

# ARTICLES

## PARADIGM AND FALSIFICATION: TOOLS IN A SEARCH FOR TRUTH

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### WHAT THIS ARTICLE IS ABOUT

*In the 1960s Thomas Kuhn and Karl Popper became two of the best-known philosophers of science. Kuhn stressed “paradigm” and Popper “falsification” as important principles that influence the practice of science. The purpose here is not to analyze whether they are correct, but rather to see how we might best profit from these two principles.*

*The idea of paradigm is that a group of people are united in subscribing strongly (often without realizing it) to a certain set of understandings of some area of science. Accordingly, they can progress further in research without having to start all over making the basic discoveries.*

*The idea of falsification is that one should not accept a new finding uncritically, but should do one’s best to devise experiments to discredit (falsify) it; that which survives the hardest tests is taken as the closest to truth.*

*Three conclusions are drawn here:*

- a. The paradigm concept is useful in assuring efficiency of research — the framework is already built. But there should also be heavy emphasis on an alternative-hypothesis approach, in the hope that it might foster some openness even to an alternative-paradigm approach.*
- b. The falsification concept is useful in assuring rigor in research — an attempt to falsify a conclusion is a real test of it. It can increase the quality of evidence.*
- c. Sufficient higher-quality evidences could help choose between whole paradigms — a most difficult but important task.*

*Finally, applications to religion are proposed (Appendices).*

## INTRODUCTION

In the 1950s while a graduate student at Stanford University, I was impressed by some guest lectures by William Pollard. He was both a practicing physicist (research and teaching) and a practicing Christian clergyman. His thesis was that to be a true physicist, one had to “enter the community” of physicists. Sometimes he would receive crank letters (for example, proposing a new perpetual motion machine) from people who obviously had not entered the community. Most of his students did not enter either, but occasionally one would catch the light and start going all out for physics (not grades).

Likewise Pollard said that to truly evaluate Christianity, a person would have to enter the community of Christians; short of this, even one claiming Christianity would grossly misrepresent it both personally and to others. I did not know it then, but came later to realize that these lectures had effectively introduced me to the concept of “paradigm,” the first of the two main topics of this essay.

In 1965 a classic paper (Chamberlin 1890) on multiple hypotheses was republished. It showed the enormous value (though involving *hard* work) of setting up alternative explanations. Again, only later did I realize that this prepared me to appreciate “falsification,” the other main topic here.

Two of the most influential philosophers of science in recent years have been Thomas Kuhn and Karl Popper, as reflected in Kuhn’s *The Structure of Scientific Revolutions* (1962), and Popper’s *The Logic of Scientific Discovery* (1959 English translation). This is not to say that they have been universally accepted (cf. Hacking 1983, Lipton 1993); but rather that the contributions are important enough that one should be acquainted with them.

My purpose here is to outline these contributions as stated in the classic books cited above, then to consider how they might best promote understanding and advancement in science, and in religion as well. (As a specific example of the latter, the Bible will be referenced in a series of notes keyed to the text [Appendix I].)

Each subtopic under **KUHN AND PARADIGM** below starts with an abstract (on green background) of Kuhn’s position, keyed to page references in his book; this is usually followed by possible implications as I see them for the study of science and/or religion. Then the same is done under **POPPER AND FALSIFICATION**.

## KUHN AND PARADIGM

### Definition

According to Kuhn, “normal science” means research firmly based on past achievement which, for some particular scientific community, supplies the foundation for its further practice. The closely related term “paradigm” is used for achievement both (a) unprecedented enough to attract an enduring group of adherents away from competing modes of scientific activity; and (b) open-ended enough to leave all sorts of problems for the redefined group of practitioners to resolve.

In other words, a paradigm represents a particular, coherent tradition of scientific research. People with research based on a shared paradigm are committed to the same rules and standards for scientific practice. (p 10-11)

### Advantages

Therefore a paradigm approach makes for great efficiency. It ends having to constantly reiterate the fundamentals. Instead, one can begin where the textbook leaves off.

It inspires a confidence that this is the way to go, encouraging more precise, knowledgeable, or consuming work.

Its high focus compels investigation of some part of nature in a detail or depth otherwise unimaginable. Problems are solved that would scarcely be imagined possible — that would not even have been undertaken without commitment to the paradigm. (p 18,20,24,25)

Because working within a paradigm provides such a stable base, one can study interrelations within the field better, and there can be greater harmony among workers in different subfields. It is easier to recognize where there is need for more study or better understanding.

In sum, there is greater progress not only because of the intense focus provided, but also because of the basic consensus within the committed group.

If the paradigm concept plays such a role in the advancement of science, it should be more often recognized for what it is. One possible example, where there is now real polarization, relates to the abrupt vs gradual origin of the major diversity in living things (and of astronomical entities). To even properly evaluate the less popular abrupt-origin paradigm would require a much more intense, long-term effort than is usually given — a commitment that might get a person, in a sense, “inside” the paradigm. But that is more demanding (or distracting) than many people would want to consider.

## Disadvantages

A paradigm could be seen as an attempt to force nature into a relatively inflexible box, blinding one to other possibilities. It becomes the very criterion for identification of problems assumed to have solutions. Other problems are rejected, for example, as metaphysical [*“metaphysics” is that which is untestable, or at least has not been tested — see FALSIFICATION section below*]. In fact, it may be difficult even to invent certain concepts that another paradigm would suggest.

Because discovery involves fact plus assimilation to theory, it is a process and takes time. Therefore one should expect acceptance of a new paradigm to take a great amount of time and effort. (p 7,24, 37,55,142-143)

One of the great advantages of a paradigm approach, the extremely intense focus involved, *could* also be a disadvantage:

1. It might delay consideration of a valuable new paradigm.
2. It could discourage use of another paradigm as a valuable source of ideas.
3. Finally, a possible cost of research that follows a paradigm pattern is being less prepared for the *really* innovative.

## Relation Between Paradigm and Textbook

By intent, by the very definition of paradigm, science textbooks (and popularizations and philosophical works modeled on them) are severely circumscribed. Further, they not only ignore anomalies or other paradigms, but truncate or distort history, and hence are deceptive. Even scientists looking back at their own research tend to make it look linear or cumulative toward what they finally realized was the answer. And graduate programs often emphasize textbooks to the neglect of original literature.

Such circumscription is good insofar as it facilitates the advantages of a paradigm approach, such as the utmost efficiency in preparing for a highly focused, unified life of research. But such training is not well designed to produce people likely to discover such a fresh approach as that involved in a new paradigm. (p 136-141,165-166)

It is important to recognize how circumscribed, and in fact deceptive, textbooks (and derived popularizations and philosophical works) can be. Authors themselves may unwittingly fail to understand how paradigm-bound they are.

A more healthy perspective for present-day science would come from a better analysis of history, of which Kuhn gives many examples. He

outlines the tortuous pathway by which many major “discoveries” were actually made. Such analysis improves preparation for being truly scientific.

This is not to say that textbooks should not be written within a particular paradigm. But it does call for choosing or developing textbooks (and syllabi) that at least include alternative hypotheses, are less dogmatic, and are open to more than one world view. Further, more assignments and recitations should be from the original literature.

Our own study or research should incorporate an alternative-hypothesis approach — and even an alternative-*paradigm* approach — more often. And we might more judiciously choose books for student (and faculty) reading lists.

The next section asks explicitly just how changes from one paradigm to another occur.

### How Do Revolutions Come About?

Scientists living in different worlds (that is, paradigms) may have different perceptions from a set of observations; so “before they can hope to communicate fully, one group or the other must experience the conversion that we have been calling a paradigm shift.” In fact, “to desert the paradigm is to cease practicing the science it defines.”

There is such **heavy** constraint even on what one sees, that it is most difficult to change paradigms. Change requires both intense concentration on crisis-provoking problems, and people so young or new to the field that they are less committed to the rules of the prevailing paradigm.

Competition between segments of the science community is the only historical process that results in the rejection of one accepted theory or the adoption of another.

It is most important that there be a legitimate claim that the new paradigm solves critical problems of the old, as well as a demonstration of crucial experiments that sharply discriminate the new from the old. To embrace the new at an early stage requires a faith that it will succeed with the many large problems confronted, in defiance of the problem-solving ability of the old. (p 8,34,62-64,144,150,153,158)

Such use of discriminating experiments suggests at least a limited “weight-of-evidence” basis for commitment\* to the new paradigm. This freedom in turn inspires yet further investigation, and a consequent increase or decrease in weight of evidence.

We should expect another paradigm to seem peculiar. If some openness to a new one is important for fundamental progress, there should be

deliberate training for it: stress a multiple-hypothesis approach even in current study or research; concentrate on crisis-provoking problems of the prevailing paradigm and how the new one might solve them; include experiments that clearly discriminate the two.

Ideally there should also be a real “live-in” trial of another paradigm — “entering the community of believers,” as Pollard once said (see Introduction). If this seems impossible, at least live with persons who *are* fully within it; that is, spend much time in close acquaintance with them and their work. Favorably consider their arguments, giving as coherent a picture of phenomena as possible through their eyes. This would at least contribute information toward a sound decision.

More evidence should be obtained by thoroughly interviewing those who had lived (grown up?) as genuine supporters of one paradigm, but had decisively changed to another. Their unusual experience would provide a retrospective “live-in” test, with the number of replicates being the number of such people found.

Of final importance is a *weight-of-evidence* decision (as opposed to expecting final “*proof*”).

## POPPER AND FALSIFICATION

We have seen the value of Kuhn’s paradigm concept, emphasizing focus on one belief in common in order to make the most progress. Popper emphasizes another aspect, a scientific method that tests with enough rigor to avoid undue bias; thus it may safely test many alternative ideas, even those metaphysical in origin.

### Problem of Knowing

*Uninterpreted* sense experiences are not in themselves science. A common practice of science (called “*inductive*” inference) is to pass from particular statements, such as accounts of observations or experiments, to universal statements, such as hypotheses or theories. But suppose an exception turns up in such a “universal” statement. This is the problem of knowing something “by experience” (see next paragraph). So Popper recommends a directly opposite method, “*deductive*” testing — a hypothesis can only be empirically (i. e.,

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\* “Faith is often used for belief *not* based on evidence. But why not also for belief that *is* based on evidence, as just illustrated in Kuhn? Thus faith could relate vertically to evidence, building with or on it, rather than standing alongside (as if evidence were “for science” but faith “for religion”).

experimentally) *tested* (vs proved), and only *after* it has been advanced. (p 27,28,30,39,280)

### “Falsification” Method

A deduction is drawn from the new hypothesis or theory, then tested: if the deduction is *falsified*, the new theory is also falsified; if *verified*, the theory has for the time being passed the test. (So long as it withstands detailed, severe tests, it is said to be corroborated by past experience.) The falsification method thus singles out a scientific system in the negative sense — to be valid it must be open to *refutation* by experience. (p 32-33,41)

### Advantages

The method is a means of selecting the very best of hypotheses or theories by exposing them all to the fiercest struggle for survival.

The results provide evidence — an *objective* experience — on which we can decide; rather than just a private *subjective* experience or conviction, which is not open to someone else. There is then a basis for coming to an agreement among ourselves about what is the closest to truth.

The greater the amount of information a universal statement conveys, the more likely it will clash with possible particular statements. That is, the statement is testable more explicitly or in more ways, and hence has survived more tests. To put it another way, the more a law of nature prohibits, the more it says. (p 41,42,44)

The falsification approach should especially appeal to all who are the most interested in truth.

- It provides a methodology for arriving at the best possible understanding, and thus progressing toward ultimate truth.
- It encourages focusing on evidence, for example, via use of multiple hypotheses.
- It facilitates mutual sharing of evidence or experience.
- It discourages hanging on to a conclusion or interpretation because of personal bias. In other words, it forces a rigorous look at traditional or pet interpretations.
- In sum, it provides an ever more solid basis for conviction or action.

### Disadvantages

There are no ultimate statements. That is, testability always implies that, from statements which survive testing, further testable state-

ments can be deduced. But if basic statements themselves, in turn, are to be testable, there can be no statements of final truth in science (whereas *inductive* logic says all statements of empirical [*experimental/observational*] science can be either verified or falsified). However, this does not demand that every scientific statement be tested before acceptance; only that it be *capable* of being tested. (p 40,47,48)

The fact that there are no ultimate statements with this method (contrary to the thought of inductive science) might seem a disadvantage. But in a way, it could really be an *advantage*: it points out the importance of going beyond falsification testing. That is, if there are enough items in a system or paradigm that can be tested via falsification, the results could encourage or discourage accepting the whole system via confidence based on the *weight* of evidence (see Table 1). This more secure basis for early decision should apply even to systems of metaphysical origin, *provided, of course, that the above conditions could be met.*

### Empiricism vs Metaphysics

Empirical science is that which has stood up to testing; metaphysics is that which has not been tested, or even is in principle unrepeatable. Our business is not to overthrow metaphysics; but rather, to distinguish between it and science. Empirical science must represent the

**TABLE 1. Possible relationship between falsification and weight-of-evidence testing; and between metaphysics and science ideas (or whole paradigms) with respect to testing.**

SOURCE	TESTABLE VIA FALSIFICATION?	RESULT	TESTABLE VIA WEIGHT OF EVIDENCE?	RESULT
Metaphysics idea	Yes No	Science Meta- physics		
Science idea	Yes No	Science Meta- physics		
Metaphysics paradigm			If enough falsifiable components	Basis for decision
Science paradigm			If enough falsifiable components	Basis for decision



world of possible *experience* — it has stood up to tests by the deductive (falsification) method. The *source* of a new idea or theory is irrelevant to the logic of scientific knowledge; so we distinguish sharply between the process of conceiving a new idea, and the method or results of examining it logically.

Only in subjective experiences of conviction or faith can we be “absolutely certain.” Science cannot decide a controversy concerning unrepeatable events: this would be a metaphysical controversy. We may be utterly convinced of truth, certain of the evidence of our perceptions, overwhelmed by the intensity of our experience, with every doubt seeming absurd — but none of this is reason for *science* to accept.

We have a metaphysical faith in the existence of regularities in our world (though we do not argue for or against such metaphysical questions), without which practical action is hardly conceivable. Our guesses are guided by an unscientific, metaphysical (though biologically explicable) faith in laws or regularities we can uncover. Bold ideas, unjustified anticipations, speculative thought — these are our only means for interpreting nature; but if we are unwilling to expose our ideas to refutation, we do not take part in science. (p 30,31,37, 46,252-3,278,280)

To carefully distinguish between empiricism and metaphysics, then, could lead to greater clarity in science, and in religion as well. Further, giving metaphysics proper place might enlarge the source of ideas and alternative hypotheses, thus advancing science.

### **Danger of Explaining Away Falsification**

In a time of crisis, new experiments which we interpret as falsifications are often explained away by questioning adequate mastery of the system, or the reliability or objectivity of the scientist; or by ad hoc auxiliary hypotheses. But that makes it impossible to divide theories on whether they are falsifiable or not. *We* hope to be helped by a new understanding, and are much interested in the falsifying experiment. So be cautious about such explaining away to save a system if it is threatened. If we find such a “rescued” system, it should be tested afresh. (p 80-81,82)

If apparent falsifications are explained away too fast, we may lose the very advantages of this approach (see “**Advantages**” above). (It might be like the saying, “My father’s church was good enough for him; it is good enough for me.”) Recognize anomalies, and if serious enough, be willing to change theory. It is here that weight of evidence is so important.

## Real Quest for Truth

It is not the *possession* of knowledge, of irrefutable truth, that makes a scientist; rather, it is the persistent, critical quest for truth. This search is carefully controlled by tests — not to defend, or prove right, but to try to overthrow. Thus it is a process of ever discovering new, deeper, and more general problems, of subjecting ever tentative answers to ever renewed and more rigorous tests. (p 279,281)

That, in turn, encourages conviction or action. The more something is defined by what can be rigorously tested, the more dependable the evidence; and it is the *weight of evidence* that enables us to decide or act (as contrasted with absolute certainty of final truth).

### SUMMARY OF IMPLICATIONS FOR UNDERSTANDING OR APPLICATION

The falsification philosophy of science draws deductions from a hypothesis, theory, or world view (paradigm) and deliberately tries to falsify them. In fact, if an idea is not capable of being falsified, it is not considered as a part of science. This is rigorous testing, and those ideas or deductions that survive are more dependable than others.

This should make it important for advancement in especially controversial fields of science (or religion). Then one could utilize the weight of evidence from falsification testing, as a basis for firm conclusions about a paradigm, or how to live.

### COULD PARADIGM AND FALSIFICATION CONCEPTS COMPLEMENT EACH OTHER?

Could these two concepts be put together? We have seen how useful a paradigm can be toward the intense focus necessary for real advances. In fact, failure to enter a paradigm could mean a great loss.

On the other hand, complete immersion in a paradigm could blind one to the virtues of totally different approaches, or to possible metaphysical truth. Here, falsification testing can be especially useful, because it helps protect against undue bias: what tests something better than deliberately arguing against it?

Further, ideas from both metaphysics and science sources can be tested, since testability of an idea is more important than its source (Table 1). With the high quality of evidence this provides, the weight of evidence becomes more plausible as a basis for decision for (or against) a whole paradigm.

## **CONCLUSION ON THE USE OF FALSIFICATION IN PARADIGM RESEARCH**

A metaphysical idea is one which is either untested or untestable. Whether ideas are disciplined or wild or metaphysical, if they survive falsification testing they provide evidence. Weight-of-evidence testing asks if the crucial falsification experiments, taken as a whole, heavily support one theory or paradigm over another; the outcome could provide confidence for acceptance (or denial) — in other words, a sufficiently secure understanding of nature for real-life usefulness.

Thus things can be checked more rigorously, as a basis for pleasure or practical application. Further, while much of nature (for example, mind or beauty or free will) is hardly subject to a falsification approach, and hence by definition is metaphysical, the untestable part *could* nevertheless be accepted (or rejected) on the basis of the weight of evidence for a whole paradigm.

The merit of this is that even though some body of belief (internally coherent world view or paradigm) is seemingly beyond test, that is not necessarily so. The weight-of-evidence method could reduce the tendency to reject a whole paradigm just because not everything can be tested *directly*.

This method could open up a larger realm of nature or religion, or illuminate it in a new way — both as source of ideas to test, and source of a whole body of belief to test. It could facilitate intelligent (vs blind) choice of a belief system that would bring ultimate meaning to life. This might be of special help (1) to those who treasure an *evidence* (vs simply a “deep-down-in-my-heart-feeling”) approach to important things; or (2) to those who might see only a skeptical or cynical way out.

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## APPENDICES: POSSIBLE APPLICATION TO RELIGION RESEARCH

### APPENDIX I. NOTES ILLUSTRATING SPECIAL TRIAL

Notes 1-6 below could be thought of as “footnotes” from the main text of the paper, as one trial of its concepts in a *non-science* area — specifically Bible research or belief. A (modified) *Text* paragraph is given first, followed by the *Note* springing from it.

#### #1

*Text (p 13)*: The way Kuhn suggests the value of discriminating experiments in moving from one paradigm to another suggests at least a limited “weight-of-evidence” basis for commitment to the new. This in turn inspires yet further investigation, and hence increase or decrease in the weight of evidence.

*Note*: By analogy, the same approach could be valid for religion, which should be brought to such a test — including religion “experiments.” *Personal* religious living experiments test for oneself, but not for another (except as one replicate). Fortunately there are enough Bible experiences to serve as replicates for use in the more general test suggested here (Appendix III).

#### #2

*Text (p 15)*: If there are enough items in a system or paradigm that can be tested via falsification, the results could encourage or discourage accepting the whole system via confidence based on the *weight* of evidence (see Table 1). This more secure basis for an early decision should apply even to metaphysical systems, *provided*, of course, that the same conditions could be met.

*Note*: That in turn might open up the whole area of revelation in such a system. For example, the Bible could become not only a metaphysical source of hypotheses to be tested [via falsification approach]; but also another testable source of a body of truth.

#### #3

*Text (p 16)*: To carefully distinguish between empiricism and metaphysics could lead to greater clarity in science, and in religion as well. Further, giving metaphysics a place (that is, exposing some of its ideas to falsification testing)

might enlarge the source of ideas and alternative hypotheses, thus advancing science.

*Note:* Could it provide for inclusion of some hypotheses suggested in the Bible, which might on testing turn out to be valid additions to science itself?. With respect to religion, the careful distinction between metaphysics and empiricism allows two major premises: the Bible as a source of *revelation*, but also as a source of *evidence*. This distinction would invite weight-of-evidence study with a falsification approach; *if* this yields a high *positive* weight, one could then appreciate the Bible in a new way.

#### #4

*Text (p 17):* The process of subjecting ever-tentative answers to renewed and more rigorous tests encourages conviction or action. The more something is defined by what can be rigorously tested, the more dependable the evidence; and it is the *weight of evidence* that enables us to decide or act (as contrasted with absolute certainty of final truth).

*Note:* Such dependable evidence is a superior basis for evaluating the claim that God's revelation of truth goes beyond what finite science in itself can discover. So one might argue for: (1) testing as many as possible of the Bible's statements or ideas (including religion "experiments," as well as tests against archaeology, internal harmony, etc), thus moving any that might be falsifiable into the realm of science; (2) via the weight of evidence thus accumulated, deciding with respect to the rest of Bible statements (which may not be subject to falsification), and hence the Bible paradigm itself; (3) acting on that decision.

#### #5

*Text (p 18):* Weight-of-evidence testing asks if the crucial falsification experiments, taken as a whole, heavily support one theory or paradigm over another. The outcome could provide confidence for acceptance (or denial) — and thus a secure enough understanding of **nature** for real-life usefulness. It would be a firmer basis for pleasure or application. Further, while much of **nature** (for example, mind or beauty or free will) is hardly subject to a falsification approach, and hence by definition is metaphysical, the untestable part *could* nevertheless be accepted or rejected on the basis of the weight of evidence for a whole paradigm.

*Note:* For specific application here, replace each "**nature**" with "the Bible" in the above text paragraph.

#### #6

*Text (p 19):* The weight-of-evidence method could open up a larger realm of nature or religion — whether as source of ideas, or of a whole body of belief,

to test. It could facilitate intelligent (vs blind) choice of a belief system that would bring ultimate meaning to life.

*Notes:* (1) The importance of a rational way to include ultimate meanings like beauty or moral responsibility, urges a search for the best paradigm that incorporates them. The weight-of-evidence method of evaluation proposed here should help. (2) If the Bible paradigm includes origin by creation, one might consider the possibility a) that things like moral absolutes are built into man's very physical being, and/or b) that they are continually imparted. (3) Refusing to choose short of certainty, is morally passive "in a world desperate for moral courage."<sup>1</sup> Here lies the value of doing what truly good science does: choose and act on the best supported (vs absolutely certain) position.

## APPENDIX II. HASEL'S ANALYSIS OF KUHN'S PARADIGM PHILOSOPHY

The aim in my present paper was **not** to directly evaluate Kuhn's concept per se, but rather to see how the paradigm idea might be useful (or detrimental) in science or religion research. Hasel (1992),<sup>2</sup> on the other hand, **does** examine Kuhn's philosophical contributions and limitations.

### Limitations Suggested by Hasel

Hasel points out the value of Kuhn's paradigms. But he also sees problems: (1) For judging paradigms, *there is no standard higher than the assent of the relevant community*, and hence (2) *no way to assure getting closer to ultimate truth via changing paradigms*.

Kuhn assumes naturalistic metaphysics, thus (3) *limiting the source of ideas to test*. But God can act in *supernatural* ways, too. A Christian paradigm accepts God, through revelation as given in the Bible along with the historical evidence also given there.

Kuhn subscribes to the common belief of evolutionary origin (see near the end of his last chapter). *Evolutionary logic* (interpreting the past by comparison with the present, rather than by actual history) (4) *undermines the normative use of history* (use of history to establish a norm or standard). But the Bible is based on the interaction of God with history.

### How Might These Limitations Be Counteracted?

Granting such problems, how could one still profit from the paradigm concept? The main body of my paper suggests (1) *an external standard* (that is, a criterion for evaluation) for paradigms, namely, "weight of evidence." Further, it suggests Popper's falsification approach as a rigorous way to improve the quality of evidences making up that weight.

For Popper, any metaphysical (including supernatural) idea is admissible as (3) *a source of ideas or hypotheses (if falsifiable)*. Hence the Bible could be included as a source, much of it testable. And if it survives sufficient falsification tests to build up a high weight of evidence,<sup>3</sup> the Bible could become an external standard — rather than simply the internal assent of a particular human community. (This is not to ignore a role of direct divine guidance, *not considered here*.)

Thus by weight of evidence one could choose paradigms (for example, one consistent with the Bible) by Kuhn's (paradigm/scientific revolution) method. They would be paradigms with more than science sources of truth considered, opening (2) *the way to get closer to truth* via changing paradigms. Further, one could use this method to test the creation-Flood premise of the Bible, instead of an evolution premise, thus (4) *making normative use of the history* in the Bible.

In summary, a *comprehensive use of evidence* could facilitate

- making a choice between a naturalistic and a naturalistic + supernaturalistic paradigm; and/or
- using the best of paradigm and falsification concepts for their value in improving science or religion. Too often has religion been thought to be immune from evidence.

### APPENDIX III. TRIAL OF A TEST WITHIN A BIBLE PARADIGM (New American Standard Bible used for all Bible texts)

#### Rationale

How might one even begin to evaluate a belief system (here, a Bible paradigm) that is often considered too metaphysical for test? As often suggested above (see, for example, Table 1), a paradigm might be evaluated by the proportion of its hypotheses which pass falsification tests (that is, by *weight of evidence*). Another possibility would be to check for *internal consistency* — the *only* way the paradigm is evaluated here.

But there are different Bible paradigms. One that takes the Bible more directly than others would lend itself to more direct test, and is used here. Significantly, the Bible itself invites this: “Test Me now in this [promised blessing]” (Mal 3:10). “Examine everything carefully” (1 Thes 5:20-21).

This particular trial involved Bible instructions on *how to live*: did “prosperity” truly depend on following the Bible God? Replicates were persons who *did* vs those who *did not*.

For such an internal-consistency test, one must enter into the paradigm enough to consider the Bible dependable in its factual details. Faults of both good and bad people are expressed more frankly than in most biographies, thus facilitating the test.

## Design of the Test

### *Hypotheses*

A basic hypothesis central to this evaluation is that people truly committed to the God of the Bible “prospered” more than those not so committed. The hypothesis (divided into two, “material” and “spiritual” prosperity) would be falsified if committed persons failed to prosper (or if *uncommitted did* prosper). The outcome of the test might also be used to examine the question of universal application across the vast expanse of history or culture (for example, is the God of the New Testament the same as the God of the Old? or from one civilization to another?)

### *Variables (see also Special Notes below)*

*Material Prosperity* (dependent variable): Idea of pleasure from physical good things, or honor or position conferred by other people, whether eternal or not.

*Spiritual Prosperity* (dependent variable): Idea of ultimate or eternal well-being: was person translated (like Elijah) or resurrected (like Moses) to heaven? included in “honor roll” list of Ez 14:20 or Heb 11?

*Commitment* (independent variable): show active interest in learning more about God? follow instruction with respect to accepting/obeying Him? repent after failures in this? In sum, *ultimate* commitment is what the Bible sees as important. As for other variables, objectivity here required strict limitation to evaluations or biographical details actually given in the Bible.

### *Replicates*

Persons with enough Bible information given, and that lend themselves to direct pairing with others. Such pairing reduces observer bias, by using all (with enough data) in a given sub-group, rather than just the first that happened to be chosen. And if more analysis were desirable, matching within these subgroups could reduce differences due to other than the *primary* variables of interest. Table 2 gives the basis of grouping for Tables 3 and 4.

## **Are Bible Records Biased Toward Examples that Meet Prediction?**

Since the very nature of Kuhn’s paradigm may include bias within the community, how about bias in Bible authorship?

That would seem unlikely because frankness itself is so typical of Bible accounts mentioning bad as well as good traits of some of the best people. Further, the paradigm frankly pictures a God who greatly respects free choice, even though at the risk of being misunderstood (for example, as being easy on evil).

But even if the Bible were biased toward cases where outcome fitted prediction, the biographical examples were by so many different *authors*, in such different *cultures* or *circumstances*, and over so many *centuries* (more than a



millennium) that we still might expect significant discord. So a test of internal harmony is in this *second* sense independently valuable.

## **Special Notes on the Bible Paradigm**

### ***Promises and Conditions of Prosperity***

Nowhere are these better laid out than in Deuteronomy 28.

But that chapter at least partly concerns a nation as a whole (v 1,9,13). The following texts clearly refer to *individuals*:

*Honor your father and your mother that your days may be prolonged in the land which...God gives you (Ex 20:12).*

*If you [Solomon] will walk before Me...in integrity..., doing.. all...I have commanded,...then I will establish.. your kingdom (I Kgs 9:4-7).*

*How blessed is the man who does not walk in the counsel of the wicked,...nor sit in the seat of scoffers! But his delight is in the law of the Lord...in whatever he does, he prospers. The wicked are not so, but they are like chaff which the wind drives away (Ps 1:1-6).*

*Because he has loved Me,...I will deliver him....He will call upon Me, and I will answer him; I will be with him in trouble (Ps 91:14-16).*

*God so loved the world that He gave His only begotten Son, that whoever believes in Him should...have eternal life (Jn 3:16).*

*Not every one who says to Me, 'Lord, Lord,' will enter the kingdom of heaven; but he who does the will of My Father... Many will say ... 'Lord, did we not prophesy in Your name?' ...I will declare to them, 'I never knew you; depart from Me, you who practice lawlessness'.... Every one who hears these words of Mine, and acts upon them, may be compared to a wise man, who built his house upon the rock....The floods...burst against that house; and yet it did not fall....Every one who hears these words...and does not act upon them, will be like a foolish man, who built his house upon the sand....Great was its fall (Mt 7:21-27).*

Note how opposite are the promised results. A fundamental condition is seen to be *commitment* for or against God: He strongly supports “those whose hearts are completely His” (2 Chr 16:9). David made gross mistakes, but always repented and would talk with God about it. (But Saul, the preceding king of Israel, justified himself.) Peter denied Jesus, against previous promise; but tearfully repented. (But Judas who long planned to betray Jesus, hung himself afterward.) (See Tables 3 & 4 below.)

### **Seeming Lack of Fulfillment: Material vs Spiritual Prosperity**

A test of internal harmony of a paradigm would require use of the Bible's *own* criteria for prosperity. In accord with those listed above, the Bible portrays a law-abiding universe:

**TABLE 2. Replicates used in Tables 3 and 4, to suggest relationship within each group of 2 or 3 persons — for example, same family, same time and/or place in history, similar experience, mutual contact.**

CAIN/ABEL: Brothers in direct contact.

NOAH/Any one of REST OF WORLD: They were exposed to his Flood prophecy for 120 years.

SARAH/LOT'S WIFE: Wife of Abraham/wife of his nephew & close associate.  
JACOB/ESAU: Twin brothers in direct contact early & late in life.

JOSEPH/JUDAH: Brothers in direct contact early & late in life.

JOB/JOB'S FRIENDS: In direct conversational contact.

JOCHEBED/RAHAB: Mother of leader to Canaan/Canaanite woman who helped Israel enter there.

PHARAOH/MOSES/BALAAM: Moses had been heir to throne of Egypt & Pharaoh was in fact king at time of their direct confrontations; later Balaam was hired to curse very people Moses led out of Egypt.

2 SPIES (either one)/OTHER 10 SPIES (any one): The 12 (1 from each tribe) went on a 40-day trip to spy out Canaan.

SAUL/DAVID: 1st & 2nd kings of Israel, in much mutual contact.

SOLOMON/ABSALOM: Brothers; first was to be king after his father David, second tried to become king instead.

JEZEBEL/AHAB/ELIJAH: King Ahab & wife Jezebel were repeatedly warned by prophet Elijah.

DANIEL/BELSHAZZAR: Daniel had been prime minister of Babylon, later was in direct mutual contact with King Belshazzar.

JOHN THE BAPTIST/HEROD ANTIPAS/HEROD AGRIPPA: Antipas & John, as ruler & subject, had direct encounters with each other; Agrippa was nephew of Antipas & replaced him as ruler.

THIEF/PILATE/CAIAPHAS: All in direct conversational contact with Jesus at time of crucifixion.

JOHN/PETER/JUDAS: Each was one of Jesus' 12 disciples; John & Peter both were Bible writers.

*'Let there be light';...God saw that the light was good.... The heavens are telling of the glory of God....The law of the Lord is perfect....I am fearfully and wonderfully made....He declared to you His...ten commandments (Gn 1:3-4; Ps 19:1,7; 139:14; Dt 4:13).*

People would function superbly in accord with these laws, but were given complete freedom to choose for or against:

*I have set before you life and death.... So choose life ... by loving the Lord ..., obeying ..., holding fast to Him. If it is disagreeable ... to serve the Lord, choose for yourselves today whom you will serve.*

*If the Lord is God, follow Him; but if Baal, follow him (Dt 30:19-20; Jos 24:15; 1 Kgs 18:21).*

Central to the paradigm is seen a great conflict between God and His enemies who (in spite of repeated appeals) turn Him down. *Material* prosperity alone would be an insufficient criterion of the validity of Bible promises. This is made clear by one struggling with the problem:

*I was envious...as I saw the prosperity of the wicked...They are not in trouble as other men...Always at ease, they have increased in wealth...When I pondered to understand..., it was troublesome in my sight until I...perceived their end...utterly swept away by sudden terrors!...Those who are far from Thee will perish...Be not envious toward wrongdoers, for they will...be cut off, but those who wait for the Lord...will inherit the land...Better is the little of the righteous than the abundance of many wicked (Ps 37:1-2,9,16; 73:3,5,12,16-17,19,27).*

Thus material prosperity could be minimal or delayed, but *spiritual* (ultimate, eternal) prosperity could begin here and now.

A primary reason for this is that Satan deliberately brings bad things on good people (sometimes good things on bad people), as far as permitted: “The Lord said to Satan, ‘...All that [Job] has is in your power, only do not put forth your hand on him.’ So Satan killed his herds, servants, and children” (Jb 1:12-19).

God, on the other hand, brings good things: “The Lord restored the fortunes of Job,...increased all that Job had twofold” (42:10).

Similarly, Jesus said, “you will be hated by all on account of My name, but it is the one who has endured to the end who will be saved” (Mt 10:22). One who goes all out for Him will receive many things now, *but* “along with persecutions; and in the world to come, eternal life” (Mk 10:29-30).

*These died...without receiving the promises, but...having welcomed them from a distance, and having confessed that they were...exiles on the earth..., seeking...a [heavenly] country (Heb 11:13-16).*

They were even willing to do without material prosperity in order to gain spiritual prosperity.

## **Results**

The Bible data (with text sources) are tabulated for the variables (across the top margin) and replicate persons (down the left margin) in Table 3 following.

## **Conclusions from the Test Results**

See Table 4 for analysis of Table 3. Note that some of the positive/negative decisions in Table 4 were limited by amount or type of data; and further, that

**TABLE 3. This listing shows just the first two and last two of the 37 individuals analyzed, to illustrate the method used. Commitment: as shown by fundamental direction of loyalty to or against God. Material Prosperity: in present temporary 'secular' sense. Spiritual Prosperity: in eternal sense, whether actually in present time, or after a resurrection; recognized by personal indication of relation to God, or by evaluation by Jesus or others.**

			NT = New Testament
	<b>COMMITMENT</b>	<b>MATERIAL PROSPERITY</b>	<b>SPIRITUAL PROSPERITY</b>
CAIN	Counterfeit offering angry at God; killed brother; no repentance (Gn 4:5-10, 13-14)	Sad when offering not; accepted; ground cursed; so harder work; fear of murder	God refused offering; condemned when rejected plea; NT warning (Gn 4:5-12; 1 Jn 3:12; Jude 11)
ABEL	By faith gave proper offering (Gn 4:4; Heb 11:4)	Killed (Gn 4:8; Mt 23:35)	God accepted offering; Jesus called righteous; Heb 11 honor roll (Gn 4:4; Mt 23:35; Heb 11:4)
PETER	Left all to follow Jesus; made impulsive mistakes; denied Him but repented in sorrow; boldly defended Him; rebuked by Paul; looked to new earth (Mt 4:29-31; 16:21-23; 26:69-75; Mk 14:37; Lk 5:11; Jn 6:68; 18:10-11; 21:15-22; Acts 3:12-26; 5:29-32; Gal 2:11-14; 2 Pt 3:13)	Given great hauls of fish; got to see Moses & Elijah; jailed; killed, as foretold by Jesus (& described in secular history) (Mt 17:1-4; Lk 5:9-10; Jn 21:6, 18-19; Acts 4:3; 2 Pt 1:14)	Give miraculous power; Bible writer; enjoyed assurance of Jesus (Acts 3:6,12; 9:33-41; 1 Pt 1:1; 2 Pt 1:1, 16-19)
JUDAS	Stole funds; under Satan, betrayed Jesus; admitted guilt; suicide instead of repenting (Mt 27:3-5; Lk 22:3-6; Jn 12:6; Acts 1:16-18)	Given special place as treasurer for disciples; hanged himself (Mt 27:5; Jn 13:29)	Agony from betraying Jesus; "wicked," gave up "apostleship" (Mt 27:3-5; Acts 1:17-22,25)

the following conclusions are based on correlation - a preliminary type of evidence.

It can be seen that *spiritual* prosperity was related to commitment in all cases (46/46) (all the committed prospered and none of the noncommitted

**TABLE 4. Summarized from evidence in Table 3.**

NAME	EARLY						LATE(R)		
	C	MP	SP	C	MP	SP	C	MP	SP
CAIN				-	-1	-1			
ABEL				+	-	+1			
NOAH				+	-	+1			
REST OF WORLD				-	-1	-1			
SARAH				+	+1	+1			
LOT'S WIFE				-	-1	-1			
JACOB		±	+1				+	+1	+1
ESAU	-		-1				-	+	-1
JOSEPH	+	±½	+1				+	+1	+1
JUDAH	-	-1					+	+1	+1
JOB	+	-	+1				+	+1	+1
JOB'S FRIENDS	-	-1	-1				+	+1	+1
RAHAB				+	+1	+1			
JOCHEBED				+	+1	+1			
MOSES				+	-	+1			
PHARAOH				-	-1	-1			
BALAAM				-	-1	-1			
2 SPIES				+	+1	+1			
10 SPIES				-	-1	-1			
DAVID	+	±½	+1				+	±½	+1
SAUL				-	-1	-1			
SOLOMON	+	+1	+1	-1	-1	-1	+	-	+1
ABSALOM				-	±½	-1			
JEZEBEL				-	±½	-1			
AHAB				-	±½	-1			
ELIJAH				+	±½	+1			
DANIEL	+	+1	+1				+	+1	+1
BELSHAZZAR				-	-1	-1			
JOHN THE BAPTIST				+	-	+1			
HEROD ANTIPAS				-	+	-1			
HERODAGRIPPA				-	-1	-1			
THIEF ON CROSS				+	-	+1			
PILATE				-	-1	-1			
CAIAPHAS				-	-1	-1			
JOHN				+	±½	+1			
PETER				+	±½	+1			
JUDAS				-	±½	-1			
<b>TOTAL</b>					20½/20	29/29		6½/9	9/9
<b>GRAND TOTAL</b>		5½/8	8/8		26/37	37/37		32½/46	46/46

A + or - represents a positive or negative commitment or prosperity: for commitment (C), what is seen to be basic or ultimate commitment; for material prosperity (MP), 'net' prosperity (both + & - if necessary); for spiritual prosperity (SP), especially what is judged to be final or ultimate prosperity. In MP and SP columns, 1 = positive correlation with C (½ = halfway correlation); note that it is much less for material than for spiritual prosperity. For some, separate columns show early and late(r) parts of life. Horizontal red lines separate matched groups of 2 or 3 persons. Blue = persons; Red = cases.

prospered). Evidently the promises for or against spiritual prosperity could be depended on.

*Material* prosperity was about 70% related to commitment, whether in terms of cases (32½/46, counting early and late segments of life as separate cases); or of persons (26/37, counting the most mature segment if both an early and late segment given). (To put it another way, more than half of the committed prospered; more than half of the noncommitted did not prosper.) This suggests a partial internal harmony of paradigm, but not the 100% seen for the spiritual prosperity.

Are then God's promises for material prosperity less dependable than for spiritual? Further analysis suggests a different answer. The Bible says clearly that material prosperity may be deferred until the end. To fully demonstrate the nature of *Satan's* kingdom, he is allowed to work, thus adding to the evidence needed to freely decide for or against God's universe. The Bible presents Satan as a hater of all good, and one would expect him to remove material prosperity from God's followers as far as allowed (or else give it to the disloyal, so as to confuse). But he cannot remove the *spiritual* prosperity promised if one decides for God.

Once the Bible's own definition of prosperity and the conditions for attaining it are understood, the correlation that really counts (that is, spiritual prosperity) appears high indeed. Thus, *within such limitations as stated in the first paragraph above*, one may conclude that the paradigm survives *this particular test* of internal consistency. Actually, given Satan's challenge to God as pictured in the Bible, and God's respect for free choice, it may be remarkable that even the correlation between *material* prosperity and commitment could be as high as it seemed to be. In fact, the very complexities of the paradigm — more than one type of prosperity, total freedom of choice — give more meaning to the outcome of the test.

Is there bias in God's choice of what biography to include? As mentioned under **Design** above, there is reason to consider it unlikely. If there were such bias, it would not invalidate the evidence for internal harmony, but might rather explain the source of the harmony in terms of a God who is deceitful (hence directly opposite to the whole body of Bible teachings).

Further, the analysis used above to test for commitment/prosperity harmony can also be used to test for internal harmony in *another, quite different, sense*: One would expect almost inevitable discord from the enormous spans of author variable, culture/circumstance variable and time-era variable. But judging by the high correlations just described from Table 4, the examples seem relatively free of this type of discord as well - another evidence of internal consistency. In summary, this trial was limited in scope, and took for granted a paradigm belief that Bible biographies are factual. It found high consistency (1) of outcome with commitment, and (2) across the vast span of author, circumstance and era - both (1) and (2) unexpected unless there were high internal harmony of paradigm.

For comparison with another religious paradigm, one could make a similar analysis of that paradigm (of the Koran, for example). Or external tests could be made in such areas as archaeology. But the purpose here was rather to design and carry out one trial of the possibility of evaluating a non-science paradigm.

As it turned out, even deciding what should be replicates and independent or dependent variables was more demanding than expected. Development of Tables 3 and 4 was as objective as possible, limiting examples to those where the Bible itself made the evaluations or gave sufficient life-history data. The outcome was not known until the last, and demanded yet more thought as to the meaning of the 'prosperity' variables.

There is no final experiment, but trial after trial, improvement after improvement. It is easy to agree that "sometimes getting close is as close as we are ever going to get."<sup>4</sup>

### ENDNOTES

1. Taylor D. 1986. *The myth of certainty*. Waco, TX: Word Books (also Zondervan 1992 reprint).
2. (a) Hasel FM. 1992. Thomas Kuhn's revolution: a new way of looking at science. *Dialogue* 2:11-13. Also pertinent: (b) Roth AA. 1988. Truth — an endangered species. *Origins* 15:49-51; and (c) Roth AA. 1990. What is happening to the philosophy of science? *Origins* 17:3-7.
3. There is one religious writer who repeatedly emphasizes a weight-of-evidence approach; for example, "God designs that men shall not decide from impulse, but from weight of evidence." (White EG. 1898. *The desire of ages*. Mountain View, CA: Pacific Press Publishing Assn., p 458.)
4. Speakman JR, et al. 1993. *Physiological Zoology* 66:1049, on the problem of finding animals diverse enough to differ taxonomically, yet alike enough for comparative studies.