THE GENESIS FLOOD

The Biblical Record and Its Scientific Implications

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Contents

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOREWORD</td>
</tr>
<tr>
<td>INTRODUCTION</td>
</tr>
<tr>
<td>PREFACE TO THE SECOND PRINTING</td>
</tr>
<tr>
<td>PREFACE TO THE SIXTH PRINTING</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
</tr>
<tr>
<td>CHAPTER I. BASIC ARGUMENTS FOR A UNIVERSAL FLOOD</td>
</tr>
<tr>
<td>The Depth of the Flood</td>
</tr>
<tr>
<td>The Duration of the Flood</td>
</tr>
<tr>
<td>Twenty-one Weeks of “Prevailing”</td>
</tr>
<tr>
<td>Thirty-one Weeks of “Assuaging”</td>
</tr>
<tr>
<td>The Geology of the Flood</td>
</tr>
<tr>
<td>The Size of the Ark</td>
</tr>
<tr>
<td>The Need for an Ark</td>
</tr>
<tr>
<td>The Testimony of the Apostle Peter</td>
</tr>
<tr>
<td>The Total Destruction of a Widely-Distributed Human Race</td>
</tr>
<tr>
<td>The Total Destruction of Humanity</td>
</tr>
<tr>
<td>The Extensive Distribution of the Antediluvian Race</td>
</tr>
<tr>
<td>Summary and Conclusion</td>
</tr>
<tr>
<td>CHAPTER II. BASIC ARGUMENTS AGAINST AN ANTHROPOLOGICALLY UNIVERSAL FLOOD</td>
</tr>
<tr>
<td>Introduction</td>
</tr>
<tr>
<td>Indians in America Before the Flood</td>
</tr>
<tr>
<td>The Babylonian Flood Account</td>
</tr>
<tr>
<td>The Presuppositions of Age Determination Methods</td>
</tr>
</tbody>
</table>
CHAPTER III. BASIC NON-GEOLOGICAL ARGUMENTS AGAINST A UNIVERSAL FLOOD

Universal Terms Used in a Limited Sense
- Most Universal Terms Are to be Interpreted Literally
- The Context Determines the Meaning
- Universal Terms Are Literal in Genesis 6-9 Because of the Physical Phenomena

Noah and the Animals
- Gathering the Animals to the Ark
- The Capacity of the Ark
- Caring for the Animals in the Ark
- The "Natural-Supernatural" Philosophy of Miracles

Postdiluvian Animal Distribution
- Three Major Views
- Australian Marsupials
- Rapid Animal Dispersion

Summary and Conclusion

CHAPTER IV. UNIFORMITARIANISM AND THE FLOOD: A STUDY OF ATTEMPTED HARMONIZATIONS

Introduction
- Cuvier's Catastrophism and the Diluvium Theory
- Cuvier's Multiple Catastrophism
- Buckland's Diluvium Theory
- Lyell's Uniformitarianism and the Tranquil Theory
- The Rise of Uniformitarianism
- The Tranquil Theory
- The Language of Scripture
- The Imperilling of the Ark
- The Olive Leaf

John Pye Smith and the Local Flood Theory
- The Birth of the Theory

Summary and Conclusion
Contents

The Initial Creation Itself 214
The Work of the Six Days of Creation 214
The Antediluvian Period 215
The Deluge 216
The Modern Post-Deluge Period 216

*The Beginning of Creation*

The Origin of the Solar System 218
The Origin of the Universe 218
The Primeval Earth 219

*The Scientific Basis of Creation*

The First and Second Laws of Thermodynamics 222
The Unique Processes of Creation 223
The Entropy Principle and Evolution 224

*The Geologic Work of Creation Week*

The First Day 228
The Second Day 229
The Third Day 229

Creation of “Appearance of Age” 232
Modern Rejection of This Biblical Doctrine 233
The “Steady-State” Cosmology 235
The “Eternal Oscillation” Cosmology 236
Importance of the Doctrine of a “Grown Creation” 237

*The World That Then Was*

“Waters Above the Firmament” 239
No Rainfall Before the Flood 241
Little Volcanic or Tectonic Activity 242

*Geologic Evidences of Antediluvian Climate*

Universally Warm Climate 243
The Supposed Permian Glaciation 245
Explanations of Climatic Change 250
The “Greenhouse Effect” 253
The Antediluvian Vapor Blanket 235

*Overflown With Water*

The Destructive Power of Modern River Floods 259
Destructive Power of Ocean Waves 261
Sedimentation and Fossilization During the Flood 265

*Emergence of the Lands*

New Atmospheric Movements 266
Isostatic Readjustments 268

*The Order of the Strata*

Tectonic Origin of Continental Blocks 270
Sequence of Stratified Beds 271

*Early Burial of Marine Creatures*

Hydrodynamic Selectivity of Moving Water 273
Higher Mobility of the Vertebrates 275
Burial of Land Animals and Plants 277
Formation of Coal Beds 279
The “Mesozoic” Strata and the Dinosaurs 281

*The Final Flood Deposits*

Tertiary Stratigraphy 281
Mammals as Index Fossils 284
Uplifts of the Pliocene 286
Continuing Abnormal Conditions 287

*Post-Deluge Geologic Activity*

Freezing of Arctic Soils 288
Siberian Mammoth Beds 289

*The Glacial Period*

Onset of the Ice Age 292
Ice-Age Theories 293
The Flood and the Glacial Period 294
The Theory of Multiple Glaciations 295
The Evidence for Only One Glaciation 296

*The End of the Ice Age*

Sudden Warming of the Climate 303
Atmospheric Carbon Dioxide 306

*Residual Effects of the Deluge Period*

Continuing Volcanic and Tectonic Disturbances 311
Enclosed Lake Basins and Raised Beaches 313
Raised River Terraces 318
Evidence of Former Lower Sea Levels 324

Summary and Conclusion 326

CHAPTER VII. PROBLEMS IN BIBLICAL GEOLOGY

*Introduction*

Methods and Results of Geochronology 331
The Lead Age Methods 334
Experimental Difficulties 334
Original Lead 335
Leaching 336
Lead Isotope Methods 337
Radiogenic Lead Contamination 340
Other Methods 341
Discordant Ages 341
## Contents

**The Rubidium Method**  
341

**The Potassium Methods**  
342

**The Significance of the Radioactivity Data**  
343

**The Fact of a “Grown” Creation and “Apparent Age”**  
344

**Variations in the Decay Rates**  
346
  - Supposed Invariability  
  - The Decay Processes  
  - Alpha-Decay and the Potential Barrier  
  - External Energy Sources  
  - Cosmic Radiation  
  - The Van Allen Radiation Belt  

**Agreement of Ages from Different Methods**  
355
  - Creation of Accordant “Apparent Ages”  
  - Concordant Changes in Decay Rates  
  - Pleochroic Halos  

**Supposed Correlation of Radioactivity and Stratigraphic Ages**  
362
  - Extent of Agreement  
  - Cause of Apparent Limited Agreement  

**Astronomic Methods of Age Measurement**  
368

**The Radiocarbon Dating of Recent Deposits**  
370
  - Assumptions in the Method  

**Carbon 14 and the Deluge**  
374
  - Antediluvian Radiocarbon Proportions  
  - Postdiluvian Radiocarbon Proportions  

**Contradictions in Geochronology**  
378
  - Meteoritic Dust  
  - Meteorite Radioactivity  
  - Tektites  
  - Disintegration of Comets  
  - Atmospheric Helium  
  - Salt in the Sea  
  - Juvenile Water  
  - Crustal Accretion  

**Post-Deluge Chronology**  
391
  - Tree Rings  
  - Origin of Postdiluvian Civilizations  
  - Population Statistics  

**Antediluvian Longevity and Radiation**  
399
  - Effect of Canopy on Longevity  
  - Somatic Effects of Radiation  
  - Genetic Effects of Radiation  

## APPENDIX I. PALEONTOLOGY AND THE EDENIC CURSE

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>454</td>
</tr>
<tr>
<td>Anthropology and the Fall</td>
<td>455</td>
</tr>
<tr>
<td>The Animal Kingdom and the Fall</td>
<td>458</td>
</tr>
</tbody>
</table>
  - The Bondage of Corruption | 459 |
  - Adam's Dominion over Animals | 459 |
  - Vegetarian Diet Before the Fall | 461 |
  - The Edenic Curse and Structural Changes | 464 |
| The Plant Kingdom and the Fall | 466 |
Contents

The Balance of Nature and Harmonistic Theodicy 468
Summary and Conclusion 471

APPENDIX II. GENESIS 11 AND THE DATE OF THE FLOOD

Genesis 11 Need Not Be Interpreted as a Strict Chronology 474
The Numbers of Years Are Not Totalled 474
The Name and Years of Cainan do not appear in the Hebrew Text 475
Genesis 5 and 11 Are Perfectly Symmetrical in Form 475
Information Is Given Concerning Each Patriarch Which Is Irrelevant to a Strict Chronology 476
The Postdiluvian Patriarchs Could Not Have Been Contemporaries of Abraham 477
The Bible Implies a Great Antiquity for the Tower of Babel 478
The Messianic Links Were Seldom Firstborn Sons 479
The Term “Begat” Sometimes Refers to Ancestral Relationships 481
Genesis 11 Cannot Be Stretched Beyond Certain Limits 483
The Analogy of Biblical Chronology 485
The Dating of the Tower of Babel 486
The Patriarchs and the “Old Stone Age” 487
The Babylonian Flood Traditions 488
Conclusion 489

INDEX OF SUBJECTS 491
INDEX OF NAMES 508
INDEX OF SCRIPTURE 515

List of Illustrations and Diagrams

Fig. 1 The Chronology of the Flood 3
Fig. 2 The Abating of the Flood Waters 8
Fig. 3 Patriarchal Ages at Maturity and Death 24
Fig. 4 Diagram of Three Genesis Kinds 67
Fig. 5 Geologic Time Table 133
Fig. 6 Grand Canyon of the Colorado 152
Fig. 7 Incised Meanders 155
Fig. 8 Fossil Graveyard 161
Fig. 9 Footprints in Cretaceous River Bed 167
Fig. 10 Contemporaneous Footprints of Man and Dinosaur 174
Fig. 11 Giant Human Footprints in Cretaceous Strata 175
Fig. 12 The Tuatara 177
Fig. 13 Heart Mountain Thrust 182
Fig. 14 Supposed Thrust Contact Line 183
Fig. 15 The Lewis Overthrust 186
Fig. 16 Chief Mountain 188
Fig. 17 Lewis Overthrust Contact Line 190
Fig. 18 Intercalation at Contact Plane 192
Fig. 19 Double Intercalation at Contact Plane 194
Fig. 20 The Matterhorn 199
Fig. 21 Mixing of Pleistocene and Cretaceous Strata 202
Fig. 22 “Thrust” Plane 204
Fig. 23 A “Deceptive Conformity,” or Paraconformity 208
Fig. 24 Double Paraconformity 210
Fig. 25 Flood Debris Near Los Angeles 262
Fig. 26 Marine Terraces 316
Fig. 27 Buried “Forests” in Specimen Ridge 420
Fig. 28 Comparison of Banding Effects 426
interpretation. In these days of intellectual and cultural conformity, real independent thinking seems to be becoming a lost art. A volume such as this offers us the challenge to begin to think carefully and creatively concerning the great issues with which it deals.

Introduction

The question of the historicity and the character of the Genesis Flood is no mere academic issue of interest to a small handful of scientists and theologians. If a worldwide flood actually destroyed the entire antediluvian human population, as well as all land animals, except those preserved in a special Ark constructed by Noah (as a plain reading of the Biblical record would lead one to believe), then its historical and scientific implications are tremendous. The great Deluge and the events associated with it necessarily become profoundly important to the proper understanding of anthropology, of geology, and of all other sciences which deal with historical and pre-historical events and phenomena.

But of even greater importance are the implications of the mighty Flood of Genesis for Christian theology. For that universal catastrophe speaks plainly and eloquently concerning the sovereignty of God in the affairs of men and in the processes of nature. Furthermore, it warns prophetically of a judgment yet to come, when the sovereign God shall again intervene in terrestrial events, putting down all human sin and rebellion and bringing to final fruition His age-long plan of creation and redemption.

But we have come to a day when the world of science and scholarship no longer regards the witness and warnings of the Flood with any seriousness. Men instead have adopted a philosophy of uniformity and evolution with which to interpret both cosmic and human history and with which even to predict and plan the future. Even
Introduction

evangelical Christians, though still professing belief in the divine validity of Scripture, have often capitulated to uniformitarian\(^1\) scholarship, denying the universality of the Flood and, with the denial, thereby sacrificing its mighty evangelistic witness to a world in rebellion against its Creator.

Our present study therefore has a twofold purpose. In the first place, we desire to ascertain exactly what the Scriptures say concerning the Flood and related topics. We do this from the perspective of full belief in the complete divine inspiration and perspicuity of Scripture, believing that a true exegesis thereof yields determinative Truth in all matters with which it deals.

We accept as basic the doctrine of the verbal inerrancy of Scripture, to which Benjamin B. Warfield has given admirable expression in the following words:

The Church has held from the beginning that the Bible is the Word of God in such a sense that its words, though written by men and bearing indelibly impressed upon them the marks of their human origin, were written, nevertheless, under such an influence of the Holy Ghost as to be also the words of God, the adequate expression of His mind and will. It has always recognized that this conception of co-authorship implies that the Spirit's superintendence extends to the choice of the words by the human authors (verbal inspiration), and preserves its product from everything inconsistent with a divine authorship . . . thus securing, among other things, that entire truthfulness which is everywhere presupposed in and asserted for Scripture by the Biblical writers (inerrancy).\(^2\)

The second purpose is to examine the anthropological, geological, hydrological and other scientific implications of the Biblical record of the Flood, seeking if possible to orient the data of these sciences within this Biblical framework. If this means substantial modification of the principles of uniformity and evolution\(^3\) which currently control the interpretation of these data, then so be it.

We realize, of course, that modern scholarship will be impatient with such an approach. Our conclusions must unavoidably be colored by our Biblical presuppositions, and this we plainly acknowledge.

But uniformitarian scholarship is no less bound by its own presuppositions and these are quite as dogmatic as those of our own! The assumptions of historical continuity and scientific naturalism are no more susceptible of genuine scientific proof than are Biblical catastrophism\(^1\) and supernaturalism. Furthermore, we believe that certain of the assumptions implicit in evolutionary theory (e.g., tacit denial of the two universal laws of thermodynamics\(^4\)) are much farther removed from scientific actualities than are our own premises. We believe that a system founded squarely on full confidence in the Scriptures will be found ultimately to be much more satisfying than any other, in its power to correlate scientific data and to resolve problems and apparent conflicts.

We recognize, certainly, that a work of this nature cannot deal comprehensively with all the problems entailed in the formulation of a truly Biblical and scientific catastrophism. The scope of these problems is vast, bearing really upon the whole spectrum of the sciences. The background and special interests of the authors are, on the one hand, the fields of Old Testament interpretation and Biblical criticism and, on the other, the fields of hydraulics, hydrology, and geomorphology. It is hoped that this combination will serve as well as any for a preliminary study\(^5\) of the Genesis Flood and its implications.

organisms, man included, have been derived by gradual diversification from common ancestral forms of life, through innate processes of variation and selection, forms which in turn originally were derived by spontaneous generation from inanimate matter.

\(^1\) Biblical catastrophism is the doctrine that, at least on the occasions mentioned in Scripture, God has directly intervened in the normal physical processes of the universe, causing significant changes therein for a time. At the same time, such miraculous intervention acquires significance only against the backdrop of a basic pattern of uniformity.

\(^2\) Evolution, in the broad sense, implies increasing organization and complexity in the universe and is in effect a doctrine of continuous creation; conversely, the first law of thermodynamics affirms that creation is no longer normally occurring, and the second that the original creation is decreasing in organization and complexity. See pp. 222f.

\(^3\) We emphasize, as strongly as possible, that this can only be an exploratory sketch of a vast and complex field of study. It will necessarily be subject to extensive modification and amplification, but we trust that such difficulties of detail as may occur to the reader will not deter him from a genuinely candid consideration of the picture as a whole.
Introduction

The advice of many others, specialists in different pertinent disciplines, has also been very helpful.

Nevertheless, we are realistic concerning the reception this work may expect, by and large, from evolutionary scientists. We believe that most of the difficulties associated with the Biblical record of the Flood are basically religious, rather than scientific. The concept of such a universal judgment on man's sin and rebellion, warning as it does of another greater judgment yet to come, is profoundly offensive to the intellectual and moral pride of modern man and so he would circumvent it if at all possible.

We hope, however, that those whose confidence, like ours, is centered in the revelation of God, will be encouraged herein to see that a truly Biblical approach will eventually correlate all the factual data of science in a much more harmonious and satisfying way than the uniformitarian assumption can ever do. Because the Creator is also the true Author of Scripture, we believe that the more faithfully we believe His Word, the more effectively shall we be able to advance the frontiers of true knowledge concerning His Creation, exercising in the process the functions of the image of God in man.

Preface to the Second Printing

The authors wish to take this opportunity to thank God for the large measure of favorable response He has seen fit to grant to this volume. Letters have been received from pastors, missionaries, and Christian men of science all over the world, which indicate that the book has helped to meet an urgent need in the realm of Christian apologetics. There are many who agree with us that the time has come when the false presuppositions and implications of organic evolution and geologic uniformitarianism need to be challenged in the name of holy Scripture. We hope that THE GENESIS FLOOD has made a positive contribution in this direction.

Of about twenty published reviews that we have seen thus far, only two have been unfavorable. Certain important implications of these two critical reviews call for clarification at this time. In the first place, the basic argument of this volume is based upon the presupposition that the Scriptures are true (being verbally inspired by God—II Timothy 3:16, II Peter 1:21, John 10:35, etc.). We believe it has been proved that they consistently teach the universality of the great Flood of the days of Noah. It is quite significant, in the light of this, that neither review alluded to above attempted to deal with this Biblical doctrine of the Flood.

In the second place, it seems quite obvious that a misrepresentation of the authors' position on the doctrine of uniformitarianism continues to persist in some quarters. So far from holding that this doctrine, which underlies much of modern scientific theory, is totally invalid, the authors have insisted that "the principle of uniformity in present processes is both scientific and Scriptural (Gen. 8:22), but comes into conflict with Biblical revelation when utilized to deny the possibility of past or future miraculous suspension or alteration of these processes by their Creator" (xx, note 1).

In the third place, we have made every effort to quote our sources in proper context and to avoid attributing our own views to those
whom we have quoted. Having observed these precautions, however, one has a perfect right in polemical writings to quote from one's opponent in order to expose the inconsistency of his position. Full documentation has been given in THE GENESIS FLOOD for each reference, and any reader who may question the propriety or pertinence of any of them is urged to look them up for himself. True Christian scholarship thrives on an open Bible and on fair and open debate.

Finally, we emphasize again that many minor details of our analysis of these problems may require modification in the light of further study, but these will not affect the major conclusions. We therefore urge the reader not to be overly swayed by minor difficulties, but rather to consider candidly the tremendous accumulated weight of Biblical and scientific evidence validating the universal Flood and its geological implications.

In this second printing of THE GENESIS FLOOD, a few minor errors have been corrected, mostly typographical in nature. The general format and pagination remains unchanged.

It is our sincere prayer that God may continue to use this volume for the purpose of restoring His people everywhere to full reliance on the truth of the Biblical doctrine of origins. We are convinced that it is only through a proper understanding of God's Word that men can understand the mysteries of God's world. "With thee is the fountain of life: in thy light shall we see light" (Psa. 36:9).

Henry M. Morris
John C. Whitcomb, Jr.

November 15, 1961

Preface to the Sixth Printing

The authors wish to take this opportunity to thank God for the large measure of favorable response He has seen fit to grant to this volume. Letters have been received from pastors, missionaries, and Christian men of science all over the world, which indicate that the book has helped to meet an urgent need in the realm of Christian apologetics. There are many who agree with us that the time has come when the false presuppositions and implications of organic evolution and geologic uniformitarianism need to be challenged in the name of holy Scripture. We hope that THE GENESIS FLOOD has made a positive contribution in this direction.

Of the forty-five published reviews that we have seen thus far, only a few have been unfavorable. The few critical reviews seem to focus upon two main objections. One is the supposed impropriety of questioning the authority of those geologists and other scientists who have concluded that the earth and its life forms have been developing into their present state for billions of years. The second is a complaint against our use of documented quotations from various authorities, who themselves would disagree with our basic position, as evidence in support thereof. The first criticism implies that no one but a geologist has the right to evaluate a geological theory; the second would in effect preclude the use of statements from anyone except authors already in agreement with our position, as this would be "quoting out of context."

Rather than attempting to answer the various specific examples of these objections selected by the reviewers, it will be more to the point to deal with these basic charges in their totality. We believe, of course, that the reviewers have misunderstood what we were saying in the specific examples cited. A more careful reading of the whole book, instead of isolated portions lifted out for criticism, we believe would show that every one of the objections raised is without foundation. However, it is more important to get at the basic issues, and so we confine our attention to the two fundamental objections noted above.
The first point has been discussed at considerable length in the book, and since the reviewers have chosen to ignore our references to this matter, we must emphasize again several things. In the first place, we do not presume to question any of the data of geological science. Science (meaning “knowledge”) necessarily can deal only with present processes, which can be measured and evaluated at the present time; the “scientific method” by definition involves experimental reproducibility. Thus, extrapolation of present processes into the prehistoric past or into the eschatological future is not really science. Such extrapolation necessarily involves assumptions and presuppositions and is therefore basically a philosophy, or even a faith. The assumption of uniformity is one such assumption that can be made, but it is not the only one, and there is no way of proving that it is the correct one. The very same data can also be explained in terms of the assumption of Biblical creationism and catastrophism, and it is mainly a matter of one’s own judgment and preferences as to which he chooses. We frankly prefer the latter presupposition, on the basis of what we consider wholly adequate grounds centered in the revelation of God in Christ. We believe that the Bible, as the verbally inspired and completely inerrant Word of God, gives us the true framework of historical and scientific interpretation, as well as of so-called religious truth. This framework is one of special creation of all things, complete and perfect in the beginning, followed by the introduction of a universal principle of decay and death into the world after man’s sin, culminating in a worldwide cataclysmic destruction of “the world that then was” by the Genesis Flood. We take this revealed framework of history as our basic datum, and then try to see how all the pertinent data can be understood in this context. It would be salutary for the “uniformitarians” to recognize that this is exactly the procedure they follow too, except that they start with the assumption of uniformity (and therefore, implicitly, evolution) and then proceed to interpret all the data to fit into that context. Neither procedure is scientific, since we are not dealing with present and reproducible phenomena. Both approaches are matters of faith. It is not a scientific decision at all, but a spiritual one.

In the second place, we emphatically do not question uniformity of the basic laws of physics (e.g., the two laws of thermodynamics) as charged by the reviewers. We strongly emphasized that these laws have been in operation since the end of the creation period. The first teaches that no creation is now taking place, and the second enunciates the universal law of decay. These laws are basic in geology and in all science, and are clearly set forth in Scripture. This is the true principle of uniformity. We only question the assumption of uniformity of rates of geological and other processes, and even here essentially only as required by Biblical revelation. It is well known that the second law of thermodynamics implies decay but does not say anything about the rate of decay. There is nothing fundamentally inviolable about even rates of radioactive decay.

Geologists, therefore, must leave the strict domain of science when they become historical geologists. We repeat that we have no quarrel whatever with geological science, which in its many disciplines is contributing most significantly to our understanding and utilization of our terrestrial environment and resources. The so-called historical geology, on the other hand, has not changed or developed in any essential particular for over a hundred years, since the days when its basic philosophical structure was first worked out by such non-geologists as Charles Lyell (a lawyer), William Smith (a surveyor), James Hutton (an agriculturalist), John Playfair (a mathematician), George Cuvier (a comparative anatomist), Charles Darwin (an apostate divinity student turned naturalist), and various theologians (Buckland, Fleming, Pye Smith, and Sedgwick). Might we respectfully suggest that, if non-geologists were allowed to develop the standard historical geology, non-geologists might also be permitted to evaluate and criticize it? Historical geology, with its evolutionary implications, has had profound influence on nearly every aspect of modern life, especially in its fostering of an almost universal rejection of the historicity of Genesis and of Biblical Christianity generally. It is not reasonable, therefore, to expect Bible-believing Christians to acquiesce quietly when, in the name of “science,” historical geologists attempt to usurp all authority in this profoundly important field of the origin and history of the earth and its inhabitants.

It is at this point that the authors feel that these critical reviewers have been most unfair. As we have stressed repeatedly in our book, the real issue is not the correctness of the interpretation of various details of the geological data, but simply what God has revealed in His Word concerning these matters. This is why the first four chapters and the two appendixes are devoted to a detailed exposition and analysis of the Biblical teachings on creation, the Flood, and related topics. The last three chapters attempt then, in an admittedly preliminary and incom-
plete manner, to explain the pertinent geological and other scientific data in the light of these teachings. The criticisms, however, have almost always centered upon various details of the latter, and have ignored the former and more important matters. The very strong and detailed Biblical evidences for a recent Creation, the universal effects of the Curse, and the worldwide destructive effects of the Deluge, have evidently been neglected as peripheral and inconsequential as far as these reviewers are concerned. Of course, they cite opinions to the effect that various interpretations are possible, etc., but none ever deals with the actual Biblical evidence.

The only conclusion that one can draw from this is that the authors and their critics seem to be operating on two entirely different sets of presuppositions. On the one hand, scientific data are interpreted in the light of Biblical revelation; on the other hand, both revelation and the scientific data are interpreted in the light of the philosophic assumption of uniformity.

The second basic criticism of these reviewers is the charge that we have supported our position by quotations taken out of context, and that these quotations are consequently misleading. To this we would only suggest that skeptical readers look up the references for themselves. We have been careful to give full documentation for every reference, for just this reason. We flatly reject the innuendo that we have tried to give the impression that the authorities cited agree with our basic position or even with the particular argument we are attempting to illustrate by each quotation. We are of course trying to show in each case that the actual scientific data can be interpreted just as well or better in terms of the creation-catastrophe framework. Since it would be unrealistic to expect most readers to accept our description of the particular phenomenon under discussion simply on our own authority, we use instead the works of recognized geologists of the orthodox school. No implication is intended, unless explicitly so stated, concerning the beliefs of the particular writer quoted. We believe the quotation in each case speaks for itself concerning the issue at hand. This, of course, is standard procedure in scientific dialogue and argumentation. The latter would be quite impossible were writers expected to limit their citations to recognized authorities who already agreed with their position.

Space does not permit a detailed discussion of the specific examples which the reviewers give in support of their charge of misleading quota-

However, we deny not only the general charge but also the validity of the individual examples. We believe a careful reading of both the original articles and our use of portions of them in our discussions will verify their pertinence and contextual soundness as they stand. We of course readily acknowledge our fallibility. When and if legitimate weaknesses or mistakes are pointed out, we hope that we shall be willing to acknowledge and revise them. As we have tried repeatedly to stress in the book, our specific discussions of individual geologic problems are tentative and subject to continuing re-evaluation with further study, but these problems do not, and cannot be allowed to, raise questions concerning the basic framework of Biblical revelation within which they must be understood.

It is our sincere prayer that God may continue to use this volume for the purpose of restoring His people everywhere to full reliance on the truth of the Biblical doctrine of origins. We are convinced that it is only through a proper understanding of God’s Word that men can understand the mysteries of God’s world. “With thee is the fountain of life: in thy light shall we see light” (Psa. 36:9).

Henry M. Morris
John C. Whitcomb, Jr.

May 25, 1964
for such a condition, continuing throughout an entire year, would contradict all known laws of water action.\(^1\) Albertus Pieters, a more recent advocate of the limited-Flood view, frankly admits the problems that this view entails:

If the relative elevation of the continents above the sea level was as at present, and if the "mountains of Ararat" mentioned as the resting place of the ark are the table land now known by that name, the flood must have been universal or nearly so; for that region is now 5,000 feet above sea level, and an inundation sufficient to cover it would cover the whole world, with the exception of the highest mountain ranges. But it is not at all certain that the levels have not changed.\(^2\)

Therefore, we conclude that the argument based upon a limited usage of universal terms must be rejected. It does not do justice to the context of the Flood narrative, it fails to cope with the physical phenomena described in those chapters, and it has encouraged Christian thinkers to take utterly unwarranted liberties with the text of Scripture. Our main concern, as honest exegetes of the Word of God, must not be to find ways of making the Biblical narratives conform to modern scientific theories. Instead, our concern must be to discover exactly what God has said in the Scriptures, being fully aware of the fact that modern scientists, laboring under the handicap of non-Biblical philosophical presuppositions (such as materialism, organic evolution, and uniformitarianism), are in no position to give us an accurate reconstruction of the early history of the earth and its inhabitants.

\(^{1}\) It is of interest to note that his co-worker, C. F. Keil, was strongly opposed to the local-Flood concept: "A flood which rose 15 cubits above the top of Ararat could not remain partial, if it only continued a few days, to say nothing of the fact that the water was rising for 40 days, and remained at the highest elevation for 150 days. To speak of such a flood as partial is absurd. Even if it broke out at only one spot, it would spread over the earth from one end to the other, and reach everywhere to the same elevation. However impossible, therefore, scientific men may declare it to be for them to conceive of a universal flood of such height and duration in accordance with the known laws of nature, this inability on their part does not justify anyone in questioning the possibility of such an event being produced by the omnipotence of God." Op. cit., p. 146.

\(^{2}\) Pieters, op. cit., p. 119. J. J. Stewart Perowne, another advocate of a limited Flood, was embarrassed by the same problem: "On reading this narrative it is difficult, it must be confessed, to reconcile the language employed with the hypothesis of a partial deluge... The real difficulty lies in the connecting of this statement [7:19] with the district in which Noah is supposed to have lived, and the assertion that the waters prevailed fifteen cubits upward." Loc. cit., pp. 2181-2182. Not until Christian scholars show a willingness to break completely with uniformitarian geology will they begin to understand the full significance of the Genesis Flood.

NOAH AND THE ANIMALS

Another familiar cluster of objections to the doctrine of a universal Flood gathers around the problem of how the animals were brought into the Ark and cared for during the 371 days of the Flood. Conservative Christians of the local-Flood school believe that collecting a few domesticated animals in Mesopotamia and caring for them in the Ark would have been a relatively simple matter. But to gather and care for two of every kind of land animal in the world would be a different matter. It has been repeatedly asserted by these men that even if Noah could have collected such a vast number of animals, the Ark could not have contained them, nor could they have been properly cared for by eight persons for an entire year.

Gathering the Animals to the Ark

Since the year 1840, when John Pye Smith first set forth these objections,\(^1\) writers of the limited-Flood school have outdone one another in an effort to depict the supposed absurdities of such a situation. For example, Robert Jamieson wrote in 1870:

On the hypothesis, therefore, of a universal flood, we must imagine motley groups of beasts, birds, and reptiles, directing their way from the most distant and opposite quarters to the spot where Noah had prepared his ark—natives of the polar regions and the torrid zones repairing to sojourn in a temperate country, the climate of which was unsuited alike to arctic and equatorial animals. What time must have been consumed! what privations must have been undergone for want of appropriate food! what difficulties must have been encountered! what extremes of climate must have been endured by the natives of Europe, America, Australia, Asia, Africa, and the numerous islands of the sea! They could not have performed their journeys unless they had been miraculously preserved.\(^2\)

Twenty years later, Marcus Dods added some finishing touches to this caricature of Genesis by suggesting that the animals of Australia, "visited by some presiment of what was to happen many months after, selected specimens of their number, and that these specimens


... crossed thousands of miles of sea ... singled out Noah by some inscrutable instinct, and surrendered themselves to his keeping."

However, by the time the Flood controversy had reached this stage, several important fallacies became apparent in the arguments which Marcus Dods and others were setting forth in refutation of the universal Flood view. For one thing, it was recognized on all sides that there was definite danger involved in carrying this type of logic too far—the danger of removing every supernatural element from the Genesis Flood and explaining everything on a purely naturalistic basis. One defender of a limited Flood who clearly saw this danger was J. Cynddylan Jones. In his "Davies Lecture" for 1896, he took occasion to rebuke Marcus Dods:

That doubtless is the way Dr. Dods would set about it ... "get the animals to select specimens of their number," though the learned divine does not condescend to tell us whether it would be by ballot or by show of hands. However, the Supreme Being is not necessarily confined to Dr. Dods' methods. Even if the Deluge were universal, the difficulties enumerated would not prove insuperable to the Almighty ... Such writing ignores the supernatural character of the episode, endeavors to explain it on naturalistic principles, and thereby comes very near holding up to ridicule Him who is God blessed for evermore.1

An equally serious fault in this type of reasoning is that it begs the question of the extent and effects of the Deluge. It assumes, for example, that climatic zones were exactly the same before the Flood as they are now, that animals inhabited the same areas of the world as they do now, and that the geography and topography of the earth continued unchanged. But on the assumption of a universal Deluge, all these conditions would have been profoundly altered.2 Arctic and desert zones may never have existed before the Flood; nor the great intercontinental barriers of high mountain ranges, impenetrable jungles, and open seas (as between Australia and Southeast Asia, and between Siberia and Alaska). On this basis, it is quite probable that animals were more widely distributed than now, with representatives of each created kind of land animal living in that part of the earth where Noah was building the Ark.

The Capacity of the Ark

Another aspect of this problem is the capacity of the Ark for carrying two of every kind of land animal and seven of every "clean beast" (Gen. 7:2-3).3 Realizing full well that the Ark was a gigantic structure, advocates of a local Flood have had to resort to various methods of "multiplying the species" in order to make it impossible for any ark, however large, to carry two of each kind. One method has been to take the phrase "seven and seven" (Gen. 7:2-3) to mean fourteen, instead of "by sevens," and to classify all the birds of the heavens as "clean." Jan Lever, Professor of Zoology at the Free University of Amsterdam, has done this and comes to the conclusion that "of the clean animals and of the birds there were seven pairs, of the unclean one pair. There are known at present about 15,000 species of birds. This means that there were 210,000 birds in the ark."2

But even assuming that there were 15,000 different species of birds in the days of Noah,3 Dr. Lever has put 180,000 too many birds into the Ark! The Hebrew phrase "seven and seven" no more means fourteen than does the parallel phrase "two and two" (Gen. 7:9,15). It assumes, for example, that climatic zones were exactly the same before the Flood; nor the great intercontinental barriers of high mountain ranges, impenetrable jungles, and open seas (as between Australia and Southeast Asia, and between Siberia and Alaska). On this basis, it is quite probable that animals were more widely distributed than now, with representatives of each created kind of land animal living in that part of the earth where Noah was building the Ark.


3 See discussion of antediluvian geography and climate, pp. 121-122; 240-245; 287-293.
mentioned so that Noah might not be left to his own devices in fixing the limits of what verse 2 included.  

Another common method of “multiplying the species” has been to identify the “species” of modern taxonomy with the “kinds” of Genesis. John Pye Smith seemed to find much delight in pointing out that the Ark was too small for such a cargo, for “the innumerable millions upon millions of animalcules must be provided for; for they have all their appropriate and diversified places and circumstances of existence.”

But a hundred years of further study in the science of zoology has brought to light some interesting facts concerning the amazing potentialities for diversification which the Creator has placed within the Genesis kinds. These “kinds” have never evolved or merged into each other by crossing over the divinely-established lines of demarcation; but they have been diversified into so many varieties and sub-varieties (like the races and families of humanity) that even the greatest taxonomists have been staggered at the task of enumerating and classifying them.

Frank Lewis Marsh has prepared a diagram (see Fig. 4) to illustrate his conception of how some of the typical baramins (from bara—“created,” and min—“kind”) might have become diversified before and after the Flood. He points out that over 500 varieties of the sweet pea have been developed from a single type since the year 1700; and that over 200 distinct varieties of dogs, as different from each other as the dachshund and the collie, have developed from a very few wild dogs. In further discussing the matter, Dr. Marsh writes:

In the field of zoology a very good illustration of descent with variation is furnished by the domestic pigeon. The diversity in form and temperament to be found among strains of pigeons would stagger our belief in their common origin if we did not know that they have all been developed from the wild rock pigeon of European coasts, Columbia livia. It is extremely interesting to see the variations from the ancestral form which are exhibited in such strains as the pouter, the leghorn runt, the fantail, the tumbler, the owl, the turbit, the swallow, the carrier, the nun, the jacobin, and the homer. Different “species” names and possibly even different “generic” names would certainly be assigned to some of these if it were not known that they are merely strains of a common stock.

It is unwarranted to insist that all the present species, not to mention all the varieties and sub-varieties of animals in the world today, were represented in the Ark. Nevertheless, as a gigantic barge, with a volume of 1,396,000 cubic feet (assuming one cubit = 17.5 inches), the Ark had a carrying capacity equal to that of 522 standard stock

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Fig. 4. DIAGRAM OF THREE GENESIS KINDS.

(From Frank L. Marsh, Evolution, Creation, and Science, p. 179.)

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1 Leupold, op. cit., p. 290. Birds are specifically divided into “clean” and “unclean” kinds in Leviticus 11, along with the other animals.
2 John Pye Smith, op. cit., p. 144.
3 Robert E. D. Clark has recently concluded: “Every theory of evolution has failed in the light of modern discovery and, not merely failed, but failed so dismally that it seems almost impossible to go on believing in evolution!” Darwin: Before and After (Grand Rapids: Grand Rapids International Publication, 1958), p. 145.
cars as used by modern railroads or of eight freight trains with sixty-five such cars in each.\(^1\)

Ernst Mayr, probably the leading American systematic taxonomist, lists the following numbers for animal species according to the best estimates of modern taxonomy:\(^2\)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammals</td>
<td>3,500</td>
</tr>
<tr>
<td>Birds</td>
<td>8,600</td>
</tr>
<tr>
<td>Reptiles &amp; Amphibians</td>
<td>5,500</td>
</tr>
<tr>
<td>Fishes</td>
<td>18,000</td>
</tr>
<tr>
<td>Tunicates, etc.</td>
<td>1,700</td>
</tr>
<tr>
<td>Echinoderms</td>
<td>4,700</td>
</tr>
<tr>
<td>Arthropods</td>
<td>815,000</td>
</tr>
<tr>
<td>Mollusks</td>
<td>88,000</td>
</tr>
<tr>
<td>Worms, etc.</td>
<td>25,000</td>
</tr>
<tr>
<td>Coelenterates, etc.</td>
<td>10,000</td>
</tr>
<tr>
<td>Sponges</td>
<td>5,000</td>
</tr>
<tr>
<td>Protozoans</td>
<td>15,000</td>
</tr>
</tbody>
</table>

**TOTAL ANIMALS** 1,000,000

In the light of this recent estimate, one wonders about "the innumerable millions upon millions of animalcules" which Pye Smith insisted the Ark had to carry, especially when we consider that of this total there was no need for Noah to make any provision for fishes (18,000 "species"), tunicates (marine chordates like sea squirts—1,700), echinoderms (marine creatures like starfishes and sea urchins—4,700), mollusks (mussels, clams, oysters, etc.—88,000), coelenterates (corals, sea anenomes, jelly fishes, hydroids—10,000), sponges (5,000), or protozoans (microscopic, single-cell creatures, mostly marine—15,000). This eliminates 142,000 "species" of marine creatures. In addition, some mammals are aquatic (whales, seals, porpoises, etc.); the amphibians need not all have been included; a large number of the arthropods (815,000 "species"), such as lobsters, shrimps, crabs, water fleas, and barnacles, are marine creatures, and the insect "species" among arthropoda are usually very small; and


\(^3\) H. W. Vaughan: types and Market Classes of Live Stock (Columbus, Ohio: College Book Co., 1945) p. 85.

\(^*\) Lest anyone be concerned about the space occupied by the insects, worms, and similar small creatures, let it be noted that, if the space occupied by each individual averaged 2 inches on the side, only 21 more cars of this size would suffice for over a million individuals. Extant animals such as the dinosaurs may also have been represented on the Ark, probably by very young animals, only to die out because of hostile environmental conditions after the Flood; it seems more likely, however, that animals of this sort were not taken on the Ark at all, for the very reason of their intended extinction.
I am convinced that many thousands of plants survived either as floating vegetation rafts or by chance burial near enough to the surface of the ground for asexual sprouting of new shoots. I am, of course, aware that objections could be raised on the idea that long exposure to salt water would be so harmful to any vegetation as to either kill it or so reduce its vitality as to make root and new shoot formation impossible. However, I see no reason at all to postulate that the salt content of the ocean at the time of the flood was as high as it is now. In fact, on the basis of the canopy theory, we would most certainly expect that the salt content of the ocean before the flood would be diluted, perhaps by one-half. Naturally, during the first few hundred years after the flood the salt content of the ocean would again be rather rapidly raised because of the much above normal drainage of the land surface.\[^1\]

Marsh further suggests that:

There was doubtless a considerable number of plants which were carried through the Flood in the form of seeds which composed a portion of the large store of food cached in the ark. But most of the vegetation sprang up here and there wherever the propagules were able to survive the Flood.\[^2\]

\section*{Caring for the Animals in the Ark}

Granting, then, that the Ark was large enough to carry two of every kind of land animal, how could Noah and his family have cared for them during the year of the Flood? Ramm fears that “the task of carrying away the manure, and bringing food would completely overtax the few people in the ark,” and quotes F. H. Woods in the \textit{Hastings Encyclopedia of Religion and Ethics} to the effect that even the most skilled modern zoologists could have coped with such a task.\[^3\] Arthur Custance multiplies the difficulties even more:

Many commentators have calculated the size of the Ark and the total number of species in the world, and spoken freely of its capacity to carry them. What they do not always remember is that such animals need attention and food, the carnivorous ones, if they existed as such, requiring meat which would have to be stored up for one whole year. In any case, a sufficient supply of water for drinking would probably have to be taken on board since the mingling of the waters in a worldwide Flood would presumably render it unfit to drink . . . It is rather difficult to visualize a

\[^1\] Letter from W. E. Lammerts, Livermore, Calif., Nov. 27, ’57.
\[^2\] Marsh, \textit{op. cit.}, p. 213.
\[^3\] Ramm, \textit{op. cit.}, p. 246.

\section*{Non-Geological Arguments Against a Universal Flood}

Flood of worldwide proportions but with so little turbulence that four men (perhaps helped by their womenfolk) were able to care for such a flock. It would take very little unsteadiness to make the larger animals almost unmanageable. It becomes even more difficult to conceive how proper provision could have been made for many animals which spend much of their time in the water, such as crocodiles, seals, and so forth.\[^1\]

Since the Bible does not give us details on these points, we are of course unable to speak dogmatically as to the methods which were used in caring for the animals. We suggest the reasonable possibility, however, that the mysterious and remarkable factor of animal physiology known as \textit{hibernation} may have been involved. There are various types of dormancy in animals, with many different types of physiologic and metabolic responses, but it is still an important and widespread mechanism in the animal kingdom for surviving periods of climatic adversity.

\textit{Hibernation} and \textit{estivation} occur in every group of vertebrates save birds, and its pre-disposing causes, immediate and remote, are by no means uniform.\[^2\]

Hibernation is usually associated with “winter sleep,” estivation with escape from summer heat and drought. Other factors also apparently are often involved, such as food shortage, carbon dioxide in the environment, and accumulation of fat. Practically all reptiles and amphibians have the capacity of hibernation. Mammals, being warm-blooded, do not have as great a need for it, and so at present, relatively few practice it. Nevertheless, it is probable that the latent ability to do so is present in practically all mammals.

The zoological dispersion of hibernation among mammals is not especially illuminating, since closely allied forms may differ radically in this

\[^1\] Custance, \textit{op. cit.}, pp. 19-20. May we suggest at least that Noah may have obtained drinking water from the rain that fell? Custance imagines another difficulty when he says that the “railed atmosphere” at elevations above that of Mount Everest, if the Flood covered the mountains, would “render all but a few creatures insensible in a very few moments for lack of oxygen” \textit{(op. cit., p. 9). He particularly expresses concern about Noah and his sons having to climb between the ark’s three decks at such high elevations! He of course has overlooked the elementary fact that atmospheric pressure depends on elevation \textit{relative to sea level}. The air column above the raised sea level during the Flood was just as high, and the resulting sea level atmospheric pressure just as great, as the present sea level pressure.}