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## **Bayesian Reasoning: Criticising the ‘Criteria of Authenticity’ and Calling for a Review of Biblical Criticism**

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### **Abstract:**

*It is my contention that some of the methods used by a significant portion of Scholars of Religion – Biblical Scholars – are suspect. The following paper criticises Biblical scholars’ use of the ‘Criteria of Authenticity’ in studying Biblical texts, such as the Gospels. Objections to the Criteria offered by various Biblical scholars, historians and philosophers are considered, and it is concluded that methodologies revolving around the Criteria should be reviewed and replaced. One alternative is Bayesian reasoning, which is revealed to be already in use by historians, and which makes the work of historians, Biblical scholars and academics in other disciplines more transparent. A review of objections to Bayesian methodology reveals them to be largely irrational. It is finally argued that Bayesian reasoning could be useful in all academic disciplines, which essentially must utilise and build on an existing knowledge base, in order to formulate probabilistic hypotheses.*

**Key words:** *Criteria of Authenticity, Bayes’ Theorem, Bayesian reasoning, Biblical scholars*

### **1. Introduction**

Oft-used by Biblical scholars seeking to extract ‘kernels of truth’ regarding Jesus’ sayings and deeds from the New Testament sources, the ‘Criteria of Authenticity’ are becoming increasingly criticised. Use of the Criteria is widespread, from conservative scholars such as William Lane Craig (Craig, 2008), to more liberal Biblical scholars such as Bart Ehrman (Ehrman, 2012). In regards to the Criteria

themselves, many of them are contradictory, redundant, and speculative. With regards to their application by Biblical scholars, use of the Criteria can often be inconsistent and inadequate. The evidence of the inadequacy of this methodology is provided by the result. An astonishing diversity of views on who the 'Historical Jesus' was, what he said, and what he did. Crossan elaborates:

But that stunning diversity is an academic embarrassment. It is impossible to avoid the suspicion that historical Jesus research is a very safe place to do theology and call it history, to do autobiography and call it biography(Crossan, 1991: xxviii).

After examining many reasons why the Criteria (or their use by Biblical scholars) are unreliable, a review of Scholars' methodology is called for. One alternative is briefly considered: Bayes' Theorem. Already used in mathematics, science, philosophy, and arguably, history, the use of Bayesian thinking in Biblical studies has been elusive. A case study is presented, which gives examples of how the Criteria and Bayesian methodology deals with stories of the death of Herod Agrippa, and objections to Bayesian methods are analysed and discussed.

## **2. Criticisms of the Criteria**

### *A. Multiple attestation*

The more independent references to an event, the more likely it happened(Charlesworth, 2008: 23). While generally a logical principle, its use by Biblical scholars could be invalid, due to the scarcity of sources and the timelines involved. Few individual units of the Jesus tradition, for example, are multiply attested, and even then, establishing independence is difficult(Eve, 2005: 23-45). The Gospels are reliant on each other (particularly on Mark) so may not actually be independent, hypothetical and non-extant sources such as *Q*, *M* and *L*, and even second and third-generation

hypothetical and non-extant sources behind these sources(Ehrman, 2012: 77-82),<sup>1</sup> cannot be used to determine anything with certainty, the writings of the Apostle Paul mention little about the events of Jesus' life, while extra-Biblical passages appear later in the record, are disputed, and cannot be ruled out as being influenced by Mark and the other Gospels. Gager theorises that a tradition's multiple attestation 'will not establish anything beyond its early date'(Gager, 1974: 260). It could also be perceived as inconsistent that mainstream secular Biblical scholars do not use this criterion to establish Jesus' resurrection, or other supernatural events. As Richard Carrier notes, scholars cannot presume multiple independent attestation when the authors of the Gospels are anonymous, and present additional problems:

All we have are uncritical pro-Christian devotional or hagiographic texts filled with dubious claims written decades after the fact by authors who never tell us their methods or sources. Multiple Attestation can never gain traction on such a horrid body of evidence(Carrier, 2012: 172-175).

### *B. Embarrassment/dissimilarity*

The criterion of embarrassment, along with the similar criterion of dissimilarity (sometimes known as the criterion of double dissimilarity) supposedly indicates that if a saying or event found in the Gospel story is embarrassing or counter-intuitive to Jews, early Christians (including the Gospel writers), or both, it is likely to be true(Charlesworth, 2008: 20-22).<sup>2</sup> The idea could seem rational in the sense that

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<sup>1</sup> Ehrman acknowledges that a common story among the Gospels is not necessarily multiply attested. He then places great confidence in hypothetical sources (such as *M* and *L*), 'allowing' him to claim multiple attestation (2012: 290-291). Hypothetical sources cannot be examined or dated, so should not be used in building a case for multiple attestation.

<sup>2</sup> These criteria also apply when a story does not obviously serve a Christian agenda, or when the story actually seems to work against the interests of those transmitting it. Ehrman, for example, assumes that the tradition of Jesus' hailing from Nazareth is true, as 'Nazareth was a tiny hamlet riddled with poverty, it is unlikely that anyone would

it could be unlikely for a scribe or church for example, falsifying an event or teaching that they would find embarrassing. Firstly, it could be possible that the author purposely provides an 'embarrassing' or 'dissimilar' example to make a point (perhaps on humility, or separation from the ego), or to provide a feeling of authenticity and credibility, avoiding suspicion over constant positive or beneficial assertions. Secondly, given the diversity of Jewish religions, and the diversity even of early Christianity (Ehrman, 2003), it cannot be assumed (with the canonical Gospels at least, with their anonymous authors) that the author would find the event or teaching in question to be embarrassing. Biblical scholar Christopher Tuckett (University of Oxford) argued that "The very existence of the tradition may thus militate against its being regarded as 'dissimilar' to the views of 'the early church'" (Tuckett, 2001: 132).

Philosopher Stephen Law (University of London) generally dismisses the authenticity criteria as applied to the Gospels, noting that they could only be helpful if scholars already had access to confirmed facts from external sources. With regards to the criterion of embarrassment, Law mentions that it is not unheard of that a new religion would make embarrassing and untruthful claims, pointing to the fantastic and embarrassing - to modern understanding of science and history - claims of intergalactic wars made by Scientology founder, L. Ron Hubbard (Law, 2011: 129-151). New Testament scholar Stanley Porter (McMaster Divinity College) describes determining what might have been embarrassing to early Christians as 'very difficult... due especially to the lack of detailed evidence for the thought of the early Church, apart from that found in the New Testament' (Porter, 2000: 109).

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invent the story that the messiah came from there' (2012: 292-293). Ehrman overlooks the possibility that this tradition emphasises humility, and perfectly illustrates Jesus' own point that 'the last will be first' (Matthew 20:16). Ehrman also assumes that Jesus must have had brothers, as the Gospels' claims about Jesus' brothers do not 'serve any clear-cut Christian agenda' (2012: 292). Apart from the obvious possibility of the Gospel writer merely fleshing out the story (vividness of narration perhaps), Ehrman overlooks the importance of Jesus' physical family serving as a contrast to his proclamations about his spiritual family (Matthew 12:49-50).

As with Tuckett, Richard Carrier agrees that the very fact a certain tradition survived in the Gospels is actually evidence that that traditional saying or deed is not dissimilar to what early Christians believed (Carrier, 2012: 124). It does seem illogical to proclaim that a Gospel author is writing stories that contradict what early Christians believed, when the Gospel authors themselves presumably were early Christians, and among the earliest Christians on record; from which later Christians would derive their faith. Carrier also notes that any reason to preserve a supposedly embarrassing and truthful passage, which could have been altered or removed by over-eager scribes, would also be reason to fabricate the passage; indeed, that the supposedly embarrassing stories suited some purpose of these early Christians, might even point to their fabrication (Carrier, 2012: 156). Gager alludes to the difficulties posed by the incomplete understanding of 'the early Church':

It may well be the case, in the words of Hooker, that "if we knew the whole truth about Judaism and the early Church, our small quantity of 'distinctive' teaching would wither away altogether" (Gager, 1974: 259).

### *C. Coherence*

This criterion indicates that a particular saying or action is more likely to be authentic, if it coheres with other authentic sayings and actions (Charlesworth, 2008: 24). A clear problem with the use of this criterion in New Testament studies is in establishing a base of authentic sayings and actions. With a lack of primary (contemporary or eyewitness) sources, and anonymous authors for the main secondary sources that discuss the major events of the New Testament (the canonical Gospels), finding what is authentic is not a simple task. This criterion would seemingly rely heavily on assumptions. Without a solid base of certain sayings and deeds that do stem from historical persons, using this criterion would be somewhat circular and relying on other

criteria, as implied by Stanley Porter, who also notes that when it comes to the criteria for authenticity, 'each of them seems subject to valid criticism'(Porter, 2000: 79-82). Nor is it impressive if sources that could borrow and evolve from each other show signs of 'coherence'. It is obvious that coherence can be fabricated, especially when the documents in question are separated in time, often by decades. Gager also criticises this criterion, alluding to the 'floodgate' of improbable claims that are consistent with other information:

To allow a saying that is simply consistent with or does not contradict another saying is to open a floodgate, for the range of such a criterion is virtually limitless(Gager, 1974: 260).

#### *D. Vividness of narration*

A story's vivid details could supposedly indicate it to be an authentic eyewitness report(Evans, 1996: 128). This is very speculative, with Biblical New Testament scholar Craig A. Evans (Acadia Divinity College) calling it 'dubious' (1996: 128). A genuine report could be very brief, and it could be unnecessarily long, depending on the eyewitness; there is a potential issue here, with the Gospels having anonymous authors. A fictitious report could also be brief, or exhaustively detailed. J. R. R. Tolkien's decades long work on his *Middle-Earth* saga(Tolkien, 2011) for example, whilst providing entertaining stories for novels and films, does not prove the events actually happened, or that the sayings really did originate with a historical King Aragorn; in fact vividness would be expected of fiction. This criterion also directly contradicts the criterion of **least distinctiveness**. If less vivid and more vivid descriptions both point to authentic deeds and sayings, scholars could 'authenticate' any aspect about New Testament figures, or any other historical or mythological figure.

*E. Other criteria*

Another suspect criterion, is the criterion of the crucifixion which generally assumes that Jesus was crucified, presumably known through use of other suspect Criteria(Carrier, 2012: 179-180). Employing this criterion is to commit the fallacy of begging the question. Another pair of potentially contradictory (yet also complementary) criteria would be the criterion of Greek context and the criterion of Aramaic context(Gager, 1974: 260-261). Carrier is bemused by these illogical (relying on unproven premises) criteria, wondering why it would be assumed that Greek or Aramaic context would indicate that the tradition originates from Jesus, or the Apostles, rather than the Greek or Aramaic-speaking Gospel writer, or an earlier source, such as those found at Qumran(Carrier, 2012: 184-185). That Aramaic context might be found in the Gospels should not be particularly convincing of anything, apart from the possibility that the author or a source spoke Aramaic(Tuckett, 2001: 136). Used together, these criteria could potentially validate every word of the Judeo-Christian Bible, including the inherently implausible supernatural claims. Finally, the criterion of historical plausibility (as well as the related and lesser-known criteria of contextual plausibility and natural probability) seems superfluous given that it is the historian's core duty to determine which explanations are more plausible.

Robert Price criticises the criteria and how they are used by New Testament critics 'who nominate as authentically dominical the sayings that are not obviously disqualified by their criteria', noting that 'any or all of them still might be spurious.' Price then speculates on what conclusions would be reached if scholars applied the criteria to the sources of other religious traditions, such as the *Hadith* of Muhammad(Price, 2011: 327-328). With such criteria, scholars could label as 'authentic' numerous events in the lives of mythological and fictional characters, which did not actually happen in a historical sense. Complicating the issue further, if there were definitive criteria of inauthenticity,

actual historical events could be potentially labelled 'inauthentic'.

That a story is embarrassing, vivid, or has been repeated many times, does not prove that the events described therein had indeed occurred. These criteria could be applied to any work of fiction or mythology, to find 'authentic' sayings and deeds. Richard Carrier argues (Carrier, 2012: 136) that by employing the criterion of embarrassment, scholars could establish the historical existence of figures such as Attis (castrated), Inanna (stripped naked and killed), and Romulus (kin-slaying founder of Rome). The same criterion could be used to show that Jesus would be accurately described as a child murderer, as the potentially embarrassing story of his killing of a clumsy young boy (the crime was a bump on the shoulder) depicted in the *Infancy Gospel of Thomas* 'must' be authentic (Hock, 1995: 109). Gager identifies and criticises the circulatory methods of Biblical scholars, particularly the criteria of authenticity:

A more serious problem is the patent circularity of the method in dealing with the Gospels. Apart from Paul, who says precious little about Jesus, the sources for our knowledge of early Christian communities are identical with the sources for the quest itself... it is difficult to see how else one might proceed responsibly to distinguish between "history" and "tradition" in the Gospels (Gager, 1974: 258-259).

Gager alludes that the inadequate methodology of many Biblical scholars is due in part to their personal faith, which necessarily places limitations on perceived possibilities.

Rigorous historical method has been subordinated to religious and theological concerns. With dogged regularity, the desire to reach authentic Jesus material has led questers to sacrifice methodological rigor or to minimize the difficulties posed by the sources... Working hypotheses have

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tended to become methodological dogmas and hence immune to critical reassessment... I will argue that previous attempts at the quest have proceeded on unexamined assumptions with respect to one or another of these issues and that prospects for a responsible quest must remain pessimistic until new foundations can be formulated and laid down(Gager, 1974: 244-245).

Specifically on the quest for the 'Historical Jesus', an area of research in which the Criteria are often employed, Gager concludes:

Basically, it will not be possible to write a biography of Jesus. For this we lack all of the essential data. We know virtually nothing of his parents, siblings, early years (childhood, adolescence, early adulthood), friends, education, religious training, profession, or contacts with the broader Greco-Roman world. We know neither the date of his birth, nor the length of his public ministry (the modern consensus of two or three years is an educated guess based largely on the Gospel of John), nor his age at death (Luke 3:23 states that he was 'about thirty when he began'). Thus even an optimistic view of the quest can envisage no more than a collection of "authentic" sayings and motifs devoid of context. How, then, can the historian hope to interpret this material and construct even a sketchy image of Jesus in the absence of these fundamental data? This, after all, is the goal of the quest(Gager, 1974: 261).

The use of the Criteria by Biblical scholars points to an uncritical faith in the New Testament sources. James Charlesworth provides such an example, arguing that, 'we also should assume a tradition is authentic until evidence appears that undermines its authenticity'(Charlesworth, 2008: 18).Perhaps the strongest indictment of the authenticity criteria (and how they are used by Biblical

scholars) however, is demonstrated by the result: an 'embarrassing' diversity of theories on who Jesus was, what he said, and what he did(Crossan, 1991: xxviii). If scholarly views on Jesus' historicity, authentic sayings, and deeds, are derived from such tenuous methodology, it seems reasonable that they ought to be reviewed. Not with the same methodology, but with tools that are logical, mathematical, and critical. One such alternative, which incorporates (such as the criterion of natural probability) and supersedes all the Criteria of Authenticity, utilises Bayes' Theorem.

### **3. Bayes' Theorem**

While the humanities, and also the social sciences, can be perceived as being relatively unscientific, many claims about Biblical figures made by Biblical scholars are historical claims; and historical claims are probabilistic. While mathematics may initially seem out of place in the humanities, it is undeniable that the historian relies on probability judgements, in trying to ascertain what actually happened in the past. Bayes' Theorem then, a mathematical theorem that aids in calculating probabilities derived from a number of factors (and their associated probabilities), is a useful tool in analysing the sources used to establish the historicity and reasoning behind many Biblical passages. Bayes' Theorem does not tell us what the truth is, or what actually happened in the past. It tells us what is reasonable to believe, after considering all the evidence and alternative explanations. Historian Richard Carrier recently introduced the idea of use of Bayes' Theorem as a method of approaching history(Carrier, 2012). Hector Avalos, a professor of Religious Studies (Iowa State University), praises Carrier's use of Bayes' Theorem, arguing that it could revolutionise how Biblical studies are done(Carrier, 2012: back cover endorsement).

Carrier begins with the 'embarrassing' problem(Crossan, 1991: xxviii) that Biblical scholars have access to the same sources, yet produce wildly differing conclusions; which implies flawed methodology(Carrier, 2012: 14). He also

confirms that nothing can be known of history with certainty, especially with regards to the scant and problematic evidence provided by the Gospels, and that historians must be comfortable with ambiguity (23). An ‘agnostic’ position (described by Carrier as ‘not knowing’) is asserted to be a very common result in historical studies (87). Noting that ‘possibly, therefore probably’ is fallacious, Carrier asserts that mainstream Biblical scholars have not done their job competently (26-30). Carrier argues that the solution is Bayes’ Theorem, already used in the fields of mathematics, science, philosophy and law, and that all valid historical methodologies already conform to it, presenting his ‘historical version’ of Bayes’ Theorem in a natural language format (45-50):

$$\begin{array}{r}
 \text{The probability} \\
 \text{our explanation} \\
 \text{is true}
 \end{array}
 = \frac{\begin{array}{r} \text{How typical our} \\ \text{explanation is} \end{array} \times \begin{array}{r} \text{How expected} \\ \text{the evidence is} \\ \text{if our explanation} \\ \text{is true} \end{array}}{\left\{ \begin{array}{l} \textit{repeat} \\ \textit{the above} \end{array} \right\} + \left\{ \begin{array}{r} \text{How atypical our} \\ \text{explanation is} \end{array} \times \begin{array}{r} \text{How expected} \\ \text{the evidence is} \\ \text{if our explanation} \\ \text{isn't true} \end{array} \right\}}$$

This calculation relies on the probabilities of the truth of the historical theory considering background knowledge, and considering the evidence in question. Crucially, this equation also takes into account alternative theories that fit the evidence, while Carrier suspects that Biblical historians may have been guilty of only addressing contradictory evidence relevant to their particularly theory (75-76). None of this is foreign to the historian, though Biblical scholars may be guilty of ignoring the latter, and perhaps of not fully accounting for all the background information; hence the many differing historical theories that result. Using Bayes’ Theorem then encourages historians to consider other theories that fit the evidence just as well (or better), and can allow them to be transparent with their claims by assigning quantitative values. For example, a certain scholar might be a major proponent for theory *x*, which has a 72% chance of explaining the evidence. When employing Bayes’ Theorem however, the same scholar realises that theory *y* has an 87%

chance of explaining the evidence; there can be no hiding from this inescapable conclusion. When employing Bayes' Theorem, the historian will no longer be allowed to pass off a merely possible theory as one that is probable, or almost certain; the numbers cannot lie.

Those who are sceptical of applying a mathematical approach to the humanities are easily answered by Carrier who asserts that history relies on probabilities, which are mathematical, even when numbers are not explicitly used (63, 286). 'Even odds' means 50% for example, 'improbable' might mean 20%, 'very probable' could mean 95%, while 'more than likely' would mean greater than 50%. Bayes' Theorem just makes the process more transparent; what was once said intuitively can now be asserted mathematically. Mathematics is not necessarily out of place in historical or Biblical studies, as demonstrated by historian Adam M. Schor's use of quantitative modelling in studies of early Christian growth (Schor, 2009: 472-498). Feuerverger used mathematics (admittedly not Bayesian) to argue that the controversial Talpiot Tomb contained the remains of numerous New Testament figures (Feuerverger et al., 2008: 3-112). In the same article, numerous scholars criticised his assumption that the tomb had (and should) contained the remains of Mary Magdalene and various aspects of his methodology (78-84), with Ingermanson showing – through Bayesian methods – that the Talpiot Tomb's ossuaries containing names associated with New Testament characters was actually insignificant (85-90).

Carrier then further explains with detailed examples how all valid historical methodologies (such as the argument from evidence and the argument to the best explanation) already conform to and/or are superseded by Bayes' Theorem, and those that do not are not logically valid (Carrier, 2012: 97-119). It would after all be very difficult to convince a competent historian that considering background knowledge and alternative theories is not good historical methodology; this is precisely how competent historians go about their work. Carrier then uses Bayes' Theorem to show that the

authenticity criteria used to authenticate various aspects of the Biblical texts are generally invalid, as we have seen (Carrier, 2012: 121-205). Bayes' Theorem allows the scholar to objectively compare how revealed evidence fits various theories, and thus could be very helpful in the study of the Gospels, and other religious texts. A case study will now be considered that demonstrates how useful Bayesian thinking can be in religious and Biblical studies (as well as many other fields in the Academy), and especially highlights Bayesian methods' superiority to the Criteria of Authenticity.

#### **4. Case study: The death of Herod Agrippa**

21 On the appointed day Herod, wearing his royal robes, sat on his throne and delivered a public address to the people. 22 They shouted, "This is the voice of a god, not of a man." 23 Immediately, because Herod did not give praise to God, an angel of the Lord struck him down, and he was eaten by worms and died (Acts 12:21-23).

The Book of Acts (often seen as an extension to Luke's Gospel) claims that Herod Agrippa was struck down by 'an angel of the Lord'. Given that angels are mythical creatures, this story is inherently unlikely to be historical. Nevertheless, the Criteria of Authenticity could support this passage's authenticity. On the one hand, this is a potentially embarrassing claim, as God is portrayed in a violent manner, so the argument could be that Luke (the alleged author of Acts) would not make up an account that portrays his God negatively; the passage must therefore be accurate. The passage is also written in Greek, so the criterion of Greek context can be invoked. Furthermore, other accounts of Herod's death exist, implying multiple independent attestation, though they tend to lack the involvement of the angel. The criterion of vividness could also be referred to, with the passage containing 'unnecessary' details such as Herod Agrippa's attire on the day.

More sceptical historians would immediately reject the Acts account of Herod's death, due to the involvement of a miraculous or supernatural explanation. John P. Meier reveals a potential flaw in the Criteria in arguing that they could support miracle traditions (Meier, 1994: 630-631), demonstrating the uncritical nature of certain Biblical scholars, and the willingness to accept implausible explanations. That this story is embellished is a conclusion that is simply arrived at by employing the principle of analogy, or in considering that history favours the most likely explanations, while miracles are by definition, unlikely. One scholar who refutes supernatural explanations is Hector Avalos, who claims that Biblical scholarship is primarily a religionist enterprise and opposes the use of Biblical sources as reliable historical accounts (Avalos, 2007: 292, 339). Avalos warns scholars to be careful how they use terms such as 'facts' and 'evidence'; he says that such passages in the Bible are evidence that these particular stories existed (or perhaps that certain people believed these events occurred), not that the event in question actually happened (Avalos & Craig, 2004).

Another Biblical scholar that dismisses miraculous claims is Bart Ehrman (Ehrman & Licona, 2009). Hoping for sources that would be numerous, independent, contemporary, coherent, fairly disinterested eyewitness accounts (Ehrman, 2012: 42), he acknowledges that the main sources discussing Biblical claims are few, relying upon each other, written decades after the alleged events, problematic, contradictory, biased, and written by anonymous authors who were not eyewitnesses (Ehrman & Licona, 2009). Ehrman also states that historians must try and determine the most probable explanations, while miracles by definition are the most improbable explanations. They are considered to be miracles because they overturn scientific laws (Ehrman & Licona, 2009). Theologian Robert Price refers to the aforementioned principle of analogy (Price & Muehlhauser, 2010); if the books of the New Testament mention events such as miracles that do not fit into what scientists and

scholars know of the world today (the laws of physics for example), and it happens to be more analogous to what is known of myth, then these stories must be rejected as literal and true accounts (Beilby & Eddy, 2009: 56). Influential American rationalist and revolutionary, Thomas Paine, lent his support to this approach, stating that it is far more likely that a person simply lied than that ‘nature should go out of her course’ (Paine, 1826: 49).

These are all good reasons to reject the Lukan account of Herod’s death, but the unlikelihood of this version of the story being authentic can be demonstrated more formally, through Bayesian methodology. Bayes’ Theorem also side-steps any sort of ‘prove the negative’ argument, hindering proponents of a theory from touting their ‘possible’ views as ‘probable’. Here is the long form of Bayes’ Theorem as applicable to historical methodology, as well as Carrier’s natural language version (2012: 50, 283-284):

$$P(h|e.b) = \frac{P(h|b) \times P(e|h.b)}{[P(h|b) \times P(e|h.b)] + [P(\sim h|b) \times P(e|\sim h.b)]}$$

$P$  = probability,  $h$  = hypothesis,  $e$  = evidence,  $b$  = background knowledge.

Which represents the logic:

“given all we know so far, then...”

$$\begin{array}{l} \text{The probability} \\ \text{our explanation} \\ \text{is true} \end{array} = \frac{\begin{array}{l} \text{How typical our} \\ \text{explanation is} \end{array} \times \begin{array}{l} \text{How expected} \\ \text{the evidence is} \\ \text{if our explanation} \\ \text{is true} \end{array}}{\left\{ \begin{array}{l} \text{repeat} \\ \text{the above} \end{array} \right\} + \left\{ \begin{array}{l} \text{How atypical our} \\ \text{explanation is} \end{array} \times \begin{array}{l} \text{How expected} \\ \text{the evidence is} \\ \text{if our explanation} \\ \text{isn't true} \end{array} \right\}}$$

Bayes’ Theorem allows the historian to compare various theories, and helps decide which is more probable. As Bayes’ Theorem forces the historian to consider how alternative

theories also fit the evidence, it avoids the effects of confirmation bias, which Carrier suspects many Biblical scholars are guilty of, and which opposes the much-trusted scientific method (61). Since Herod was killed by an angel ( $h$ ) or died by way of natural causes ( $\sim h$ ),  $P(h)$  and  $P(\sim h)$  must add up to 1, making for a relatively simple set of calculations. But there is one aspect of this formula that renders accurate calculations unnecessary. In fact, I would argue that employing Bayesian reasoning without calculations is potentially more useful and reliable, given that a multitude of errors can be made when assigning quantitative values. The inherent probability of the theory (without yet considering the available evidence, such as the reference in Acts),  $P(h|b)$ , is infinitely small. Conversely,  $P(\sim h|b)$ , is very large, rendering the possibility of  $h$ , virtually 0%.

Explaining further,  $P(h|b)$  is so small as no account of angels killing nobles has ever been confirmed. Such acts are also not analogous to our understandings of biology and physics, while they are analogous to fiction and mythology. The theory that Herod died of natural causes,  $\sim h$ , includes the explanation, 'the claim was simply fabricated'. This is an explanation that is very likely, especially when dealing with claims that violate the laws of physics. This means that the revealed evidence,  $e$ , did not even need to be considered in order to rationally dismiss the claim ( $h$ ). The evidence must be so extraordinary and thorough that it overcomes the inherently low  $P(h|b)$  and the inherently large  $P(\sim h|b)$ . In the specific case of Herod's death by supernatural causes, the evidence is quite poor, stemming from an anonymous text, that along with the rest of the Gospels, are filled with errors, myth, and interpolations (Gager, 1974: 256). Given that such evidence works well for the alternative theory of fabrication, there is no extraordinary evidence that overcomes the inherently low prior probability. As this case study demonstrates, Bayesian reasoning is formally and mathematically valid, even if accurate calculations are not done.

Given that the claim is inherently implausible, the evidence is poor, and alternative explanations such as fabrication are highly plausible, the matter can be considered settled. It is reasonable to believe that Herod died by natural causes; he was not killed by an angel of the Lord. The antithesis is strengthened however, by existing evidence that Herod's death was indeed natural, namely the Josephean account (Josephus & Whiston, 2010: 19.8.2). In this version of the story, there is no angel of the Lord; instead, Herod spots an owl and thinks that this bodes him ill-fortune. Herod then dies after 5 days. This account is much more plausible than the Lukan account, and Josephus is a much more reliable source (though not perfect) than anonymous Biblical writings that are filled with mythology and have clear evangelical intent. It is also easy to see how the owl (an animal that is known to exist and can be interpreted as being an ominous omen by the superstitious) could have been replaced by a murderous angel (a mythical creature) in the Lukan account. Bayesian reasoning is in this case proven superior; while the Criteria can support the supernatural account, Bayesian thinking leads historians and other scholars towards far more plausible theories.

## **5. Objections to the use of Bayes' Theorem**

Given that the core principles of Carrier's historical adaptation of Bayes' Theorem perfectly align with good historical methodology, objections to the use of Bayesian reasoning in Biblical studies and similar fields could be irrational. One example is provided by Stephanie Louise Fisher, whose article, *An Exhibition of Incompetence: Trickery Dickery Bayes*, attacks Carrier's use of Bayes' Theorem in historical studies. She claims that 'Bayes' theorem was devised to ascertain mathematical probability. It is completely inappropriate for, and unrelated to historical occurrence and therefore irrelevant for application to historical texts'(Fisher, 2012). Fisher seems to have not read Carrier's *Proven History*, which includes a natural language version of the theorem (with no accurate calculations

necessary), and seems to overlook the simple fact that all historical claims are probabilistic. In the same article, she herself makes a probabilistic historical claim:

Thus all the tomb inscriptions from Beth She'arim are too late in date to affect the question of which language(s) Jesus is likely to have spoken in order to communicate with audiences in first century rural Galilee(Fisher, 2012).

And in the comments section, both Fisher and Hoffmann agree that history deals with plausibility. Despite not appreciating the potential for Bayesian thinking, Fisher does acknowledge that the methodology of Biblical studies needs reviewing(Fisher, 2012). Another objection could be the difficulty in assigning quantitative values. Firstly, there are challenges to all quests for truth. Secondly, this is an issue that this article's brand of 'Bayesian reasoning' (where accurate probabilities are unnecessary) addresses. It is important for Biblical scholars to understand that history is probabilistic, so can make use of mathematics, and that factoring in all background information and the probabilities of alternative theories (which Bayes' Theorem enforces) is good historical methodology. There is one objection however that is not so irrational: 'GIGO'. Like all formulas, Bayes' Theorem is at the mercy of the all-important 'garbage in, garbage out' principle.

Just as a valid deductive argument is only as good as its weakest premise, so the formulaic solution can only be as reliable as the data – sometimes relying on key assumptions – used in calculating it. There are instances, related to religious studies, where Bayes' Theorem has been misused by scholars, which could contribute to hesitation in deeming Bayesian reasoning appropriate. One example is the case of Jesus' resurrection (T. McGrew & McGrew, 2009; L. McGrew, 2011), whereby the researchers admitted that their work relied on the unproven assumption that God exists (T. McGrew & McGrew, 2009: 595). Such an assumption has massive implications on prior probability, so arguably, the

McGrews are not utilising Bayes' Theorem at all. They also overestimated the reliability of the Gospels (630) assuming, erroneously, that in all 'natural matters', the Gospels are accurate,<sup>1</sup> and ignored the high probability of outright fabrication.

Robin Collins utilises Bayes' Theorem to justify the teleological or 'fine-tuning of the Universe' argument (Collins, 2009). There are numerous issues with such arguments, though one specifically relevant to Bayesian reasoning would be the identity of the Creator involved. Assuming design, the inherently unlikelihood (prior probability) that it is Collins' God that is the designer (out of thousands of imagined gods and infinite amounts of gods not yet imagined) is not addressed by Collins, despite his claim to be utilising Bayes' Theorem. Strong empirical evidence would be required, though Collins offers none, meaning that this crippling prior (im)probability is not overcome. Perhaps realising these problems, Collins admits to diminishing the significance of prior probabilities, though they are so crucial to Bayesian methodology:

Further, as much as possible, I shall avoid using theories of confirmation that attempt to account for everyday and scientific forms of reasoning but whose claims go significantly beyond what these forms of reasoning demand. Thus, for instance, I will avoid appealing to prior probabilities and to notions of purely logical probability that claim that relations of probability exist completely independently of human cognizers (Collins, 2009: 203).

Noted philosopher of religion, Richard Swinburne also uses Bayes Theorem and attempts to incorporate *some*

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<sup>1</sup> The authors generally argue for the truth of the non-miraculous portions, which is reminiscent of philosopher Stephen Law's 'bracketing' concept. Law takes issue with conservative Christian apologists who initially ignore the miraculous parts of the Gospels, accept the remainder as truth, then use these 'firmly established facts' to demonstrate that the supernatural portions of the texts must also be true (Law 2011).

background knowledge, though misuses the formula by incorporating unjustified probabilities (Swinburne, 2003: 211-214). Swinburne provides a perfect example of how a useful formula can be used correctly (in regards to the actual calculation), yet is subject to data that has been incorrectly obtained. None of this should deter the historian or Scholar of Religion from making use of Bayes' Theorem or Bayesian reasoning. It is, rather, an indictment of those scholars who seek to misuse Bayes' Theorem in an unscholarly pursuit to justify their personal beliefs. Scholars can debate endlessly over whether Bayes' Theorem or mathematics in general has any place in the humanities and social sciences. Noting that Bayesian thinking conforms to good historiography (considering the current theory, alternative theories, current evidence, and previous knowledge) and remembering that historical claims are probabilistic, opposing the usefulness of Bayesian thinking would seem to be an exercise in foolishness.

## **6. Conclusion**

It was discovered that the 'Criteria of Authenticity' used in Biblical studies are in themselves inappropriate, or used in an inappropriate manner (Carrier, 2012: 121-205). The inconsistency of many Biblical scholars, and their perceived lack of scepticism, was also briefly mentioned. Conversely, Bayes' Theorem was discovered to be a useful, reliable, and transparent tool in historical methodology. Utilising Bayes' Theorem demonstrates that what may have previously been claimed intuitively or expressed through informal logic, can now be stated mathematically.<sup>1</sup> Employing correct Bayesian methods could move Biblical scholarship away from unjustified explanations and could drastically change how scholars utilise the Gospels. One positive implication could be that the focus of research by Biblical scholars moves from unnecessarily and unsuccessfully 'authenticating' various

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<sup>1</sup> David Hume provided sound reasons for being sceptical about miraculous claims as early as the eighteenth century. Bayes' Theorem allows the scholar to confidently apply these principles, mathematically; in a fair and transparent manner.

Biblical passages to the intended messages of the teachings (Gager, 2005: 66).<sup>1</sup> It is further argued that Bayesian reasoning could be useful in all academic disciplines, which essentially must utilise and build on an existing knowledge base, in order to formulate probabilistic hypotheses.

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<sup>1</sup>Gager and Flusser allude to the importance of Biblical teachings, which have 'the potential to change our world' (66). Hector Avalos also encourages Biblical scholars to focus on solving worthwhile 'problems' (Avalos 2007: 314).

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