SERAPHIC VELOCITIES
and
Other Related Problems

by

Merritt C. Horn, Academic Officer
The Boulder School
for Students of The URANTIA Book

There has been much discussion recently of certain problems regarding the velocities of spiritual beings as revealed in The URANTIA Book. In this article, these problems will be summarized and a solution will be suggested.

A Note on Symbols:
In the interest of brevity, the following symbols will be used in this article:

C = the speed of light	Cy = light-year
UD = Urantia day	UY = Urantia year
JD = Jerusem day	JY = Jerusem year
Vt = theoretical velocity: N x C	Vo = observed velocity in C
D = distance in Cy	N = a variable, multiple of C
T = elapsed time	

Problem #1:
How do guardian seraphim on death duty reach Jerusem in three days if they can travel only three times the speed of light, as Jerusem must be more than 9 (or 27) light-days away from Urantia?

Before we can begin to solve this problem we must first determine the length of the "days" referred to, and second, estimate the distance to Jerusem.

Length of Day:
It should be noted that while we do not know what "day" or "period" refers to,[1] the revelators could have refrained from using "day" if it was misleading. Therefore it must have some recognizable meaning, though the use of "period" may indicate that the day referred to is not the UD. The most likely day would be the JD which is almost exactly (99% of) 3 days of Urantia time.[2] (This leads to the 27 light-day figure suggested above: 3C x 3JD = 27 Urantia light days.)

It will be assumed, for reasons that will be made clear later, that the "day" referred to in this connection is the Jerusem Day.

Distance to Jerusem:
The distance to Jerusem is not revealed to us, but using some clues that are revealed, and current scientific knowledge, we can make a reasonable estimate:

We are told that there are about 2,000 suns in Satania.[3] The star population density in our local area of the universe is about one star per 300 cubic light-years.[4] The volume of space required for 2000 stars is thus about 600,000 cubic light-years. If Satania is roughly spherical it would therefore be about 104.2Cy in diameter.

Jerusem is near the center of Satania [5] and is therefore about 50Cy from

planets at the outskirts of the system, and Urantia's solar system is, with one exception, the farthest removed from Jerusem in Satania.[6] The distance from Jerusem to Urantia is thus about 50Cy, though 30Cy to 70Cy would be a reasonable range.

Problem #2:
  The Melchizedek receivers arrived on Urantia 70 days after Adam and Eve defaulted. There is no question here about the meaning of "days".[7] Since the Melchizedeks returned to Jerusem about 7 years after Adam and Eve arrived, we have no reason to suspect that they would return from any other place—at least not from any nearer location. 70 x 3C = 210 light-days which is far less than the 50Cy distance to Jerusem. We do not know if the Melchizedeks departed immediately upon learning of the default; they might have deliberated for some time before leaving Jerusem, but they had no more than 70UD to make the trip.

Problem #3:
  Six Urantia Days after Adam and Eve were installed, a messenger seraphim arrived from Jerusem bearing acknowledgement of the installation.[8] We do not know how or when the Jerusem authorities received notice of this action (more on this later), but it must be possible to travel to Jerusem in 6UD or less at a velocity of 3C.[9]

Problem #4:
  We are told that Solitary Messengers sometimes serve as ambassadors ad-interim for a Local Universe "when it develops that it will require hundreds of years for a native ambassador to reach a far-distant universe." These ambassadors travel by seraphic transport at 3C.[10] We do not know what "year" they are referring to, but usually if they are referring to other than Urantia standards of measurement they give us some indication to that effect. We will assume UY because the velocities are also given in Urantian time units.
  The superuniverse is approximately 500,000Cy in diameter.[11] Therefore a being travelling at 3C should take 166,000 years to cross it. This is 200 to 1,000 times the length of time that "hundreds" of years would seem to indicate. (Again, we must assume that the revelators said "hundreds" because they meant "hundreds".)

Problem #5:
  The Divine Counselor writing Paper 19 tells us that he travelled from Uversa to Urantia in 109 days of Urantia time.[12] This distance is approximately 200,000Cy.[13] If you calculate the velocity that this Divine Counselor attained in his flight, you will find that it was about 671,141C. This velocity, while astounding, is not of itself a problem as the Divine Counselor tell us that he is able to move about "freely and quickly".[14]
  A problem does arise, however, when that velocity is compared to that recorded for a Solitary Messenger: 841,621,642,000 miles per second.[15] This velocity is approximately 4.5 million times C, or only about 6.7 times the speed of the Divine Counselor. This difference--analogous to a car moving 10 miles per hour being passed by another going 67—while great, is not of an order that would evoke the Divine Counselor's musings in Paper 23 as to how a being can move as fast as the Solitary Messenger and still remain personal. The Divine Counselor's attitude implies a relative difference of a _far_ higher magnitude.

Problem #6:
  We are told that Lucifer expressed open disloyalty to Michael's rule to Gabriel just a few "days" (presumably JD) prior to open rebellion and that Gabriel

therefore went directly to Edentia to confer with the Most Highs "regarding the measures to be employed in case of open rebellion".[16] This statement leads us to believe that Gabriel was able to travel to Edentia in less than "a few days" or at least that he believed he could reach Edentia before the outbreak of the rebellion which he regarded as certain and "impending".

We do not know how fast Gabriel can travel through space, though we can assume that his velocity is no less than that of a seraphim and perhaps more, though probably less than that of the Divine Counselor.

How far is Edentia from Jerusem? Using the same star density figures referred to above, and assuming that the proportion of stars to inhabited planets is about the same in Norlatiadek as in Satania, Norlatiadek in volume would be equivalent to a sphere with a radius of about 241C. Because Satania is near the outskirts of Norlatiadek, we will use 250Cy as the distance from Jerusem to Edentia. This is admittedly a gross estimate, but it is probably of the correct magnitude.

If we calculate the length of time that we would expect a seraphim to take to make this journey, we obtain 83.3UY or 101.4JY. A Divine Counselor could make the same journey in .14JD which is quite fast enough to satisfy our requirements except for the problem noted above that this speed appears to be much too close to that of a Solitary Messenger to be correct. If we simply calculate the velocity required to travel between Jerusem and Edentia in 3JD we get 10,145.8C which is 0.2% of the Solitary Messenger's speed—a very high number.

Problem Summary:

	Revealed As	Calculates as Being
1) Death-duty seraphim	3JD or 3UD	16.7UY
2) Melchizedeks from Jerusem	70UD	16.7UY
3) Messenger from Jerusem	6UD	16-32UY
4) Transport across Orvonton	"hundreds of years"	up to 166,000UY
5) a) Divine Counselor	not revealed	671,141C
b) Solitary Messenger	not revealed	4.5 million C
6) Gabriel Jerusem to Edentia	not revealed	10,145.8C

Interpretation:

These problems apparently have in common a misunderstanding of the relation between velocity and time when travelling faster than the speed of light.

Science gives us little assistance here, as our only source of information is the activity of light itself under certain conditions. The velocity of light appears to remain constant no matter what the velocity of its source—even as the source velocity approaches C. We cannot therefore project what the result of the superimposition of two, three, or more of these constant velocities will be.

The way that these velocities are presented in The URANTIA Book leads us to believe that they can be simply added together, probably because this addition gives a fairly clear idea of the nature of seraphic propulsion without getting into the problems of time and velocity relativity that are involved in travel beyond the speed of light. The numbers presented to us must be related to observed velocity in some way, and the revelators give enough clues for us to formulate a predictive theory about such relationships.

Solution:

It will be suggested here that velocities which are faster than C can be measured in miles per second only theoretically, that is, instantaneously. If you could measure the velocity 3C without the traveller moving any distance during that measurement, you would describe the velocity as about 558,000 miles per second. But if you attempt to calculate the time actually required to cover a specified distance at this speed, you run into serious trouble, as found in the problems outlined above. Therefore, the velocities presented in The URANTIA Book will be described as "theoretical" velocities (Vt) based on the velocity of certain basic currents in space which are to be contrasted with observed velocities (Vo) which predict the time required to make a journey between two points.

There must be a relation between Vt and Vo and I suggest that a serviceable formula is this (where $Vt = N \times C$ by definition):

$$1)\ Vo = N(10(N-(1/N^N)))C \qquad\qquad NC\,(10^{N}-N^{-N})$$

By definition, $Vo = D/T$, and from these formulae, we can solve for the other variables:

$$2)\ T = D/Vo$$

$$3)\ Vt = Vo(10-(N-(1/N^N)))$$

Unfortunately, equation #3 has the variable N on both sides so it is not actually serviceable. A direct solution for N has eluded me though it is fairly easy to estimate accurately. (See Graph #1)

Vo is constant for each Vt as shown here:

When Vt = 1C, Vo = 1C
When Vt = 2C, Vo = 112.47C
When Vt = 3C, Vo = 2754.8C

When Vt = 4C, Vo = 39,642C
When Vt = 5C, Vo = 499,632C

If we use these equations to solve the problems listed earlier, we obtain some interesting results:

#1: The travel time for seraphim from Urantia to Jerusem.

T = D/Vo

T = 50Cy/2754.8C = .0182UY = 6.64UD = 2.24JD

This answer is well within our parameters.

#2: Melchizedek travel from Jerusem to Urantia.

This journey would, presumably, also take 2.24 Jerusem Days which means that the Melchizedeks did not leave Jerusem immediately upon receiving news of the default, but delayed departure for some reason—probably in order to consider the various courses of action available to them.

#3: The seraphic messenger from Jerusem.

    The velocity of seraphim allows them to travel between Jerusem and Urantia in 2.24JD or 6.64 Urantia days. This calculated interval is almost exactly equal to the the time which elapsed between the installation of Adam and Eve and the arrival of the messenger.

    While a small modification of the formula would allow for a round trip in that time, it is not necessary to do so based on the information available to us. Though it is true that the system circuits of intercommunication were cut at the time of the Lucifer Rebellion, and that communication could only be had within the system by seraphic messengers for that reason (suggesting the need for a round trip by seraphim to inform Jerusem of the installation and to return with the acknowledgement), it was possible for Gabriel to broadcast to Urantia his decree ending the Prince's dispensation and beginning the Adamic age.[17] It would seem reasonable that if the Gabriel broadcast could be received on Urantia, it could also be received on Jerusem. Thus, the news of the installation of Adam and Eve probably came by way of this broadcast to Jerusem, and no messenger was required to travel to Jerusem from Urantia to so inform the System Sovereign. If the Sovereign sent his acknowledgement upon receipt of the broadcast, the messenger bearing that acknowledgement would arrive on Urantia about 6 Urantia days later—the interval revealed in The URANTIA Book.

#4: Seraphic travel across Orvonton.

    Because we are told that on very long journeys the seraphic velocity drops to about 550,000mps,[18] we will change the value for Vo accordingly:

$$T = D/V_o$$

$$T = 500,000Cy/2412C = \underline{207.3UY \text{ or } 252.4JY}$$

    This magnitude is now also correct: hundreds of years rather than hundreds of thousands of years.

#5: The Divine Counselor and Solitary Messenger velocities.

    The Divine Counselor's Vt can be estimated from his Vo using Graph #1. An accurate estimate is $\underline{5.12C}$. This velocity could certainly be decribed as "quickly", and is now far below the Solitary Messenger's Vt which is 4.5 million C.

    The Solitary Messenger's Vo is of an incomprehensible magnitude (8.3 x 10 to the 10,000,000th power x C), but he would still not be classified as an instantaneous space traverser. At this velocity a Solitary Messenger would begin to be hampered by space only in the inconceivable reaches of the Cosmos Infinite.

#6: Gabriel's velocity from Jerusem to Edentia.

    In order to reach Edentia in exactly the required 3JD, Gabriel would have to travel at 3.48C—only slightly faster than transport seraphim. He may well travel even faster, but probably not quite so fast as the 5.12C of the Divine Counselor. If we assign a velocity of 4C to him arbitrarily, we find that he would be able to travel from Jerusem to Edentia in about .77JD—a very reasonable number.

Conclusion:

The suggested formula thus seems to solve, in a consistent manner, all of the problems which were presented at the beginning of the article, showing that all of the problems grew from a single misunderstanding; and that if this misinterpretation is accounted for, The URANTIA Book velocities which had seemed so confusing and conflicting are shown to be mutually consistent and intelligible.

It is not possible to explore here the implications of this solution, but I will suggest an explanation: Apparently, in a certain sense, time itself travels at the speed of light, so that when a being's velocity exceeds that of light, the relationship of that velocity to time changes, so that miles per second of velocity does not convert directly into elapsed time of travel over some distance. It appears from the predictive accuracy of the formula herein presented, that no longer is elapsed time inversely proportional to the velocity, but inversely proportional to the velocity multipled by a variable which is dependent on the multiple of the speed of light at which that being is travelling.

As to why this may be true, we can only conjecture, but it appears to be so, and we can now predict with reasonable accuracy certain time and velocity magnitudes which previously eluded us. It should be noted in this connection that the accuracy of the formula is very likely the greatest at Vt values of about 3C because that is the velocity from which most of the evidence used in the derivation of the formula was taken. To what extent, and how quickly the formula's predictive capabilities are exhausted as the magnitude of velocity departs from this value are not known. For all practical purposes, however, it is probably accurate for any velocity below that of the Solitary Messenger, and can only be somewhat suggestive of the magnitude of that being's ability to nearly transcend time.

Graph #1: Vt-Vo Conversion

This graph may be used to estimate either Vt or Vo if the other is known, but because the Vo scale is calibrated to the log of Vo, estimation of Vo from known Vt values is rather difficult. The reverse procedure can be accomplished with greater accuracy.
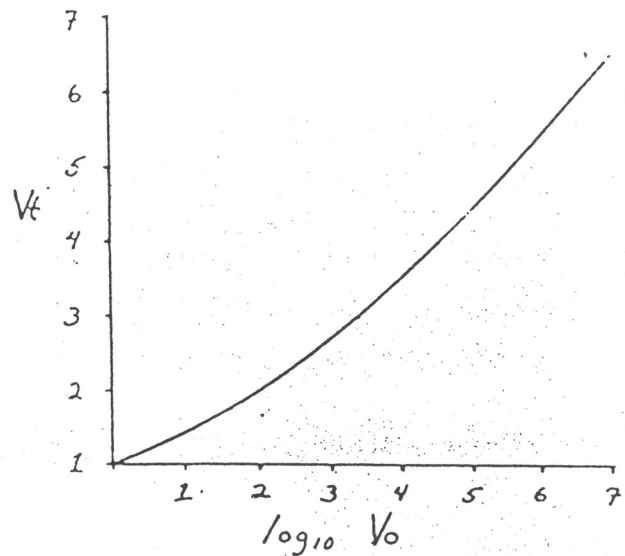
(See attached sheet)

#2: Travel Time at Various Velocities

This graph may be used to compare the time it would take beings travelling at various Vt's to go any distance from 1 to 100,000 light-years. As this graph also uses logarithmic scales, it is difficult to estimate accurately from it, but you can get an idea of the magnitudes involved.
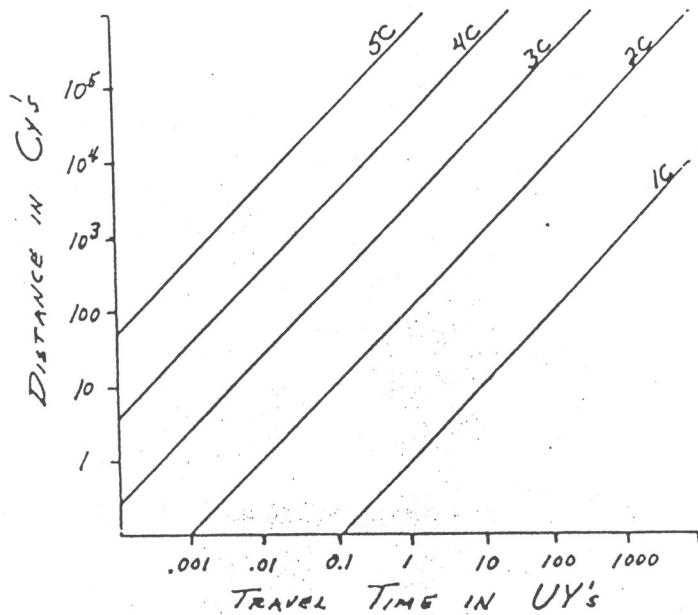
(See attached sheet)

Footnotes:

1. The URANTIA Book, URANTIA Foundation, Chicago, IL, 1955, (to be hereinafter abbreviated as UB), pp. 569:4, 1232:1, 1234:4.
2. UB p. 519:3.
3. UB p. 458:2.
4. Astronomy, August 1980, p. 15. (Thanks to Stan Hartman for this reference.)
5. UB p. 457:1.
6. UB p. 466:4.
7. UB p. 844:1.
8. UB p. 832:5.
9. Thanks to Troy Bishop for bringing this problem to my attention.
10. UB p. 260:2&3.
11. UB p. 360:0.
12. UB p. 222:5.
13. UB p. 359:8.
14. UB p. 222:5.
15. UB p. 261:1.
16. UB p. 602:7.
17. UB p. 830:3.
18. UB p. 260:2.

Graph #1

Vertical axis: Vt (marked 1 through 7)
Horizontal axis: $\log_{10} V_0$ (marked 1 through 7)

Graph #2

Vertical axis: DISTANCE IN CY's (marked 1, 10, 100, 10^3, 10^4, 10^5)
Horizontal axis: TRAVEL TIME IN UY's (marked .001, .01, 0.1, 1, 10, 100, 1000)
Lines labeled: 5c, 4c, 3c, 2c, 1c

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