THE MATURE CREATION: MORE THAN A POSSIBILITY

G. RUSSELL AKRIDGE*

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The electromagnetic fields surrounding a point charge conserve energy, preserve an orderly universe, and satisfy the mass-energy equivalence of relativity if the universe is created mature. As a part of this mature electromagnetic field, light from the distant starts was created enroute from the star to the earth. A new interpretation is presented herein for discontinuities in the electric field relating to charge creation.

Introduction

The subject of a mature creation, sometimes called creation with apparent age, has been discussed by men in the fields of philosophy, theology, and science.[1] Until now, writers have approached the subject of the mature creation as a sufficient condition for the original state, but never as a necessary condition for the original state. In this article, the mature creation is shown to be a necessary condition, not merely a sufficient condition, for the original state of matter.

The time development of the electromagnetic fields surrounding a recently created charge in a primordial state are compared with those surrounding a recently created charge in a nature state. The primordial charge creation will lead to two unreasonable situations: (1) a universe in which energy is never conserved, and (2) a universe in which there is likely to be a continual state of disorder. The mature charge creation will have none of the difficulties found in the primordial charge creation. A generalization of the argument shows that the creation of any object described by fields must be done as a mature creation. Although only classical fields are considered in this article, the concept is strong enough to call for the mature creation as a necessary condition of an orderly universe.

A participant in the audience of the creation seminar held at the Dallas Bible College in May, 1978, asked Mr. Slusher the following question about the visible portion of the electromagnetic spectrum:[2] If the universe was created no more than ten thousands years ago, how can we see the light from stars millions of light-years from the earth? One of the explanations Mr. Slusher gave was that the light from the distant stars was created enroute at the same time the star was created. This article lends support to Mr. Slusher's answer. The creation of starlight enroute is actually a necessary condition for an orderly universe.

Evolutionary Fields

The time evolution† of the electromagnetic fields due to a point charge $+q$ created without its surrounding Coulomb field is examined in Appendix A. Maxwell's equations yield the following expected time development of the electromagnetic fields surrounding q. The magnetic induction **B** is zero. The electric field intensity **E** is a discontinuous function, because the effects of the charge creation travel outward from q at the speed of light c. The electric field intensity is the Coulomb field $E = q/4\pi\epsilon_0 r^2$ inside the spherical region $r<ct$. This is the region accessible to the field propagating away from q at the speed of light. The electric field intensity is zero outside this region. The field propagating at the speed of light could not reach this region $r>ct$ in time t. This expanding spherical region of Coulomb field is illustrated in Figure 1. The expanding spherical region of influence is an evolutionary field in the sense that it can be used to determine the age of the charge. This evolutionary dating method is shown in Figures 2 and 3. If the Coulomb field of a charge q is sensed by an observer a distance R from q, then that charge's expanding Coulomb region must have had time to propagate to him. Hence, the observer concludes that the charge was created at least as long ago as R/c, because it would take that long for the expanding Coulomb region to reach him. Alternatively, if the observer does not observe a charge at a distance of R/c, he must select from two possibilities. (1) There could be no charge at R. (2) There could be a charge at R but it could be so far away that its expanding Coulomb field has not been able to reach the observer yet. In this case, q must have been created no longer ago than R/c, because at that time the expanding Coulomb region reaches the observer. If the

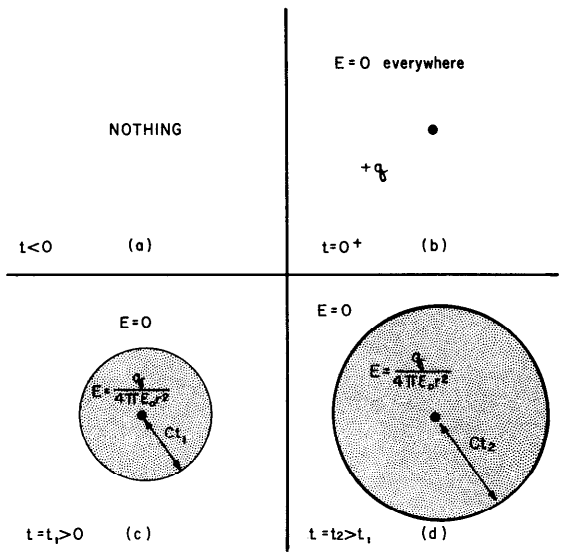

Figure 1. The time development of the fields surrounding a stationary charge q created with no fields at time $t = 0$. 1(a) and 1(b) show that the charge q is created at $t = 0$, but q's electric field is not created along with it. 1(c) and 1(d) show the time development of the Coulomb field surrounding q. This Coulomb field region is a spherical region expanding from q at the velocity of light. Inside that region, at a distance r, the magnitude of the field is $q/4\pi\epsilon_0 r^2$, as shown. Outside, there is as yet no field.

*G. Russel Akridge, Ph.D., is with the Natural Science Department, Oral Roberts University, 7777 South Lewis, Tulsa, Oklahoma 74171.

†By the evolution of a field is meant just development, the true meaning of the word. Nothing Darwinian is implied.

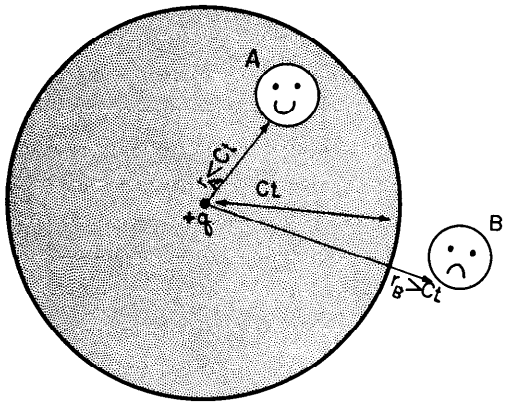

Figure 2. Determination of the age of q. Both observers, A and B, know their distances, r_A and r_B, from q. Observer A knows that q is older than r_A/c, because the Coulomb region expanding at the speed of light has reached him. Observer B is unaware of the presence of q. Observer B must conclude that if there is a charge q a distance r_B from him, it is younger than r_B/c, because the Coulomb region expanding at the speed of light has not reached him.

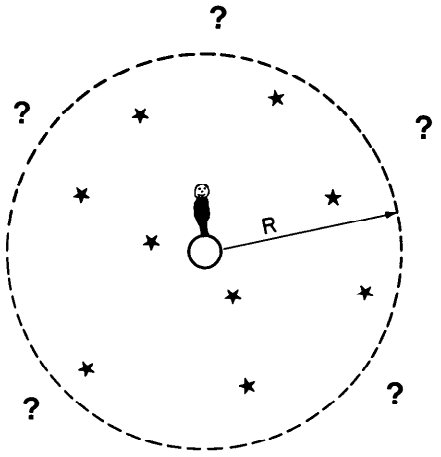

Figure 3. Determination of the date of Creation. The earth observer notices stars out to a distance R, but no further. He can conclude: (a) the universe is limited in size, or (b) the age of the universe is R/c, because the light from stars more distant than R has not had time to travel to the earth since Creation.

observer knows there is a charge a distance R from him, he is certain that its age is less than R/c.

In a recent article, David M. Harris proposed a solution to the same problem of light from distant stars. The problem is

> . . . the difficulty of reconciling the fact that we can see the stars that are apparently billions of light-years away, with the fact that the universe is probably only thousands of years old.[3]

Mr. Harris offered an alternative to the view that the light was created from star to earth. His proposal illustrates the current continuing interest in the original state of the electromagnetic spectrum as compared with what we observe it to be now.

Before the consequences of the expanding Coulomb field are examined, let us follow the logical extension of evolutionary field to date the age of the universe. No one observes the effect of a single stationary electron or of a single stationary proton light-years away from the earth. The fields of a single charge are far too weak to be noticed at that distance. However, huge complexes of electrons and protons which stars can be considered to be, can be observed with the naked eye even though they are believed to be many light-years away from the earth. The fact that the electrons and protons in the stars are in rapid motion will make no difference in the discussion to follow. The motion of the charges will not alter the speed c with which that field propagates, and the following discussion depends only on the speed of propagation.

The age of the universe could have a limit set on it by measuring the distances to the most distant visible stars as shown in Figure 3. If the most distant star visible were, say, 10,000 light-years from the earth, then the age of the universe would be only 10,000 years. Light from more distant stars would not have had time to reach the earth. As time progressed, new stars would continually pop into view in the night sky as their expanding spheres of electromagnetic fields finally reached the earth. Of course, the actual situation is quite different. One can observe the light from vast numbers of stars many billions of light-years from the earth,[4] and new stars are not observed to pop into existence. (Except the occasional novae, which have nothing to do with the present argument.) Thus, it would seem that the universe must be many billions of years old, because the light that left the stars billions of years ago can be seen on earth today.

The presupposition in either the age of the star or the age of the charge argument is that created charges are initially surrounded by zero fields. An alternative to this particular choice of initial condition will be presented in the next section. In the remainder of this section, the mathematical and physical consequence of this zero field initial condition is examined. The simple case of the point charge is used instead of the star. The same principles apply to both the star and the point charge, but the single charge is mathematically simpler.

At a time t after the creation of this charge, the spherical Coulomb region has expanded to a radius $r = ct$. The spherical region contains a non-zero electric field everywhere within it. At time $t + \Delta t$ the spherical Coulomb region will expand to a larger radius, $r + \Delta r = c(t + \Delta t)$, and it will support a larger volume of electric field. This increased volume occupied by the electric field means that the total energy contained by the field has increased during time Δt. The energy density in an electromagnetic field is[5]

$$\frac{dU}{dV} = \frac{1}{2}(\epsilon_o E^2 + \mu_o H^2) \tag{2.1}$$

Thus, the increase in field energy ΔU during time Δt is

$$\Delta U = \frac{\epsilon_o}{2} E^2 \Delta V \tag{2.2}$$

As shown by Figure 4, $\Delta V = 4\pi r^2 \Delta r$ is the increase in the volume occupied by the field during Δt. Since the field propagates at the velocity of light,

$$\Delta r = c\Delta t \tag{2.3}$$

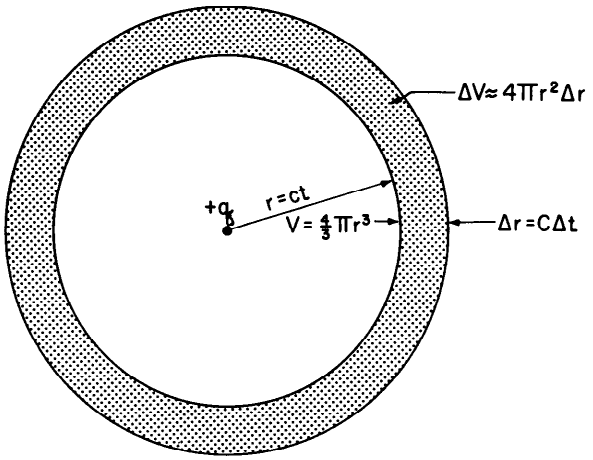

Figure 4. Non-conservation of energy. As the spherical Coulomb region expands from radius $r = ct$ to radius $r + \Delta r = c(t + \Delta t)$ at time $t + \Delta t$, the electrostatic field occupies an increased volume $\Delta V = 4\pi r^2 \Delta r$.

When equation (2.3), and the Coulomb field $E = q/4\pi\epsilon_0 r^2$ are substituted into equation (2.2), the result is

$$\frac{dU}{dt} = \frac{q^2}{8\pi\epsilon_o c}\frac{1}{t^2}. \qquad (2.4)$$

The rate of creation of the energy to expand the volume occupied by the field as expressed by equation (2.4) is *never* zero. Thus, energy must forever be created from nothing to allow for the expansion of the Coulomb region at the speed of light. The creation of energy from nothing violates all known laws of physics. This non-conservation of energy is sufficient grounds for rejecting the assumed evolutionary initial condition of zero fields at the instant of q's creation.

A word of caution is in order about the magnitude of the non-conservation of energy. The term $q^2/8\pi\epsilon_o c$ in equation (2.4) in the MKS system has a numerical value of only 7.19×10^{-18} eV-sec. Further, the factor of $1/t^2$ in equation (2.4) decreases the value of dU/dt as time proceeds. Thus, non-conservation of energy at the rate of one eV per second per electron occurs only during the first nanosecond of the electron's lifetime. After 6,000 years, the rate of non-conservation of energy is decreased to only 2×10^{-40} eV per sec. per electron.

There is a physical reason for the constantly increasing amount of energy that must be created and stored in the electric field. Appendix A shows that the expanding Coulomb field is equivalent to a layer of surface charge whose total charge $-q$ is uniformly distributed over the surface of the expanding outer boundary of the Coulomb field. The force necessary to expand this spherical surface charge outward against the inward pull of the charge $+q$ requires the input of energy expressed by equation (2.4). From this point of view, energy must be continually created to force opposite charges further and further apart.

The problem of order in the universe is posed by the evolving fields. A given charge will experience shock after shock as the expanding Coulomb regions of charges at different distances burst upon it from random directions. These sudden accelerations would cause the charge to emit sudden bursts of radiation causing the disturbance to continue. Thus, the creation of an orderly universe is threatened by the evolving fields. Whether or not the initial disorder ever subsided, at least the initial state of the universe would be a condition of gross disorder.

Mature Creation

There is an alternative to the initial condition of zero fields surrounding a charge at the instant of the creation of that charge. The alternative does conserve energy, does preserve order in the universe, and does resolve the paradox of the light from the distant stars.

The alternative: At the instant of creation (a) each electrically charged particle was created and (b) the fully developed electromagnetic field surrounding each charge was also created. These fully developed electromagnetic fields created with the charge at the instant of creation are called mature fields. If one insists on retaining the evolutionary presuppositions, these mature fields have the appearance of age at the instant of creation. Of course, the appearance of age when there is no age is not God's way of fooling anyone. Rather, it is a result of an erroneous preconceived notion of evolution.

If the single charge were created at $t = 0$, and if the surrounding Coulomb field $E = q/4\pi\epsilon_0 r^2$ were also created at time $t = 0$, then the fields would not change with time at all. The field would forever be a solution of Maxwell's equations. No energy need be created to sustain the field. The energy for the entire field would be created at the same time the charge was created. A charge in a more complicated state of motion at the instant of creation would have a more complicated but fully developed electromagnetic field appropriate to its state of motion.*

Order in the universe would not be threatened if the mature electromagnetic fields were created at the same time their charge sources were created. With the complete field present at the instant of creation, there are no expanding Coulomb regions causing discontinuities in the motion of other charges. Rather, the field from each charge extends outward to all other charges at creation and therefore acts on them in a continuous manner after the creation event.

The paradox of light from the distant stars is no longer a paradox. Light is an electromagnetic disturbance. Creation of the charges in the star would be accompanied by the creation of the mature electromagnetic field of the charges in the star. Unlike the evolutionary field, this mature electromagnetic field would extend throughout the entire universe at the instant of creation. Thus, the light from the distant stars would be created enroute from those stars at the instant of creation. Therefore, when one observes the light from a star one billion light-years away, he does not observe the light that actually left the stars one billion years ago. Rather, he observed the light that was created enroute only a few thousand years ago. As strange as

*It is true that if a charge already existing, along with its static field, be moved, set vibrating, etc., a different field will spread out from it. That is what happens when light is emitted. However, there is no creation of energy in such a case. It is just a transfer of energy which is provided by the force which caused the motion, vibration, etc.

this concept may seem, it is required for an orderly universe in which energy is conserved.

One final support for mature creation comes from the equivalence between mass and energy, $E = mc^2$. According to the theory of relativity, energy and mass are interchangeable. In fact the classical electron radius is derived[6] from the assumption that the energy contained in the electrostatic field $E = q/4\pi\epsilon_0 r^2$ of the electron is equal to the mass of the electron times c^2. If the mass of the electron and the energy in the field of the electron are equivalent and interchangeable, creation of one alone would be impossible.

Appendix A

Maxwell's equations for the electromagnetic field "in vacuo" are[7]

$$\nabla \cdot \mathbf{E} = \varrho/\epsilon_o \tag{A.1}$$

$$\nabla \cdot \mathbf{B} = 0 \tag{A.2}$$

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t} \tag{A.3}$$

$$\frac{1}{\mu_o}\nabla \cdot \mathbf{B} = \mathbf{j} + \epsilon_o \frac{\partial \mathbf{E}}{\partial t} \tag{A.4}$$

In the above equations, **E** is the electric field intensity, **B** is the magnetic induction, ϱ is the electric charge density, and **j** is the electric current density. We seek to show that the expanding Coulomb field

$$\mathbf{E} = \hat{\mathbf{r}}\frac{q}{4\pi\epsilon_o r^3}U(ct - r), \mathbf{B} = 0 \tag{A.5}$$

is a solution to Maxwell's equations. The unit step function U is described in Appendix B. Equations (A.2) and (A.3) are $0 = 0$ for the assumed solution in equation (A.5). Substituting equation (A.5) into the first of Maxwell's equations (A.1) gives

$$q\delta^3(\mathbf{r})\, U\,(ct - r) - \frac{q}{4\pi r^2}\delta(r - ct) = \varrho \tag{A.6}$$

The Dirac delta function, δ, is explained in Appendix B. The $q\delta^3(r)U(ct\text{-}r)$ term describes the point charge $+q$ created at the origin at time $t = 0$. The other term, $-q\delta(\mathbf{r} - \mathbf{ct})/4\pi r^2$, is unexpected. It describes a charge $-q$ uniformly distributed over the surface of an expanding sphere of radius $r = ct$.

When the assumed solution (A.5) is substituted into the final equation (A.4) of Maxwell's equations, the solution for the electric current density is

$$\mathbf{j} = -c\,\frac{q\delta(r - ct)}{4\pi r^3}\hat{\mathbf{r}} \tag{A.7}$$

This **j** is the electric current density produced by the expanding spherical shell of uniformly distributed charge $-q$.

This expanding shell of charge is now shown to be a consequence of Gauss' law as pictured in Figure 5. In Figure 5, the Coulomb field has expanded to a radius $r = ct$. The inner Gaussian surface $\mathbf{S}_i$ is a sphere of radius slightly less than r, and the outer Gaussian surface $\mathbf{S}_o$ is a sphere of radius slightly greater than r. Gauss' law is

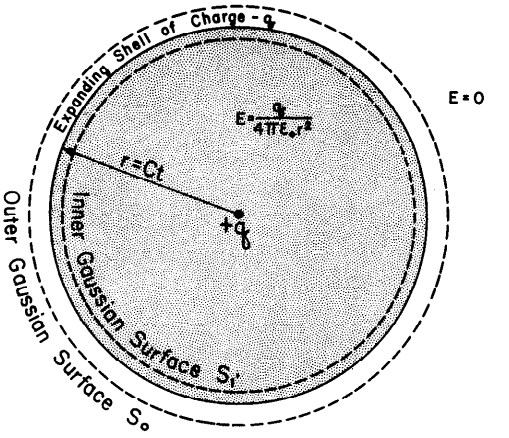

Figure 5. The two Gaussian surfaces: The Coulomb field $E = q/4\pi\epsilon_0 r^2$ extends out to a spherical shell $r = ct$. Gaussian surface S_0 is slightly exterior to the spherical shell. Gaussian surface S_i is slightly interior to the spherical shell.

$$\int \mathbf{E} \cdot d\mathbf{S} = \frac{Q}{\epsilon_o}\,(\text{inside volume bounded by surface S}) \tag{A.8}$$

When Gauss' law is applied to the inner Gaussian surface $\mathbf{S}_i$ where $E = q/4\pi\epsilon_0 r^2$ the result is

$$\frac{Q}{\epsilon_o}\,(inside\ S_i) = \frac{1}{4\pi}\frac{q}{r^2}\cdot 4\pi r^2, \text{ or}$$

$$Q\ (inside\ S_i) = q$$

When Gauss' law (A.8) is applied to the outer Gaussian surface $\mathbf{S}_o$ where $\mathbf{E} = \mathbf{0}$, the result is

$$Q\ (inside\ S_o) = 0$$

However, the only difference between the volumes enclosed by the two surfaces, $\mathbf{S}_0$ and $\mathbf{S}_i$, is the spherical shell between them.

$$\begin{aligned} Q\ (on\ expanding\ shell) &= Q(inside\ S_o) - Q(inside\ S_i), \\ &= 0 - q, \\ &= -q \end{aligned}$$

The fundamental principles of physics are violated by the expanding shell of charge. First, the shell of charge is expanding at a speed equal to the speed of light in a vacuum c. The theory of relativity demands that every object travel at a speed *less* than the speed of light, unless that object has zero rest mass.[8] For example, the photon, a quantum of light, can travel at the speed of light only because the photon has zero rest mass. On the other hand, the electron can never travel as fast as the speed of light, because the electron has a non-zero rest mass of 9.11×10^{-31} kg. All known electrically charged objects have non-zero rest mass, and they cannot travel at the speed of light. Thus, the expanding shell is not a *known* electrically charged object. The second principle of physics violated by the expanding shell of charge is the quantization of charge. In 1909, R.A. Millikan demonstrated that electric charge comes in quanta equal to integer multiples of 1.6×10^{-19} Coulomb, the charge on the electron. Until recent years, physicists believed that the smallest unit of electric charge was 1.6×10^{-19} Coulomb. Now, physicists speculate that a

smaller unit of charge, the quark, equal to ⅓ x 1.6 x 10^{-19} Coulomb may actually be the smallest unit of electric charge.[9] In any case, physicists are sure there is some smallest unit of electric charge. However, the expanding shell had a charge $-q$ *uniformly* distributed on it. If this expanding shell was due to the creation of a single electron, the expanding shell would contain the charge $-q$ of a single electron uniformly distributed on it. The single electric charge on the expanding spherical shell becomes more and more spread out, instead of being quantized as the laws of physics require.

The expanding charged shell cannot be a physical reality for the two reasons previously stated. However, the charged shell has been shown to be a valid mathematical consequence of Maxwell's equations with zero field initial conditions. There are only two logical explanations. First, although the model is mathematically possible, it is not physically possible. Therefore charge creation with an expanding Coulomb field is an impossibility in the real world. If Maxwell's equations have remained unchanged over the years, the conclusion is that no charges ever have been or ever will be created with expanding Coulomb fields around them. Creation of both the charge and its complete (mature) Coulomb field is the alternative. The second logical explanation is that the mathematical solution is correct, but that the physical interpretation is incorrect. The discontinuity at $r = ct$ in electric field which has always been interpreted as a physical surface charge,[10] is not a charge in this case. Rather, the discontinuity is a consequence of charge creation. The general conclusion is that discontinuities in electric field are a result of either a surface charge at the location of the discontinuity or of a charge created earlier somewhere else. We have never noticed the discontinuities in electric field caused by charge creation because charges are not now created by themselves (unless one accepts Hoyle's discredited theory).

The propagation velocity of the field discontinuity distinguishes between a genuine surface charge and a remnant of charge creation. If the propagation velocity of the field discontinuity is less than the speed of light, the field discontinuity is a result of surface charge located at the surface of discontinuity. If the propagation velocity of the field discontinuity is equal to velocity of light, the field discontinuity is a remnant of charge creation at another location in the past.

Appendix B

The unit step function[11] $U(t)$ is zero whenever t is negative, and $U(t)$ is + 1 when t is positive.

$$U(t) = \begin{cases} +1, & t > 0 \\ 0, & t < 0 \end{cases} \qquad \text{(B.1)}$$

A graph of $U(t)$ appears in Figure 6. Roughly speaking, $U(t)$ "turns off" whatever it is multiplied by if $t<0$, and $U(t)$ "turns on" whatever it is multiplied by whenever $t>0$.

The Dirac delta function $\delta(t)$ is the derivative of the unit step function.

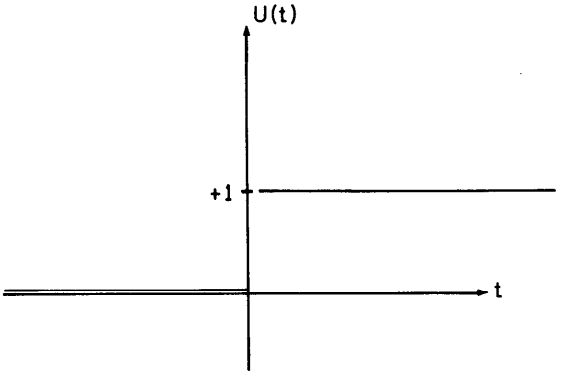

Figure 6. The unit step function U(*t*). This might fairly be named after Heaviside, as the delta function is after Dirac.

$$\delta(t) = \frac{dU(t)}{dt} \qquad \text{(B.2)}$$

From the graph in Figure 6, the slope of $U(t)$, and therefore the value of $\delta(t)$, is zero for $t \neq 0$. Thus, $\delta(t)$ can differ from zero only at (or near) the origin $t = 0$. The behavior of $\delta(t)$ at the origin $t = 0$ can be obtained by integrating equation (B.2).

$$\int_{-\infty}^{+\infty} \delta(t)dt = U(+\infty) - U(-\infty) = 1 - 0 = 1$$

Thus, the area under $\delta(t)$ must be 1. Since $\delta(t)$ differs from zero only at one point, $t = 0$, $\delta(0) = \infty$. A convenient approximation to $\delta(t)$ consists of using $\delta(t) = 0$ except in a small region near the origin. Then $\delta(t)$ surges upward to a very large value in this small region around $t = 0$. The total area under the curve is 1. This graph of $\delta(t)$ is shown in Figure 7. Loosely speaking, $\delta(x)$ would describe an object all of which is located at $x = 0$, i.e., a point object. In Appendix A, the electron is represented by $\delta(x) \cdot \delta(y) \cdot \delta(z)$ because it is thought to be a three-dimensional point charge.

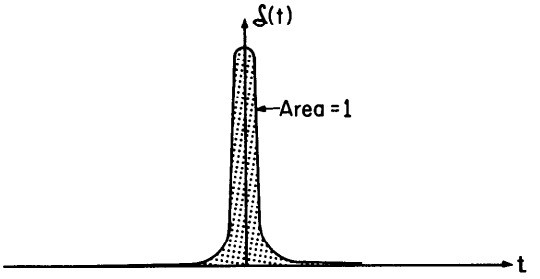

Figure 7. The Dirac delta function, $\delta(t)$.

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[2]The question and Mr. Slusher's answer are preserved on the cassette tapes of the seminar made by the Dallas Bible College, Dallas, TX.

[3]Harris, David M. 1978. A solution to seeing stars. *Creation Research Society Quarterly* 15 (2):112-115.

(Continued on page 83)

However, if the necessary torques had been applied to the earth's crust, and only to the crust, the inertia of the mantle and the core might have caused disastrous results. Therefore we must imagine a pattern of torques applied to the entire earth and decreasing continuously with decreasing distance from the earth's axis. Once we visualize such a pattern, we can imagine it to be applied to every object on the surface and even to the atmosphere. If we go this far, we can drop the need for a slow deceleration and re-acceleration, and can think of both as being very rapid.

The long day of Joshua 10:12-14 was a miracle like the raising of the dead. Our present-day knowledge of biochemistry should not cause us to question the latter type of miracle, but should cause us to appreciate it all the more. Similarly our knowledge of astronomy and physics should increase our appreciation of the great events described by the simple words, "the sun stood still."

Reference

[1]Hanson, James N., 1978. Against catastrophic rationalism: gravitational attitude deflections of the Earth's axis. *Creation Research Society Quarterly* 15 (1):55-68 and 72.

Sincerely yours,
Harry Akers, Jr.
826 "K" Street, Apt. 4.
Anchorage, Alaska 99501
Received 11 January, 1979

Reply to Akers' Letter

In reply to Mr. Harry Akers' comments:

1) I surely am suggesting a geocentric model for the whole Universe. Specifically, one wherein the earth does not spin nor does it translate through space but is at the center of Creation just where the Bible puts it.

2) The Bible in no way requires one to view anything from a heliocentric framework. One may argue with me that certain verses are not geocentric but he will not find a single verse or even allusion to heliocentricity.

3) I am confused by the phrase "deceleration of about 0.01g." This is a linear acceleration measured in units of length per unit time squared whereas angular acceleration must be measured in units of angular displacement per unit time squared. In any event, whatever is meant, it is an unsubstantiated conjecture that such deceleration and reacceleration would have negligible effect. I should like to see such computations. The fact is that very small accelerations do produce and would produce cataclysmic effects (see Editor H. Armstrong's note in my paper). One need only investigate water tides, and even earth tides, as developed e.g., in Lamb's *Hydrodynamics* in order to discern this.

4) If Mr. Akers can "imagine a pattern of torques applied to the entire earth and decreasing continuously with decreasing distance from the earth's axis," an assumption not at all found or alluded to in Scripture, then I must, similarly, ask him to consider an earth not moving in the first place and a diurnally moving sun and moon which God caused to stop at Joshua's command, and which *is* to be found in Scripture. I regard such an assumption as fanciful, not in evidence and unsupported by any theoretical development, save saying it is so.

5) Joshua's long day is indeed a miracle and in my paper I did not rationalize it, in fact, my whole paper, was against such rationalizations, e.g., as Mr. Akers' assumption.

6) Mr. Akers seems to have missed the main point of my analysis, to wit, that the requirements that the sun and moon remain stationary in the sky (with respect to the local horizon) precludes any possibility for the earth to be rotating in that no rotation would preserve the sun's and moon's immobility in the sky above Gibeon.

James N. Hanson
Department of Computing
and Information Science
Cleveland State University
Cleveland, Ohio 44115
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[7]Panofsky, Wolfgang K., and Melba Phillips, *Op. cit.*
[8]Wehr, M. Russell and James A. Richards, 1978. Physics of the atom. Addison-Wesley Publishing Co., Reading, MA.
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Pangaea Shattered

(Continued from page 15)

[48]Molnar, Peter and Paul Tapponnier, 1977, The collision between India and Eurasia. *Scientific American*, 236 (4): 30-41. See especially p. 32.
[49]Jamieson, Robert, A. R. Fausset and David Brown, 1961, Commentary on the Whole Bible. Zondervan Publishing House, Grand Rapids, Michigan, p. 866.