

# The Whole Truth

## II. THOUGHTS ON THE SCIENTIFIC ATTITUDE

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### I

Fringe benefits — a little something extra, over and above the original or principal motivating reward — we have a number of them here at Walla Walla, and some don't even involve money. One of the most valuable, to me, is the "three free hours" of classwork made available to a faculty member — an opportunity to take one class each quarter from one of my colleagues, usually in a subject area that was somehow slighted in my education. To get back on the front side of the desk for a short time always provides a refreshing change of pace in my schedule.

The secondary reward may sometimes be unexpected. One quarter I decided to take an introductory speech class. My reasons were mundane. I simply felt the need to develop this technical skill. I was not really expecting to have my thought patterns challenged by any radically different ideas of the deeper philosophical type. But I was caught off guard.

Experiments in the art of persuasion, it seems, show that, when dealing with a potentially hostile audience, a speaker has the best prospect of success (that is, having his ideas accepted or approved) if he will candidly present all evidence bearing on the question.<sup>1</sup> After discussing how to give proper weight to reasons both pro and con, he can give his judgment as to the final conclusion with greater credibility. But for an audience already sympathetic to his viewpoint, he is advised to present only the "favorable" side. That is, "don't rock the boat — just strengthen their faith."

A remarkably simple technique, this would seem; in fact, perhaps quite an attractive strategy. After all, why not make use of every advantage avail-

able? Yet a gnawing pang of Idealism makes its presence known. Am I passing over a deeper ethical question?

I find myself disturbed, first of all, at a purely personal level. In order to be realistic, and to avoid emotional connotations, let us suppose that I am to speak on "Stochastic Acceleration in Astrophysical Plasmas." Now this is a difficult subject, and the conclusions are not entirely clearcut, but fortunately I know I will be speaking to a group favorably disposed to my own views. Shall I aim for "success"? Admittedly I would enjoy an approving response; furthermore, it would probably be easier to concentrate on one side of the topic. The faithful Ego presents the clinching reason: as long as the correct final conclusion (i.e., mine) is given, Truth will also be served.

Or does Truth include the entire structure of observation and reasoning on which this conclusion is based? If so, is my commitment to it strong enough that I would risk disapproval in order to paint for my friends the most accurate picture I could? Would I risk weakening their favorable opinions by admitting that the evidence is not all clearly on my side?

I believe that my response to these questions reveals a great deal about my personal religion. Probably it reveals also whether I possess an astute caution, for in the short time since I first formulated my opinions on stochastic acceleration in some detail, new and unforeseen astronomical evidence has been discovered. Much as I might dislike it, this new evidence is in some ways contrary, and it makes my whole dissertation seem less important now than before.

## II

To think about the corporate church as an entity that must weigh these possible goals of Truth and Success can be even more disturbing. Does the church see Truth as a *means* (for example, to "save souls") or as an *end*? If the reader accepts Truth as a tool, either to be used or to be withheld from use in the service of some other purpose, he may as well be forewarned that he will disagree with most of the rest of this article. I personally find it hard to think that one can fool someone into a certain state of belief, and then expect that belief to be pleasing and acceptable to God.

It seems to me that the apostle Paul was speaking in terms of Truth as an ultimate goal in First Corinthians 13:12. Here he indicates the hope of attaining a state of perfection such that he would no longer know only in part, but with the same clarity and completeness with which he was known by God. But now if Truth is an end, are there some persuasive strategies that are less than ideal, because they do not exhibit all aspects of Truth?

Reluctantly I record here my personal opinion that the church has relied

rather heavily on the so-called faith-strengthening method of persuasion in most of its preaching and many of its publications. Granted, one can expect thus to "succeed" in evangelizing people who already think much as the church does. And one may well hold in loyal membership as many as are content to stay this way indefinitely, or as are never forced by external circumstances into an awareness of contrary arguments. But perhaps, in the light of my argument above, this apparent success may actually constitute failure.

Furthermore, even if the church is willing to write off as pseudo-intellectual snobs, unworthy of the proffered salvation, those whom it does not persuade, I suspect that the proportion of people susceptible to the faith-strengthening approach is currently decreasing. I believe this proportion may also be decreasing even within the church, as a result of its emphasis on education. Therefore I propose that, for the future, the faith-strengthening (or prejudice-confirming) policy may not only fail in sufficient commitment to expose the entire truth, but it may even no longer maintain its past level of apparent "success."

### III

In order to make the argument clear, I must deal in specifics. I approach this point somewhat unwillingly, because there will be no perfect example, and because there is danger that the importance of the individual instance may appear to be overemphasized. It may also be difficult to keep clearly in view my concern that this criticism be given in a constructive and Christian spirit. Nevertheless, onward.

My attention was recently drawn to an article by Professor Harold W. Clark entitled "Is the Grand Canyon Really Old?"<sup>2</sup> It should be emphasized at this point that I have high respect for the long service Clark has rendered, and for his strong faith in special creation. I venture comment on his article only because I see it as one article in a large class of writings that are in some degree one-sided. This may be particularly unfortunate with a topic like the Grand Canyon, since church writers have often been quite ready to ascribe biased or incomplete treatment of evidence to the evolutionists. They, of course, see it the other way around. Darwin himself complained that "a distinguished zoologist, Mr. St. George Mivart, has recently collected all the objections which have ever been advanced by myself and others against the theory of natural selection, . . . and has illustrated them with admirable art and force. When thus marshalled, they make a formidable array; and as it forms no part of Mr. Mivart's plan to give the various facts and considerations opposed to his conclusions, no slight effort of rea-

son and memory is left to the reader, who may wish to weigh the evidence on both sides.”<sup>3</sup>

I will attempt to illustrate my contention by brief remarks on just two of a number of questions raised by Clark’s presentation.

First, he observes that the largest valleys cut into any of the upper layers of sediment, before deposition of the next layer above, were only about 150 feet deep and half a mile wide. (For comparison, the present Grand Canyon typically has a depth of 5,000 feet and a width of five or ten miles.) This information is then used as the basis for a conclusion that “there is evidence of only one period of extensive erosion” — namely, that which produced the present canyon. This erosion is identified with the time immediately following the Genesis Flood.

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But the quoted conclusion is difficult to retain when one looks more closely at the various discontinuities in the rock strata (FIGURE 1). There are some cases in which sediments appear to have been deposited continuously in parallel layers, with only a change in the type of sediment available; an example would be the transition from Tapeats Sandstone to Bright Angel Shale. The other cases are the ones of interest here — the ones where there is evidence for erosion of the surface of one layer before the beginning of deposition of the next. These are called *unconformities* by the geologist, and several types may be distinguished.

The simplest is the *disconformity*, at which the layers continue to be parallel but the irregularity of the boundary between rock types reveals the interlude of erosion. Five examples are indicated in FIGURE 1, and they do indeed seem to represent only minor erosion in comparison to the present canyon. But now consider the so-called Grand Canyon series of nonhorizontal Precambrian strata that appear near the bottom of FIGURE 1, and notice the unconformities that separate this group from the Vishnu formation below and the Paleozoic sediments above. Below the Tapeats formation we have an *angular unconformity* ( $U_2$ ), where the lower formations were tilted; this was followed by sufficient erosion to leave only low relief on a land surface *not* parallel to the rock strata of which it is composed. (This process is called *peneplaining*, the making of a plain.) Furthermore, below the Bass limestone is an example of a third type of unconformity, sometimes known as a *nonconformity* ( $U_1$ ). Here the underlying rock which has been peneplained is characterized not by parallel layers but by a highly distorted and folded structure; it is a *metamorphic* rock known as *schist*.

The mere cutting of canyons looks very pale beside the two erosive epi-

FIGURE 1. Schematic diagram of Grand Canyon wall. Disconformities are denoted by D. Clark's description of 150-foot-deep channels probably refers to that below the Temple Butte formation. Unconformities discussed in the text are denoted by U. Key to other symbols:

- F Fault
- V Vishnu Schist
- BA Bass Limestone
- HA Hakatai Shale
- SH Shinumo Quartzite
- TA Tapeats Sandstone
- BR Bright Angel Shale
- MU Muav Limestone
- TB Temple Butte Limestone
- R Redwall Limestone
- SU Supai Formation
- HE Hermit Shale
- C Coconino Sandstone
- TO Toroweap Formation
- K Kaibab Limestone
- MO Moenkopi Formation

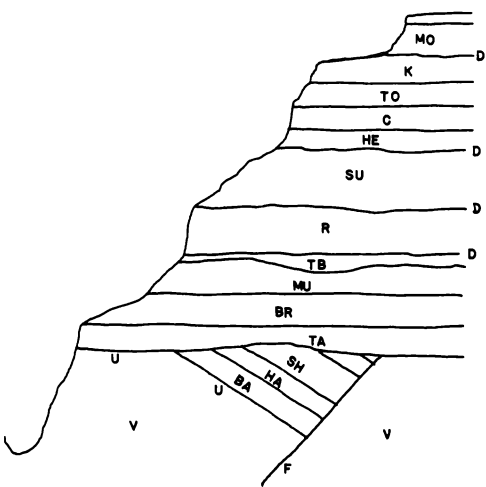


FIGURE 1

BA, HA, and SH are the major beds of the Grand Canyon Series. (Adapted from Shelton,<sup>4</sup> p. 267.)

FIGURE 2. Broken lines indicate Grand Canyon Series material that must have been removed prior to deposition of Tapeats Sandstone.

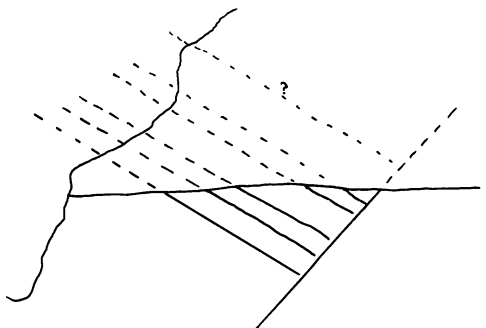
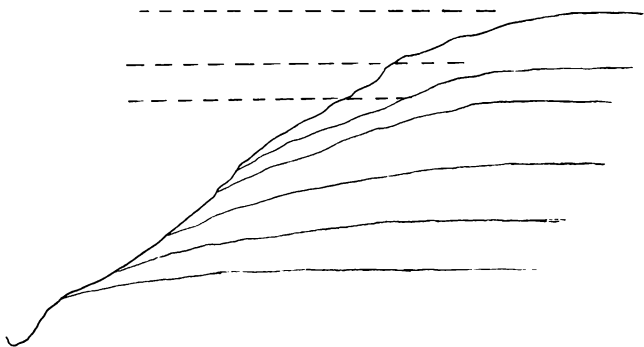


FIGURE 2

FIGURE 3. Intuitive picture of possible Grand Canyon configuration if it were cut rapidly in poorly consolidated sediments. Compare FIGURE 1.

FIGURE 3



sodes that prepared the peneplains bounding the Grand Canyon series. Especially must one be impressed by realizing that, in order for metamorphism to have operated on the Vishnu schist, it must have been overlain by a considerable thickness of rock to supply the necessary high pressure. But this rock, many thousands of feet of it, was completely removed, leaving no trace, before the deposition of the Bass limestone. The work accomplished in the more recent episode is indicated in FIGURE 2. Clark may indeed have an explanation for these events too, but in its absence the blanket statement about a single period of erosion is all too likely to mislead the ignorant and repel the knowledgeable.

Now to my *second* point of contention. Clark argues that the Grand Canyon could easily have been cut by the post-Flood Colorado River in a short time, because "the sediments would still be comparatively soft, having only recently been laid down." But this coin has two sides. If the sediments were not yet well consolidated, they would very likely be subject to creep or even large-scale slumping. The lower formations, if indeed poorly consolidated, would be unable to bear thousands of feet of overburden (pressures of thousands of pounds per square inch) without deformation at the canyon wall. This should result in quite a different canyon from the one that exists, as suggested in FIGURE 3.

It seems hardly fair to claim the advantage in this, or any, idea without somehow dealing with its accompanying disadvantage. And quite aside from fairness, there is the matter of survival. In spite of numerous exceptions, most scientists in the "outside" world exercise considerable care to avoid publishing a proposed model for some natural phenomenon purely on the basis of the points where it succeeds. If they fail to take public cognizance of the points where the model fails, it is very likely that someone else will do so — in print, and in the same journal that published the original article (if indeed that article somehow got past the referee).

When it comes to general conclusions, Clark claims that "when we put all these facts together, not only do they make the theory of long ages of evolutionary time untenable, but they fit perfectly into the Flood theory of geology. . . . The Flood theory affords a much more satisfactory explanation."

What can I say? Scientifically, there is no other term for it than non sequitur — the conclusion simply does not follow from the arguments given. And in the preceding article of this series<sup>5</sup> I have argued why one should not cultivate such statements of surpassing certainty as "expressions of faith."

#### IV

Is the time not overdue to begin to "tell it like it is"? In spite of its basically nonscientific goals, I propose that even the *Signs of the Times* should consider the establishment of higher standards of objectivity. For objectivity means not only keeping the "facts" straight, but exercising a very high level of ethical responsibility in reporting realistically just how well the conclusions given are supported by *all* the relevant facts. How else can the church attract people who will be more than fairweather friends?

Related to this is the very real problem of dealing with a certain class of students among those coming into college from Seventh-day Adventist preparatory schools. Their cerebrums have been laved (at least as thoroughly as they would be on the other side by public education) with altogether too many overoptimistic statements from both preachers and teachers, in addition to the printed word as it comes from Adventist publishing houses, about how successfully the present frail creationistic model (and they usually think there is only one) accounts for all observed facts. To help students become aware of the true status of scientific creationism, without earning a reputation as a destroyer of faith, can be rather ticklish.

How much mental agony could be saved if all who had taught them had had a truly scientific concern for accuracy in touching on scientific subjects! I think objectivity is not a purely scientific concern; it is a Christian duty as well, an expression of allegiance to the goal of Truth. It is something to be practiced as part of one's faith, not to be thought of as opposed to that faith.

I propose that the *Signs*, the *Review*, and other church journals make more use of refereeing, as is done by most scholarly journals. Refereeing is already practiced, in a very narrow sense, by checking manuscripts for theological orthodoxy and rejecting those deemed not to adhere to established doctrine; but I mean much more than that. First, most of the articles published have implications not only for theology, but for other areas as well, such as geology, biology, sociology, psychology, history, anthropology, etc. Persons well qualified in those fields should give advice on whether an article is responsible and fair insofar as it bears on their specialty. Second, one should not think just in terms of acceptance or rejection. Refereeing yields its full value only when it often leads to suggestions acceptable to the author as to how he can improve his article, and/or suggestions to the editor that he solicit other articles presenting alternative views for simultaneous publication.

I believe there is nothing new, nor profound — nor heretical — in what I am arguing for. But others have said it better, and I should like to conclude

by quoting one: "It is important that, in defending the doctrines which we consider fundamental articles of faith, we should never allow ourselves to employ arguments that are not wholly sound. They may avail to silence an opposer, but they do not honor the truth. We should present sound arguments, that will not only silence our opponents, but will bear the closest and most searching scrutiny."<sup>6</sup>

With today's general level of education, perhaps it is only the sound arguments, those which take *all* the evidence into account, that have any real chance of silencing opponents anyhow.

#### REFERENCES

- 1 Jane Blankenship, *Public Speaking* (Englewood Cliffs, New Jersey: Prentice-Hall, Incorporated 1966), p. 46.
- 2 Harold W. Clark, Is the Grand Canyon really old?, *Signs of the Times*, pp. 5-7 (July 1969).
- 3 Charles Darwin, *The Origin of the Species* (New York: New American Library 1958), p. 200.
- 4 John S. Shelton, *Geology Illustrated* (San Francisco: W. H. Freeman and Company 1966), p. 267.
- 5 Donald E. Hall, On being a seven-day scientist: thoughts on the scientific attitude, *Spectrum* 1:33-37 (Summer 1969).
- 6 Ellen G. White, *Gospel Workers* (Washington, D. C.: Review and Herald Publishing Association 1920), p. 299.

#### HAROLD W. CLARK'S REPLY:

In response to Hall's discussion of scientific writing, I point out there is an important difference between a scientific paper on a topic that is open to various interpretations and an article written to defend a position taken by a group. In the first case it is advisable — yes, doubtless necessary — to give an adequate coverage of all aspects of the question, in order that the readers may be able to decide what interpretation is most acceptable. But in the second case, to give all the various angles of the case would be to confuse and bore the average reader, and he would throw the article aside and come to no conclusion whatever.

Writing for a church paper like the *Signs of the Times* or the *Review*, or for a journal like the *Creation Research Society Quarterly* is not for the purpose of presenting all aspects of the problem, but to present data which will support or verify the fundamental philosophy advocated by the publishers of those journals. In a court trial the attorneys do not give arguments on both sides of the case, but only those lines of evidence that they feel will support their side. In the case of discussions of evolutionary theories and their application, an abundance of "evidence" has been and

is being presented *for* evolution. It is only fair that creationists should make a rebuttal and present evidence *against* evolution or in favor of creation.

In my article in the *Signs of the Times* of July 1969 dealing with age of the Grand Canyon, I was not dealing with the whole geological history of the Grand Canyon region. The nature of the rocks in the bottom of the canyon really have no bearing on the case I presented. That there was action on a terrific scale when they were formed no one with any knowledge of geological processes doubts for a moment. However, after the Precambrian rocks of the region were formed, and the terrific movements had taken place that peneplained them, whether that action was fast or slow, there followed an entirely different series of events, building up many thousands of feet of sediments. In terms of uniformitarian geology, that was supposed to have taken millions of years. The rocks at the top of the series are reckoned at perhaps half a billion years younger than the ones at the bottom. Then, within the last five million or so years, the erosion of the canyon was supposed to have taken place. Now my argument was entirely on the question of how fast this erosion of the Grand Canyon took place. That is why I entitled the article "How Old Is the Grand Canyon?" That was the problem to be discussed.

The erosion of the Grand Canyon has no relation to the action that produced the Precambrian deposits that now lie in the lower depths of the Canyon. It began near the top of two or more miles of sand and shale and limestone and cut its way down through them and into the distorted Precambrian rocks until it reached its present level. My point was that to cut this tremendous canyon was an event of a nature entirely different from what had taken place during the deposit of the Paleozoic rocks of the area (and of Mesozoic rocks along the Colorado and Green rivers farther north).

There is no evidence that during the time required for deposition of these rocks (geologists say about half a billion years) there was any action going on like that required to cut the canyon. And, since the canyon showed such unique action, its cutting supported the Flood theory of geology. Here is a simple case of the presentation of a line of evidence, leaving the reader to accept or reject it as he may feel justified in doing. That is all the creationist writer can do; he cannot force a decision, nor can he expect every reader to agree with his argument. All he can do is to present the evidence and leave it to the judgment of the reader.

Hall's second question was regarding the statement I made as to the hardness of the rocks soon after the Flood. As a physicist he deals with physical factors, whereas I, as a geologist (although an amateur), deal with what I see in the field. It is a well-known fact to field geologists that many rocks when first excavated are comparatively soft, but become very hard after exposure to the air. Also, it is quite generally supposed by geologists that rocks do harden slowly after deposition. But to argue that if they were laid down suddenly by the Flood they would be too soft to hold up without sloughing is hardly in line with observed facts. It is true that in some places rocks do show that they have been thinned out by pressure of layers above them. But this is not the usual situation. Material laid down as mud or soft sand, provided that it has in it sufficient hardening material, will set up quite rapidly. One has only to observe the setting of concrete to realize this.

I am somewhat of a rockhound. In grinding and cutting rocks, I find that some are apparently hard; at least they bear up well enough in the field. But when subjected to grinding or tumbling, they abrade so rapidly as to be of little value. I conclude that rocks in the field are subject to quite variable action, some eroding rapidly and others slowly.

All in all, I still maintain that my point regarding the wearing away of rocks in the formation of the Grand Canyon would have been considerably easier after the Flood than it would be today.

And now just a word on the question of refereeing. I agree that it is a good idea, and I believe it is done more than Hall may realize. I receive manuscripts for articles, or even books from some of the church publishing houses, with the request that I look them over and make recommendation as to whether they be published or not. And I know of several creationist writers who have been asked to give their opinions. In some of my articles, I have submitted all or part of them to critics before sending them to the publishers. And it is well known that any book that comes from Adventist publishers has to run the gauntlet of a reading committee.

One problem is the paucity of qualified critics in certain fields. If I wish to publish a book on the geological evidences of the Flood, how many men in the church ranks are qualified to judge the validity of my ideas? Only a few. And so it is possible that some opinions may be advanced that some scientifically minded men might question. It is possible that errors may be made. I always expect criticism from readers. When I get it, I check the data over again, and in many cases I make revisions in interpretation of the problem. One perfects techniques by studying and reevaluating the evidence.

To wait until one has "the whole truth" before publishing anything would mean that nothing would ever be published. One can only present what he understands to be the best solution of the problems, and then learn and make changes as his knowledge grows. Anyone who would read my articles written forty years ago and compare them with what I write today would easily see that I have made changes in my thinking. I intend to keep on doing so. To cease to change is to fossilize, and I do not intend to become a fossil if I can help it. I appreciate any help readers can give me, including criticism, because it is from this that one corrects errors and reaches a deeper understanding of the problem.

Some creationists do not dare to "stick their necks out" and contend for their views for fear their ideas will be ridiculed or unappreciated. But the only way truth is ever attained is by trial and error, unless it is truth that is revealed in the Bible and the writings of Ellen White. In the field of science the Bible believer must not be afraid to battle for what he believes to be right, even though he may not understand all details perfectly.