
The Age of the Earth and the Universe

Are the Earth and the universe young or old? - an overview of the evidences

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Sources

- Dalrymple, G. Brent, *The Age of the Earth*, 1991, Stanford University Press, Stanford, CA
 - é Gives a history of Earth dating schemes and describes how the 4.54 billion age is determined
- Morris, John D., *The Young Earth*, 1994, Master Books, Green Forest, AR
 - é Describes evidences for a young Earth and universe
- Humphreys, D. Russell, *Starlight and Time*, 1994, Master Books, Colorado Springs, CO
 - é Describes a creationist white hole cosmology

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Keeping Perspective

- The most important focus of creationism is the fact that the universe, Earth, and people were created for a purpose, and are not the result of chance events
 - é Creation is true, naturalism is false
- Of secondary importance is the age of the Earth, and possibly of yet less importance, the age of the universe
 - é The Genesis account is from a reference frame of the Earth

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Overview

- Standard theory places the universe at about 7-20 billion years old and the Earth at 4.54 billion years old
- There is division in the creationist camp between those who believe in a young Earth (about 6-10,000 years old) and an old Earth (in accord with standard theory), and many unwilling to even state a position!
- The central issue is:
 - If the Earth is young, what about scientific evidence that appears to point to an old age?
 - If the Earth is old (implying evolution) how can the six creation days of Genesis be reconciled with this?

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Why is this Question Important?

- Overview of the actual history of the Earth and the human race is dramatically different if the Earth is young versus old, and only one can be true
- The apparent discrepancy between the young Earth of the Bible and scientific evidences of an old age casts doubt upon the reliability of the rest of the Bible, and ultimately, the claims of the Gospel
- Belief in both the trustworthiness of the Bible and the general validity of scientific techniques forces one to reconcile the two when they are in conflict, as they appear to be here

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Starting Points

- The six days of Genesis 1 describe ordered history as the Bible is a trustworthy revelation from God, who does not lie
- Unguided biological macro-evolution is unproven, and stellar evolution seems unlikely
- The universe really is very big (billions of light-years in extent)
- The Earth is a special place to God because mankind created in His image lives there
- God exists outside of time

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How is Dating Performed?

- Universe: assume Big Bang, measure Hubble constant
- Earth: radiometric dating - decay of one radioactive isotope to another at known rate; works on igneous rocks (lava, granite) but not sedimentary rocks
- Earth/solar system: radiometric dating of meteorites
- Earth: global processes (oceans, atmosphere, magnetic field, erosion of continents, etc.)
- Sedimentary rock: assume evolution has occurred, look for presence of specific index fossils
- Recent history, once living things: carbon-14

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Young or Old?: The Options

- 1 - The universe/Earth are **actually old** (universe 7-20 billion years, Earth 4.5 billion)
- 2 - The universe/Earth are **actually young** (6-10,000 years) but **appear old** (mature)
- 3 - The universe/Earth are **actually young** and **appear young** if data is interpreted properly
- 4 - The **universe is old** but the **Earth is young**, as seen through general relativity theory from the point of view of the Earth (Humphreys white hole cosmology)

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Universe/Earth Actually Old

- Solves: scientific measurements of old age are at least approximately correct
- What problems does this cause?
 - é Implies that evolution (of stars, planets, life) happened - what was going on otherwise?
 - é Difficult to map six Genesis days (order of Genesis events and standard evolutionary theory don't match, such as plants before Sun)
 - é Theological issues regarding the nature of God: Bible says no death before sin of Adam, struggle and death in evolution cannot be every good

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Universe/Earth Actually Young, but Appear Old

- Solves: Genesis account is literally valid
- Problem s:
 - é Some regard concept of mature creation as deceptive (but would be more deceptive for God to imply young when really old)
 - é There are clearly stars > 10,000 light years away (but light could have been created in-transit)
 - é Appearance of supernova > 15,000 years away implies artificially inserted into light stream - seems unlikely God would do this

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Universe/Earth Actually Young, Appear Young

- Solves: Genesis account is literally valid; some global processes can fit a 10,000 year scenario
- Problem s:
 - é No natural short-lived radioactive isotopes
 - é Distant supernova
 - é Radiometric dating giving millions/billions of years ages; general tendency for dates to increase as expected with depth in Earth
 - é Many global processes imply a youngish age (millions of years), but not 10,000 years young

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Universe Old, Earth Young

- Humphreys theory based on general relativity but with starting assumption of bounded cosmos
 - é Earth and universe form out of a white hole
- Six days pass on an Earth clock while billions of years pass beyond the white hole event horizon
- Solves: distant starlight, supernova, red shift, cosmic background radiation, Genesis valid
- Problem s:
 - é Still have radiometric dating of Earth rocks/solar system meteorites, no short-lived radioactive isotopes issues (unaddressed)

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Young Earth Creationism

- The six days of Genesis 1 are 24 hours each
- The Earth is between 6-10,000 years old and was rapidly made ready for its purpose as a home for man
- Individual kinds of plants and animals were created directly by God in a mature state
- There was no death before the sin of the first man, implying God did not use macro-evolution
- God cursed the creation because of the sin of man, introducing decay processes into what was perfect
- The flood of Noah's time was violent, covered the entire Earth, and largely formed the geologic column

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Geologic Evidences of a Young Earth

- Polystrate fossils (extending through multiple strata)
- Lack of living communities in rock layers
- Lack of soil layers
- Limited extent of unconformities
- Soft-sediment deformation
- Sharp-edge contact between adjacent beds
- Retention of surface features on lower beds
- More accurate: these are geologic evidences of quickly-formed geologic column (recent global flood)

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Other Evidences of a Young Earth

- Recent dating of civilization, written history (3500 B.C.)
 - Modern man supposedly stopped evolving 100,000 years ago
- Population statistics (how long to get present population)
- Lunar recession (Moon moving away from the Earth)
- Buildup of helium and radiocarbon in the atmosphere
- Mutation load (negative effect of mutation on organisms)
- Decay and reversals of Earth's magnetic field
- Accumulation of salt and sediments in the ocean
- Erosion of the continents
- Slowing down of the Earth's rotation

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Old Earth Creationism

- The Big Bang (7-20 Ga) points to a creator
- The fine-tuning of the universe and our solar system point to a creator (intelligent design)
- The days of Genesis 1 are long periods of time (the 6 day-aged theory)
- Or there is a large time gap between Genesis 1:1 and 1:2 (the 6 gap theory)
- Evolution has occurred, but with God's help
 - Theistic evolution - God set evolution in motion
 - Progressive creation - God repeatedly stepped in to move evolution to the next level as needed
- Pre-men hominids existed, God infused a soul at the right time
- Noah's flood was just a local event or a tranquil global flood

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Theological Difficulties

- Goodness of God violated: God is good, and finished creation as every good is hard to understand if struggle, death, and large-scale natural disasters and extinctions were used to form man
- Basis of Gospel is that Adam's sin introduced death and decay; Jesus's death paid penalty for our sin; His resurrection overcame death - death is bad!
- If God used evolutionary processes, He could have/would have clearly told us so
- If Genesis chapters 1-11 are not historical, it places doubt on the remainder of the Bible

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Evidences for an Old Earth

- Radiometric dating of meteorites (4.4-4.6 Ga)
- Radiometric dating of moon rocks (4.5 Ga)
- Radiometric dating of Earth's oldest rocks (3.8-3.9 Ga)
- Best estimate = 4.54 Ga

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Weighing the Evidence

- It is difficult to formulate a theory which reconciles a young Earth with distant starlight/supernova and radiometric age measurements - best current option is:
 - Created with appearance of age and/or infinite light speed in vacuum of space
- On the other hand, the old Earth creationist position is difficult to reconcile with Genesis, and the purely naturalistic position has few good explanations for the creation of the material of the universe, life from non-life, and macro-evolution

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Conclusions?

- **Young Earth** - must accept appearance of maturity as non-deceptive, assume something to explain distant starlight, supernova, background radiation, redshift
- **Old Earth creationist** - must live with serious theological difficulties
- **Old Earth non-theist** - must ignore the appearance of design in nature, and live with the lack of good answers for the formation of life and mechanisms of macro-evolution

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