There is need for a clear distinction at this point. Unlike evolutionary geologists, creationists do not need sophisticated scenarios to explain P/T or K/T, or any other extinction. The Flood can wrap the whole nine extinctions in one 400-day event. Climate change, no matter how drastic, would not produce serious extinctions in such a short time. Whatever climate changes may have occurred during the Flood, they were much less important than the changes, that occurred at the end of the Flood and which shaped the new world. The Ice Age was by far the most important aftermath (climate-wise) of the Flood, as Oard has so clearly demonstrated.[18]

Though not initially my purpose, this speculative sketch of a Flood scenario came naturally, like the pieces in a puzzle, while reading Hoffmann's article. Is there a time coming when, faced with the overwhelming evidence, the uniformitarian geologists will admit that those nine catastrophes were not separated by millions of years, but are part of one **BIG** catastrophe? It seems like these evolutionary geologists have spelled out the answer, letter by letter: Fire (on) Land, Overall Ocean Destruction. They have not noticed that the initials read 'FLOOD'.

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Recent Cosmic Microwave Background data supports creationist cosmologies

John G. Hartnett

In 1965 Arno Penzias and Robert Wilson discovered the cosmic microwave background (CMB) and found the intensity in different directions to vary by less than 10%. The CMB describes the electromagnetic energy at microwave frequencies (1 to 100 GHz) pouring in from the cosmos in all directions. This energy can be uniquely described in terms of the temperature of an ideal radiator, called a 'black body', that produces radiation at the same frequencies and intensity. In 1977, Smoot and others detected a system of 'hot' and 'cold' patches across the sky in the microwave spectrum.[1] A two-dimensional map, as shown in Figure 1, was the result. If one points one's radiometer (a device to measure 'black body' radiation temperature) away from the hub of our Milky Way galaxy, a signal with a 'black body' radiation temperature of about 2.7 K is observed. Smoot detected a sinusoidal variation in the temperature of the CMB at the 1 part in 10^3 level.[1] This was attributed to the motion of the Earth. In order to resolve intrinsic fluctuations, statistical analyses were needed and fluctuations of the order of 10 μK were extracted.[2,3] Later, higher resolution measurements were made by the Boomerang (balloon observations of millimetric extragalactic radiation and geomagnetics) experiment, which involved a microwave telescope lofted 38 km over Antarctica.[4]

The CMB itself seems to indicate a preferred frame of reference, which is not inconsistent with the *principle of relativity*.[5] Inertial observers would not be able to distinguish anything about their motion except by comparison with this preferred frame. The largest observed differences in

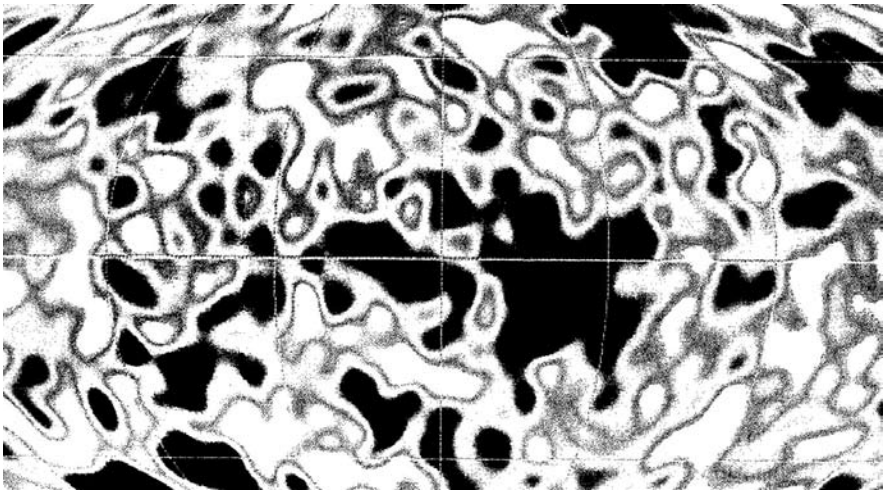

Figure 1. *Light and dark patches representing the variation of the temperature of the CMB radiation after all foreground sources have been subtracted (after COBE).*[26] *The different regions represent temperature differences of the order of 0.01% above or below the average sky temperature of 2.73 K.*

temperature, or anisitropy in the CMB radiation, is due to the motion of the Earth relative to this preferred frame of a 'co-moving observer'—one who rides along with the general expansion of the universe. That motion has been measured at about 370 km/sec in the direction of Leo, and our galaxy calculated to be moving about 600 km/sec with respect to this reference frame.[1,6] The relativity principle simply rules out a reference frame that is preferred on the basis of how the laws of physics work.[7]

These CMB observations are consistent with the general relativistic creationist models of Humphreys[8] and Gentry,[9] which explain the current state of the universe within a creationist timeframe. However, they are inconsistent with all big bang cosmologies. In both creationist models the matter distribution is bounded, while space may or may not be. The red-shift, too, may show we are in a preferred frame of reference. The Cosmological Principle, which assumes that the universe is unbounded, is an evolutionary assumption—an untestable hypothesis. Gentry's model explains red-shifts, CMB and the paucity of quasars past red-shift, $z = 4$, in a static space-time.[9] It is a finite universe model consistent with all observational data.

After the motion of the Earth and our galaxy is removed, there are found, buried in the CMB radiation, at sufficiently small angular resolutions, small intrinsic variations of the order of 1 part in 10^5, actually ≤ 70 μK.[4,10] This in itself is a problem, because cosmologists have stated that variations greater than 1 part in 10^4 are needed for galaxies and clusters to form in the cosmological time available to gravity.[11]

'Blotches'

The elongated shapes or 'blotches' in the two-dimensional temperature maps (shown in Figure 1) in the CMB have been interpreted by Gurzadyan as the effect of geodesic (trajectory) mixing on the properties of a bundle of CMB photons propagating through space.[12–14] That is, because a bundle of photons is not a point object, the individual photons follow different paths from the source to the receiver. The result at the receiving end is an enlarged and smeared image as illustrated in Figure 2. This results in a distinct signature and depends on the geometry of space, indicating that a negatively curved Friedmann-Robertson-Walker (FRW) universe will produce the observed elongated anisotropy spots (Figure 2). Thus, the blotches are ***not*** the result of some 'clumpiness' of the radiation density soon after the big bang.

The negatively curved FRW universe refers to the standard big bang cosmology where the curvature constant $k = -1$, which usually means the space is open and infinite. This may be contrasted with a closed universe with a positive curvature constant $k = +1$ or a flat universe where $k = 0$. The latter is usually referred to as Euclidean space and is what we are familiar with on a local scale. However, on a galactic or universal scale, reality may be different.

Cold dark matter

The dynamic behaviour of galaxies and galactic clusters begs for dark matter, as will be explained later, but to date none has been found. According to McGaugh,[10] recent Boomerang data,[4] which contain the amplitudes in the angular power spectrum of the anisotropies in the CMB radiation, suggest that the universe is filled with normal (baryonic) matter, and not with exotic particles or cold dark matter (CDM).

Looking at the velocity of stars distributed in spiral galaxies, typically the stars in the extremities of the arms have higher centripetal velocities than those in the hub.[15] This observation has been made based on a well-established physical law—one of Kepler's equations. In addition, Isaac Newton showed that only the mass lying within the orbit of the star affects its motion; the rest can be neglected. From these facts the mass of the galaxy (m) can be determined through:

$$m = \frac{v^2 r}{G}$$

where v is the velocity of the outermost stars determined from Doppler measurements of their proper motions, r is their distance from the centre, and G is the universal gravitational constant. This mass calculation is then compared with the mass of the observed number of stars in the galaxy and found to be an order of magnitude larger. Hence the need for additional non-luminous matter to balance the calculation—dark matter.

Also, the virial theorem can be used

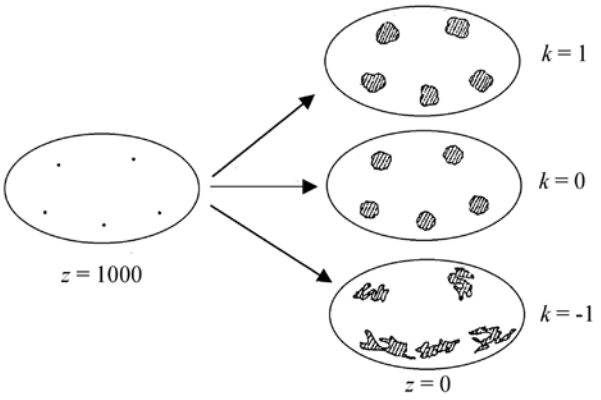

Figure 2. *The evolution of photon beam anisotropy due to mixing effect in hypothetical universes with different curvatures, k (after Gurzadyan and Kocharyn).*[14]

to calculate the mass of either a single galaxy or a galaxy cluster, typically of the order of a few hundred members. The theorem relates the potential and kinetic energies of a system that is gravitationally stable, without collapse or disintegration taking place. Evolutionary astrophysicists suppose galaxies and galaxy clusters must be gravitationally bound. Otherwise, over the billions of years since their alleged birth, they would have flown apart. The theorem states that the total gravitational potential energy of the star system equals exactly twice the total kinetic energy. If this condition is not met, the component objects will either cascade inward or escape, depending on the direction of imbalance. From the virial theorem,[16] the mass of a galaxy cluster (M) can be calculated as follows:

$$M = \frac{3V^2R}{G}$$

where V is the *rms* averaged velocity of the member galaxies, and R the estimated radius of the entire cluster.

Essentially the same calculation can be performed on a cosmological scale when assumptions about the cosmology of the universe are made. These calculations determine whether the universe has sufficient mass density for closure to occur and the current expansion (as the red-shift of galaxies is interpreted to mean) to be halted or reversed. The standard cosmological paradigm is of a universe in which ordinary matter comprises only about 10%, and the other 90% is in non-baryonic forms. The latter may include the elusive axion, WIMPs (weakly interacting massive particles) or other unknown particles, which allegedly don't interact with light.

Missing dark matter and smooth CMB

The 'standard' CDM[17] model started simple but soon evolved into a more convoluted model, LCDM,[18] with many complexities. McGaugh states in his paper:

> 'The presumed existence of CDM is a well-motivated inference based principally on two astrophysical observations. One is that the total mass density inferred dynamically greatly exceeds that allowed for normal baryonic matter by big bang nucleosynthesis. The other is that the cosmic microwave background is very smooth. Structure cannot grow gravitationally to the rich extent seen today unless there is a non-baryonic component that can already be significantly clumped at the time of recombination without leaving indiscriminately large fingerprints on the microwave background.'[10]

However, the large fingerprints are just not observed.

These two issues are fundamentally important to the evolutionary cosmologist. The missing dark matter in galaxies, galaxy clusters, and the whole universe, and the smoothness of the CMB radiation create unassailable problems in the formation of stars and galaxies in the 'early universe'. Prof. Stephen Hawking in his book said, 'This [big bang] picture of the universe ... is in agreement with all the observational evidence that we have today', but admitted, 'Nevertheless, it leaves a number of important questions unanswered ….'[19] The important questions left unanswered, of course, concern how stars and galaxies could have originated.

Spiral galaxy arms

Creationist cosmologies may also require some dark matter (which may be ordinary but unobserved baryonic matter), but only to account for the orbital motion of stars in spiral galaxies. Even without this form of dark matter the observed orbital motions are not necessarily a problem for the creationist. Possibly the galaxies were not in equilibrium when they were created, and have not had time to disintegrate since. This of course assumes that only 6,000 years or so have passed on the galaxy in question. Some creationists have suggested that this may not have been the case.[8] On the other hand, evolutionary (big bang nucleosynthesis) assumptions require large quantities of non-baryonic dark matter. The Creation model has no such constraint.

Some 30 years ago a 'density wave' theory was postulated to solve the 'wrap-up' problem in the arms of spiral galaxies.[20] That is, the arms of spiral galaxies should be very tightly wound if they are indeed billions of years old. Apparently, it requires much fine tuning to get the theory to work,[21] and recently has been called into question by the very detailed spiral structure in the central hub of the Whirlpool galaxy, M51, discovered by the Hubble Space Telescope. The new observations show that the inner spiral structure extends inward further than was previously thought. The spiral arms are wrapped about the centre for about three full turns,[22] which the

density wave model does not explain well. Kennedy eloquently sums up the problem: '…the precise physical recipe that predicts their [density waves'] behaviour continues to elude us'.[23] Even though no such problem exists for the creationist, I suspect that an understanding of the structure in tightly-wound spiral galaxies will need to include some dark matter. But this will only be of the ordinary baryonic form, not the hypothetical, non-baryonic CDM.

An *a priori* prediction

Models for the angular power spectrum of fluctuation in the CMB have many free parameters, making it possible to fit a wide variety of models to a given data set. However, the baryon content is the principal component that affects the amplitude of the odd and even peaks, and may therefore be used to predict what should be observed. Based on standard cosmological theory for the baryon content prescribed by big bang nucleosynthesis and the abundances of light elements, both peaks should be present. But, when CDM dominates, the even numbered peaks should be foremost. If CDM is negligible, the second peak should have a much smaller amplitude. The latter is consistent with the Boomerang data.[4] Considering the LCDM model,[18] all reasonable variations of parameters considerably over-predict the height of the second peak compared with the data.

As McGaugh shows, the *a priori* prediction for a purely baryonic universe is totally consistent with the data. The amplitude of the second peak is much smaller than that predicted by LCDM models. If we believe in the experimental method and the principle of falsification, there is one glaring result of this analysis; either **non-baryonic cold dark matter doesn't exist, or big bang cosmology,** on which the prediction is based, is **wrong!** This, of course, presumes that the anisotropy in the amplitudes of the CMB radiation is correctly interpreted. Assuming the latter for the moment, if CDM doesn't exist, the big bang cosmologists have problems explaining the existence of galactic clusters. Another consequence is that the observed mass density, without CDM, is too low for closure, and, as a result, would indicate the universe is open or has negatively curved space.

Cosmologists grasp at straws

Naturally, the lack of CDM is of considerable concern for evolutionary cosmologists. Some enterprising Princeton astrophysicists have attempted to solve this problem by proposing particles as big as galaxies to explain lack of dwarf galaxy formation.[24] The hypothetical particles have a density of the order 10^{-24} of that of an electron and wave-functions of the order of 3,000 light-years! They interact only with gravity and are almost impossible to detect. The only reason these particles are needed, it seems, is to explain why dwarf galaxies are far rarer than big bang theory predicts. As theory goes, CDM was introduced to get matter to form galaxies early in the universe's history, but that created another problem—computer simulations predicted that a huge number of dwarf galaxies would have formed but these are undetected. Hence the need for the huge hypothetical particles that 'would form giant globs of "fuzzy" cold dark matter'.[24]

One physicist, Gruzinov, even challenges his colleagues to prove him wrong, saying this model is consistent with all known observations. Where have I heard that before? Where does 'faith' stop and the facts begin? It would seem, in this area of astrophysics (stellar formation and galaxy evolution), '**faith'** is all they have. The facts are so sparse and the parameters so many, that almost any proposal can be published, provided it is consistent with the evolutionary paradigm. 'If stars did not exist, it would be easy to prove that this is what we expect.'[25]

Big bang misses the mark

The latest evidence from the Boomerang data strongly suggests, based on standard big bang cosmology, either that there is no CDM, or that big bang cosmology is wrong, or both! It cannot be ruled out that contradictions in the models exist simply because the big bang cosmology is wrong. In this case, it may be impossible to get any predictions to fit the observed data in the fine detail, because incorrect assumptions were made in the first place. In any case, the Boomerang data indicate that the big bang cannot explain the formation of galaxies and clusters.

Conversely, these latest findings about the anisotropy of the CMB are consistent with creationist cosmologies, which do not require these 'ripples' to explain galaxy formation in the early universe.

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Insect leg development: evolution out on a limb

Pierre Jerlström

Hidden unity

The body plans of vertebrates and insects differ greatly in their size and shape, and in the type and number of appendages. Nevertheless, there is a hidden unity in the genes and the genetic system that control their development. Cells along the main body axis of vertebrates, and of insects such as fruit flies, 'know' their position as well as what type of appendage they will develop into from the level of expression of the homeotic selector genes (Hox) inside their nuclei.[1]

The role of specific Hox genes in insect limb development has recently been studied. At a certain stage of insect larva growth the Distal-less (*Dll*) gene switches on, causing some of its cells to organize into legs. Switching off *Dll* on the other hand, results in only stumps forming.[2] In the early 1990s, scientists were astounded to find almost identical copies of this gene in vertebrates, and to find that as with insects, these genes switch on during leg development. This was surprising because vertebrates and insects have completely different limbs: bugs have their muscles on the inside of a protective exoskeleton, whereas in animals muscle covers the bone. And, according to evolutionary belief, insects and vertebrates are only distantly related to a limbless flatworm that lived perhaps a billion years ago. They believe that limbs and the genes for their development have evolved independently in these two lineages.[2]

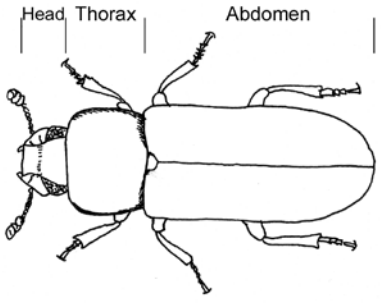

Figure 1. *Adult red flour beetle* Tribolium castaneum *(after Merit Students Encyclopedia).*[9]

Scientists further looked at other 'distant relatives' of the flatworm such as velvet worms, sea urchins and sea squirts, which also have limb-like appendages. They found that *Dll*-like genes were active in the developing appendages in each of these animals.[2]

Looking at the evidence within a Biblical framework, it is easy to recognise this hidden unity in limb development as the work of one Creator who used a highly successful, basic blueprint to design appendages for movement for the various created kinds. By analogy, the wheels of bicycles, cars, trains, etc., have not arisen by accident, but are all variants of a basic engineering design. In this light, it is not surprising to find that similar molecular information (Hox genes) in the genetic code of different animals gives rise to analogous leg structures.

Mutant study

Two other Hox genes, *Ultrabithorax* (*Ubx*) and *abdominal-A* (*abd-A*), also have distinct functions in some insects. In the red flour beetle, *Tribolium castaneum*, *abd-A* determines whether or not a limb grows in the abdomen by acting on *Dll*, while *Ubx* tells the cells what type of limb they should become.[3,4] When scientists inactivated these two genes they found that flour beetle larvae sprouted 16 legs on their abdomen. This has been hailed as supporting evidence for the idea that insects and arthropods (animals without backbones) evolved 400 million years ago from animals resembling centipedes and millipedes, which have many non-specialized body segments, each with its own pair of legs. During the supposed evolution of insects, groups of segments fused together to form the head, the thorax and a legless abdomen. Leg-making genes also switched off, giving rise to more agile six-legged insects.[4,5]