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THE SONS OF GOD

As briefly discussed in timeline.doc, perhaps the most fascinating and mysterious observation in the timeline data (for those of us mystically inclined) is the fact that six of seven Sons of God (Zoroaster, Siddharta Gautama, Vardhamana, Confucius, Jesus Christ) were born within a seven century span of time from (approximately) 700 B.C. to 0 A.D. Only Mohammed's birth lies outside this time period. A priori, it is difficult to imagine why such births would not be spaced throughout the 5,000 years of recorded history and that the pattern would be essentially random. To postulate otherwise, assumes something "special" or unusual about the period 700 B.C. to 0 A.D. that never ocurred earlier in history and has never been duplicated since. In effect, such a hypothesis would placed the label 'unique' upon this seven century period of time.

The clustering of the Sons of God within this time frame has been noted in many history books, but it is given only passing mention. Hypotheses would seem to lurch off into the realm of the occult and what self respecting historian would wish to enter that territory? What circumstances, environmental or otherwise, might foster the appearance of what I shall term "deity beings"? My speculation upon such matters will not be presented here. Rather, I have a more modest goal for this document.

I shall subject the data to a fairly rigorous statistical analysis, if only to demonstrate in quantitative terms how improbable is this clustering of deity beings within the period 700 B.C. to 0 A.D. The much maligned and often hated statistical tools have real tactical value. They serve to confirm (or refute) our intial intuition and observations that are based upon a quick visual scan of the pattern in the data. A quick scan, of the timeline may be misleading in the sense that subconsciously I might "wish" to see this clustering, particularly when my study has primed me to look for it and I "want it to exist". The serious question is whether or not the apparent clustering meets scientific criteria of extreme unusualness or improbability. My eyes, and yours as well, may be perceiving a trend that is of no significance.

I will go slowly with full explanation. In order to provide you, dear reader, with the motivation to continue, I shall tell you the conclusion in advance. From a strict statistical point of view (which is the only scientific methodology that is acceptable), the clustering of six Sons of God within the

first seven centuries B.C. is *extremely improbable*, so much so as to deserve the label "unique". It cannot be explained within the context of the usual (i.e. "normal") distribution of events presumed to occur at random. This analysis is designed for the skeptics and is a preliminary exercise that clears the way for an attempt at a mechanistic explanation for this extraordinary clustering of deity being births.

These data are very simple from a mathematical point of view but the statistical tools that will be employed to analyze them while not advanced computationally, are complex and subtle conceptually. These data lend themselves to cross tabulation in a simple 2 x 2 table. In statistics the organization of a body of data determines the tools that may be appropriately applied in the analysis. Cross tablulated data are very common, a battery of statistical tools is at hand; indeed entire books have been written on the analysis of data in this form.

Case 1 will present two closely related tables. Table 1A tabulates the presence and absence of Sons of God over the 4,000 years of recorded history documented in the timeline. Table 1B presents such observations for the 5,000 years of recorded history to date; i.e. from c. 3,000 B.C. to c. 2000 A.D.

Case 1: Presence and Absence of Sons of God

Table 1A: SONS OF GOD: Presence-Absence Analysis		
	SG_{by}	SG_{ab}
700 BC to 0 AD	6	694
c.3000 BC to 900 AD	7	3993

Table 1B: SONS OF GOD: Presence-Absence Analysis		
	SG_{by}	SG_{ab}
700 BC to 0 AD	6	694
c.3000BC - c.2000AD	7	4993

where:

SG_{by} = Sons of God birth years; and

SG_{ab} = Non-birth years for Sons of God; i.e. years within   the designated time interval in which births of a Son of God   *did not* occur; i.e. were absent.

Several statistics for these table were computed using Statgraphics 5.0, a state of the art statistical software package. All statistics supported the conclusion of extreme improbability. In this and all succeeding tables in this analysis, there is one degree of freedom, i.e. only one dimension for data independence. For Table 1A, the contigency coefficient C = 0.04619. This is a measure of association between two attributes and it is very low here, 4.6% to be precise, and of no significance in either the strict statistical sense or the everyday meaning of the word. The pattern of births for the Sons of Gods in the time interval 700 B.C. to 0 A.D. is completely unlike that over the entire 4,000 year span of the timeline. For Table 1B where all of recorded history is examined, C = 0.049 and the conclusion is the same. Strict significance levels for cross tabulated data are usually assessed from the Chi-square statistic (X^2). For Table 1A, X^2 = 10.05 and the significance level (ρ) is 1.52 x 10^{-3}. A variation in computation of the X^2 known as the Yates correction takes into account extremely small sample sizes, a situation that we have here for SG_{by} and $SG_{ab.}$ X^2_y = 7.73 with ρ = 5,43 x 10^{-3} for Table 1A. For Table 1B, X^2 = 13.88 with ρ = 1.95 x 10^{-3} and X^2_y = 10.91 with ρ = 9.59 x 10^{-3}. Fisher's Exact Test assesses the probability that the data in the four cells of the table should be exactly as they are assuming the total number of observations for the entire table is fixed (held constant). Further assumptions are that the classes for categorizing are mutually exclusive (they certainly are here - either a deity being is born in a given year or is not); and that the underlying distribution of the data while exhibiting a peak and two 'tails' need not be taken to be 'normal' (i.e. is not the familiar bell shaped curve). For our purposes, this a particularly powerful statistical tool because no assumptions are allowed about the underlying distribution that characterizes the data. For theoretical reasons, it is not applicable to Case 1 but will be applied to Cases 2 and 3.

Case 2: Sons of God: Model I for Expected Births

Routine formula based upon theoretical statistical models allow for the easy computation of expected values of any observation in data that are cross tabulated. The expected values caculated by this procedure are rounded off to the nearest whole integer; certainly fractional people or deity beings make no sense and could not exist.

Table 2A: Model I for Expected Births-Timeline only		
	SG_{ob}	SG_{ex}
700 BC to 0 AD	6	2
c.3000BC - c.900AD	7	10

Table 2B: Model I for Expected Births-all recorded history		
	SG_{ob}	SG_{ex}
700 BC to 0 AD	6	2
c.3000BC - c.2000AD	7	11

where:

SG_{ob} = observed births of Sons of God (= SG_{by} in Case 1)

SG_{ex} = expected births of Sons of God for time interval as   computed by the standardized statistical approach.

In Case 2, we are assessing the degree to which the expected numbers differ from the observed. This is a very direct approach. Unlike Case 1, the question of interest may be asked directly. Are there more Sons of God in the time interval 700 B.C. to 0 A.D. than would be expected assuming their existence to be spread evenly throughout recorded history?
For Table 2A, which tabulates the data for the interval represented by the timeline, C = 0.30. X^2 = 2.49 with ρ = 0.114 and X_y^2 = 1.32 with ρ = 0.250. For Table 2B, which tabulates the data for all of recorded history, C =

0.32. $X^2 = 2.89$ with $\rho = 0.089$ and $X_y^2 = 1.63$ with $\rho = .202$. While the Chi-square values are not nearly as high as in Case 1 and the corresponding ρ values are greater, there is still a firm case for the nonidentity of the two rows of data and the extreme improbability of the observed births of Sons of God. For Table 2A, Fisher;s Exact Test gives a $\rho = 0.125$ for the one tailed test and $\rho = 0.202$ for the two tailed test. For Table 2B, Fisher's Exact Test gives a $\rho = 0.100$ for the one tailed test and $\rho = 0.202$ for the two tailed test. The conclusion is that the distribution of Sons of God birth years as tabulated is very unusual; the probability that it would fall out as observed is, at most, 20%.

Case 3: Sons of God: Model II for Expected Births

In the second model for expected births, the expected number of Sons of God per time interval is computed from an hypothesis of total randomness; i.e. such births are equally probable in any year.

Table 3: Model II of Sons of God: Expected Births		
	SG_{ob}	SG_{ex}
700B.C. to 0 A.D.	6	1
c.3000BC - 900AD	7	7

The expected numbers calculated under this hypothesis are the same if the entire span of recorded history c.3000 B.C. to c. 2000 A.D.is considered and therefore this one table encompasses both scenarios. For this model, C = 0.33, $X^2 = 2.53$ and $\rho = 0.112$ while $X_y^2 = 1.24$ with a $\rho = 0.267$. Clearly, there is a very significant difference between the observed number of deity being births in each time interval and the number one might expect asssuming complete randomness of such events. Fisher's Exact Test yields $\rho = 0.133$ for the one tailed test and $\rho = 0.174$ for the two tailed test thereby confirming the highly improbable distribution of observations as seen in Table 3.

Each of the three tabulations of data and their respective analyses provide the same conclusion. These statistical tools confirm in a rigorous manner what our intuition suspected upon casually glancing at the timeline. The number of Sons of God clustered in the interval 700 B.C. to 0 A.D. is truly extraordinary, exceptional and improbable!

References

Siegel, S. 1956. *Nonparametric Statistics for the Behavioral Sciences.* New York: McGraw-Hill.

Simpson, G.G., A. Row and R.C. Lewontin. 1960 rev.ed. *Quantitative Zoology*. New York: Harcourt, Brace & World.

Sokal, R.R. and F.J. Rohlf. 1980 2nd ed. *Biometry*. San Francisco: W.H. Freeman.

SGC. 1991. *Statgraphics Version 5.0*. Reference Manual. Rockville,   Md: STSC, Inc.