

Chapter 8d

The following is excerpts taken from,

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Although this is a somewhat older resource, it will provide an interesting insight into the subject of relativity and space/time from a Christian/biblical perspective.

GOD, the ATOM, and the UNIVERSE

Man's recent steps into space have brought him face to face with a new challenge—a vastly different universe from the one to which he has become accustomed. The new challenge has stirred man's imagination as perhaps nothing else has done since Columbus opened the door to the world.

The limitless universe is now the unknown sea that draws men's interests. More and more scientists are becoming deeply involved in its exploration and are asking questions. What actually is the universe? What does it hold for man? How was it made? How did it all begin? Will it ever end?

To answer these questions scientists are undertaking experiments of all kinds, mathematical analysis and other endeavors that are completely new.

When they analyze light from distant stars, astronomers are essentially looking back in time at light that was created billions of years ago. Man has not yet and probably never will be able to look back as far as the actual beginning of the universe, which happened about 20 billion years ago, according to recent calculations. But the information gained by this searching, when added to the knowledge of the atomic reactions that take place in the suns and of electromagnetic forces at work in the plasmas of space, and the detailed information from photometric and spectrographic analysis of starlight, is making it possible even now to decide between the various theories of the beginning.

And public interest continues to mount. It is so high that when some prominent scientists abandoned the "steady state" theory of the "beginning" in favor of the "Big-Bant" theory, it made front page news.

The new knowledge of the universe has caused many people to examine their picture of God more closely. Many have discovered that their previous view of God was far too small.

Even though science has taken us back to the basic building block of the universe—the atom—scientists still haven't found the answer to "Before that, what?" After all, atoms do not reproduce themselves, and the probability of all the atoms of the universe showing up on their own by chance is too staggering a possibility to imagine.

The Bible on the other hand turns to the "before" part of the question rather than the "what" for the answer—which has been there for centuries. The Bible's answer lies in its first four words: "In the beginning God." To appreciate the full meaning inherent in these words requires a careful consideration of several advanced scientific concepts as well as a wide range of biblical statements and verses.

The Bible's first statement indicates that: before the universe—God; before time—God. **In these four words we can find a deeper knowledge of the fourth dimension—time—than one could ever have suspected before today.**

In the past, time, or the idea of time, was a subject that fell only in the realm of philosophy. But thanks to Einstein and other scientists it has become another dimension in science and technology. Only recently have we really studied time itself and learned that time can vary. Relativistic science has shown that time can no longer be considered a smooth, unchanging stream flowing in one direction. This fact is supported by many and varied, biblical sources.

The scientific support of this assumption comes from the work of Einstein and Lorentz which showed that time varied with speed, although this was not widely accepted for a long time. However, enough experimental proof has now been gathered to have the theory firmly installed in today's scientific book of knowledge, and to be used to support other theories. A closely related part of this theory, that mass or weight increases as speed increases, has been proven beyond a doubt.

Enough evidence has now been gathered to prove that time changes with speed. One has to reach tremendous speeds before any [significant] change in time will occur. In fact, to notice any change one must travel near the speed of light—about 186,000 miles per second. But even then, you would have no way of knowing that your time was slowing down. Everything you could use to measure it would be changing too—including you! It would take somebody not traveling at your high speed to note any difference.

But what does this all mean? What happens as time slows down when speed increases? Probably the best way to answer this question is to cite an example. Therefore, let's consider a trip to the sun's nearest neighbor in space, Alpha Centauri. This "neighbor" is about four and a quarter light years away, or about 25,000,000,000,000 miles. To travel this distance with current spacecraft speeds would take centuries. However, if man could

travel at, or near, the speed of light he could make the round trip in about ten years, which makes it more feasible.

But even if this took ten years this would not solve the problem. For enough fuel, food, and life support equipment would have to be supplied to keep the astronauts alive for at least ten years. These requirements, plus the power to accelerate all this to the proper speeds, would seem to make the trip almost impossible—unless man finds a new power source, or learns how to live on a lot less.

But don't sell our space scientists short. They now know they can get around this problem once they attain speeds close to the speed of light. Traveling near the speed of light would make the time in which the astronauts live slow down; therefore they would not need all these supplies. As far as the astronauts were concerned, only about a month of their time would go by if they were traveling to Alpha Centauri about 99.995% of the speed of light. The time in which they lived, worked and breathed would have slowed down this much. As a result they would only have to carry enough food and equipment to supply about thirty days.

But while the time for those who make the trip will slow down, here on Earth, time will move at its usual rate while we wait for their return. Therefore, when the astronauts step out of the spacecraft on its return they will be only one month older, while those who have been waiting here on earth will have aged ten years. (Which means we had better send bachelors—a father wouldn't want to miss out on the fun of watching his children grow up!) While it may be hard to understand how time can flow at two different rates, at the same time, science now recognizes that this is possible.

Once man is capable of capitalizing on this change of time with speed he will want to make even longer trips. One of these will undoubtedly be to the center of the galaxy, which is about 27,000 light years away. It will also be possible to make this trip in about a month (one way) once man can increase his speed by less than .005% of that which is required to make the trip to Alpha Centauri.

In order to clarify any remaining doubts about the variation in time let us consider this trip a little more closely. In this case it may help if we assume that man has also developed his TV communication systems to a point where it will be possible to say in communication with the spacecraft as it goes hurtling through space. So let us suppose that we on earth will be able to watch the astronauts moving in their time and that they, in turn, can watch us in ours.

Frankly it will be a rather boring show from our end. It will be necessary to watch them for about a month and a half in order to see a ten second performance on their time scale! Talk about slow motion, no one has ever watched anything quite this slow, even with time-lapse photography. On the otherhand, our actions on their TV tube would only be a blur. For over four days of our actions would be squeezed into one second of their time. It would probably take a long time at each end before anyone would believe that there were living beings on the other end.

Maybe its about time to do this with the Bible's statements too. For this is exactly the ratio of time difference that the Bible tells us about in 2 Peter 3:8:

"But, beloved, be not ignorant of this one thing, that one day is with the Lord as a thousand years, and a thousand years as one day" (2 Pet 3:8).

The times mentioned here vary in the same ratio as the above TV example. In the example cited one would have had to watch the astronouts a thousands years to see one of their days pass by. They, on the other hand, would have had to watch only one of their days see a thousand years of earth's history pass across their tube.

While this ratio is the sanme as that given in the Biblefor God's time, it is important to note another fact inherent in the Bible's statement. God can take either view or exist in either time scale. He can move in and through time as freely as man can in his three dimensions. God is not contrained to move or live in man's time. Finally this verse not only shows that the Bible (and God) knew that time can vary, but seems to indicate that God expected ma to learn on the fact one day.

But will man ever be able to travel at these speeds to check the facts? Traveling at speeds near that of light does sound fantastic now, even though God said that man imagined he could do so. Today one can provide many reasons why travel at this speed is impossible. But who can see the technology advances of tomorrow? There are always those who claim it is impossible to take the next step forward. In 1943, fo rexample, it was the author's privilidge to listen to a lecture given by a leading aeronautical authority in which he proved that it would be impossible to fly faster than the speed of sound. Yet a year or so later they were designing a supersonic tunnel to check models of planes that were to fly at these speeds.

Once man can travel at these speeds he will undoubtedly want to make even more dramatic trips and explore even deeper into space (see Genesis 11:6). One trip that will probably be considered is a voyage to the Andromeda Balaxy, the nearest galaxy to our own Milky Way Galaxy. The round trip would take three million years to make at the speed of light. But, astronauts flying near this speed could make it in about sixty years of their time. However, by the time they returned, the earth would have aged three million years. It would hardly seem to be worth returning, for they would have been forgotten for centuries, if indeed the earth were still here. They might be better off if they looked for an inhabitable planet in the Andromeda Galaxy.

But there may be some hope for shortening the time lapse of the voyage in such a way that we earthlings might not have to wait long! This might happen if man can ever breat through the "speed of light" barrier, as he did the sound barrier. Several science fiction writers have already imagined this and it is now receiving some serious thoughts from others, even some scientists. After all science has now discovered anti-matter, and some scientists postulate an anti-world. Perhaps in this anti-world time might run backwards. (In fact some claim it must to keep symmetry.) It might be that going faster than the speed of light would take one into a world where time ran "anti" too.

If this dream did turn out to be true then maybe the astronauts could so arrange their trip that they would return the day they left, or even the day before! Which brings to mind a limerick that once made the rounds in relativistic science circles. It goes like this.

There once was a lady named Bright
Who could travel faster than light.
She went out one day
In a relative way
And came back the previous night!

Was this ability to move backward in time what the Bible had in mind in Psalm 90:4?

"For a thousand years in thy sight
are but as yesterday when it is past,
or as a watch in the night."

This verse shows the Bible does recognize that time can vary. Here again God's time is equated to two periods of man's time: "yesterday when it is past," and a "watch in the night."

An even deeper point which these verses make is that God is the ruler of time and has always had the ability to move through time as we do space. Man can now see how he may be able to slow down time, and he can imagine the possibility of having time move backwards. But the Bible has been pointing to the fact that God always had this ability.

But setting aside the presently unproved postulation of moving backward in time, consider the interesting situation that arises at the speed of light. As man is able to travel at speeds closer and closer to that of light he will be able to slow time more and more. Note that in the first example given to illustrate this, the astronaut's time of 30 days for a round trip to Alpha Centauri was equal to ten of earth's years. Then at a lightliiy faster speed it took only 60 years to make a 3,000,000 year trip to the Andromeda Galaxy, which was a much higher ratio. As one continues to go even faster the ratio will grow until theoretically at the speed of light time wll stand still. That is, the traveler's time would encompass all that which remained for the universe we know. A second of this time could be equal to billions of years of our time—a rather fantastic thought to contemplate.

Is this the full meaning of the Bible when it states that "God is light" in 1 John 1:5—that God is eternal as well as all illuminating? In view of hwat the Bible says about time it could very well be. There is further confirmation of this in the name that God gives Himself in Exodus 3:13-15. Moses asks,

"And Moses said unto God, Behold, when I come unto the children of Israel, and shall say unto them, The God of your fathers hath sent me unto you; and they shall say to me, What is his name? what shall I say unto them? And God said unto Moses, I AM THAT I AM: and he said, Thus shalt thou say unto the children of Israel, I AM hath sent me unto you. And God said moreover unto Moses, Thus shalt thou

say unto the children of Israel, The LORD God of your fathers, the God of Abraham, the God of Isaac, and the God of Jacob, hath sent me unto you: this is my name for ever, and this is my memorial unto all generations" (Exo 3:13-15).

The meaning of the original word translated as I AM is I exist. The name God gives Himself implies this eternal relationship to and control of time. Some of the more recent translators interpret this statement as meaning "I WILL BE WHAT I WILL BE." When this phrase is considered in the light of the surrounding context, it carries the same implication—that God existed in the past just as He will in the future, that He wills His existence throughout all generations.

The importance that the Bible attaches to the name I AM is indicated by the reverence with which the Jews have treated it down through the ages. This is the name of God which they considered so sacred that they would not pronounce it when they came to it in their reading. It is the name that is known as "Jehovah" today. The Jews considered this as The Name for God—that God is—I AM.

In the New Testament it teaches that man's approach to God is through the Lord Jesus Christ, the substitute that God supplied for man—that Christ, the Lord, is the way for man to approach I AM,

"Who alone has immortality and dwells in unapproachable light, whom no man has ever seen or can see" (1 Timothy 6:16).

Most of us recognize the manhood of Jesus Christ and His historical existence, for there are historical records of His existence here on earth, but many fail to recognize that Christ is also the I AM; He too is eternal. That Christ also has the eternal nature of God is stated quite clearly in the Bible. For example, Hebrews 13:8 tells us that "Jesus Christ is the same yesterday and today and forever." Jesus also testified to His eternal existence when He said, "Truly, truly, I say t you, before Abraham was, I am" (John 8:58). Here is an indication that Christ also knew the significance of I AM.

The fact that Jesus Christ is eternal, in the sense that He exists thorough al time (from before He was born as a man, as well as from that time on), is also indicated in several other places. The Bible states clearly that "He was in the beginning with God" (John 1:2). This and the following excerpts from the first chapter of John make it clear that Jesus Christ was not only at the beginning with God but that the universe was made through Him.

"The same was in the beginning with God. All things were made by him; and without him was not any thing made that was made. In him was life; and the life was the light of men. And the light shineth in darkness; and the darkness comprehended it not. He was in the world, and the world was made by him, and the world knew him not" (John 1:2-5,10).

More biblical statements could be given on this point, but here we are commencing to tread on theological ground. The references already used would certainly seem to be enough to show that the Bible had the facts. Our knowledge of Einstein's theory can help our understanding of hteBible on this eternal relationship of God and Christ.

Before leaving the subject of the relativity of time it will be interesting to note another fact. A thorough consideration of Einstein's theory will show that science must also take things "in faith." Scientists must believe in things that are beyond comprehension at this state of man's knowledge.

It should be remembered that relativity still pushes the state-of-the-art. For while man accepts, and even builds, equipment to its facts, he still admits to the apparent impossibility of reaching its indicated limits—that is the speed of light. A careful reading of any discussion on the effects of travel near the speed of light will show that they are always couched in such terms as "near," "as one approaches," at "99.00% of," etc.

There are very good reasons for this. As scientists analyze what would happen at the speed of light they run into some interesting problems. One is the fact that as one nears this speed, mass (weight) also increases without limit; the weight of the moving object would approach infinity. Another problem is that the length of objects moving at this speed would decrease towards zero. Thus on reaching the speed of light the object would seem to disappear.

Sounds paradoxical doesn't it? At the speed of light one would weigh more than the universe, but be too small to measure, and would live forever, in no time!

Obviously man still has a long way to go to resolve the problems. However, in the meantime he works with the portions of the theory that supply the answers he needs now, and goes on with the expectation that as his knowledge advances he will obtain enough additional information to take the next step. In other words he has faith in the theory even though he can't understand its ultimate end.

Isn't this exactly what God asks us to do, to have faith? We are to accept that which we do not understand of Him in faith, and to go on, learning as we go. Why is it any harder to believe in God, to whom the Bible points, than to believe that a solution to the paradox of relativistic theory will be found? Both are beyond our present knowledge and both require faith. The one requires faith in man's ability to find the facts of the universe, the other faith in the god who created us. Which one presents the more logical call of faith? Those of us who call ourselves Christians should be able to say, "By faith we understand that the world was created by the word of God, so that what is seen was made out of things which do not appear" (Hebrews 11:3).

Even this statement points out that the Bible knew the facts. It is another example of biblical statements fitting the facts of the universe, and one that has kept expanding in meaning as man's knowledge improved. When man postulated the atom, it fit. When Einstein postulated his theory on the equivalence of mass and energy, it fit. If man finds anti-matter it will still be valid.

Again, the Bible is on the side of fact. Perhaps some of the problem with man's faith in God and His Word is that man doesn't know the Bible as well as he should. In this case it

is the lack of familiarity that breeds contempt. One wonders what might happen if man worked as hard at finding the facts about God as he does to find out about the universe. But one thing is certain about this endeavor—it would certainly lead towards the God of eternity, the One who was here at the beginning of the universe, the God of the fourth dimension who started time as well as the universe—"in the beginning."

Man has generally believed vaguely that God always existed. But for the most part, it was concluded that once man was born he and God existed on together in a time that flowed smoothly towards eternity. Now, thanks to man's increased knowledge, and numerous verses in the Bible, a fuller meaning of God's relation to time can be seen. God exists throughout time paying no respect to the limits man must meet. Thus, man's past as well as his future events can occur in God's today.

The Bible presents a God who exists throughout time now. Just as God is omnipresent in space He is also omnipresent in time. He existed, exists, and will exist always as far as man is concerned. He is "the Alpha and the Omega, the beginning and the end" (Revelation 21:6; see also Revelation 1:8). "Thus says the Lord... "I am first and I am the last; beside me there is no god" (Isaiah 44:6).

Before man, and after him, there is God. Before the universe, and after it, there is God. The Bible's first statement contains a full answer to man's question. "Before that, What?" But it was given in a way that we can only now begin to appreciate in full. Before the universe—I AM; before all—I AM; before time—I AM; in the beginning—I AM.