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JESUS AND STATISTICS

The Talpiot tomb, a tomb excavated outside Jerusalem in 1980 and brought to worldwide public attention in 2007, contained ten ossuaries, six of which were inscribed with names. The English equivalents of the names are Jesus son of Joseph, two Marys, a rare diminutive form of Joseph, a diminutive of Matthew, and a Judah son of Jesus. Because of the similarities between this collection of names and certain names appearing in the Christian New Testament, some are curious as to whether the Talpiot tomb may have once interred the remains of Jesus of Nazareth and some of his relatives. A number of statisticians have weighed in on the issue, and come to drastically different conclusions, admittedly based on different assumptions.[1] The diversity of conclusions is at least in part due to the difficulty of modeling the problem for the purpose of statistical analysis.

Here we will consider a question of identity among certain persons in the New Testament that lends itself to a much more straightforward probabilistic analysis.

THE BROTHERS OF JESUS AND THE APOSTLES

The Gospels make reference to Jesus having brothers. Mark 6:3 (NRSV) lists them as James, Joses, Simon, and Judah. Matthew 13:55 parallels Mark 6:3, but lists Judah just before Simon, and has the much more common variant "Joseph" in place of "Joses." Paul makes reference to "James the Lord's brother" in Gal 1:19. Those churches which hold to the doctrine of the perpetual virginity of Mary mother of Jesus, assert that either these brothers are actually sons of Joseph by a prior marriage, and thus really adopted half brothers of Jesus (the Eastern Orthodox view), or they were not really brothers but rather

cousins of Jesus (the Roman Catholic view). The traditional Protestant view is that Mary and Joseph went on to have normal marital relations after the birth of Jesus, and therefore these are the younger (half) brothers of Jesus. Those that deny the virgin birth, of course, have no problem seeing James, Joses, Simon, and Judah simply as the younger (full) brothers of Jesus. These alternatives will not concern us here. All of the preceding perspectives view James, Joses, Simon, and Judah as close relatives of Jesus of the same generation. We will use the term "brothers" to refer collectively to James, Joses, Simon, and Judas without favoring one viewpoint over the others.

Traditionally, most Christians have believed that the family of Jesus, including his brothers, opposed him during his earthly ministry, and did not become "believers" until after his death and resurrection. Nonetheless, this view appears to be supported by only two verses in the New Testament, namely Mark 3:21 and John 7:5. A number of modern scholars have come to doubt the historical accuracy of this assertion. Richard Bauckham states that "at least by the time of his last visit to Jerusalem, Jesus' relatives—his mother, brothers, his uncle Clopas and his wife, and probably another aunt—had joined his followers."[2] John Painter argues that Jesus' brothers "are portrayed as 'fallible followers' rather than outright unbelievers. In this their portrayal does not differ greatly from that of the disciples . . . The overall effect is to lead the reader to the conclusion that the mother and brothers of Jesus were among his intimate supporters."[3]

John Gunther judged that the Beloved Disciple was one of the Twelve Apostles, and speculated that he was Jesus' brother Judas.[4] James Charlesworth concludes that the Apostle Thomas was a brother of Jesus, and that Thomas is the best candidate for the Beloved Disciple.[5] James Tabor goes even farther and asserts, "This is perhaps the best-kept secret in the entire New Testament. *Jesus' own brothers were among the so-called Twelve Apostles.*[6]" (emphasis his)

But is this going too far? Bauckham writes, "the Gospel tradition several times distinguishes the brothers of Jesus from the Twelve (Mark 6:13–15; John 6:66–7:10, Acts 1:14), which would be tolerable if one of the brothers were a member of the twelve, but not if more were. We conclude that it is unlikely that any of the Twelve were related to Jesus."[7]

We will attempt to assess the likelihood that the brothers of Jesus were among the

Twelve Apostles based on name frequencies.

But first, let us review the names of the Apostles. Matthew 10:2–4, Mark 3:16–19, and Luke 6:14–16 each list the Twelve Apostles.

Mark 3:16–19 (NRSV)	Matthew 10:2–4 (NRSV)	Luke 6:14–16 (NRSV)
Simon (to whom he gave the name Peter); James son of Zebedee; and John the brother of James (to whom he gave the name Boanerges, that is, Sons of Thunder); and Andrew,	first, Simon, also known as Peter; and his brother Andrew; James son of Zebedee, and his brother John;	Simon, whom he named Peter, and his brother Andrew, and James, and John,
and Philip, and Bartholomew, and Matthew, and Thomas,	Phillip and Bartholomew; Thomas and Matthew the tax collector;	and Phillip, and Bartholomew, and Matthew, and Thomas,
and James son of Alphaeus, and Thaddeaus, and Simon the Cananean, and Judas Iscariot, who betrayed him.	James son of Alphaeus, and Thaddeus; Simon the Canaean, and Judus Isacariot, the one who betrayed him.	and James son of Alphaeus, and Simon, who was called the Zealot, and Judas son of James, and Judas Iscariot, who became a traitor.

Table 1: The lists of the Tweleve Aposltes in the Synoptic Gospels

While lists are not identical, there is enough consistency that the standard attempts to harmonize them do not seem particularly farfetched.

Luke 6:16 mentions a "Judas brother of James" (presumably this James is the son of Alphaeus), but no Thaddeus, so this Judas and Thaddeus are usually taken to be one and the same.

Mark 2:14 mentions a "Levi son of Alphaeus sitting at the receipt of custom" who is called by Jesus. This Levi is usually identified with Matthew the tax collector. Note also that he is a son of Alphaeus, which would make him a brother of James son of Alphaeus, and therefore also a brother of Judas/Thaddeus.

Some complications arise when one attempts to cross reference the preceding with the Gospel of John, which is based on sources independent of Matthew, Mark, and Luke. John's Gospel refers several times to "the Twelve" (John 6:67, 6:70, 6:71, 20:24) but never provides a full list. A disciple named Nathanael appears in six verses (John 1:45, 46, 47, 48, 49; 21:2), but nowhere outside the Gospel of John. Nathanael is often identified with Bartholomew, because of his interaction with Phillip in John 1:46, combined with the consistent pairing of Phillip with Bartholomew in the listings of the Apostles in the Synoptic Gospels. John also refers to the following Apostles by name: Simon Peter, Andrew, the sons of Zebedee, Philip, Thomas, Judas Iscariot, and another Judas called "Judas (not Iscariot)." Presumably, Judas *not Iscariot* is Judas (brother of James)/Thaddeus. We learn in John 11:16 that Thomas is also called Didymus.

Finally, we note that in the non-canonical Gospel of Thomas, Thomas is called "Didymus Judas Thomas." Further, *Didymus* (διδυμος in Greek) and *T'oma* (תאומא in Aramaic) both mean "twin" and neither is a proper name. It would appear that the real name of Thomas is therefore Judas, which means that *three* of the twelve Apostles had the name Judas.

Jeffrey Bütz[8] argues that the brothers of Jesus were supportive of his earthly ministry, but does not suggest that the brothers were among the Twelve Apostles. In fact he says, "We also have evidence that Jesus' brothers are *not* to be identified with the apostles."[9] Further, Bütz states, "Ιακοβ [Greek for James] was an exceedingly common name in first century Israel, as witnessed by the fact that eight different people in the New Testament bear the name."[10] The problem is that this assertion *presupposes* that all eight of those called James are in fact different people and *then* concludes that the name was exceedingly common. However, according to Bauckham's[11] compilation of Ilan's[12] data,

only 1.5%[13] of Jewish male contemporaries of Jesus were named יעקב (=Ιακοβ = James). We would therefore like to assess the relative likelihood of two alternatives:

• the brothers of Jesus are among the Twelve Apostles, or
• the brothers of Jesus and the Twelve Apostles are two distinct groups.

JAMES BROTHER OF JESUS AND JAMES SON OF ALPHAEUS

Eastern Orthodox and Protestant Christian tradition, as well as most modern scholars take James Brother of Jesus and James Son of Alphaeus to be different people. On the other hand, St. Jerome[14] believed them to be the same and this view is generally supported in Roman Catholic circles.

Tabor[15] provides a line of reasoning based on the uncertain paternity of Jesus, the identification of Alphaeus with Clophas (who is believed to be a brother of Joseph, the husband of Jesus' mother Mary), and levirite marriage law (Deuteronomy 25:5–10). Interestingly, Tabor's analysis has the unintended consequence of partially *harmonizing* several traditional understandings of the actual relationship between Jesus and his brothers. They are simultaneously *half brothers* (as sons of Mary by a different father) and *first cousins* (as sons of Joseph's brother Clophas/Alphaeus).

A Probability Calculation Concerning Men Named James

As noted earlier, about 1.5% of Jewish males at the time of Jesus were named Jacob/James. Accordingly, 98.5% of males were named something other than James. (Actually, this is a bit of an oversimplification; as we have seen, some of the Apostles seem to have been known by several names each. Accordingly, there may be some individuals who fit into both categories. We shall ignore this complication.)

As a warm up, let us first consider the probability that a randomly selected group of twelve men will contain exactly one James.[16] The probability that the first man is named James is about 1.5%= 0.015. The probability that the second is *not* named James is thus 1–0.015 = 0.985; likewise the third, fourth, etc. Assuming the names are chosen independently of one another, the overall probability is thus

$$0.015 \times 0.985 \times 0.985 \times \overset{(11\,times)}{\cdots} \times 0.985 = 0.015 \times 0.985^{11} \approx 0.013.$$

But this is not quite the probability we seek. The preceding calculation only considers the possibility that the *first* person is named James and the others are not. We would like to take into account the possibility that the second man is a James (and none of the others are), the third man is a James (and none of the others are), etc. Accordingly, we must multiply 0.013 by 12 to account for any one of the twelve men to be a James, while the other eleven are not James:

$$0.015 \times 0.985^{11} \times 12 \approx 0.154$$

In other words, in the time and place of Jesus, if we took a 1000 randomly selected groups of twelve men each, we would expect about 154 of those groups of twelve to contain exactly one man named James.

To calculate the probability that there will be exactly two men called James in a group of twelve men, we multiply

$$0.015^2 \times 0.985^{10} \times 66 \approx 0.013,$$

where 66 is the number of different ways two items can be selected from a group of twelve. Students of mathematics will recall that the number of ways to select r objects from a set of n objects is denoted $\begin{pmatrix} n \\ r \end{pmatrix}$, and equals

$$\frac{n \times (n-1) \times (n-2) \times \cdots (n-r+1)}{1 \times 2 \times 3 \times \cdots \times r},$$

so in this case we have

$$\begin{pmatrix} 12 \\ 2 \end{pmatrix} = \frac{12 \times 11}{1 \times 2} = 66.$$

Thus, we would expect there to be about thirteen groups in which exactly two of the twelve men are named James, out of our hypothetical 1000 groups.

Let us now turn our attention to the second possibility, i.e. that the brothers of Jesus are *not* among the Apostles. Then we have a group of sixteen men, three of whom are named James. The probability that this will occur is[17]

$$0.015^3 \times 0.985^{13} \times 560 \approx 0.0016 \approx 0.002,$$

where 560 is the number of ways three objects can be selected from a collection of sixteen objects. Notice that

$$\binom{16}{3} = \frac{16 \times 15 \times 14}{1 \times 2 \times 3} = 560.$$

So, only about 2 in 1000 randomly selected groups of sixteen men will contain exactly three men named James.

Note that the ratio $0.013 \div 0.0016$ is about 8.1, i.e. we are more than *eight times as likely* to encounter a group of twelve men with two named James as we are to encounter a group of sixteen men with three named James.[18]

A Probability Calculation Concerning the Apostles and Brothers of Jesus

We will now perform the analogous calculation taking into account not just James, but all four brothers of Jesus.[19] Everyone will presumably agree that Jesus had brothers named James, Joses, Simon, and Judas (provided the term "brothers" is appropriately explained). Furthermore, there is no controversy over the assertion that Jesus had, among his apostles, men named James, Simon, and Judas. Tabor[20] has suggested that Levi/Matthew might be identified with Joses. While this is intriguing, we would like to keep our assumptions as conservative as possible, and thus we will not assume this identification, nor will we use it in our calculation.

Name	Transliteration	Translation	Total valid	Relative Frequency
שמעון	Shimon	Simon/Simeon	243	0.0926
יהוסף	Yehosef	Joseph/Joses	218	0.0830
יהודה	Yehudah	Judah/Judas	164	0.0625
יעקוב	Ya'aqov	Jacob/James	40	0.0153
		Total males in Ilan database	2625	

Table 2: Frequency of Selected Jewish Male Names in Late Antiquity[21]

Suppose a group of n objects is divided into r distinct categories, with n_1 objects in the first category, with n_2 objects in the second category, etc., and $n_1 + n_2 + \cdots + n_r = n$. The total number of ways of doing this is

$$\frac{n!}{n_1! n_2! \cdots n_r!},$$

where $k!$ ("k factorial") denotes the expression $1 \times 2 \times 3 \times \cdots \times (k-1) \times k$, and 0! is defined to be 1.

The Twelve Apostles include two men named James, two named Simon, and three named Judas. Bearing in mind the data in Table 2, the probability that a randomly selected group of twelve men consists of exactly two named James, two named Simon, three named Judas, and five with other names is

$$\left(\frac{40}{2625}\right)^2 \times \left(\frac{243}{2625}\right)^2 \times \left(\frac{164}{2625}\right)^3 \times \left(1 - \frac{40 + 243 + 164}{2625}\right)^5 \times 166{,}320 \approx 0.0000317,$$

where $166{,}320 = \dfrac{12!}{2!2!3!5!}$ is the number of ways to choose 2 objects of one type, 2 objects

of another type, 3 objects of a third type, and 5 objects of a fourth type from a group of size twelve.

On the other hand, if the four brothers are distinct from the Twelve Apostles, we have a group of sixteen men, in which three are named James, three are named Simon, four are named Judas, and six have names other than these. The probability of a randomly selected group of sixteen having this shape is

$$\left(\frac{40}{2625}\right)^3 \times \left(\frac{243}{2625}\right)^3 \times \left(\frac{164}{2625}\right)^4 \times \left(1 - \frac{40 + 243 + 164}{2625}\right)^6 \times 33{,}633{,}600 \approx 0.000000469.$$

The ratio of these two probabilities $0.0000317 \div 0.000000469$ is about 67.6, i.e. the scenario that Jesus' brothers James, Simon, and Joses are among the Twelve Apostles is *more than sixty-seven times as likely* as the traditional scenario that the brothers are separate from the Apostles, based on name frequencies.

CONCLUSION

While unlikely events and coincidences do occur, it is clear that under the preceding analysis, the view that the brothers of Jesus were among the Apostles is much more likely than the traditional view. Surely, this possibility should be taken seriously and studied further, as we continue our search for the Historical Jesus.

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NOTES

[1] Andrey Feuerverger, "Statistical Analysis of an Archaelological Find," *Annals of Applied Statistics* 2 (2008): 3–54; Camil Fuchs, "Discussion of: Statistical Analysis of an Archaelogical Find," *Annals of Applied Statistics* 2 (2008): 57–65; Donald L. Bentley, "Discussion of: Statistical Analysis of an Archaelogical Find," *Annals of Applied Statistics* 2 (2008): 66–73; Sheila M. Bird, "Discussion of: Statistical Analysis of an Archaelogical Find—Skeptical Counting Challenges to an Archaelogical FInd," *Annals of Applied Statistics* 2 (2008): 74–76; Holger Höfling and Larry Wasserman, "Discussion of: Statistical Analysis of an Archaelogical Find," *Annals of Applied Statistics* 2 (2008): 77–83; Randall Ingermanson, "Discussion of: Statistical Analysis of an Archaelogical Find," *Annals of Applied Statistics* 2 (2008): 84–90; J. Mortera and P. Vicard, "Discussion of: Statistical Analysis of an Archaelogical Find," *Annals of Applied Statistics* 2 (2008): 91–96; Joseph B. Kadane, "Discussion of: Bayesian Views of an Archaelogical Find," *Annals of Applied Statistics* 2 (2008): 97–98; Andrey Feuerverger, "Rejoinder of: Statistical Analysis of an Archaelogical Find," *Annals of Applied Statistics* 2 (2008): 99–112.

[2] Richard Bauckham, *Jude and the Relatives of Jesus in the Early Church* (Edinburgh: T&T Clark, 1990), 56.

[3] John Painter, *Just James: The Brother of Jesus in History and Tradition* (Minneaopolis: Fortress, 1999), 17–18.

[4] J. J. Gunther, "The Relation of the Beloved Disciple to the Twelve," *Theologische Zeitschrift* 37 (1981) 127–148.

[5] James H. Charlesworth, *The Beloved Disciple: Whose Witness Validates the Gospel of John?*, Valley Forge, Pa..: Trinity Press, 1995.

[6] James D. Tabor, *The Jesus Dynasty: The Hidden History of Jesus, His Royal Family, and the Birth of Christianity* (New York: Simon & Schuster, 2006), 165.

[7] Bauckham, *Jude*, 18.

[8] Jeffrey Bütz, *The Brother of Jesus and the Lost Teachings of Christianity* (Rochester, Vt.: Inner Traditions, 2005).

[9] Bütz, 14.

[10] Bütz, 9.

[11] Richard Bauckham, *Jesus and the Eyewitnesses*, (Grand Rapids, Mich.: William B. Eerdmans, 2006), 85–88, Table 6. In particular, the total valid occurrences of Jacob/James is 40 out of 2625 individual males; 40/2625 is about 1.5%.

[12] Tal Ilan, *Lexicon of Jewish Names of Late Antiquity, Part I: Palestine 300 BCE–200 CE* (Tubingen: Mohr Seibeck, 2002).

[13] While one could question the validity of this estimate based on the fact that we do not have anything approaching complete census records for first century Jerusalem, Ilan's compilation is the largest and most complete sample of names we have from this location and time period. Using the standard statistical technique of confidence intervals for proportions, we note that based on Ilan's data as compiled by Bauckham, we are 95% certain that the true percentage of men named Jacob/James was between 1.1% and 2.0%.

[14] St. Jerome, *De Viris Illustribus*, Caput II.

[15] Tabor, Chapter 4.

[16] Students of statistics will immediately notice that what we are about to do is equivalent to the following: Let X be a random variable denoting the number of men named James in a randomly selected group of twelve men. The X is a binomial random variable with $n = 12$ Bernoulli trials and probability of success p approximated by

$$\hat{p} = \frac{40}{2625}. \text{ So } \Pr(X=2) = \binom{12}{2}\left(\frac{40}{2625}\right)^2\left(1-\frac{40}{2625}\right)^{10} \approx 0.013.$$

[17] Note to students of statistics: Let Y be a random variable denoting the number of men named James in a randomly selected group of 16 men. Then Y is a binomial random variable with $n = 16$ Bernoulli trials and probability of success p approximated by $\hat{p} =$

$$\frac{40}{2625} \approx 0.015. \text{ So } \Pr(X=3) = \binom{16}{3}\left(\frac{40}{2625}\right)^3\left(1-\frac{40}{2625}\right)^{13} \approx 0.0016.$$

[18] This calculation is based on the estimate that the proportion of men named James was 40/2625, or about 1.5%. As mentioned in note 13 above, a 95% confidence interval for

this the proportion of men named James is 1.1% to 2.0%. Substituting the two extreme figures of 1.1% and 2.0% into the preceding calculation, we are then 95% confident that it was between 6.3 and 11.1 times more likely to encounter a group of twelve men with two named James than a group of sixteen with three named James.

[19] Note to students of statistics: the analogous calculation, of course, uses a multinomial distribution in place of a binomial distribution.

[20] Tabor, 164.

[21] Bauckham, *Jesus and the Eyewitnesses,* 85–88, Table 6.