THE QUEEN OF SCIENCE EXAMINES THE KING OF FOOLS[1]

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The treatment in this article is mathematical and the purpose is to demonstrate the following: (1) That evolution is so improbable as to be scientifically impossible; (2) That to extrapolate from present data to the remote past (four billion years ago) is impossible because the error term is too large; (3) That a careful analysis of population growth shows the creation model to be reasonable, but the evolution model is absurd. This last point is proved by using facts of Jewish history as the control. The creation model and the evolution model are then compared with the figures gathered from Jewish history. Two different population growth equations are analyzed in this fashion.

Introduction

The molecules-to-man evolutionist[2] demands an extremely old earth. He argues that, given enough time, present processes working at present rates are sufficient to account for the varied life forms which are now observed. Three observations are in order:

OBSERVATION 1. Given all the time that the evolutionist claims to need, one can show that the probability that a simple organism could be produced by the presumed process of mutations is so small as to constitute a scientific impossibility.

REMARK 1. In the first section of this paper the author will show that the probability that such a thing could have happened anywhere in the universe is less than 1 in $10^{2,999,942}$ (i.e., one followed by 2,999,942 zeros). The approach is somewhat technical and is not unlike that approach taken in other creationist publications.

OBSERVATION 2. Even if one were to assume the doctrine of uniformitarianism[3] which the evolutionist demands, one can show that the extrapolation error bound is so large that any predictions of the conditions on the earth of four billion years ago, based on data gathered within the last several hundred years, are of necessity meaningless.

REMARK 2. In fact, the author will show in the second section below that assuming that all functions have the necessary derivatives (a most uniformitarian assumption) forces the error term to have a coefficient greater than $(4,000,000,000)^n/n!$ where n is the number of experiments conducted. Each experiment conducted must be involved in the calculation. This is rarely done. Such an error term means that until four billion experiments are completed, each experiment actually increases the coefficient in the error term! This section is also somewhat technical. It appears that this approach is somewhat novel in creationist literature.

OBSERVATION 3. Even if one assumes that the above problems do not exist, there are data that are inconsistent with an earth of a supposed age of billions of years—or even millions of years. In other words, there are clear (often ignored by humanistic evolutionists) evidences of a young earth.

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REMARK 3. Compelling evidence will be presented from equations for population growth. Section 3 is a discussion of population doubling. In section 4 discussion involves what most consider to be a more accurate equation for population growth. In each case the well-documentable history of the Jewish people is used as a control. The creation model/Biblical chronology is then tested as is the evolution model. Section 4 is fairly technical and is new to creationist literature. Section 3 is similar in approach to an old approach taken by Williams[4] though his figures and formulas need revision.

In section 5, these approaches are compared to the one usually taken in recent creationist literature.

1. Probability

Evolutionists claim that, through the process of chance mutations, they can explain the appearance of all the varied life forms observed today.[5]

In fact, Ernst Mayr stated, "It must not be forgotten that mutation is the ultimate source of all genetic variation found in natural populations and the only new material available for natural selection to work on."[6]

Another evolutionist has said, "It remains to say that we know of no other way than random mutation by which new hereditary variation comes into being, nor any process other than natural selection by which the hereditary constitution of a population changes from one generation to the next."[7]

Generally, an accepted upper bound for the probability that a mutation is not harmful is 1/1000. Some researchers have estimated that well over a billion mutational steps would be required for many organisms to come into existence, but on a more conservative basis others have assumed that only one million mutational steps would be required. By well known rules of probability, the chance for such an organism to evolve by mutations is[8]

$$(1/1000)^{1,000,000} = 10^{-3,000,000} \tag{1}$$

The surface of the earth (including that land which is under water) is 196,950,000 square miles, or $5.614821088 \cdot 10^{15}$ square feet. By assuming one billion mutating systems per square foot, one could conclude that there are less than 10^{25} mutating systems on the earth.

Now, one million mutations constitute a trial, and would involve figures favorable to the evolutionist and the strongest case for his position.

Accordingly, let us assume that each system produces a mutant a second and that the earth has existed for 10^{18} seconds—over 30 billion years (i.e., one year = 365.25 days = 31,557,600 seconds). Since one million mutations constitute a trial, then there would be $10^{12} = 10^{18}/10^6$ trials per mutating system.

Putting these figures together, there would have been 10^{37} trials (i.e., 10^{12} trials per 10^{25} mutating systems) on this earth throughout the earth's history. The probability of the organism under discussion "evolving" is then $10^{37}/10^{3,000,000}$.

However, an evolutionist might contend that life just happened to appear on a "lucky" planet. Let us continue then.

Current estimates are that there are perhaps 100 billion galaxies.[9] There are about 30 billion stars in the Milky Way galaxy, which is regarded as average. For this discussion, let us assume 60 billion stars in each galaxy. This means that there are about $6 \cdot 10^{21}$ stars.

To date, there is no evidence that life exists on any planet other than the earth. However, to be extremely generous, let us assume that each star has 15 planets capable of supporting life. Thus, fewer than 10^{23} such planets are assumed for the universe.

Therefore, throughout the universe throughout history there would have been fewer than $10^{37+23} = 10^{60}$ trials. The chance of success anytime on some planet is then $10^{60}/10^{3,000,000}$ or 1 in $10^{2,999,940}$ (i.e., one followed by 2,999,940 zeros).

There is no way to visualize such a number. Nothing in the experience of man would allow such an improbability. In fact, there are few books in which this number could be written (without the exponential shorthand). A typical book has 41 lines per page and fewer than 60 characters per line. If a person wrote one followed by 2,999,940 zeros, over one thousand pages would be required!

The author concludes that evolution is a scientific impossibility.

2. Extrapolation Error

Sooner or later, evolutionists try to extrapolate from available experimental data (derived within recent times) to four and one-half billion years ago. Such extrapolation must have error. The problem is to find the magnitude of such error. Least squares curve fitting is essentially without error bounds when used for extrapolation. In addition, the method involves the assumption that the exact nature of the function is known so that only a few constants need be determined.

The other approach would be to take some form of Lagrange or Hermite interpolation-extrapolation[10]. Only Lagrange will be followed. And before the error term can be given, some terms must be defined. Let us suppose that $f(x)$ is a function (of time) that determines some process. Let us further suppose that we have conducted n experiments and have obtained from our experiments the values $f(x_1),\ldots,f(x_n)$ as observed values of the function $f(x)$ at the times $x_1,\ldots,x_n$. If all data is used (to ignore data amounts to prejudicing the conclusion), to have an error term requires that $f, f', \ldots, f^{(n-1)}$ be continuous in $[a,b]$ and differentiable in (a,b) where $[a,b]$ is the smallest closed interval containing $x, x_1, \ldots, x_n$.

Such assumptions amount to assuming the ultimate in uniformitarianism. Without these assumptions, there is no way to estimate error—this means that such data can't be used for extrapolation.

With these assumptions, there is a value u in (a,b) so that the error is

$$f^{(n)}(u)\,p(x)/n! \tag{2}$$

The polynomial $p(x) = (x-x_1)\ldots(x-x_n)$.

If f is a function of time where the time is expressed in years then each of the x-values are times. Since an approximation f at some time over four and one-half billion years in the past is desired, and each of $x_1,\ldots,x_n$ are the dates of experiments (hence within the last several hundred years, then each x-x_i is greater than four billion. Therefore, $p(x)$ is greater than $(4{,}000{,}000{,}000)^n$ and the coefficient of the error term is greater than

$$(4{,}000{,}000{,}000)^n/n! \tag{3}$$

As a consequence, any approximation of $f(x)$ based on extrapolation (and there are no methods with well defined error terms that are not such), for the purposes of talking of conditions on the earth four billion years ago, is meaningless.

3. Simple Approach to Population Growth

Now let us approach the question of population growth by considering the time it takes for a population to double. This approach should be justified at the outset.

Except for outside factors (such as recent advances in medical science), population growth is usually assumed to be exponential. The differential equation for population growth is usually

$$p' = ap. \tag{4}$$

In this equation, p is the population expressed as a function of time. This equation is often stated by saying that the rate of change of the population is proportional to the present population. Such a problem is a standard exercise in most elementary differential equations textbooks.[11]

By changing parameters, the solution to Equation 4 can always be stated in the form

$$p = 2^n s. \tag{5}$$

Such a function is "exponential" for it is a constant ('s') times some number (a '2' in this case) raised to a power. The constant s represents the initial population and n must be proportional to the time.

Another way to view Equation 5 is to start with a population s, and assume that if the population doubles n times, then the present population (if n represents the doublings to get to the present population), or at least the population after n doublings, is p. If d denotes the time it takes a population to double, and t represents the total time, then the following holds:

$$t = nd \tag{6}$$

which can be written in relation to Equation 5 as

$$p = 2^n s \quad \text{where } n = t/d. \tag{7}$$

Actually, this is all the formula needed. The arithmetic was done on a Hewlett Packard electronic calculator, which performs simple calculations with 10 digits of accuracy.

First some reasonable values for d, the doubling period, are needed. Due perhaps to medical science, the population today is increasing more rapidly than it did in the past. The world population in 1971 is listed at 3.70 billion with an annual rate of 2% in the American Almanac.[12] This means that population is currently doubling every 35 years. For most of history, d is larger than that. In extending life expectancy medical science has contributed to a large reduction in the value of d. Consequently, the present value of d is not acceptable for this discussion.

The Jewish people have kept fairly accurate population statistics since 1899. Also, to some extent at least, the length of their history is known. For present purposes, the exact year of the origin of the Jewish people is not needed, since only an approximate figure will be quite useful. And further, it is important that this figure be derived from historians rather than from the Scriptures, since validation of the Scriptures is expected. Bright stated[13] that the patriarchs lived 1700 B.C,-2000 B.C. While some historians would argue that the patriarchs began after 1700 B.C., none would put their date of origin any earlier than 2000 B.C.

Since Jacob had children of four women, it is necessary to consider not only the doubling rate based on an initial population of two ($s = 2$, Jacob and one wife), but also the rate based on an initial population of five ($s = 5$, Jacob and four wives). Population figures obtained upon study of a number of volumes of the American Jewish Yearbook[14] are listed in Table 1. The doubling rates based on various assumptions as to initial population and date of origin are also given in Table 1.

Table 1
The Jewish Population

Year A.D.	Population (Jewish)	Values for the Doubling Periods (in Years): Initial Population = 2, began 1700 B.C.	Initial Population = 2, began 2000 B.C.	Initial Population = 5, began 1700 B.C.	Initial Population = 5, began 2000 B.C.
1899	10,728,491	160.99	174.41	171.11	185.38
1904	10,932,777	161.02	174.42	171.13	185.37
1921	14,771,931	158.70	171.85	168.46	182.42
1937	15,524,621	158.90	172.01	168.64	182.55
1938	15,290,983	159.10	172.22	168.86	182.79
1939	16,181,328	158.58	171.65	168.27	182.14
1940	15,748,091	158.89	171.99	168.62	182.52
1948	11,373,350	162.57	175.94	172.75	186.96

The results of Table 1 can be summarized by stating that any value between 150 years and 200 years would be a reasonable value for d. The reader should notice that even the holocaust of Nazi slaughters did not significantly alter the value of d. The Jewish population at the end of 1939 was listed as 16,633,675, and that of 1948 as 11,373,350 in the 1949 Jewish Year Book. This is a 32% reduction in that period, yet d was affected only 2.3%. The figures in Table 1 then are extremely reliable.

These figures for the Jewish population are a base against which the two major models of man's origin can be tested. Let us then find the values for the doubling periods for world population first for the creation model and then for the evolution model. In these tests, the Jewish population will be used as a control group against which to compare the figures for the creation model and those of the evolution model.

First, consider the creation model. The creation model meant here is one consistent with the Biblical record. According to this, every person alive is descended from Noah's three sons and their wives. This means an initial population of six ($s = 6$). Next, the Noachian flood must be dated. According to Williams,[15] on the basis of Hale's chronology of the Septuagint (Greek Old Testament of long ago) the flood occurred at 3255 B.C. Ussher's date for the flood was 2348 B.C.

To avoid the effects (as much as possible) of modern medicine, the oldest reliable figure for world population will be used. Again according to Williams, the Berlin census of 1922 listed the world population at 1,804,187,000. As shown in Table 2, the doubling period (for this creation model) is in the range of 151.61 years to 183.82 years. Clearly, the Biblical chronology is reasonable.

Table 2
Creation Model/Biblical Chronology

Date of the Flood	Doubling Period (Years)
2348 B.C.	151.61
3255 B.C.	183.82

What is the situation regarding the usual evolution model? Evolutionists state that man has been on the earth in excess of one million years (some even double that figure). If man has existed for one million years then (using the population of 1922 A.D.), the doubling period throughout man's history has been 33,614.9 years. When such a figure is applied to the history of the Jews then, in 1899, there would have been only 5.42 Jews! Such a rate of population growth is clearly absurd.

To allow for even more latitude for the evolutionist, let us assume that man has existed for only 100,000 years. In that case the doubling period is 3,361.49 years. Now if a doubling period were applied to Jewish history then, in 1899, there would have been only 11.17 Jews! Recall that the correct figure is over ten million.

Table 3
Usual Evolution Model

Man's Existence	Doubling Period	Number of Jews Today If That Doubling Period Had Held in Jewish History
1,000,000 yrs.	33,614.9 yrs.	5.42 (assuming 5 to begin with)
100,000 yrs.	3,361.49 yrs.	11.17 (assuming 5 to begin with)

On the other hand, if the absurdly large value of 500 years for d is assumed, and if man has existed one million years, then the present population should be over 10^{602} (i.e., one followed by 602 zeros)! Now the universe could probably be filled completely with 10^{100} people. Yet, if the evolutionary chronology were valid, over 10^{500} universes could be filled completely with people!

To summarize, after analyzing a population with known history (a control group), and testing both the creation and evolution models, the following conclusion is reached: **The creation model is reasonable and the evolution model is absured.**

To avoid the implications of the above discussion, evolutionists usually propose a position that might be called the evolution-equilibrium model. In this model, it is presumed that human population leveled off at three million until man began to farm, and then the population increased to the present size. The usual date given for the origin of (widespread) farming is about 12,000 years ago. Such information results in Table 4. As can be seen from the table, even this model leads to an absurdity.

Table 4
Evolution-Equilibrium Model

Duration of Widespread Farming	Doubling Period	Number of Jews if That Doubling Period Had Held in Jewish History
12,000 yrs.	1,299.80 yrs.	39.99 (assuming 5 to begin with)

Clearly both evolution models are absurd. The creation model is, however, most reasonable.

4. More Complex, Accurate Approach Population Growth

Boyce and DiPrima[16] and May[17] have suggested that a more accurate growth equation for human population is

$$p' = ap - kp^2. \quad (8)$$

This equation takes into consideration the fact that a population essentially grows exponentially until it approaches an equilibrium. At near equilibrium, growth slows down.

Actually, if m is defined as $m = k/a$, and the notation $exp(x)$ is used for e^x, then the solution to Equation 8 is

$$p = c\,exp(at)/(1+cm\,exp(at)) \quad (9)$$

where, if $p(0)$ is the initial population,

$$c = p(0)/(1-mp(0)). \quad (10)$$

Some explanation of the constants $a, k,$ and m is in order. From the definition of m, the constant $k = am$. Thus, only the values of m and a need be determined.

It is not difficult to show that $1/m$ is the maximum population possible (the equilibrium population) and that the population tends to $1/m$ as t tends to infinity. Boyce and DiPrima have suggested 25 billion as the value for the maximum population.[18] This gives $m = 4 \cdot 10^{-11}$.

The value for a must be determined from some control group just as the doubling period was determined from a control group in the previous section. In fact, until the population nears the equilibrium, a is approximately inversely proportional to the doubling period.

At times, it is convenient to write Equation 9 where ln is the natural logarithm as

$$at = ln(p/(c(1-mp))). \quad (11)$$

First, the values for a based on Jewish population figures and known facts about Jewish history will be computed. The reader can consult section 3 for reasons for using the figures of 1700 B.C. and 2000 B.C. for the dates of Jacob's life, and for considering initial populations of two and five.

It seems unreasonable to assume that the equilibrium population for the Jews is 25 billion. Rather in computing the figures in Table 5, 160 million has been used as the equilibrium figure for Jewish population. (The reader can verify that, if 25 billion is used the figures are not significantly different. Actually, the position taken in this paper would have been favored.) This figure is about 10 times the 1939 population figure, just as 25 billion is close to 10 times the 1939 world population. (For the population of a given year, see Table 1.)

Table 5
The Jewish Population

	Values of the Constant a (Times 1,000)			
	Initial Population = 2		Initial Population = 5	
Year A.D.	began 1700 B.C.	began 2000 B.C.	began 1700 B.C.	began 2000 B.C.
1899	4.325	3.992	4.070	3.757
1921	4.394	4.058	4.141	3.824
1939	4.400	4.065	4.149	3.833
1948	4.284	3.958	4.033	3.726

From Table 5, one can conclude that a is between $3.726 \cdot 10^{-3}$ and $4.400 \cdot 10^{-3}$. The difficulty is that it is hard to give such an abstract constant any meaning. One way to give meaning to such figures is to ask when, given a certain value for a, the world's population should have reached equilibrium. Usually, this means that the population is 99 per cent of equilibrium; whereas, the date when human population should have been 99.99 per cent of equilibrium has been computed in Table 6 (current population growth proves that the world's population is not even near this level yet). Our results are Table 6.

Table 6
Time It Would Take Human Population to Reach 99.99 Per Cent of Equilibrium

Value of a	Time to Reach 99.99 Per Cent Equilibrium
$3.726 \cdot 10^{-3}$	8711 years
$4.400 \cdot 10^{-3}$	7377 years

In other words, applying data from the control population to human population growth, the human population would have reached equilibrium in less than 10,000 years.

Following the treatment of section 3, let us now test the creation model and the evolution model to see which model gives reasonable figures. The reader should understand that a figure is reasonable if it is in some way consistent with known facts about the Jewish population (the control group).

Data obtained from the creation model are listed in Table 7. According to these figures, the creation model is quite reasonable.

Table 7
Creation Model/Biblical Chronology

Date of Flood	Value of a	Time for Population to Reach 99.99 Per Cent of Equilibrium
2348 B.C.	$4.589 \cdot 10^{-3}$	6833 years
3255 B.C.	$3.785 \cdot 10^{-3}$	8285 years

What is the situation with regard to the usual evolution model? An interesting relationship between the figures in Table 8 and the corresponding figures in Table 3 is noticeable.

According to Table 8, if man has existed for one million years, and if population satisfies Equation 8, then in 1899 there would have been only 5.42 Jews! This when there were five to start with! Unfortunately for the evolutionists, the more refined differential Equation (8) does not "deliver" them from the absurdities of their model.

Table 8
Evolution Model

Man's Existence	Value of a	Number of Jews Today If That Value Had Held in Jewish History	Time to Reach 99.99% Equil.
1,000,000 yrs.	$2.070 \cdot 10^{-5}$	5.42	1,568,000 yrs.
100,000 yrs.	$2.070 \cdot 10^{-4}$	11.20	156,800 yrs.

Finally, results for the evolution-equilibrium model are given in Table 9. This model presumes that population leveled off at three million until 12,000 years ago when it shot up resulting in our present population. At this point, calling the evolution model absurd is monotonous though highly appropriate.

Table 9
Evolution-Equilibrium Model

Duration of Widespread Farming	Value of a	Number of Jews If That Value Had Held During Jewish History	Time to Reach 99.99% Equil.
12,000 yrs.	$5.395 \cdot 10^{-4}$	40.98	25,250 years

One can conclude that, no matter which equation one uses for population growth, the evolution model cannot be defended, but the creation model is quite reasonable.

5. Comparison of Approaches

Regular readers of creationist publications are no doubt aware of the fact that each of the approaches to population growth used above differs somewhat from the approach taken by Henry Morris;[19, 20] wherein equations are derived from a truncated geometric sum. The basic equation is

$$p = 2(c^{n-x+1})(c^{x}-1)/(c-1) \tag{12}$$

where one assumes that n is the number of generations, x is the average life-span expressed in generations, each family has an average of $2c$ children, and of this family of $2c$ children, c are boys and c are girls. Often $x = 1$ so that Equation 12 becomes

$$p = 2c^{n}. \tag{13}$$

Even Equation 12 can be reduced (assuming x remains constant) to

$$p = qc^{n} \tag{14}$$

where q is defined by

$$q = 2(c^{-x+1})(c^{x}-1)/(c-1). \tag{15}$$

Therefore, both Equations 12 and 13 are simply different forms to the solution to Equation 4. That is, they are both exponential type equations.

Though the approach in section 3 of this paper is logically equivalent to that used by Henry Morris, the approach taken in this article has the following advantages:

1. The concept of doubling is more easily grasped.
2. In section 3, only values for s and n are needed. Even the two in Equation 13 is an assumed value. Thus the approach discussed here seems to involve fewer assumptions.
3. Repeated use has been made of a control group with known history, which is recognized as well established, even by those who reject the Biblical record.

Because of these advantages, the approach of section 3 is recommended for use before popular audiences.

References

1Mathematics is often called the Queen of Science, and it is a consequence of this article that evolution is the King of Fools.

2Throughout, this is what will be meant by the term, "evolutionist."

3That is, that present processes working at present rates are sufficient to account for all that has happened in the geological and biological worlds in the past.

4Williams, William A. 1925. Evolution disproved. Published by author.

5One could say that the gods of the evolutionist are Father Time and Mother Nature.

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