ways out of this contradiction ... abandoning the big bang theory . . . (or) *. . . reintroduce a cosmological constant.'*[102]

He continues:

'Most cosmologists detest the cosmological constant ... it seems little more than a "fudge factor" invoked to solve the problem about the age of the Universe'.

Two pages later he says:

'The trouble is that . . . you can pick the cosmological constant to be anything you want',

and on the next page he writes:

'(A high Hubble constant) *would make the Universe younger than its oldest stars. If that happens, cosmologists would then have only one more thing to do: dump the big bang.'*

Even John Gribbin admits that,

'Perhaps cosmologists have been charging up a blind alley, and there never was a big bang at all. It would not be the first time that science took a wrong turning.'[103]

In a letter to **Nature**, Arp *et al.* made a stringent attack on the Standard Big Bang model, pointing out that believers are

'. . . impelled to chase after chimeras instead of real beasts ... of the many failures (of the big bang), *are the failure to explain galaxy formation, . . .failure to find fingerprints of galaxy formation in the microwave background, . . . failure to identify missing mass, the age problem, and ultimately the origin problem. In view of this negative record we find the enthusiastic claims made by Peebles* et al. *surprising.'*[104]

Although Arp and his colleagues are just as enthusiastic in promoting their own theory of an eternal Universe, it is hard to disagree with their sentiments — the failure list of the Big Bang theory is indeed impressive. In another paper by the same critics, they state that:

> *'Cosmology is unique in science in that it is a very large intellectual edifice based on* ***very few facts'*** (emphasis added).[105]

Their attitude is understandable.

Spergel and Turok, writing about the 'inflation' subtheory of the Big Bang model, complain of certain defects therein, and then continue:

> *'. . . certain parameters in the theory must be tuned to* ***implausibly tiny values*** *to make the rather delicate theoretical edifice hang together. Moreover, observations of very large scale structures increasingly* ***conflict*** *with it'* (emphasis added).[106]

Then of course there remains the mystery of where the matter came from in the first place. Nobody has produced the solution for this problem. There is now an exotic theoretical model which attempts to explain how matter produced itself, and this will now be discussed.

THE MYSTERY OF CREATION

If the Standard Model and the various eternal Universe hypotheses are surrounded by so many problems and difficulties, some of them apparently fatal, we must look elsewhere.

Before so doing, the 'naturalistic' origin model may be given a final chance. For many decades some scientists with an anti-supernatural bent have ridiculed ideas that a Supreme Being could have created the Universe. Most of them apparently find it difficult to believe there are events which lie beyond the capacity of science to explain, and so, with the appearance of quantum mechanics, many have grasped an opportunity which may be the mechanists' last throw of the dice.

In his 1992 work **The Mind of God,** Paul Davies explores the possibilities of a self-creating cosmos, which not only removes any need for a creator, but in fact actually denies that an external Supreme Eternal Being even **could** have brought matter into existence.[107]

After Dr Davies stresses the paramount importance of the Second Law and the fact that the Universe must eventually run down to maximum entropy, which points to an actual beginning, he moves to the question of what caused the big bang in the first place. He says the idea of an explosion of a concentrated lump of matter is badly misleading:–

> *'Suppose there was a state of maximum compression. This would imply the existence of some sort of outward force to overcome the enormous gravity; otherwise gravity would win and the material would be still more compressed.'*[108]

He therefore concludes that there is no force in the Universe capable of defeating gravity. I would ask here, what Universe? A theorized tiny point of compressed matter? How could it be compressed if it didn't yet exist?

Let us now go to his question, Did God Cause the Big Bang?[109] Davies believes the simple picture of God setting off the big bang

> *'. . . makes "little sense" because a supernatural creation cannot be a causative act in time, for the coming-into-being of time is part of what we are trying to explain. Therefore such an explanation cannot be a case of cause and effect.'*

The obvious reply is that if there is a Supreme Being he could do anything; there would be nothing outside His power except perhaps to act against Himself. As far as I know, there is no creationist objection to the concept of time and space (as we know it) being created along with the material Universe.

After commenting that the big bang

> *'. . . seems to be an event without a physical cause',*

he looks for an explanation and finds a 'tiny loophole' called quantum mechanics which weakens the link between cause and effect. He simply extrapolates the rules of the quantum micro-world to the macro-world:–

> *'If a way can be found to permit the Universe to come into existence from nothing as the result of a quantum fluctuation, then no laws of physics would be violated . . . the spontaneous appearance of a Universe is not such a surprise, because physical objects are spontaneously appearing all the time ... in the micro-world.'*[110]

He then admits that all this

> *'. . . depends on the validity of quantum mechanics when applied to the Universe as a whole. This is* ***not*** *clear cut ... and there are deep questions of principle* (involved)' (emphasis added).

Quantum mechanics, which includes the 'uncertainty principle', is a difficult concept to grasp. Davies however finds little difficulty in the belief (or is it faith?) that because physical objects in the micro-world can appear spontaneously without well-defined causes, the same could apply to the macro-world of the Universe. Davies does not deny that the Universe is not infinitely old — he simply asserts that there was no 'before' in terms of time and space, but he has trouble with the origin of the laws of physics.[111] It is this difficulty which seems to bring him to the point of not ruling out the possibility of Divine creation.

To describe the origin of matter as being *'the result of a quantum fluctuation of nothing',* as Gribbin does, is no more or no less of a mystery than the statements of Genesis,[112] because on the very next page he admits the *'highly speculative nature'* of the theory.

To cut the argument short Davies quotes Hawking:–

> *'If the Universe is completely self-contained, it would have neither beginning nor end: it would simply be.'*

What place then, for a creator ?[113]

Rather than get involved in a long and deep metaphysical discussion, I wrote to Davies and asked some obvious questions. His reply dated March 22, 1993 yielded the following concessions:

(1) *'No theory can rule out divine creation. Scientific theories are simply proposals for how the world is, to be tested by observation. There is* ***no*** *logical impediment to God creating the Universe five minutes ago in its present state, complete with human memories. In the end a theory stands or falls on whether human beings consider it reasonable'* (emphasis added).

(2) '*Of course the current* (Big Bang) *theory can fall from favour. It is simply the best theory we have in the present state of our knowledge. What more can be expected of science?'*

We may ignore Davies' obvious irritation, but with these comments and the statement with which he began his presentation of the quantum mechanics argument,

'I should say right at the outset that this particular explanation may be quite wrong',[114]

it is not necessary to proceed further. The origin of the Universe is still, in scientific terms, an unresolved question. It is all very well to present a theory which in this case is not subject to experimental verification, but many will not find it satisfactory or compelling unless a person is absolutely determined to reject any consideration of the supernatural whatever. To most people, arguments such as those of Hawking and Davies smack of mathematical gobbledygook, but one thing seems sure — unaided science cannot solve the great cosmological mystery.

At least Dr Davies does find that the existence of the physical laws of the Universe requires some sort of meaning or purpose in it all for human beings — somehow we are involved, and this is at least encouraging.

GENERAL COMMENTS

Ivars Peterson was seriously concerned by the shortcomings of the Big Bang model, and he makes comments such as — '. . . *considerable difficulties'* and;

'Yet the theory survives for want of a better idea . . .'; *'It's a kind of guessing game . . .'; 'Physicists remain uncomfortable with several aspects of the inflation scenario, which the model requires . . .'*;

and:

'Cosmologists find they must labor to ***squeeze*** *their pet theories into the steadily tightening straitjacket of observational data'* (emphasis added).[115]

He cites Peebles of Princeton and Silk of USCB as asking:

'Will our feeble minds ever comprehend the evolution of the Universe?'[116]

In another place Peterson quotes Arp and his colleagues as complaining thus:

'As a general scientific principle it is undesirable to depend on what is ***unobservable*** *to explain what is observable, as happens frequently in Big Bang cosmology'* (emphasis added).[117]

Corey Powell is also less than impressed. After expressing considerable skepticism about **all** current models, he cites Lubin's comment with obvious relish:–

'Every generation thinks it has the answers, and every generation is humbled by nature.'[118]

I have cited these authorities to indicate just how much of the various theories is unsettled and uncertain even among the experts, so it's not just creationists who are skeptical — the doubts are also there among those who do not subscribe to any supernatural type of model. However, the strongest criticism of Big Bang cosmology comes from Lerner, who devotes half of his 460-page book to a very detailed and incisive criticism of the Standard Model.[119]

Among the more interesting things Lerner has to say are some complaints particularly in regard to the methodology and the conceptual approach of Big Bang theorists. For instance, he attacks the tremendous growth of the theoretical side, which inevitably causes bias against observation, which now has to take second place to the 'real work of manipulating equations'.

In short, instead of observation taking the primary role in this field of science, the position is now occupied by computer models and pencil and paper.[120]

Dr Lerner severely criticizes the peer review system whereby 'establishment' specialists work against any articles which go against the prevailing orthodoxy.[121]

Lerner is also very critical about the Big Bang view of origins, and describes the concept of a Universe which was once smaller than a pinhead as weird. What came before that?, he asks.[122] He also points out that:

'. . . ***nowhere*** *do we see something emerge from nothing* (therefore) *we have no reason to think this occurred in the distant past'* (emphasis added).[123]

While one could agree with just about every criticism which Lerner directs against the Big Bang and its adherents, it must be remembered that virtually each attack is also applicable to the eternal Universe theory which he favours, even though he is a respected independent researcher. If the notion of 'nothing' producing 'something' is contrary to logic and experience, as Lerner says, so is the idea of a no-beginning Universe. Of course, it is acknowledged that in the final analysis **all** theories of origins are outside human comprehension, and this only serves to illustrate that the concept of an eternal Supreme Being is no more or less unbelievable than are the mechanistic, 'natural' origins myths of modern science. A sudden creation by a Supreme Being would appear to naturalistic science as a singularity, and this also applies to the concept of a quantum fluctuation of nothing.

In fact, Lerner's Universe has a starting point where it was

'filled with a uniform hydrogen plasma, free electrons

and protons

concerning the origin of which:

'We have no real knowledge'[124]

and then evolves into structures which eventually become cold cinders and black holes.[125]

Some stars explode as supernovae and the process starts again. But he overlooks the problem that those stars that **do** die take matter out of circulation, which eventually **must** lead to a state of maximum entropy and the death of a finite Universe, unless more matter is continuously being created from 'nowhere'. Let a million supernovae occur each year and only one star die per year, and over infinite time the Second Law will win out. It seems unlikely that the Universe can be eternal. In addition, when Big Bang cosmologists attack the proponents of the eternal Universe models, **their** criticisms are just as valid and cutting, thus leaving both camps in the position of virtually being proved wrong. There is no evidence in favour of **either** model which is not capable of being demolished, not by creationists, but by the opposing factions of secular cosmology.

SUMMARY AND CONCLUSIONS

One of the most intriguing things about cosmology is the almost religious fervour with which many scientists hold to their particular philosophy, even when faced with direct and contradictory observational evidence.

Many have come to the same conclusion — Lerner repeatedly complained about this sort of obstinacy in his 1991 work.[126] Scientists being human, the reasons for this are not hard to find — pride, the amount of work put into a theory, job tenure and so on. Cosmologists cannot be blamed too much, as many have spent a lifetime in their particular field, and to abandon a pet theory in which so much of one's self is invested is probably asking too much.

Yet there is one serious charge to lay — as in the field of alleged organic evolution, there are just too many specialists in cosmology and astrophysics who have no hesitation in presenting hypotheses and theories to the student and to the public generally as if they were absolute proven facts with no argument tolerated. ***'You are only lay-people; we are the experts so do not dare to challenge us'*** is an attitude often seen, but the media is probably just as much to blame as they concentrate on the sensational in order to boost sales.

Commonly-made pronouncements, such as — ***'We now know . . .'***, ***'There is now no question . . .'***; or ***'Science has now demonstrated beyond doubt . . .'***; and so on — are taken by the public as exactly that — facts not open to dispute, and this is simply not good enough. Countless numbers of hypotheses, theories and models have come and gone in the last century, yet, at the time they were presented, were supposedly the last word on a subject. When a continual supply of auxiliary, subsidiary sub-theory upon sub-theory is required to save a primary theory because of stubborn observational difficulties, then those primary theories are indeed in trouble; at the very least their scientific status is lowered.

In the 1940s the ruling paradigm for the origin of the planets was that a passing star had drawn gaseous material from the Sun, which eventually condensed into our current Solar System. Everything at that time appeared to support this model, yet it had to be later jettisoned and the origin of our Solar System still arouses much controversy. The Continuous Creation model of Hoyle's Universe won much acclaim at the time, yet it too was finally consigned to the waste basket of discarded hypotheses. Will the same happen to the current Standard Big Bang Model? There is no reason not to expect just the same fate.

The reader can take his or her pick of the theories currently on offer — the Modified Eternal Universe, the Big Bang, the Oscillating Models, Baby Universes. Each is as reliable or unreliable as any of the others. None are really acceptable in the light of present knowledge and observation, and each is heavily laden with subsidiary hypotheses to prop it up. Until science knows all there is to know, there will only be continuing controversy and mystery. Science of the late 19th century thought it was getting close to final answers in this field, and I would guess with good reason that even the sophisticated science of the 1990s knows perhaps 0.001 of one percent of all there is to know!

In looking back to Creation through the fallible minds of humans, we are trying to solve the unsolvable — events which are beyond our understanding, just as the eternal existence of God is something we cannot comprehend. As for exotic theories about a Universe which 'creates' itself, and which are not at all subject to experimental confirmation, the less said the better. Fallible minds are looking at the Creation event from one side only, and we devise 'natural' methods to explain the supernatural, which cannot be done. So we finish up with troubles — the Universe created itself before it existed to create itself! Physicists can do better than to indulge in such endless mathematical myths. Statements such as

> *'. . . space, time and matter are all created out of literally nothing at all, as a quantum fluctuation of nothing'*[127]

seem to be mathematical double-talk, but this is not to say that humans should not try to understand these things. However, a little more humility and modesty would not go astray.

A question one could pose in relation to modern science is this — why is creation science considered so dangerous by many modern educators, when it is not dangerous to insist to students and to the public that people are only genetic accidents in a cold, meaningless Universe? A better recipe for social trouble is hard to imagine.

The questions of time and distance have not been addressed in detail in this paper, largely because such matters demand a full-length discussion on their own, and also because both are inescapably bound up with the type of

naturalistic model which one accepts. No model is presently capable of independent verification.

There is little to prevent us from believing that at the time of Creation, the Lord God created matter, energy, space and time — the Universe and all living things — and He sustains everything from micro-second to micro-second as is proclaimed in the Christian Scriptures.

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A. W. (Bill) Mehlert has a Diploma in Theology and lives in Brisbane, Australia. He is a keen student of Flood geology and the fossil record, including the supposed fossil evidence for human evolution, and has written a number of important articles on these topics in the **Creation Research Society Quarterly** and **Creation Ex Nihilo Technical Journal.**