

GENESIS ONE : ONE

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"IN (THE) BEGINNING CREATED GOD THE HEAVENS AND THE EARTH" is a simple declarative sentence. In the Hebrew text the first word is "in the beginning." It is used here as an adverb to modify the next word "created." ordinarily the verb "create" would appear first in the Hebrew sentence but in this case it is the author's desire to emphasize "within the scope of the beginning." The duration of this time span one must determine from the remainder of the verse and the context which follows this first sentence. The second word is the verb "create" and is in the perfect tense which in Hebrew has nothing whatsoever to do with the time tense of "past, present, or future." The Hebrew perfect tense means a complete state or condition. The act of creating is said to have occurred "within the scope of the beginning" and so was in the past at the time the author wrote the sentence.

Following the verb is the subject "God" who performed the creative act. Following the subject are seen two objects . . . The Heavens . . . The Earth." My three dots indicate an omission of the Hebrew sign of the definite "wau" used as a conjunction. All of the Hebrew letters are consonants, though two of them are used as vowels. The little dots and dashes indicate the vowels, but they were not a part of the original Hebrew text. They were added by the Hebrews some centuries after Christ. They are not inspired so smart students will feel free to reappraise these vowel markings in some contexts and perhaps find such reappraisals more meaningful. Each of the objects has its one letter definite article attached to it. The first object — The Heavens — is a plurality of items distributed overhead and the second object — The Earth — is a single item upon which the author and the reader stand. So by the perfect tense we understand the two objects were created in a complete state or condition and by the adverbial expression we understand to mean the time span within which creation occurred. I have presented and discussed the verse as an abstraction which leaves ambiguity with respect to the order of creation. Does the perfect tense mean that both objects were created simultaneously? Or Heaven first and then Earth? Or Earth first and then Heaven? The language as it stands is suitable for either view. The ambiguity can be removed only by the succeeding context of Genesis and if that does not suffice then the entire context of the scripture. My reader will understand my assertions are qualified as expressing my understanding of what I have studied. I have no professional qualifications to make authoritative statements with respect to Hebrew grammar. All of my views are submitted for the students appraisal of their merit (or lack of it).

Being an electrical engineer I find it quite helpful in my understanding of Genesis to draw upon relevant physical concepts to enhance my interest in certain particulars of the scripture testimony. Take the expression "created within the scope of the beginning" and apply to it the smallest of particles — the electron — and say "In the beginning God created an electron." This can be very meaningful if we view an electron in terms of the modern concept of the equivalence of matter and energy — the now familiar Energy = mass times the velocity of light squared. This serves to get rid of that annoying concept of "create out of nothing" by thinking of the creative act as transforming directly the energy of The Spirit into an electron. In this case it is self-evident that the time rate or velocity of the change-of-state is instantaneous or next to zero time. In one instant we have only energy and the next instant there is an electron. So here it is in the nature of the case that the Hebrew perfect is punctiliar and the adverbial expression "in the beginning" is compressed to a point. If we use a proton instead of an electron the velocity of the change-of-state is the same, thereby indicating the creative power is 1800 times as great as that of the electron because the proton mass is 1800 times as great as that of the electrons.

Now if we imitate the scripture and substitute proton for The Heavens and electron for the earth we would have the same ambiguity with respect to the order of the events as we had with the scripture terms "Heavens and Earth." We do have, however, the advantage that we can speak of the proton and the electron as an atom of Hydrogen and say "In the beginning God created a Hydrogen Atom." The perfect tense would then specify it was a complete atom in one act and the adverbial expression would indicate the beginning as a point of time.

Some readers may be a bit "rusty" on the use of numbers with exponents so a brief explanation is in order. The number 10 is used as a base. Ten raised to the first power is 10^1 , and 10 raised to the second power is 10^2 and 10 raised to the third power is 10^3 . 10^3 then means $10 \times 10 \times 10 = 1000$. Now, 10^3 takes less writing space than 1000 but not enough to bother with the awkwardness of writing 10^3 on a typewriter. 10^6 , however, begins to pay off instead of writing 1,000,000 and 10^9 much more so than 1,000,000,000. In the case of the fraction 1/10 we can write 10^{-1} and for 1/100 write 10^{-2} and 1/1,000 write 10^{-3} . Obviously we can express these as decimals 0.1, 0.01, 0.001. The student can readily see that 10^6 means six zeros after one and 10^{-6} also means six zeros after one but is located in the denominator of a fraction. So all one needs to remember is that the number occurring as an

exponent indicates the number of zeros after "1" whether it is in the numerator or denominator of a fraction or an equation and the minus sign before the number always indicates its location in the denominator or below the line in an equation. If, however, he thinks in the decimal system then the number of zeros between the decimal point and "1" is just one less than the minus or negative exponent as can be seen from $10^{-6} = 0.000001$. Obviously then 10^{-23} means 23 zeros after "1" in the denominator or 22 zeros before "1" in the decimal expression. Now, just take a number like 10^{81} and write out the 81 zeros. In addition to this advantage it is so easy to express multiplication of $10^2 \times 10^3$ by just adding the exponents to obtain 10^5 . Likewise, to divide $10^5 \div 10^3$ just subtract $5 - 3$ and get 10^2 . Also, keep in mind that a 1000 has three zeros, a million has six and a billion has nine. So a thousand times a million times a billion = $3 + 6 + 9 = 10^{18}$. Now then, see that $10^{18} = 10^3 \times 10^6 = 10^6 \times 10^6 \times 10^6$.

Since we have arrived at the creation of one atom it will be helpful to quantify the velocity of the change-of-state from energy to matter. Yang (Elementary Particles—Princeton) mentions 10^{-23} seconds as the collision time of particles approaching one another near the velocity of light. Such collisions transform energy into particles and Yang considers 10^{-23} seconds — "in many senses a unit of the time scale of the phenomena." This is many billions times faster than the "batting of an eye," "snapping the fingers," or saying "scat." So, if energy generated from matter can produce matter at the velocity of 10^{-23} seconds then so can The Spirit at the same or faster rate. This transformation has to be thought of in terms of each individual particle however small, however large, or however numerous. So now let's increase our scale of magnitude and go in one leap from a hydrogen atom to a drop of water. The Hughes Aircraft Company circulated a pamphlet giving a calculation of 1.4×10^{21} electrons in a rain drop of 2 millimeters in diameter. Associated with each electron there would be the same number of protons. Since Hydrogen has no neutrons every H_2O molecule would mean 8 neutrons for every 10 electrons or protons, so $1.4 \times 0.8 \times 10^{21}$ neutrons. So the total number of particles could be $1.4 + 1.4 + 1.12 = 3.92 \times 10^{21}$ particles. Or if you prefer to express it in terms of molecules there would be 10 electrons for each molecule so we would have 1.4×10^{20} molecules. The perfect tense then might mean one complete rain drop in 10^{-23} seconds or 1.4×10^{20} molecules $\times 10^{-23} = 1.4 \times 10^{-3}$ seconds total time for transformation of each molecule in succession. If the author meant this successive creation and used the perfect tense — "In the beginning God created a rain drop" his use of the perfect tense for create would mean he "does not desire to lay any special stress on the

frequency or continuance of an event" — Driver. *Hebrew Tenses*, Clarendon Press.

Look now at the Creator's manipulation of water he had made "in the beginning." In John 2:3-11 "having nearly run out of wine (husteresantos oinou) . . . 'there kept being in that place (esan de ekei) six water pots, each having room (choroustar aria) for two or three 'metretas (9 gallons = Hebrew bath says A and G Lexicon). Lenski's commentary says "Rabbinist make the bath to be less than $4\frac{1}{2}$ gallons," Let's use 9 gallons per pot $\times 6 = 54$ gallons of water to start with. That's a lot of particles to manipulate in a short time. "He says to them fill at once (gemisate) the water pots with water (hurdatos), and they filled them up to the brim" (eos ano). "and then (kai) he says . . . dip out now (antlesate nun) and go on carrying (kai pherete) to the ruler of the feast. And as he tasted (hos de egeusato) . . . the water having been made and remaining wine . . . he says . . . you have kept the excellent (ton kalon) wine until now." Students think of the 4,000 billion billion particles in each drop of water and visualize, if you can, the disassociation and recombination of the particles to form the more complex Carbon, Hydrogen and Oxygen molecules. Also, if in this case the good wine had a specific gravity of 97.5%, then He annihilated about $(1.4 + 1.2) \times 0.15 = 39$ billion billion particles per rain drop before their eyes. The Spirit absorbs directly the energy of the annihilated particle and it in no way reacts with the other particles. Or on the other hand you may prefer to think in the two steps of total annihilation in 10^{-23} seconds and total creation of new wine in the next 10^{-23} seconds. Either way suits me. It's fast work.

Return to the analogy of the Hydrogen atom created punctiliarly and substitute the words "The Universe." Driver in his *Hebrew Tenses* (p. 13) classifies the perfect "create" in Genesis 1:1 as "an equivalent to the Greek Aorist, to denote an action completed and finished at a definite moment in the past, fixed by the narrative." In his commentary on Genesis (Westminster), page 3, he says "the heaven and the earth, i.e. the universe, as it was known to the Hebrews, in its complete state." Leupold's commentary (Wartburg Press) also suggests "the universe." Watts, in his *Survey of Syntax in the Hebrew Old Testament* (Broadman Press), says the perfect tense focuses attention on the "conclusion and perfected character." Since the creative power displayed resides principally in "matter and its properties" we can as a matter of convenience omit consideration of the precise structures in which it is organized and do some "doodling" with numbers. I will make use of some numbers I find in Appendix 4, page 654, of Hardin's *Biology*, Freeman Pub.). He gives the total mass in the Universe as 10^{75} g which I am converting to 10^{72} kg. His data assumes 10^{90} as the number of

fundamental particles. I have seen values up to 10^{100} for this so he is on the low side. His data pertaining to the solar system I am totalizing and rounding off to 2×10^{30} kg. This means the Universe has $10^{72} \div 2 \times 10^{30} = 5 \times 10^{41}$ as much mass as does our Solar System. Now since Ex. 10:11 uses "six days" adverbially (in the same manner with "made" in the perfect tense) we could equate "six days" to "in the beginning" in our verse without grammatical concern. So $5 \times 10^{41} \div 6 = 8.33 \times 10^{40}$ Solar System per day as far as mass itself is concerned.

I find it meaningful to view space as the region, realm or field of *The Spirit* who is the source of all energy we observe in matter in terms of its mass, motions and forces (gravitational, magnetic and electro-static). Wherever we find matter and its properties we find properties of energy and therefore a demonstration of the imminence and transcendence of *the Spirit of God* "because (gar) *in him* (en autoi) *we go on living* (zomen) *and go*

on being moved (Kai Kainoumetha) *and keep on being* (Kai esmen). So *wherever we find matter and its properties we find such only in-connection-with-him* (en autoi). There is, therefore, no such thing as "laws of nature" for such an expression can designate only the descriptions of the properties of the matter-energy system and can in no way suggest *prescriptions* residing in the matter-energy system. The *prescribing intelligence* and *will* reside in *the spirit* energy source. Since God is Spirit and God is Light, there is no difficulty in viewing what we call space as the region and realm of The Spirits Energy. Consequently, creation or the transformation of energy into an Energy-Matter system can be viewed as a simultaneous event occurring within the scope of the Spirit-Energy field. The extent, magnitude, and complexity of the Matter-Energy System therefore serves to develop awe and reverence in those spirit beings who have derived their being *in-connection-with him* (en autoi).