The Universe

ORIGIN OF THE UNIVERSE
Evolutionary Viewpoint:

Big Bang Theory:

"According to the big bang theory, all of the matter and energy in the universe was once compressed into a single area (the size of the period at the end of this sentence). That area, of course, was extremely hot and dense. Then, some 15 to 20 billion years ago, there was an enormous explosion--the big bang! Matter and energy were shot out in all directions. The fastest moving matter traveled farthest away. Energy, too, began moving away from the area of the big bang. If the big bang theory is correct, the energy left from the big bang will be evenly spread out throughout the universe. This energy is known as "**background radiation**."

The expanding universe theory can be observed by noticing a slight **red shift** of the stars. If a star is moving closer to the earth, the light spectrum reveals a **blue shift**, or a light spectrum reading toward blue. If the star is moving away from earth the light spectrum shifts toward the red.

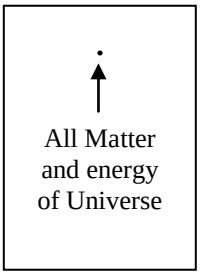
After the initial big bang, the force of gravity of the large objects began to affect the matter racing outward in every direction. The more massive objects began to attract surrounding matter pulling it together into clumps. At some time the clumps became the galaxies of the universe.

Open Universe:

"Most astronomers feel that the big bang theory leads to two possible futures for the universe. Perhaps the galaxies will continue racing outward. In this case, the universe will continue to expand, Such a universe is called an open, **eternal universe**. But eternal does not mean "forever" when it comes to the universe. In an open universe, the stars will eventually die off as the last of their energy is released. So the future of on open universe is one in which there will be nothing left. An open universe leads to total emptiness. But even if the universe is open, its end will not occur for billions of years."

Closed Universe:

"Some astronomers do not feel that the universe is an open universe. They suspect that the gravitational attraction between the galaxies will one day cause their movement away from each other to slow down. The expansion of the universe will finally come to a halt. Then gravity will begin to pull the galaxies back toward the center of the universe. When this happens, every galaxy will begin to show a blue shift in the spectrum. . . . As the galaxies race back toward the center of the universe, the matter and energy in the universe will again come closer and closer to a central area. After many billions of years, all of the matter and energy will once again be packed into a small area. **This area may be no bigger than the period at the end of this sentence. [?.?]** Then another big bang will occur. The formation of a universe will begin all over again. A universe that



periodically expands and then contracts back on itself is called a closed universe. In a closed universe, a big bang may occur once every 80 to 100 billion years." [1]

Possible Fate Of The Universe:

"The remote future may be considered in the same spirit of speculation as the early universe. In some 10^{10} (10 billion) years, the Sun will have evolved into a luminous red giant and have a radius much greater than at present, perhaps reaching the orbit of Mercury. The oceans will have disappeared and the Earth lost much of its present atmosphere, and life as it is now known will have become impossible if only because of the intense heat. The gas and dust in the Galaxy must slowly disappear as it forms into new stars, and in 10^{10} years most stars will be old and only a very few will be young. Inevitable, in the course of time, the Milky Way will become faint and dark and the Galaxy a graveyard of stars that have reached the end point of stellar evolution, and similarly with other galaxies. Man, if he has survived, in a form beyond the wildest dreams of the 20th century, will have embarked on his last and perhaps greatest adventure."

"According to the steady-state theory, dying systems are forever superseded by new-born systems, and the general appearance of the universe will remain unchanged, But in the evolutionary cosmologies, the present dark and relatively empty universe is doomed to greater darkness and emptiness. If the cosmos must forever expand, the glory of the early universe has departed forever, and an eternal future lies gripped in a frozen state of meaningless death. But it expansion is followed eventually by collapse, the future is obscured by an eschatological shroud; in some tens of times 10^9 years the recession of neighboring galactic systems will cease, and the process will start to reverse. Distant systems will still appear to recede because the universe was still expanding. But as time passes more and more galaxies will be seen to be approaching, and eventually, either dying or dead, they will be back where they are now, but in a universe that is catastrophically collapsing. As the end approaches, first the galaxies, and then the stars, are crushed into each other in an overwhelming cataclysmic inferno, in which ultimately the collapsing cosmos reverts to the primeval chaos of the big bang. Whether the universe rises again phoenix-like is not known, ant it depends perhaps on whether it can preserve identifying qualities as it passes through an inchoate quantum cosmological state of a nearly infinite density."

"The Abbe' Lemaitre, in The Primeval Atom (1931), has written: 'Standing on a cooled cinder, we see the slow fading of the suns, and we try to recall the vanished brilliance of the origin of the worlds.' The brilliance has gone; the suns are doomed; but the vanished brilliance, and with it new worlds, may once again return." [2]

[1] Coble, Charles R., Elaine G. Murray, Dale R. Rice. Earth Science. New Jersey: Prentice-Hall, 1981.

[2] "Universe, Origin and Evolution of", Encyclopaedia Britannica. 1974 ed. Vol. 18, pg. 1007.

Light Years - distance light travels in a vacuum at 186,000 mi/sec (300,000 m/sec) in one year.

Parsec - 3.26 light years.

Closest star (after sun): 4 light years - 23,460,000,000,000 mi, (Alpha Centauri)

Speed of light = 300,000 meters per second or 186,000 miles per second.

$$186{,}000_{mi/sec} \text{ X } 60_{sec/min} \text{ X } 60_{min/hr} \text{ X } 24_{hr/da} \text{ X } 365_{da/yr} = 5{,}866{,}000{,}000{,}000 \text{ mi/yr}$$

5,866,000,000,000 mi/yr * 4 yr =

23,460,000,000,000 mi
(23 trillion, 460 billion miles)

Number of stars in the Universe:

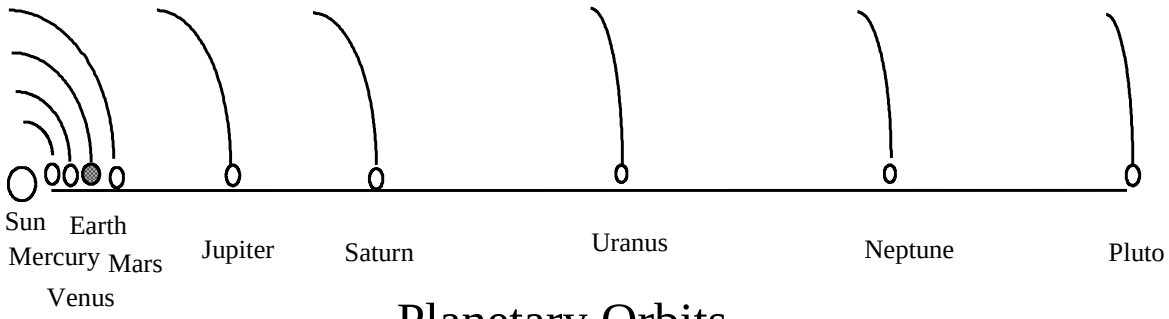
http://www.universetoday.com/guide-to-space/stars/how-many-stars/

Almost all the stars in the Universe are collected together into galaxies. They can be small dwarf galaxies, with just 10 million or so stars, or they can be monstrous irregular galaxies with 10 trillion stars or more. Our own Milky Way galaxy seems to contain about 200 billion stars; and we're actually about average number of stars.

So an average galaxy contains between 10^{11} and 10^{12} stars. In other words, galaxies, on average have between 100 billion and 1 trillion numbers of stars.

Now, how many galaxies are there? Astronomers estimate that there are approximately 100 billion to 1 trillion galaxies in the Universe. So if you multiply those two numbers together, you get between 10^{22} and 10^{24} stars in the Universe. How many stars? There are between 10 sextillion and 1 septillion stars in the Universe. That's a large number of stars.

Distance from earth to Sun: 96,000,000 miles.



Planetary Orbits

Age of Earth: [3]

6000 yrs - James Ussher of Armagh, Ireland, in 1600's. Creation at 4004 BC.

40 million - Lord Kelvin in late 1800's

50 million - James Hutton, Scottish geologist, 1785; erosion method.

4.5 billion - Uranium^{238} dating (oldest rocks = 3.7 billion).

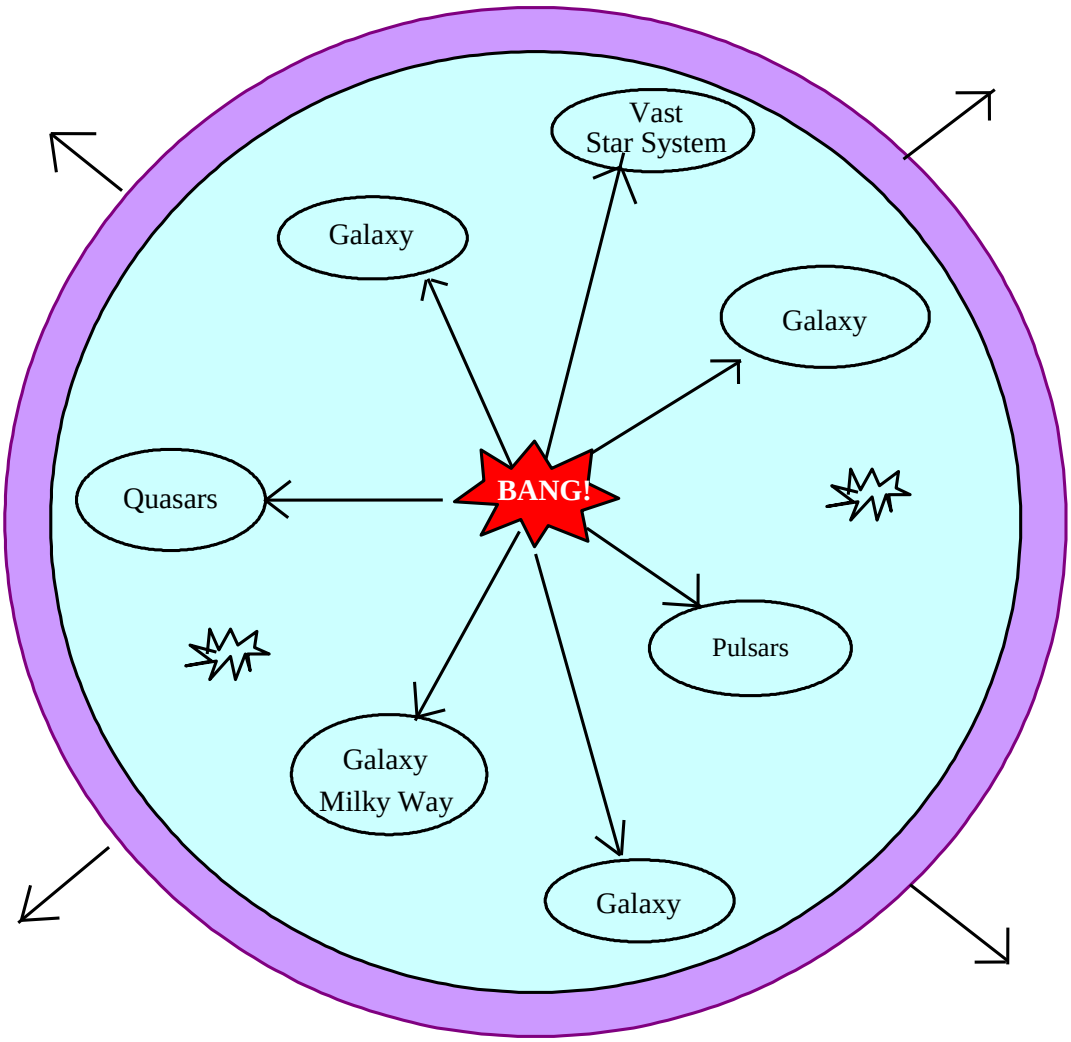
5,600 yrs - Carbon^{14}

Diameter of Milky Way galaxy: 10^5 (100,000) light years.

5,866,000,000,000 mi/yr X 100,000 yr = 5.866 x 10^{17}

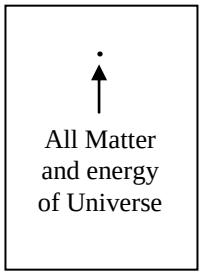
586,600,000,000,000,000 mi.
(586 quadrillion, 600 trillion miles)

[3] Brandt, John C., and Stephen P. Maran. New Horizons in Astronomy. San Francisco: W.H. Freeman and Company, 1979, pp. 51-55



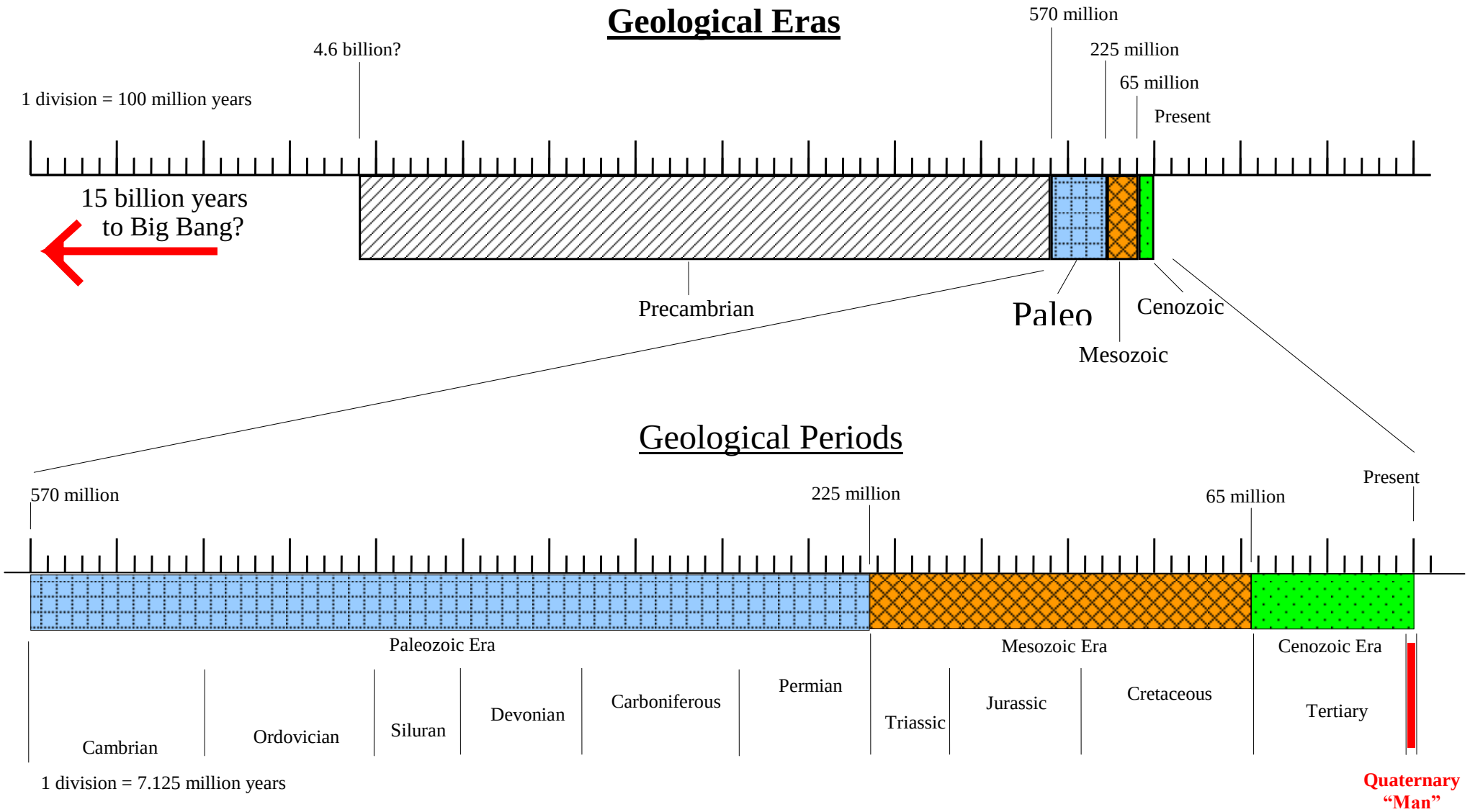
Theoretical Expansion of Matter
as a result of the Big Bang.

Remember how small the area was where all the matter and energy was packed into according to School text books!



SECULAR CHRONOLOGY WORLD VIEW

The largest divisions of geological time are called eras. They are divided into four segments: Precambrian Era (began 4.6 billion years ago, lasted 4 billion years), Paleozoic Era (began 570 million years ago, lasted 345 million years), Mesozoic Era (began 225 million years ago, lasted 160 million years) , and Cenozoic Era (began 65 million years ago, lasted to present).[4]



[4] Coble, Charles R., Elaine G. Murray, Dale R. Rice. Earth Science. New Jersey: Prentice-Hall, 1981, p. 504-505

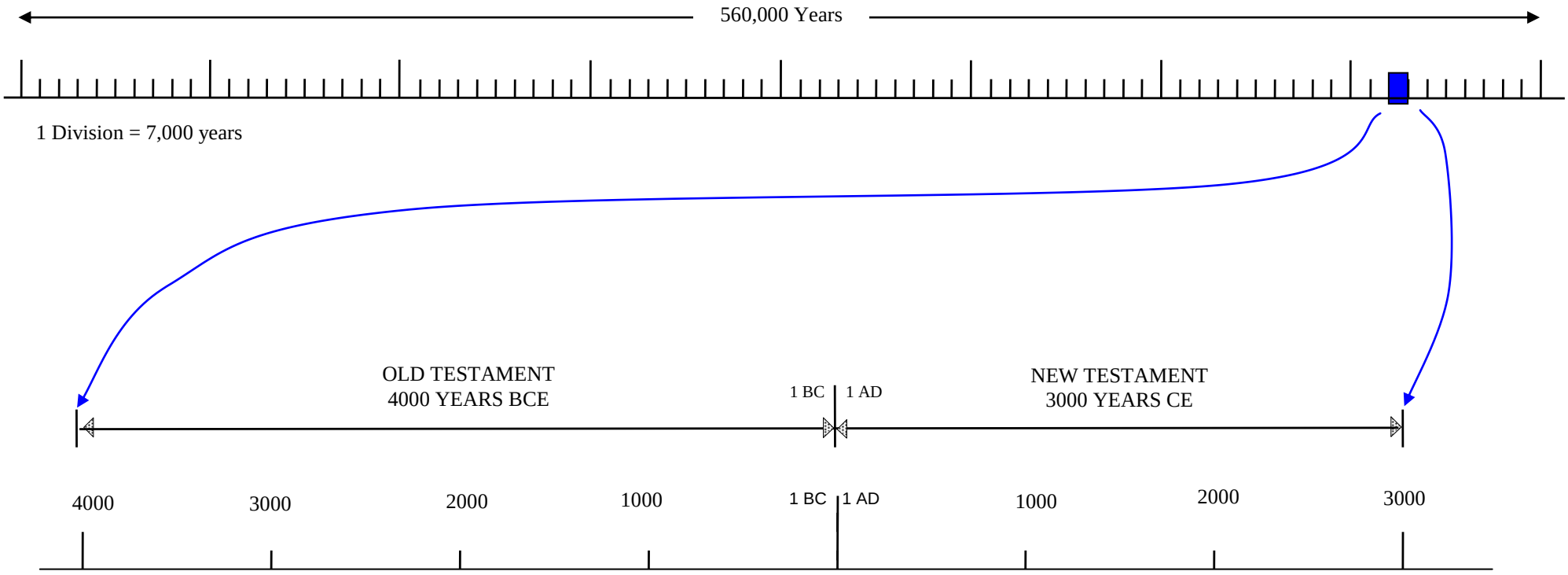
Relative Time and Distance

According to the evolutionary model of origins, preceding this page with 35,714 pages, placed end-to-end, will represent the relationship between time and distance back to the "big bang" point of origin of the universe. It will take 8,036 pages to go back in time to the origin of the earth (4.5 billion yrs.); 6,071 pages (3.4 billion yrs.) to first one-celled organisms; 804 pages (450 million yrs.) to marine life and fish; 625 pages (350 million yrs.) to amphibians; 447 pages (250 million yrs.) to reptiles and coal-forming swamps; 268 pages (150 million yrs.) to birds and mammals; 116 pages (65 million yrs.) to horses and grasses; 6 pages (3 million yrs.) to man.

1 division = 7000 years
1 page = 80 divisions or 560,000 years
pages = (20 billion yrs. / 560,000 yrs./pg.)

Pages representing age of Universe = (20,000,000,000 yrs. / 560,000yrs/pg.) = **35,714 total pages**.

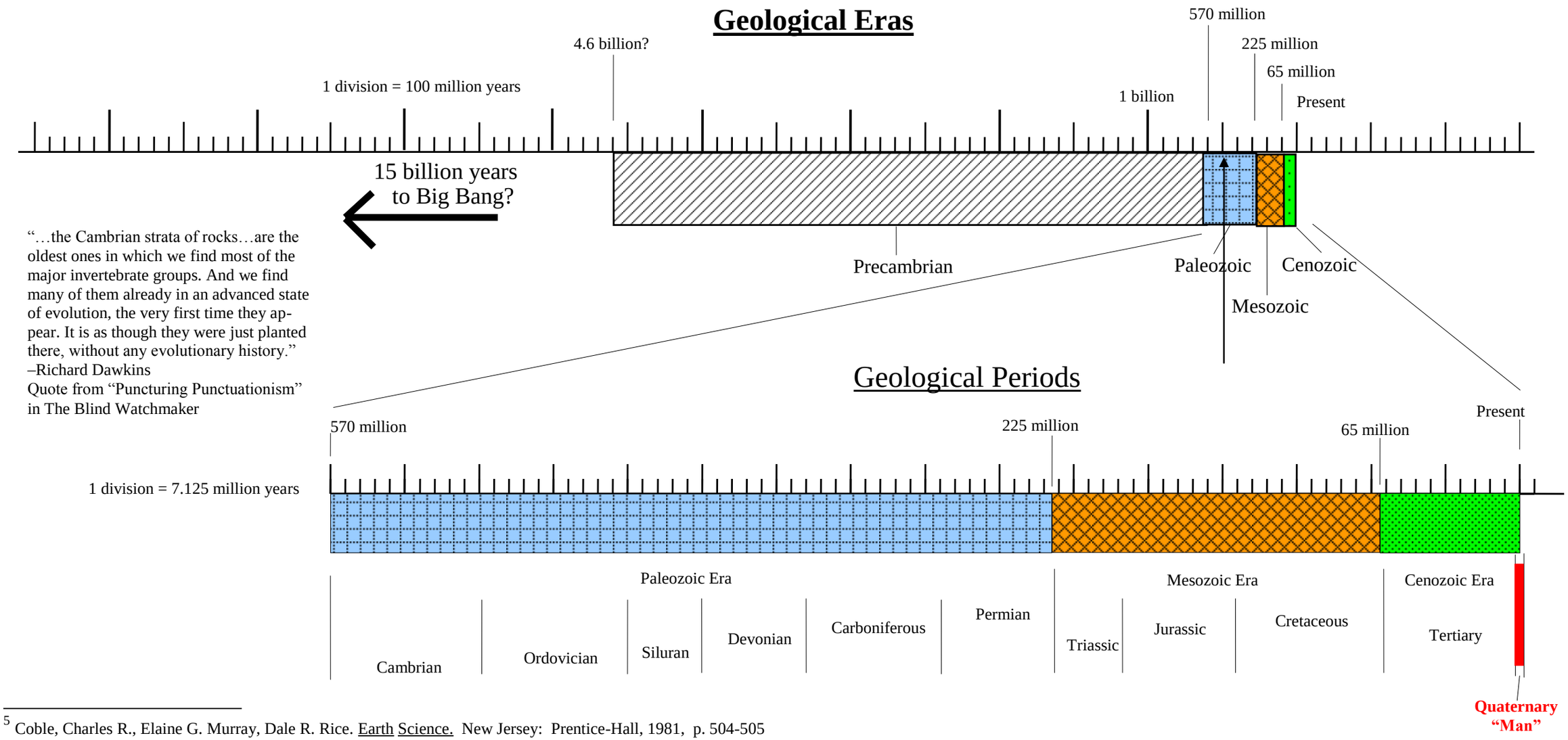
Distance represented by total pages = 0.916 ft./pg. * 35,714 pgs. / 5,280 ft./mi/ = **6.2 miles**.



Note: This simple timeline format is used as a basis for all "young age of the earth" historical charts. Graphical accuracy for time relationship is maintained throughout.

SECULAR CHRONOLOGICAL / GEOLOGICAL THEORY

The largest divisions of geological time are called eras. They are divided into four segments. The eras are named by evolutionary scholars as: **Precambrian** Era (began 4.6 billion years ago, lasted 4 billion years), **Paleozoic** Era (began 570 million years ago, lasted 345 million years), **Mesozoic** Era (began 225 million years ago, lasted 160 million years), and **Cenozoic** Era (began 65 million years ago, lasted to present).[5] The Quaternary Period follows the Tertiary Period and extends to the present. Stratigraphic scientists believe that this is the time during which recognizable humans existed.



[5] Coble, Charles R., Elaine G. Murray, Dale R. Rice. Earth Science. New Jersey: Prentice-Hall, 1981, p. 504-505