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Title: Biblical Paradox and "I am" Sayings in John

Abstract:

The study of paradox has been controversial in contemporary biblical and theological scholarship. This historical trend has been set by Russell in the study of paradox since the early 20th century, to exclude or ignore the paradox (of circular reasoning) from formal logic or to negate it as a valid reasoning. The consequence of this mainstream decision has been somewhat devastating, especially in biblical scholarship. However, there has been a renewed interest due to the innovative approach and breakthrough in the study of paradox in circularity, pioneered by Kripke. This paper explores and presents this new perspective and paradigm, and its application to circular constructs found in the Bible, especially in John. Selected biblical examples of circular relationship and coinductive reasoning are presented and analyzed. Two proof methods in John 8:12-18 are investigated and analyzed. One of the proof methods is distinctively based on self-reference (circular reasoning) to validate the self-claim of Jesus as the light of the world. Further "I am" sayings in John are analyzed as interpretive keys and with circular in-relationship.

Keywords: biblical paradox; "I am" sayings; ego eimi; circular in-relationship; John; New Testament.

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Biblical Paradox and "I am" Sayings in John

1. Introduction

The study of paradox has been one of the most neglected areas in contemporary biblical scholarship for the latter half of the 20th century. The study of the paradox in formal logic and philosophy was pioneered by Russell (Irvine 2009) in the early 20th century. The scholarly consensus and trend was to exclude circular reasoning from formal logic, to treat it as invalid (nonsense). The goal was to avoid a paradox of circularity, in the system of formal logic and reasoning. Its intention was pragmatic, thus to keep the system of formal logic manageable at that time. This scholarly trend had set not only the direction and mainstream of formal logic and reasoning but it was soon to be followed by biblical scholarship.

The consequence of this mainstream decision has been somewhat devastating, especially in biblical scholarship. As a result, biblical paradox has been one of the most confused, ignored, neglected, or misunderstood areas in biblical and theological scholarship in the latter half of the 20th century. However, there has been a renewed interest due to the innovative approach and breakthrough in the study of circularity and paradox pioneered by Kripke (1975), followed by Fitting (1985). The new paradigm has been recognized as one of the most active and controversial areas of Philosophy, Mathematical Logic, and Computer Science, to name a few. This new paradigm is one of the primary critical methods in this paper, to understand and analyze biblical paradox.

This paper explores and presents this new perspective and paradigm, and its application to circular constructs found in the Bible, especially in John. A brief survey of the selected examples of biblical paradoxes is presented and analyzed for the characteristics and features of biblical paradoxes, and their circular relationships. Two proof methods in John 8:12-18 are investigated and analyzed. One of the proof methods is distinctively based on selfreference (circular reasoning) to validate Jesus' self-claim as the light of the world. This observation provides a critical key and new interpretive paradigm to "I am" sayings by Jesus in John (self-identification or self-predication), with or without predicate. Furthermore it is noted that "I am" sayings by Jesus in John 10:1-39 are used to identify the true identity of the gate and the good shepherd in the metaphoric story (figure of speech) of John 10:1-5. With this understanding, it is noted that each predicate-metaphorical "I am" saying by Jesus in John functions as (selfidentifying) interpretive key to the true identity of the central symbolic figure as each story being unfolded. Finally various circular relationships with "I am" sayings are examined and analyzed for their circular constructs and relationships. One classical example in John is the identity of Jesus being in Father (John 14:10) who is in Jesus, presenting a paradox of circular in-relationship.

The definition for the term "paradox" in biblical scholarship has been unsettled and controversial, far from any scholarly consensus. Current working definition of (biblical) paradox in this paper is "contrary to opinion" (of common sense or expectation). This definition is somewhat flexible and pragmatic to serve the purpose and scope of this paper, conservatively following the meaning of the early Greek and *Koine* Greek of the New Testament (Luke 5:26). This definition has been commonly used in English until the 18th century. Other meanings or similar notions for paradox found in the contemporary discussions (for example, mystery, apparent or actual self-contradiction, etc.) are examined. The terms of *circularity*, *cycle*, *loop*, and *coinduction* are used somewhat informally and interchangeably in this paper, for a pragmatic reason.

For critical issues (of John on authorship, authenticity, textual, exegetical, and theological issues), the reader is referred to the scholarly works by Morris (1969; 1986; 1989; 1995), Cullmann (1959; 1970), Ladd (1993), Ellis (1991; 1993), and Hoehner (1978) as the author follows. Further the author consulted the works of Dodd (1953), Brown (1966; 1970), Harner (1970), Hayward (1978), Loader (1992), Evans (1993), and McDonough (1999) for "I am" in John, Santos (1994) for biblical paradox, Longacre (1983), Porter (1995; 1997), and Levinsohn (2000) for discourse analysis and intertextuality, Cassuto (1961; 1967), and Kaiser (1978; 1995) for the Old Testament study. Quotations of biblical texts are from *Novum Testamentum Graece* (Aland *et al.* 1993) and *Biblia Hebrarica Stuttgartensia* (Elliger *et al.* 1983).

The current approach of this paper is distinctively computational. The new paradigm is very promising, to understand many of confusions, failures, misunderstandings, limitations, or even ignorance among the various scholarly attempts and trend with respect to biblical paradox in the past. However, it does not solve all the problems

nor address all the issues in the area of biblical paradox. It is the author's hope through this study to bring a renewed interest, understanding, and excitement toward the study of biblical paradox in the dawn of the 21st century.

2. Preliminaries

Induction is a familiar term along with inductive reasoning, inductive logic, or even inductive bible study using the logic of induction. Induction corresponds to well-founded structures from which a basis serves as the foundation for building more complex structures. For example, natural numbers are inductively defined via the base element (zero) and the successor function (by adding one). Thus one may construct any natural number from zero by adding one repeatedly. For example, three is constructed from zero by adding one three times. Similarly one may check whether a given number is a natural number, inductively by undoing the addition of one (that is, by subtracting one) repeatedly to reach its base of zero, in a finite number of steps. An object constructed in inductive definition is called a "well-founded" object for there is a well-founded base, and a set of such objects is called a well-founded set. Hence the set of natural numbers constructed by induction is a well-founded set. And it does not include any infinite number (because the infinitely many iterations of adding one onto zero will never be terminated in finite steps). Thus minimality implies that any infinite numbers (that is, infinite-length lists of numbers) are not members of the inductively defined set of lists of numbers. Inductive definitions correspond to "least fixed point interpretation" of so-called "recursive" definitions. In summary, inductive definitions have three components: initiality, iteration, and minimality.

In contrast, coinduction eliminates the initiality condition and replaces the minimality condition with maximality. No requirement for initiality means that there is no need for a base-case in coinductive definitions. Coinductive definitions have two components: iteration and maximality. Any object constructed in coinductive definition is called a "not-well-founded" object because there is no base. Further iteration of coinductive definition (without a base) is achieved by circular construct. Thus, while these examples and definition may appear to be circular (or meaningless, as it seems to be), the definition is well formed since coinduction corresponds to "greatest fixed point interpretation" of recursive definitions. The resulting formal system of reasoning (logic) is termed as "coinduction" (in coinductive reasoning or logic), in contrast to the traditional "induction" (in inductive reasoning or logic).

For a note, we use the terms of "induction" and "coinduction" as proof method, the terms of "recursion" and "corecursion" as definition (or mapping), and the terms of "least fixed point" interpretation and "greatest fixed point" interpretation as formal meaning (semantics). The reader is referred to Barwise and Moss (1996) to for a detailed account. Some of the exemplary applications of coinduction are bisimulation, bisimilarity proof and concurrency, process algebras such as π -calculus, programming language semantics, model checking, situation calculus, description logic, and game theory and modal logic. The extension of logic programming with coinduction allows coinductive logic programming for both recursion and corecursion (Simon *et al.* 2006), and with negation (Min *et al.* 2009; Min 2010).

One misleading view on minimality in induction is a tendency for "one and only one" best model or interpretation (if one exists). The reflection of this misconception in biblical scholarship is the pervasive and persistent tendency toward one and only one (best) interpretation in the contemporary biblical exegesis and interpretation. However, the minimality requirement for induction does not warrant one and only one best model or interpretation but there could be many optimal interpretations (as a minimal set), as long as each interpretation is not implied by the other. Further, if one allows the "possible world" semantics (of modal reasoning) in coinduction, then it is possible to justify an array of potential interpretations in exegesis (where one interpretation could be even in conflict with another interpretation). The scholarly tradition of inductive reasoning and its opposition against modal reasoning could be traced back to Kant (1781), and the omission of modality by Frege (1879) in his pioneering groundwork of modern logic for propositional and higher-order logic. The reader is referred to Fitting and Mendelsohn (1998) for an excellent technical introduction.

3. Selected Examples of Biblical Paradoxes

A few selected examples of biblical paradoxes are presented and examined for their circular constructions, along with their paradoxical features of modality or nonmonotonicity.

(1) Exodus 3:14

The first example is "I am who I am" (אָקָיָה אָשֶׁר אָקָיָה) from Exodus 3:14. In this example, a simple lexical (linguistic) or conceptual diagram clearly reveals its circular construct (I am who I am). A cycle (loop) is formed to

reference itself (self-referencing). Its exact semantic meaning or interpretation is still debatable. However, one can easily see its circular meaning from the lexical or conceptual construct such as "I am who I am who I am who ...". Further one may suggest its (logical or theological) meaning as the one who is (being of) self-defining, self-identifying, self-predicating, self-referencing, self-revealing, or even self-existing (that is, the living God who has no beginning and no end).

There are many different types of self-referencing in the Bible. One noteworthy example is to define a concept by itself (self-referencing). For example, the good one brings out what is good (out of one's own good) whereas the evil one brings out what is evil (out of one's own evil) (\dot{o} $\dot{\alpha}\gamma\alpha\theta\dot{o}\zeta$ $\ddot{\alpha}\nu\theta\rho\omega\pi\sigma\zeta$ $\dot{\epsilon}\kappa$ τοῦ $\dot{\alpha}\gamma\alpha\theta\sigma$ ῦ $\theta\eta\sigma\alpha\nu\rho\sigma$ ῦ $\dot{\epsilon}\kappa\beta\dot{\alpha}\lambda\lambda\epsilon\iota$ $\dot{\alpha}\gamma\alpha\theta\dot{\alpha}$, καὶ \dot{o} πονηρὸς $\ddot{\alpha}\nu\theta\rho\omega\pi\sigma\varsigma$ $\dot{\epsilon}\kappa$ τοῦ $\dot{\alpha}\gamma\alpha\theta\sigma$ ῦ $\theta\eta\sigma\alpha\nu\rho\sigma$ ῦ $\dot{\epsilon}\kappa\beta\dot{\alpha}\lambda\lambda\epsilon\iota$ π ονηρὸς $\dot{\alpha}\nu\theta\rho\omega\pi\varsigma\varsigma$ $\dot{\epsilon}\kappa$ τοῦ $\dot{\alpha}\gamma\alpha\theta\sigma$ ῦ $\theta\eta\sigma\alpha\nu\rho\sigma$ ῦ $\dot{\epsilon}\kappa\beta\dot{\alpha}\lambda\lambda\epsilon\iota$ π ονηρὸς $\dot{\alpha}\nu\theta\rho\omega\pi\varsigma\varsigma$ $\dot{\epsilon}\kappa$ τοῦ $\dot{\alpha}\gamma\alpha\theta\sigma$ ῦ θ σ ανροῦ $\dot{\epsilon}\kappa\beta\dot{\alpha}\lambda\lambda\epsilon\iota$ $\dot{\epsilon}$ π ονηρὸς $\dot{\epsilon}\kappa$ τοῦ $\dot{\epsilon}\kappa$ σ ονηρὸς $\dot{\epsilon}\kappa$ τ οῦ π ονηρὸς $\dot{\epsilon}\kappa$ σ ονηρος $\dot{\epsilon}\kappa$ σ ονηρος $\dot{\epsilon}\kappa$ σ ονηρος $\dot{\epsilon}\kappa$ σ ονηρός $\dot{\epsilon}\kappa$ σ ονηρος $\dot{\epsilon}\kappa$ $\dot{\epsilon}\kappa$ σ ονηρος $\dot{\epsilon}\kappa$

(2) John 14:10–11

The second example is the text from John 14:10-11. This illustrates again a circular construct. Here Jesus (the son) says: "I am in the Father and the father is in me." (John 14:10) and "The father is in me and I in him." (John 14:11). In contrast with the first example of "I am who I am", this construct is again circular with two concepts (persons) referencing each other (mutual-referencing) with a preposition ("in") of indwelling-relationship, creating a cycle.

(3) Titus 1:12

The third example is the well-known Liar's Paradox in Titus 1:12 where one of the Cretans who is also a prophet of their own said that the Cretans were always liars. The problem is that the prophet himself is a Cretan, a member of the community of the whole Cretans (of the liars whose statement is false) to whom he is referring in his prophecy (which should be true). Thus the prophet is referring to himself (creating a paradox of circularity) by referring to the group of which he is a member. A paradoxical question is whether the prophet is a liar and thus whether his prophetic assertion (which is true) is a lie (false).

This is a classical example of circular relationship dealing with a set and its member (that is, an element in the set) of "set-membership". One noteworthy and similar biblical example is found in 2 Timothy 3:16. Here Paul's letter which is a holy scripture (2 Timothy) refers to "all the scriptures" (that is, the canonic Bible yet to be completed) which includes the very scripture (2 Timothy, written in part and yet to be finished) and the very verse (2 Timothy 3:16) while Paul is writing. Moreover Paul himself made even a stronger assertion in Romans 3:4 that all human beings are liars (that is, including Paul as he is writing this very statement). There are many similar assertions of this type found throughout the Bible (for example, Psalm 116:10) which are essentially in circular reasoning with negation.

Another difficulty in the Liar's Paradox is that negation itself is not explicitly stated but negative implication is imbedded but to be uncovered in this paradox. That is, a lie is a "false" statement (proposition) and a liar tells a lie all the time. Thus, negation in a circular reasoning presents not only a challenge but also it complicates the meaning and its validity. Since the Cretan prophet asserts that all Cretans are liars, this Cretan prophet is then also a liar and thus to assert his own statement (the prophecy cited by Paul in Titus 1:12) to be a lie (that is, its truth-value to be "false"). In other words, it is the Cretan prophet whose prophecy (which is true and is even affirmed by the apostle Paul) denies truthfulness of a message of any Cretan (including himself) as a liar. If granted and extended, this line of reasoning further shakes the credibility of Paul's assertion of Titus 1:12 in Titus 1:13.

This line of reasoning seems to create a theological controversy and an easy target of being a heresy. However, one should also note that a liar needs not to tell a lie all the time. A liar may tell truth all the time except a few times to tell a lie. Further a chosen prophet may speak a true prophecy given by God (for one time, for example, in John 11:47-53). This shows one important feature of modal reasoning as one works with biblical paradox. There are many examples of paradoxical negations found in the biblical system of logic. For example, some noteworthy and more difficult examples in Mark (Santos 1997) include: (a) self-denial (Mark 8:34), (b) saving-or-losing one's life (Mark 8:35), and (c) servant-leadership (Mark 9:35), along with many other similar examples throughout the Bible.

(4) Matthew 22:23-33

The paradox of Matthew 22:23-33 is dealing with marriage and resurrection. The paradoxical question is constructed to trap someone into an intellectual and theological deadlock and dilemma. There was no known solution to this paradoxical question until Jesus resolves it in Matthew 22:29–32. The question appears to demand either true or false answer of a logical dichotomy (of "either-or" with excluded-middle, but not "both-and" or "neither-nor"). Initially it seems so impossible to be resolved (that is, whose wife the woman would be) in this world of the living. But after all it seems so trivial to say "neither-nor" in that world of the resurrected. The marital (single, married, widowed, married, widowed, ..., married, widowed) and spousal (whose wife) attributes of the woman change time after time as well as her living-status (living, dead, or resurrected). One may note her marital status in cycle, her life-status (being alive, dead, and then alive again after resurrection), and her husband-identity (from the first brother to none, to the second brother to none, ..., to the seventh brother to none, and then supposedly back to each brother after resurrection).

This aspect brings our attention to an additional and critical feature of this paradox for "nonmonotonic" reasoning. That is, the spousal attribute or the husband-identity of the woman is not monotonic (for one to be married and then to stay married) but nonmonotonic (from being married to be married again whereas the identity of her husband is changing seven times). Nonmonotonic reasoning is one of the common motifs and themes in the Bible (for example, Ecclesiastes 3:1-10; 7:14), seemingly contradictory with respect to monotonic reasoning or principle. For example, if the righteous are blessed and the evil are cursed, then how can a righteous man be cursed or persecuted (cf. Job 1-2, and Matthew 5:10-12)? Another way to look at nonmonotonic reasoning is that it deals with not only what is true (that is, monotonic) but also what is false.

(5) Matthew 22:41-46

The paradox in Matthew 22:41-46 extends the number of the constituents in a cycle. This example deals with the extended "Father-Son" relationship which is compatible with "Lord/Master-Servant" relationship. A father (who is also a king) is the lord (master) of his own son (servant). This "Father-Son" relationship is extending to his son's sons. That is, the relationship is transitive as to an immediate "Ancestor-Descendant" relationship where "Father" is also referred to as one's "Ancestor-Father" in a direct blood-linage in the biblical context. Then the question is why David called Christ (who is his own descendent) "my lord" in Psalm 110:1. This clearly illustrates a circular relationship to signify "You are my Lord" (that is, "Lord-Servant") relationship, counterintuitive to the intended "Father-Son" relationship from David to Christ. As one may note, some of these circular relationships may not be clear at lexical or syntactic level but may require a further analysis to derive circular relationship at semantic level.

In summary, we have surveyed and analyzed five noteworthy and exemplary biblical paradoxes. Each paradox represents its own type (class) of biblical paradox, presenting a diverse and complex array of biblical paradox of circularity. A circular construct (to form a conceptual cycle of a circular relationship) can be seen at lexical, syntactic, or semantic level, and further adding a layer of complexity with negation. A cycle can be constructed with (a) one concept (person, object, or attribute) in self-referencing (as in Exodus 3:14), (b) two concepts in mutual-referencing in cycle (as in John 14:10), (c) many concepts in a cycle (as in Matthew 22:41–46), or (d) one concept (an element) referring to a set (or a group) of which the concept is a member (as in Titus 1:12). Some of the key characteristics (features) of biblical paradoxes are: (a) circularity, (b) modality, or (c) nonmonotonicity. Finally the author notes (from this initial study and results) that there are so abundant and diverse examples (types) of biblical paradoxes in the Bible, yet waiting to be discovered and explored. The current lists of the types and features of biblical paradoxes of circularity in this paper are far from being complete or exhaustive, but to be explored, discovered and expanded in future study.

4. Two Proof Methods in John 8:12-20

The noteworthy example of inductive and coinductive reasoning used in the Bible is found in John 8:12-20. Here Jesus claims himself that "I am the light of the world" (Eyώ εἰμι τὸ φῶς τοῦ κόσμου ... in John 8:12). Being accused by the objection of the Pharisees (σὺ περὶ σεαυτοῦ μαρτυρεῖς· ἡ μαρτυρία σου οὐκ ἔστιν ἀληθής in John 8:13) for the self-claiming (of "I am" the light of the world), Jesus uses both coinductive reasoning (κἂν ἐγὼ μαρτυρῶ περὶ ἐμαυτοῦ, ἀληθής ἐστιν ἡ μαρτυρία μου ... in John 8:14) and then inductive reasoning citing two witnesses according to the Law in his defense (καὶ ἐν τῷ νόμῷ δὲ τῷ ὑμετέρῷ γέγραπται ὅτι δύο ἀνθρώπων ἡ μαρτυρία ἀληθής ἐστιν. ἐγώ εἰμι ὁ μαρτυρῶν περὶ ἐμαυτοῦ καὶ μαρτυρεῖ περὶ ἐμοῦ ὁ πέμψας με πατήρ in John 8:17-18). First (1), using coinductive reasoning (John 8:14) Jesus says that his testimony is valid even if he testifies on his own behalf (as he is using a circular or coinductive reasoning of self-referencing). Moreover Jesus is providing a justification for himself to use self-referencing (a coinductive reasoning) due to his own (supernatural

and omniscient) knowledge about himself to know where he came from and where he is going. In contrast to his own defense and qualification, Jesus qualifies further that they (the accusers) are not qualified due to the fact that they do not know where Jesus came from or where Jesus is going. This claim further reveals that Jesus knows not only their inner thoughts (John 2:24-25) but also their origin and destination (John 8:44). Second (2), using inductive reasoning (John 8:17) Jesus provides two witnesses (the Father and the Son himself) for the requirement imposed by the Law (Deuteronomy 19:15). Interestingly the accused (Jesus) himself is also qualified as a witness to defend himself. The accusers take at least the part of Jesus but then seek the claimed second witness (the father of Jesus) to be in a witness stance (John 8:19). It is clear that the accusers take both witnesses (Jesus and his father) as mere human beings. Later we find that there is at least one more witness (John 9:29-33) willing to stand up in the witness stance. He is the man born blind but healed by Jesus. He boldly comes forward to testify for Jesus about who Jesus is (John 9:17) and where Jesus came from (John 9:30-33).

From this perspective, one may view and understand the four agents (cases, representatives, or proofs) as the testimony (the witness or the evidence) for Jesus in John 5:31-39. These are: (1) John the baptist who is a prophet (Isaiah 39:3-9; John 1:19-37), (2) the work (the miracles) of Jesus as the signs, (3) the Father (John 1:33-34; 12:28), and (4) the Scriptures (as the system of prophecy to be fulfilled). It is sufficient to present another individual (e.g., John the baptist or the Father) along with Jesus himself, to defend his claim, as required by the Law (as noted in John 8:17). As acknowledged or challenged, it is necessary (1) to be heard of both sides in a dispute for a fair trial (Deuteronomy 1:16-17) and (2) to be validated according to the Scripture (Deuteronomy 18:21-22, also noted in John 7:51-52), to accept the miracles as the "divine" sign and means to authenticate one's claim (also noted by Jesus in John 10:25, 38).

First, we note the two conflicting statements by Jesus in John 5:31 versus John 8:16, with respect to the validity (truth) of his own self-testimony. In John 5:31, Jesus denies the validity of his own self-testimony "according to the Law". This legal compliance is always challenged by the Pharisees (John 8:13), thus to be complied (John 8:17) for Jesus as being a "mere human being" (John 10:33), even at the expense and in the gross negligence of many miracles done by Jesus. In contrast to John 5:31, in John 8:16 Jesus affirms the validity of his own self-testimony on the basis of the divine authority. Thus, in these multi-modal layers (one according to the Law and the other of the divine self-reference), one may resolve the seemingly-contradicting claims in John 5:31 versus John 8:14 where each claim has a valid model in its own modal dimension (human or divine) to be true, respectively. As noted previously (for example, in Matthew 22:23-33), a set of two contradicting interpretations (models) could be valid.

Second, we note that circular reasoning (coinductive reasoning) can be used as a sound method of reasoning or logic (just as induction as a sound method of proof). However, if an assumption or material (testimony or witness) of the argument (proof or reasoning) is invalid (whether it is inductive or coinductive), then the whole argument and thus the proof itself is invalid even though the proof method itself (whether it is inductive or coinductive) is correctly applied. For example, if a stranger says to me, "Trust me with all of your money and your life". I should guard myself to challenge him to prove it. That is, an unwarranted plain response (of "simply because I say so" from a stranger) is not good enough to be a credible proof for any cautious human being, for the entrustment of his life and all of his fortune.

There is a close parallel between John 8:12-19 and Exodus 3:14-15 with respect to the two proof methods in usage. In Exodus 3:14, God testifies (reveals or identifies) himself with respect to himself. This is clearly a coinductive (circular) proof method (reasoning). In Exodus 3:15, God testifies (reveals or identifies) himself by referencing the most credible three witnesses (Abraham, Isaac, and Jacob). They are not only the founding fathers of the people of Israel but also the living witnesses of the living God (Matthew 22:32). This is clearly an inductive proof method (reasoning). Further this parallel between Exodus 3:14-15 and John 8:12-19 may suggest or even enhance some of the intriguing arguments by Zickendraht (1922), Harner (1970), Hayward (1978), and McDonough (1999) for "I am" in John as the divine (personal) name of God in Exodus 3:14-15.

A similar provision in biblical law is explicitly stated and mandated for safeguarding against false testimony (Exodus 20:16) and the proof method in the authentication process (Deuteronomy 18:21-22). One may find many biblical examples for the "challenge-response" model or "identification-authentication" model of security, for example, for the identity and proof of Christ (John 1:19-27; 6:30) and toward the secure model of revelation. Thus the secure system of the biblical reasoning and revelation warrants the challenge-response model, using the "sign" as one of the most prominent proof methods in the Bible (Deuteronomy 18:19-22; Isaiah 7:10-17; John 20:30-31).

This elevates the necessity and interest toward the biblical concept of "sign" as a proof method in the "identification and authentication" process (cf. John 2:11). One may find the stages or the process of the faith (for example, of Peter in John) in formation, growth, and maturity through (1) an indirect but a credible personal testimony of one's teacher and prophet (John 1:35-42), (2) a direct and personal self-experience of the unshakable "sign" as a proof (John 2:11), (3) a doubt and controversy (John 6:60-71), (4) a confirmation of the faith (John 16:29-31), (5) the ultimate shake-and-break test (John 13:36-38 and 16:32-33 for John 18:25-27), and (6) the commencement (John 21:15-18).

One may extend the contemporary view and scope of paradox beyond the literary genre of discourse and rhetoric into the realm of action. Then one may view the miraculous signs in the Bible under the category of paradox "in action", thus to extend the definition of paradox, as it is either in word or in deed (as noted in Luke 5:26). Moreover the secure system is also found in the case of the biblical dream-vision and its interpretation. For example, a dream is used as a secure means of transmission of a hidden message to a particular person who may or may not know its hidden message at the time of conception. It is to be interpreted, only by a qualified or authenticated secure interpreter to reveal its hidden message securely, thus effectively protecting its trust system (cf. 2 Peter 3:16). Some of the classical and well-known examples of the secure dream-vision model are found in Genesis 40-41, Daniel 2 and 4, and Matthew 1:20-25 and 2:19-21.

The secure system of the biblical message and communication is also found applicable to biblical paradox (1) as a means of bringing out a hidden message and divine wisdom, sealed in or through the expressed paradox, and (2) for the identification and authentication of the wise messenger sent by God. The paradoxical examples in Matthew 22:15-46 clearly demonstrate the model of the secure biblical message and communication. Whether a paradox is used by those who are not aware of its hidden message (that is, its solution to a question and query of the paradox) and the one who knows both (that is, a paradox as a question and its answer), begging for its hidden (theological) message to be disclosed, explained, revealed, and thus its paradoxical quest to be completed (as a unit of a discourse or a narrative).

Similar to the biblical dreams or parables, one may find the biblical model of the paradox (1) applied as the secure message and communication, (2) with a motif of wisdom and paradigm-shift and (3) as an offensive and shock-wave rhetoric device to provoke a storm of crisis and conflict, (4) with a mind-boggling and controversial question (seemingly so naïve at first sight, but so profound theologically in reality after all), (5) with an impending suspension and thrill followed by a breath-taking silence of the audience waiting for a triumphant moment of victory or defeat (for a glory or a shame), (6) to reveal a hidden divine wisdom through a seemingly so effortless resolution and novel answer for the paradox as theological challenge and quest, (7) to identify and authenticate the divine wisdom teacher (sage), and (8) for praise to the wisdom and authority of God, with wonder and amazement.

As a discourse model and means of rhetoric, biblical paradox generates a series of life-and-death crisis and conflict, breath-taking suspension and thrill, unexpected resolution and enlightening excitement, and out-bursting joy and praising finale through stimulation and unrest among the intellectuals (cf. Ecclesiastes 9:5 or Proverbs 30:4, with John 3:3-10). Further one may find the discourse model of "question-answer" in all three paradoxical examples in Matthew 22:15-46, concluded by the overwhelming response to reveal and demonstrate the divine wisdom and biblical authority through a divine messenger to reveal the hidden message. In this regard, one may find a unifying motif and theme of the biblical revelation as the "secret" and "mystery", hidden (even before the creation of the world) then but now revealed and known (Matthew 13:35 with Psalms 78:2, and Romans 16:25-26). This motif is not only inherent in the distinctive genre of parable, dream-vision, and paradox, but also clear and abundant in the prophetic writings (for example, Psalm 110:1 with Matthew 22:41-46). Some of the well-known and landmark (paradoxical) examples of "mystery" (hidden but now revealed and known in the New Testament) include: (1) the mystery of God in Christ (Colossians 2:2), (2) the mystery of the gospel of Jesus Christ (Romans 16:25-27), (3) the mystery of God's will, set before the creation (Ephesians 1:9), and (4) the mystery of the corporate unity and relationship of Christ and the church (Ephesians 5:29-32).

Finally, the majority of "I am" claim-sayings by Jesus in John should be taken as self-identification, self-predication, self-reference, self-witnessing, or self-testimony. This is also noticed and accused by the Pharisees (for example, in John 8:13). There are a few cases (for examples, John 5:31–39 and John 8:17-18), where the evidences according to the Law (other than one's own testimony itself) are provided. This conclusion leads the author to examine and evaluate "I am" sayings (and its variants) by Jesus in John, with respect to circular and coinductive reasoning (of

self-reference) whether it is said with or without (metaphoric) predicate.

5. "I am" Sayings in John

One distinctive narrative feature of John is the abundant usage of the first person pronoun ($\dot{\epsilon}\gamma\dot{\omega}$) and the "I am" phrase ($\dot{\epsilon}\gamma\dot{\omega}$ $\epsilon\dot{\mu}\mu$), narrated by Jesus. The first personal pronoun is used 156 times in John (including 29 instances of $\kappa\dot{\alpha}\gamma\dot{\omega}$), and 141 times by Jesus. In contrast, Matthew uses the pronoun 36 times in total and 21 times by Jesus, Mark uses 16 times in total and 10 times by Jesus, and Luke uses 21 times in total and 14 times by Jesus. There are three major patterns of "I am" sayings in John: (1) absolute ("without predicate" or "predicateless") for self-identification or self-predication, (2) with a predicate, and (3) with an understood predicate.

Some noteworthy absolute "I am" sayings by Jesus are found in John 8:24, 28, 58; 13:19 (Harner 1970) where some of the noteworthy predicate "I am" sayings are found in John 6:35, 51; 8:12; 10:7, 9, 11, 14; 11:25; 14:6; 15:1, 5. These are so called seven metaphorical "I am" sayings by Jesus in John: (1) I am the bread of life (John 6:35, 51), (2) I am the light of the world (John 8:12), (3) I am the door (the gate) of the sheep (John 10:7, 9), (4) I am the good shepherd (John 10:11, 14), (5) I am the resurrection and the life (John 11:25), (6) I am the way, and the truth, and the life (John 14:6), and (7) I am the true vine (John 15:1, 5). As noted by the Pharisees in John 8:13, all of these seven metaphorical "I am" sayings are essentially self-testimonies of Jesus. Moreover the majority of these "I am" sayings of Jesus (whether absolute or predicate) is used as self-identification, self-predication, self-testimony, or self-reference, as discussed earlier, thus in circular (coinductive) reasoning. Thus the following discussion shall focus primarily on those seven predicate "I am" sayings (with the divine metaphors commonly found in the Old Testament). Further some variations of "I am" sayings in John will be presented and analyzed, including those variations called "impure" forms of "I am". One of the impure forms is "I (am) in" where a static "be" verb is missing (or understood) where one noteworthy example is the mutual in-relationship as Jesus says that "I (am) in the Father and the Father (is) in me" (ἐγὼ ἐν τῷ πατρὶ καὶ ὁ πατὴρ ἐν ἐμοί) in John 14:11. A few other variations of circular in-relationship are also considered to current discussion (for example, "the word" (John 8:31, 37) or "the truth" (John 8:44) are used in circular relationship). For detailed and scholarly account of "I am" sayings in John, the reader is referred to Hendricksen (1953), Dodd (1953), Brown (1966), Morris (1969; 1986; 1989; 1995), Harner (1970), Hayward (1978), and McDonough (1999).

5.1. "I am" as Interpretive Key

Two metaphorical "I am" sayings are found in John 10:1–18. The discourse begins with a metaphorical story (in teaching or proclamation) in figure of speech ($\pi\alpha\rho\circ\mu(\alpha\nu - \rhoarable$, proverb, or riddle) in John 10:1-5. For a convenience and practical reason, the metaphorical story in John 10:1-5 is denoted as a "parable" for now. The discourse begins with a distinctive "amen, amen" introductory opening statement by Jesus (John 10:1), uniquely observed in John. As usual, the audience does not understand the meaning of the parable (that is, its hidden and intended message). Noting the audience's inability to understand (in John 10:6), Jesus provides a key (an aid to the audience) to unlock (decode) the part of the hidden message (meaning or interpretation) of the parable, using "I am" ($\dot{\epsilon}\gamma\dot{\omega}$ $\dot{\epsilon}\mu\mu$) as the key to the "partial" and "modal" solution (interpretation) of the parable.

The first key is: "I am" the gate, to the true identity of the gate (John 10:7). The second key is: "I am" the good shepherd, to the true identity of the good shepherd (John 10:11). First (1), it is distinctively a modal approach to allow possibly more than one interpretive solution. Second, there are still many metaphorical figures in the parable whose true identity is yet to be disclosed or still undisclosed (for example, who is the gatekeeper, the sheep, the thieves, the hiring, or the wolf in the story). Thus these two keys do not provide the "complete" solution (interpretation) of the parable in John 10:1-5 but a partial solution (interpretation). Further we note a few distinctive features of the parable presented in John 10:1-5 and then its interpretation in John 10:7-18 (in contrast to the presentation and interpretation of the parables used in the synoptic gospels). For example, the parable of seed-sower in Matthew 13:3-9 (in a fixed and static content) with its "full" interpretation in Matthew 13:18-23 provides an exemplary case to be compared with the parable and its interpretation in John 10:1-18.

First (1), the parable in John 10:1-18 is explained (interpreted) with the first-person key of "I am" to reveal the hidden or intended meaning. In contrast, the figures in the synoptic parables and their interpretations are almost always in "third-person" (and rarely in the "second-person" metaphorical figure of speech, as noted in Matthew 5:13-16). The central teaching of Jesus in Matthew 13 is focused on Kingdom of God (Ladd, 1993) whereas the central focus of the "I am" sayings of Jesus in John is placed upon Jesus himself in Christology (Brown, 1966).

Second (2), the parable in John 10:1-18 is interpreted "partially" and "to the general audience". In contrast, the parable in Matthew 13:3-9 is interpreted "completely" and "to the disciples only" in Matthew 13:18-23 as noted in Matthew 13:10-17.

Third (3), the parable in John 10:1-18 is "unfolding", as it is being interpreted with the keys, by expanding or adding to the story of the parable with further "parabolic" materials (blended with the intended message), in a continuous and dynamic narrative-frame. In contrast to John 10:1-18, two stages (phases) of (a) the presentation and (b) the interpretation of a parable are usually clearly marked and distinguishable. Thus the content of a parable in scope is mostly fixed (or static) to be interpreted, and exclusively to the disciples only (Matthew 13:10-13).

Finally (4), the effect of the rhetoric process (framework) of parable in John 10:1-18 generates "catastrophic" offense, controversy, and disturbance among the general audience (for example, in John 10:19-21), and (b) with no understanding or a postponed (time-delayed) understanding of the disciples with some provisional remarks (for example, in John 3:22; 4:27; 6:60, 67-71). In contrast, the effect and outcome of parable in the synoptic gospels is mostly (a) no understanding with a calming effect (with a sense of puzzling) to the general audience, and (b) a significant teaching and learning taking place with Jesus and the disciples in the inner circle (for example, Matthew 13:10-17, 36; 14:51; 15:15; 16:6-12; 17:10-13).

This pattern is also clearly observed in John 6. (1) Jesus claims himself as the bread of the life (John 6:35) using "I am" as the key to unlock the story of "the true bread of God" from the heaven, who gives life to the world (John 6:31-34). However, it seems better to view the interpretation of the bread from the heaven with "I am" as typological (than as parabolic). (2) Jesus uses the partial interpretation of the parable to his audience, thus inviting to eat his flesh (where it is meant to receive his word as explained in John 6:63). (3) Jesus expands the parable of the bread of the life (as his fresh) to be eaten and with the living water (as his blood) to be drunken (John 6:35). Thus, (4) this rhetoric process and framework (blending of real and metaphorical concepts) generates a catastrophic confusion, disturbance, and controversy, especially among the Jews (noted in John 6:41, 52, 60, 66) as the story is being unfolded with the partial interpretation and the additional materials in metaphor.

This new perspective provides a fresh new insight to the understanding of the metaphorical "I am" sayings of Jesus in John. These "I am" sayings are used as the keys to reveal the true identity of the metaphorical figures, presented in the form of self-claim by Jesus. These "I am" metaphorical figures include: the bread of the life, the living water, the gate of the sheep, and the good shepherd.

There is an array of somewhat similar (yet different) presentations of the metaphorical "I am" sayings, in contrast to John 6:31-71 and John 10:1-18, found in John 8:12 ("I am" the light of the world), John 11:25 ("I am" the resurrection and the life), John 14:6 ("I am" the way and the truth and the life), and John 15:1 ("I am" the true vine).

First (1), there is no preceding parable (that is, a metaphorical story or a proverbial teaching in figure of speech), in an explicit form as noted in John 10:1-5 or John 6:31-34. However, a real-life case (experience as a story) is used to support the self-claim of Jesus. For example, (a) the self-claim of "I am" the light of the world (John 8:12) is clearly substantiated with the story of a man born blind to gain his sight (in John 9) and (b) the self-claim of "I am" the resurrection and the life (John 11:25) is clearly manifested with the dead Lazarus to be resurrected (in John 11).

Second (2), the message of "I am" saying is encountered with various responses and reactions varying from hostility to loyalty (to be accused in John 8:13 or to be affirmed in John 11:27).

Third (3), the discourse in John 8:12-59 is engaged by Jesus and the Jews in hostility and aggression, with the catastrophic outcome to kill Jesus. In contrast, the discourses in John 11, John 14, and John 15 are engaged by Jesus and his disciples, with their faith to be enhanced as a result.

Finally (4), the setting of the discourse in John 8:12-59 is totally open in public. In contrast, the setting of the discourse in John 14–15 is that of intimate and closed fellowship whereas the setting of John 11:25 is in public but the "I am" saying by Jesus is addressed to one person (Martha) in particular.

The message of "I am" the light of the world in John 8:12 has been relatively well-understood by the audience (the Jews) to be challenged and accused of being self-claim (in contrast to John 6:41, 6:52, 6:60, 6:66). The rich

thematic topics in John 8:12-59 are observed with an array of the dualistic (mutually-negating, bipolar) concepts of (a) light versus darkness, (b) life versus death, (c) freedom in the Son versus slavery under the sin, (d) truth versus lie, and (e) God the Father versus Devil the Father.

This concludes a brief survey of the metaphorical "I am" sayings in John. As noted, there are two classes of the metaphorical "I am" sayings in John. The first class consists of the metaphorical "I am" sayings with a preceding metaphorical (or typological) story of which the identity (of the key figure or object) is to be interpreted (or revealed) with "I am" as the key, as noted in John 6:31-34 (with John 6:35-71) and John 10:1-5 (with John 10:6-18). The second class (pattern) consists of the metaphorical "I am" sayings without a preceding metaphorical story. The metaphorical story is not narrated explicitly. However, the story is assumed to be well-known to the audience (as a background theory or a common sense). Therefore, it seems that there is no need for Jesus to repeat the story but to reveal the true identity of the key figure of the well-known story with "I am" as the key.

We note this pattern recurring in John 8:12 ("I am" the light of the world), John 11:25 ("I am" the resurrection and the life), John 14:6 ("I am" the way and the truth and the life), and John 15:1 ("I am" the true vine). All of these keys (or key-figures) are well-known to the audience with their familiarity to the Old Testament stories (in metaphor or in history). Some of the well-known examples of the metaphoric stories or typological figures in the Old Testament with the metaphorical "I am" sayings in John include: (a) the bread of God in John 6:35 with Exodus 16:15, (b) the light of the world in John 8:12 with Psalm 36:9, Isaiah 9:1-3 (also noted in Matthew 4:14-16), or Isaiah 42:6-7, and (c) the good shepherd in John 10:11 with Psalm 23, Isaiah 40:10-11, Jeremiah 23:1-6, Ezekiel 34:11-16, or Zechariah 13:7. Finally the metaphorical "I am" sayings are essentially used in self-reference (coinductive reasoning) where a statement of the metaphorical "I am" saying is said by Jesus in self-reference to himself.

5.2. "I am" In-relationship

One variant lexical pattern of "I am" ($\dot{\epsilon}\gamma\dot{\omega}$ $\epsilon\dot{\iota}\mu$) sayings in John is "I (am) in" ($\dot{\epsilon}\gamma\dot{\omega}$ $\dot{\epsilon}\nu$) with the preposition "in" (without an expected static verb "be"). The lexical pattern is commonly found in John with "the father" as in "I (am) in the father", and used together side by side as the matching pattern of "the father (is) in me" (for example, $\dot{\epsilon}\gamma\dot{\omega}$ $\dot{\epsilon}\nu$ $\tau\tilde{\omega}$ $\pi\alpha\tau\dot{\rho}$ $\dot{\epsilon}\nu$ $\dot{\epsilon}\mu\dot{\omega}$ ($\dot{\omega}$ $\pi\alpha\tau\dot{\rho}$ $\dot{\epsilon}\nu$ $\dot{\epsilon}\mu\dot{\omega}$). This lexical construct is clearly circular with two concepts (two persons) referencing each other (dual-referencing) with "be-in" relationship. Two concepts ("I" and "the father") are connected with a preposition ("in") to create a cycle.

This pair-relationship (of father-son) of circularity (in-relationship) and oneness (one-relationship) is also expressed in John 17:21–23, with the second pair-relationship (of son-disciples), in parallel. The disciples as "one" are to be in the father-son as "one" ($\hat{\epsilon}v$). Based on the in-relationships (in John 14:10, 20), one may note the two circular relationships (consisting of three entities of the Father, the Son, and the disciples) linked with the Son in the center (as a critical connection between two circles) where (a) the Father is in the Son and the Son is in the Father and (b) the Son is in the disciples are in the Son.

There is no explicit expression found in John for the Father "being or to be in" the disciples, or vice versa. In addition, it is "we" (the father and the son) as one to be in "them" (the disciples) as "they" (the disciples) are to be one. Along with "be" verb, the verb "dwell" (or "abide" or "remain" as in $\dot{o} \ \mu \dot{\epsilon} \nu \omega \nu \dot{\epsilon} \nu \dot{\epsilon} \mu \omega \dot{\epsilon} \nu \alpha \dot{\nu} \alpha \ddot{\phi}$ in John 15:5, similarly in John 6:56 and 14:23) is also used for this in-relationship. These textual evidences suggest that the in-relationship and one-relationship of the father-son have been already established, pre-existing, permanent, and intrinsic (cf. John 1:1-3, 18) whereas the in-relationship and oneness of the disciples are yet to be established (or

ongoing to be completed as one flock in John 10:16; 17:20, 22), fulfilled, and conditional (John 14:23; 17:11, 20, 21-23). Further there is a strong connection between the works of Jesus and the pair-relationship of being-one and being-in of the Father and Jesus (the Son) (John 10:25, 37; 14:10, 11).



Figure 1. Two circular in-relationships of the Father-Son and Son-Disciples (John 14:10, 20 and John 17:21-23)

The "I am" in-relationship consists of a pair-concept of two persons, being connected with "be" or "dwell" inrelationships. However, there are a few variations of in-relationship in John. The first variation (John 8:31, 37) consists of the pair-concept of (1) an impersonal object of "my word" (ὁ λόγος ὁ ἐμὸς) and (2) a person of "you" (ὑμεῖς), connected with (3) "dwell" in-relationship (μείνητε ἐν in John 8:31) or "have-place" in-relationship (χωρεĩ ἐν in John 8:37). Here the in-relationship signifies the true discipleship (ἀληθῶς μαθηταί μού in John 8:31). A similar pattern is found in John 15:17 (ἐἀν μείνητε ἐν ἐμοὶ καὶ τὰ ῥήματά μου ἐν ὑμῖν μείνῃ). Another variation (in John 8:44) consists of the pair-concept of (1) "truth" (ἀλήθεια) and (2) a person, connected with (3) "stand" and "be" in-relationships (ἐν τῇ ἀληθεία οὐκ ἔστηκεν, ὅτι οὐκ ἔστιν ἀλήθεια ἐν αὐτῷ).

One intriguing question is: what relationship may exist between "I am" in-relationship and these various other inrelationships. One passage in John 6:56 may provide a hint to solve this question. Anyone (who receives the word of Jesus) metaphorically eats the flesh of Jesus and drinks the blood of Jesus, resulting in the circular in-relationship between Jesus and that person. The metaphor of eating and drinking of Jesus is meant (as implied in John 6:58, 63, 68) to receive (believe) in the word of Jesus which is truth (John 8:46).

Finally there is one more circular relationship worthy to be noted. It is a circular relationship of "love" (in John 14:21, 23, 27, 31; 15:9; 16:27; 17:23) which turns out to be complete (with no missing link) between Jesus (the son), the Father, and the disciple(s) of Jesus.



Figure 2. Circular love-relationships between Jesus, the Father, and the disciple(s) of Jesus in John

6. Conclusion

Current approach and methodology presented in this paper is distinctively computational. The scope of this paper is restricted to the selected examples of biblical paradoxes of circularity in the Bible and "I am" sayings in John. Current working definition of the term "paradox" is "contrary to (common, expected, or accepted) opinion". As noted, this definition is both satisfactory and flexible enough for the purpose and scope of current study, even though it is informal.

In this paper, the new perspective and paradigm of coinductive reasoning and its application to the biblical texts are presented and analyzed. First, a brief survey of the exemplary and landmark examples of biblical paradoxes of circularity is presented and analyzed for their structures and inherent circular, paradoxical, modal, or nonmonotonic characteristics. Some of the examples of biblical paradoxes include: the meaning of the name of God in Exodus 3:14, the Father-Son in-relationship in John 14:10, Liar's Paradox in Titus 1:12, and the paradoxes in Matthew 22:15-46. These landmark examples provide a fair sample and collection of biblical paradoxes to start and form a categorical framework. Various circular relationships are observed at lexical, syntactic, or semantic level, adding further a layer of complexity with negation.

A literary structure of a paradoxical cycle can be constructed with one concept in self-referencing ("I am who I am" in Exodus 3:14), two concepts in mutual-referencing ("I am in the father and the father is in me" in John 14:10), many concepts in a cycle with a directed relationship (lord-servant relationship, from David to his descendants including Christ, back to David in Matthew 22:41–46), and one concept as an element, referring to a set or a group of which the concept is a member ("all Cretans are always liars" by a Cretan prophet, in Titus 1:12). Some distinctive and inherent characteristics of biblical paradoxes are: circular, modal, or nonmonotonic. The current lists are far from being complete, and waiting to be explored, studied and expanded in future study.

Two proof methods in John 8:12-20 are examined and compared. This is a solid landmark example which provides a clear evidence of both inductive reasoning based on the Law and coinductive reasoning based on the (divine) self-testimony, as the proof methods in the Bible. The discovery and presence of coinductive reasoning in John 8:12-20 creates a concrete basis for the critical method of reasoning, further to extend and explore the biblical system of reasoning, its complexity and dynamics, and its related theological concepts and motifs in John. One of the unifying concepts of the Bible, as noted in current study of biblical paradox of circularity, is the concept of secure message and communication in the biblical system, closely related to revelation, prophecy, sign, and other communication devices such as parable and dream-vision.

This observation provides a critical key and new interpretive paradigm to "I am" sayings by Jesus, for selfidentification or self-predication, as being used with or without predicate. Furthermore it is noted that "I am" sayings by Jesus in John 10:1-39 are used to identify the true identity of the gate and the good shepherd in the metaphoric story (figure of speech) of John 10:1-5. With this understanding, it is noted that each predicatemetaphorical "I am" saying by Jesus in John functions as (self-identifying) interpretive key to the true identity of the central symbolic figure as each story being unfolded. Finally various circular relationships with "I am" sayings are

examined and analyzed for their circular constructs and relationships. One classical example in John is the identity of Jesus being in Father (John 14:10) who is in Jesus, presenting a paradox of circular in-relationship. Further "I am" sayings in John are examined in the light of circular in-relationship along with one-relationship of the Father and Jesus (the Son). The pair-relationship (of in-relationship and one-relationship) is also expressed with the disciples, and in-relationship with Holy Spirit. Moreover these metaphorical "I am" sayings in John are used as interpretive key, to understand some of the very difficult sayings of Jesus (for example, "eat my flesh" and "drink my blood" in John 6). A few different types of circular relationships are noted with "the word" or "truth" with the disciple(s), and "love" which is complete (as all the relational links between Jesus, the Father, and the disciples are expressed).

The current approach with coinductive reasoning provides a promising prospective and results for many of the classical problems in biblical paradox. It does not solve all the problems but very promising. Some of the confusions, the failures, the misunderstandings, the difficulties with biblical paradox in the past are now well-understood and resolved through coinductive reasoning. This is the author's hope to bring a renewed interest, understanding, and excitement toward the study of biblical paradox in the dawn of the 21st century.

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