

# *the deluge story in stone*

BYRON C. NELSON



A HISTORY OF THE FLOOD THEORY OF GEOLOGY  
FOREWORD BY HENRY M. MORRIS



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BS 658 . N 331 1968

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IN STONE



# THE DELUGE STORY IN STONE

A History of the Flood Theory  
of Geology

BY

BYRON C. NELSON, TH. M.  
AUTHOR OF "AFTER ITS KIND"

BAKER BOOK HOUSE  
Grand Rapids, Michigan

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Bethany Fellowship, Inc.

*Seventh Printing, July 1968*

Printed in the United States of America  
by the Printing Division of Bethany Fellowship, Inc.  
Minneapolis, Minnesota

TO MY GOD-FEARING FATHER  
AND MOTHER



## FOREWORD

I first encountered Byron Nelson's remarkable book **The Deluge Story in Stone** about twenty-five years ago, and was profoundly impressed and enthused by it. Even then, it had already had a wide reading and influence for over a decade. It is probably even more relevant today than ever before, and I am pleased and thankful that Bethany Fellowship has undertaken a new edition of this work.

Biblical creationism is undergoing a genuine renaissance in these latter days, as more and more thoughtful people, in every nation and in every Christian denomination, are becoming disillusioned with the philosophy of evolutionism and uniformitarianism. The fallacies of evolution had already been persuasively presented in Mr. Nelson's earlier work **After Its Kind**, also recently republished, as well as in many other books. But many Christians, then and now, even while unwilling to believe in evolution, have failed to see that their tacit acceptance of the supposed geological ages and their fossil record of the gradual development of increasingly complex forms of life on the earth has yielded to the evolutionists' main evidence.

That is, the one primary, non-circumstantial evidence supporting the evolutionary system is simply this geological time-scale, with its record of five billion years of earth history, and the fossil record of the gradual rise of more and more complex forms of life on the earth, culminating in the appearance of man about a million years ago. If these ages really existed, in anything like the character and duration claimed by the evolutionist, then the Biblical record of early history is simply wrong. Attempts to reinterpret it to accommodate the geological ages require such distortion and semantic juggling of the text as to amount in effect to its rejection.

But the problem is resolved if we simply recognize the full implications of the Noahic Deluge, which is also recorded in the early Scriptures. For if this event really took place in the way the Bible describes, then the fossil record

does not tell us of long ages of evolution at all, but rather of a great cataclysm in which "the world that then was, being overflowed with water, perished."

Byron Nelson has performed a uniquely valuable service in demonstrating that this cataclysmic interpretation of the geologic strata is not a strange abberation of some modern fundamentalist sect, but is rather that which was held by almost the entire scientific and religious world during the 17th and 18th centuries, as well as by the earliest Christian scholars. It was displaced, not by the discovery of facts which refuted it, but by the resurgence of the ancient pagan philosophies of innate evolutionary progress which simply denied it.

The re-issue of **The Deluge Story in Stone** is timely in view of the modern revival of Biblical creationism and catastrophism. For example, one might note the recent emergence of the Creation Research Society, which is attempting to reinterpret scientific data around the Biblical framework of special Creation and the worldwide Flood. The Society publishes a quarterly journal of scientific papers dealing with these issues and is beginning to make a significant impact in the Christian world. Since its inception in 1963, over 350 qualified scientists, with at least the M.S. degree, have joined the Society, representing literally every field of the physical and biological sciences.

There is much of great interest and value in this book, and this has been very little affected by the fact that over three decades have passed since it was first written. I commend it enthusiastically and trust it will have an even wider reading than when it was first published.

Henry M. Morris  
April, 1968

## PREFACE

In nineteen hundred and twenty-seven, the author published the first edition of *AFTER ITS KIND*, a treatise upholding and explaining the Biblical doctrine of special creation, and opposing the theory of organic evolution. He was compelled in that book, by lack of space, to discuss one phase of the subject more briefly than he desired. The author pointed out that the so-called geological proof of evolution would be completely undermined if it could be shown that the strata of the earth in which fossils are contained were formed not during the long series of immense ages postulated by evolutionists, but rapidly and almost simultaneously, in the brief period of the Noachian Deluge and the readjustment period following it. The author would have liked to present more complete evidences of the Flood as the cause of the fossiliferous strata than he was able to do in the space available. He resolved, however, to satisfy his desire in this respect at a later date by writing a separate book dealing only with that subject. That book, a companion for *AFTER ITS KIND*, the writer is presenting to the Church in *THE DELUGE STORY IN STONE*.

Until one hundred years ago the thesis advanced in these pages, namely, that a great flood had produced the earth's stratified condition, was generally accepted by educated men. Today, as is well known, this theory has been so shoved into the background by modern educators as to become quite lost. The writer received an education covering a broad field before he even heard of this remarkably satisfying interpretation of the earth's physical condition. In his college days he was taught that all the stratified layers of rock were formed at the bottom of the sea of materials worn off the neighboring continents throughout hundreds of millions of years, and after being formed thus were elevated to become dry lands, themselves in turn to be gradually worn away and transformed on the bottoms of the shifting seas into strata of still later

continents. Not until his formal education was complete did the writer learn of a Flood theory of the strata.

His interest having been aroused by the new discovery, because of the bearing of the matter on the theory of organic evolution, which has as one of its main supports a supposed progression of life shown by fossils, the writer turned to a more careful study of modern geological literature. He also made it a point to examine nature itself—to view, wherever possible, the great and the small, the thick and the thin layers of rock of which the earth's surface is composed, and observe the fossils they contain.

The first fossiliferous stratum the writer carefully studied displayed to him a condition which seemed to require a watery catastrophe for its explanation. While outing in the foothills of the Rocky Mountains in Alberta, he climbed down the bank of a river to slake his thirst. Bowing to drink, he noticed that the rock fragment on which he kneeled was full of large shells. Whence came these shells? It was clear that they had never been a part of the life of that fast stream. Looking up to about the middle of the cliff-like bank, the writer saw that the fragment of rock was originally part of a horizontal stratum full of shells, a stratum which extended indefinitely through the rolling plateau. The stratum gave the impression of having been formed by the settling of vast amounts of sediment in a moving, disturbed condition of great waters. Several years later the writer visited the same place again, and searched the cliffs for a mile along that stream, finding at various heights remains not only of shell-creatures of different kinds, but black streaks of carbonaceous matter, indicative of the fact that vegetation had been buried there in the same manner as the shell-creatures. Many flat slabs of the layers fallen from the cliff showed distinct ripple-marks, with stems of jointed plants like sea-weeds lying across them. (See Fig. 29, page 101.) The second visit confirmed the earlier impression that this stratified and fossiliferous condition was due to the Flood, and years of observation of geological

conditions in many places since then have but confirmed that view.

Convinced that the Deluge offers a challenging explanation of the important facts with which geologists deal, the writer began a search into the geological literature of the past, to see what views were held before the modern (evolutionary, uniformitarian) theory began to hold sway, and was surprised to find that the Flood theory was upheld with great scholarship and ability by early geologists, that it was for centuries the one commonly accepted among thinking men, and that it only became obscured as late as the middle of the last century.

Desiring to acquaint others with what he had found so suggestive, the author thought he could do nothing better than to write a historical treatise on the Deluge theory of geology, and, by presenting the views of those early scholars who believed the theory, show the possible geological importance of the Flood.

The writer expects that many readers who devoutly and sincerely believe the Bible will stumble at the hypothesis which he seeks to place in a favorable light. Having long been accustomed to thinking that the Flood merely destroyed the inhabitants of the prediluvian world, the thought that it also destroyed the physical earth and modeled a new one will be too strange and stupendous to be suddenly adopted. The reader is asked, therefore, merely to enter with an open mind upon the discussion of the theme as it is traced from century to century, bearing in mind at the same time the supreme majesty and power of God, and that He was not likely to have done anything to leave the impression that His judgments are paltry and small.

After all the evidence from physical nature in support of the Biblical record of the Flood has been considered, there still remains a body of evidence which offers a strong corroboration of the event. Among tribes and nations entirely unrelated, there exist oral and written traditions of just such a great, earth-destroying happening as is recorded in the Bible. Flood traditions exist

and have existed in large numbers outside the Hebrew nation, and as these unmistakably substantiate the Biblical account, the writer has thought it well to offer the reader a fair sample (by no means all) of these traditions.

BYRON C. NELSON

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## CHAPTER I

### INTRODUCTION

IT would be folly indeed to maintain a Flood theory of geology, if the Bible did not countenance such a theory. It should be decided at the outset, therefore, whether the Bible itself presents such a large view of the work of the Deluge as this book advocates. The question is: Was the influence which the Noachian Deluge exerted upon the physical earth great or small? A modern scoffer has written: "To be sure, the Flood narrative gives no hint anywhere of waves or currents or any sort of violence. All this is superposed on the Biblical account."

Considering the amount of geological work done by the Flood in the light of common sense, it might be asked how it could rain extremely violently, which is the meaning of the figurative words, "The windows of heaven were opened," for forty days and nights, and immense floods not be caused which would sweep away embankments, and spread them out on the surface of the plains, in case the antediluvian earth was anything like the present one.

The Scriptures say, "And the fountains of the great deep were opened" and "the waters prevailed exceedingly upon the earth: and all the high hills that were under the whole heaven were covered." By "the deep," as in poetic language also today, is meant the ocean. How the ocean was brought upon the land, whether by the rending of the continents so that great fissures were made through which the waters could come in; whether by great tidal waves caused by the breaking and elevating of the ocean

bottoms; whether by the shifting of the earth upon its axis so as to cause the earth to wabble and the oceans to be displaced from their beds; whether by a large increase in the gravitational effects of the sun and moon so as to raise immense tides, or by a combination of all these—theories which have at one time or another been advanced—we are not told in the Scriptures. But in the most gentle and quiet manner that can be imagined under present conditions by which a universal deluge could be brought about, namely, by the gradual lowering of the land surface and the raising of the ocean depths, it is difficult to conceive how the highest points of the land could possibly become covered by the oceans *without any currents being formed*, as the critic quoted has said. Were there no tides in the seas at the time of the Deluge such as we have in the seas today?

At present, tides rise and fall twice a day along all the coasts of the world. In some places they rise to a very considerable height. Fifty feet is the average range of the rise and fall in the Bay of Fundy and rises and falls of seventy feet have been recorded there. Forty, and thirty, and twenty, and on down to two or three feet are regular ranges of the tides in other places on the ocean's shores. When the tides come in on their twice-daily visits, their tremendously destructive power is exhibited in many places. At some distance up many rivers which empty into the sea, they travel like a wall of water and spread out over the flat sands on each bank in a roaring surf. This action is commonly called the "bore." Between islands and in many straits of the world the incoming and outgoing tides flow in currents so swift as to be called a "race." In some places, as along the coast of Ireland and in the Baltic Sea, the tides set up a whirling action so strong that it forms hollows which can destroy ships. Victor Hugo, in "THE TOILERS OF THE SEA," has given a vivid description of these daily whirling phenomena.

Describing the regular action of the tide on the northern shore of France, in the Bay of St. Michael, Elisee Reclus says in "THE OCEAN," "At low water, the immense plain, about 150 square miles in extent, resembles

a bed of ashes. But when the tide, swifter than a horse at full gallop, rises foaming over the scarcely perceptible slope, a few hours are sufficient to transform the whole bay into a sheet of grayish waters, penetrating far up the mouth of rivers. . . . At the ebb, the waters retire with the same speed to nearly six and a quarter miles from the shore, and lay bare the desert strand, which is intersected by the subterranean deltas of tributary rivulets, forming here and there treacherous abysses of soft mud, into which travellers are in danger of sinking. At the time of the spring tides the liquid mass which penetrates the bay is estimated at more than 1,470 millions of cubic yards, and, even at neap tides, the deluge, which pours over the beach twice in four and twenty hours, is not less than 765 millions of cubic yards. Is it astonishing that such torrents have been able in former times, when driven by tempests, to break through the chain of sand-hills which protected the rocks of Tombelene and St. Michael on the north, and transform into sterile wastes the beautiful country, and destroy vast forests which extended to the foot of the peninsula of Cotenlin?" This description sounds almost as if the writer had the Flood in mind, but it is only part of a modern scientific treatise on the ocean.

From a Flood geologist of the past century (Graville Penn) we take the following description of the power of ocean tides at the present day: "At the mouth of a river in Nova Scotia, a schooner of thirty-two tons, laden with livestock, was lying with her side to the tide at the influx of the Bore, which was then about ten feet in perpendicular height. No sooner had this mass of water reached the vessel, than that great body was instantly turned over, like a barrel, and presently disappeared. After the tide had ebbed, the schooner was so totally absorbed into the sand and ooze, that the taffel or upper rail of the deck was alone visible."

Assuming, as is practically certain, that there were tides in ancient days as well as now, imagine the oceans beginning to encroach slowly upon the earth at the time of the Deluge, until finally the last and highest

point of land was under water.\* As the sea began to rise, each twice-daily current would come higher and higher up the rivers and valleys, spreading farther and wider inland each time, and would then recede. In places, doubtless, the incoming movements would be as fierce and violent as in the Bay of St. Michael or the mouth of the Amazon, and even more so. The directions of the tidal currents and their violence would change with the changing contours of the surfaces being encroached upon.

We do not say the Flood was brought on by the gradual raising of the sea bottoms, though it may have been. But that being the gentlest manner in which a universal Deluge could be brought about, shall we, in view of what we know of tides, say there could be a universal flood and no violence be done to the earth? Can we think it possible there were no currents, no movements, no motions of the waters back and forth and hither and yon? Pilots of ocean liners tell us that even in mid-ocean, far from shore, there are strong currents and drifts which must be taken into consideration in the steering of the ships. Were the Deluge waters only calm and motionless?

What the magnitude of the Flood was, and what geological work it must have done, *is clear to all who allow the truth of the Scriptures*. That there was an ebb and flow of the waters, and that the motion of the necessary currents for Flood geology is not superposed on the record, but rather is demanded by it, appears from the narrative itself. There are two statements describing the Flood after it had reached its greatest height and had begun to subside. The first is, "And the waters returned from off the earth continually" (Genesis 8:3). This

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\*The total period of the Flood, although readjustments on the earth's surface must have continued for many centuries afterwards, was twelve months and seventeen days. The peak of the Flood seems to have been reached in about two months' time, though this does not mean that every part of the earth was continually under water for so long a time. Many places may have been temporarily laid bare during this height. The remaining five months and more the Flood slowly and gradually receded from off the earth

translation is clear enough as it is, but we believe the thought of the Hebrew text is better expressed by the old translation "and the waters were going and returning from off the earth." Here is described some ebb and flow, some notable back and forth movement of the Deluge waters, as they slowly retreated into the ocean depths. Whether the ebb and flow was that of tides, or some other extraordinary movements, the Scriptures do not say. Special mention is made of the wind which God caused to pass over the earth. Winds of sufficient strength and continuance are capable of producing strong currents in waters. But that there were sufficient movements, tidal or otherwise, to stir up immense quantities of the soil, which perhaps covered the old earth to an enormous depth, certainly seems plain. And a little forward in the Scriptural account, in brief yet expressive narrative, it says, "And the waters decreased continually," or "were going and decreasing" (Genesis 8:5).

The *coup de grace* to the objection that physical violence and disaster in the Flood is foreign to the Bible itself is administered when two noteworthy statements are considered, statements which have always been the inspiration and grounds upon which Flood geologists have based their arguments. These statements are not easily put aside by those who are advocates, on the basis of the Scriptures themselves, of the local Deluge interpretation of the Flood narrative. One passage is found in Genesis 6:13: "And, behold, I will destroy them with the earth." The other is found in 2 Peter 3:6, where the Apostle states, "The earth that then was, being overflowed with water, perished." According to these plain words of Scripture, *not only man, the guilty cause of the event, was destroyed, but the earth, the scene of his lustful acts, as well.* By the destruction of the earth in this case, since it was done by water, can be meant that the fashion only of the old world was destroyed, not its materials. If these two passages of Holy Writ mean anything, they must mean that at the time of the Deluge, and by its actions, a new earth distinctly different from the old one was made. Some alterations that possibly came about, which

have been suggested by various writers, will be presented in the following pages. Here it may be said that the changes may have been not only in the physical earth alone, in the construction of the surface and the location of the continents, but in the temperature, rainfall, and even, so it has been suggested, in plants and animals themselves. That the Deluge was no mean catastrophe, but of a magnitude far perhaps beyond anything we can imagine, is suggested in a measure by the comparison which St. Peter institutes between the destruction of the world that then was by water, and the future destruction of the world by fire. (2 Peter 3:4-7).

## CHAPTER II

### THE EARLIEST FLOOD GEOLOGISTS

WE TURN now to a review of the thoughts and speculations of men on the Deluge of Noah as a great geological agent, beginning with the earliest times, as far as we have record of them.

The first man we meet in whose opinion the Deluge did geological work was the learned Jew, Philo, born about 15 B. C. In a treatise entitled "CONCERNING ABRAHAM" he wrote, "The vast ocean being raised to an height which it had never before attained, rushed with a sudden inroad upon islands and continents. The springs, rivers, and cataracts, confusedly mingling their streams, contributed to elevate the waters. Neither was the air quiet; dense and continuous clouds covered the whole with unremitting torrents of rain; so that it seemed as if all the parts of the universe were resolving themselves into the single element of water; until, the fluid mass having at length accumulated from above and from below, not only the lower lands, but even the summits of the highest mountains, were submerged and disappeared. For every part of the earth sunk beneath the water, and the entire system of the world became (what it is not lawful either to speak or to think) mutilated, and deformed by the vast amputation." Thus in a nutshell did this learned Jew two thousand years ago express what modern Flood geologists believe: "*the earth was mutilated and deformed by the vast amputation.*"

The second man we meet, whose thoughts along this line have been recorded, was Tertullian (155-222 A. D.), a scholarly ecclesiastical writer and defender of Christianity. His view of the Flood was expressed in a witty



Fig. 1. Part of the "Petrified Forest" of Arizona. Every stratum speaks of water. Immense stone tree-trunks lie imbedded in these strata, broken parts of which are seen in the foreground. The strata containing these petrified logs are a continuation of those strata which cap Cedar Mountain in the Grand Canyon of the Colorado a hundred miles away. (See Fig. 17, page 62.)

pamphlet entitled "CONCERNING THE PALLIUM" in which he dealt with the changing fashions of this world. He said that not only dresses and customs of men change, but even the garment of the earth itself. The Deluge was the time when a change on the earth took place. "There was a time," Tertullian wrote, "when her [the earth's]\* whole orb, withal, underwent mutation, over-run by many waters. To this day marine conchs and triton's horns [both large spiral shells] sojourn as foreigners on the mountains, eager to prove to Plato that even the heights have been inundated. But withal, by ebbing out, *her orb underwent a formal mutation.*"

The third man whose views we present is Chrysostom (345-407 A. D.), Bishop of Constantinople. Said he, "Listen! The Deluge was the common wreck of the inhabited land; the cataracts were opened, the abyss flowed out again, and everything was water: the visible things were all resolved into their elements; earth no longer appeared, for all was sea—Behold now a miracle! When the earth had been obliterated . . . Noah went forth, preserved from the wreck. He beheld the earth desolated; he beheld a tumultuary sepulchre, the mud, a sepulchre common to beasts and men; all the carcasses, of horses, and of men, and of all intelligent animals, imbedded in the same tomb. He beheld that tragedy. All had perished . . . *He beheld heaven only the same.*"

St. Augustine (354-430 A. D.) is the fourth man whose views we record. While discussing in his "CITY OF GOD" the "giants" who lived before the Flood, Augustine spoke of certain "bones of incredible size" in the rocks of northern Africa. These bones, he believed, were buried by the Deluge and were the remains of prediluvian men. In the latter belief he was undoubtedly wrong. The bones were probably those of elephants or hippopotami, whose fossil remains are particularly numerous in strata around the Mediterranean.

The fifth important person who regarded the Deluge

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\*Bracketed statements within quotations are the present writer's. Parenthetical statements belong to the quotation.

as of sufficient magnitude to do important geological work is another great light of history, Luther (1483-1546). The location of Eden has always puzzled students of the Bible. While discussing that subject, Luther said, in his "COMMENTARY ON GENESIS," "My opinion of the matter, which, indeed, I have already given, is that paradise, which was very soon closed against man on account of sin, and afterwards totally destroyed and swept from the earth by the Flood, *left no trace or vestige of its original state remaining*, which can now be discovered . . . The awful Deluge *destroyed all things*. . . . Who can doubt, therefore, that the fountains of those rivers [the rivers of Eden] were also broken up and confounded? As therefore, mountains exist where fields and fruitful plains before flourished, so there can be no doubt that fountains and sources of rivers are now found where none existed before, and where the state of nature was changed by that mighty convulsion. Nor do I entertain the least doubt that all these wonders of nature, which are from time to time discovered, are the effects of that same awful visitation, the Deluge. In the metallic mines which are now explored are found *large logs of wood*, hardened into stone; and in masses of stone themselves are perceived various forms of *fishes and other animals*. With the same confidence I also believe that the Mediterranean Sea before the Deluge was not within the land. My persuasion is that the position which it now occupies was formed by the effects of the terrible Flood. So also the space now occupied by the Red Sea was doubtless before a fruitful field, and most probably some portion of this very garden. In like manner those other large bays, the Gulf of Persia, the Gulf of Arabia, etc., as they now exist, are relics of the Deluge."

Both from a physical and a Scriptural point of view, Luther's way of accounting for the impossibility of locating Eden by the geography given in Genesis is satisfactory. Others have offered the same explanation. Whiston, a Deluge geologist of the eighteenth century, said, "I confess that the situation of Paradise has been a very obscure problem, because we still examine the description

*Photo by Rice Studio, Rapid City, S. D.*  
Fig. 2. Isolated buttes in the Bad Lands of South Dakota. The strata are mixtures of sandstone, limestone, clay, shale and conglomerates, often alternately interbedded, indicating tidal movements. The Bad Lands are noted for their wealth of animal fossils—horses, camels, rhinoceroses, dogs, cats, tapirs, deer, rodents, insect-eaters, turtles, crocodile and other extinct animals having been buried in them.



of it by postdiluvian geography." Catcott, another Flood geologist of that period said, "The waters were called by the same names as before the Flood by descendants of Noah, who were acquainted with their former names." Price, the leading modern Flood geologist, answering a critic's objection to the Deluge theory on this score, said, "We have in Genesis II a genuine antediluvian geography, wholly different from anything we have in the world to-day. Some names of that geography are identical with some names in the postdiluvian for the very reason that many names in America are identical with names in England, or Scotland, or Germany. When the survivors from the Flood went forth on their desolated earth, a world wholly new to them, they very naturally gave names to the new places which in many instances were names they had brought with them from the ancient world. But the details of the two geographies are utterly dissimilar. Thus we see that there is a truly universal Deluge, which did completely change the geography of the ancient world."

The sixth man whose views we present is Fabius Colonna, an Italian, writing in 1616. Colonna contended against the quite common opinion in his and later times that fossils were mere sports of nature. He maintained that they were *the remains of former living things*, and that they had been buried in the earth by the destruction at the time of the Deluge. These remains, he said, now exist in different forms. Sometimes shells are found in the solid earth whole and entire, and when they are taken out can be shown to be identical with living shells. Sometimes the shells have disappeared and the cast or mould formed around the shells when the burial took place is all that is left.

The seventh man among early Flood geologists whose views have come down to us is Nicolaus Steno (1638-1686), a Dane whose original name was Niels Steensen, but who changed it when he went to Italy. Late in life Steno became a saintly bishop in the Catholic Church, and devoted himself entirely to theology. In his early years he was a distinguished scientist. In anatomy he discovered

the circulation of the blood in the human body, and also the excretory duct of the parotid gland. In geology he discovered the law of crystallography known as "the law of constancy of interfacial angles." From his work, "A TREATISE ON A SOLID BODY ENCLOSED BY NATURAL PROCESS WITHIN A SOLID," published in 1669, we have his views of the Flood.

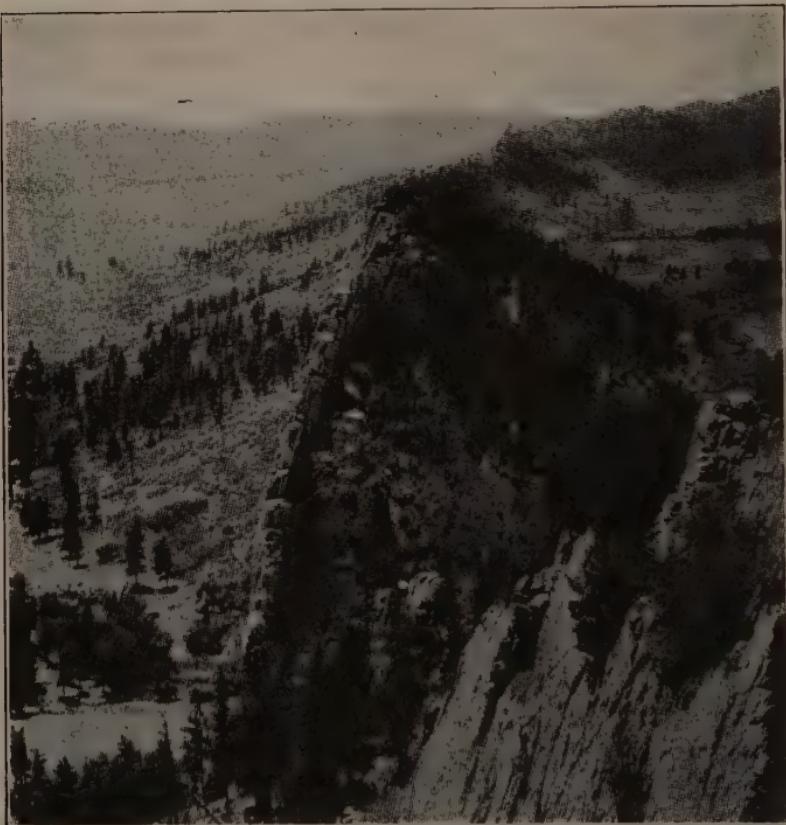
The manner in which Steno upheld the Deluge from nature—the accuracy with which he observed natural conditions, and the sound deductions which he made—speaks well for the intellectual ability of many geologists who, in early days, believed that nature bespoke a universal catastrophe like the Flood.

Steno made a careful study of the earth's formations as he came into contact with them, particularly in Tuscany. He saw that the earth's surface was composed of strata, and said that (we quote), "the strata of the earth, in respect to the manner and place of their production, are like those strata *which muddy water deposits*." His reasons for this belief were, "first, because the tiny particles of the material of the strata could not have been made into the form they are in without having been mixed with some liquid, and then, sinking by their own weight, been spread out by a movement of the same liquid; second, because the larger bodies contained in these strata follow, as a general rule, the laws of gravity; third, because the tiny particles of the strata have so fitted themselves to the bodies held in the strata, that the particles have not only filled the smallest holes, but have also manifested the smoothness and gloss of the body in that part of its own surface where it is in contact with the body."

Steno made the natural inference that the various strata in a locality were laid down in order, that is, *the bottom layers were deposited before those on top*. Furthermore, he said, "if the material of all the strata of the same place are different, it means either that streams of different kinds flowed thither from different directions at different times, or that the materials in the same sediment

were of different gravities, so that first the heavier particles, then the lighter fell to the bottom."

What Steno meant was this. In many places where the strata are well exposed, as for example in the sides of the Grand Canyon of the Colorado (see Fig. 17, page 62), the strata lying above one another are seen to change



*Photo from U. S. Geological Survey*

Fig. 3. Tilted strata. The stratum whose edge is seen sticking out, and which has other softer strata parallel to it on either side (though overgrown with trees), was originally level with the horizon. One part of the foundation of the strata in this region was either pushed up, or another part sank.

their character repeatedly as one proceeds from the bottom to the top. This phenomenon of the rocks, Steno held, varying currents in the Flood could readily explain.

All the layers of the sedimentary rocks as the Deluge formed them, Steno believed, were originally *parallel to the horizon*, and the fact that some strata are not now parallel (see Fig. 3, page 14) is due to their position having been altered from some cause since then. Two processes upset the evenness of the strata, Steno said, one "the violent upthrusting of the layers," the other "the sudden slipping or falling down of the upper layers as a result of the weakening of the underlying layers or foundation."

Steno's personal observation of geological conditions were confined largely to Italy. He said, however, judging from what he heard from other lands, that conditions in Italy were universal. The whole earth's surface was stratified.

Steno was a diligent searcher after the remains of plants and animals in the Italian strata. He found shells, fish and bones of animals, and contended that they were the remains of once living organisms which the Flood had buried. Regarding the formation of plant fossils he said, "If, in a certain stratum, we find a great amount of vegetable matter—trunks and branches of trees and things like that—we may properly decide that these objects were brought to that position by the flooding of a river or inflowing of a torrent."

Some rocks, Steno said, were free from fossils. These, he held, might have been formed at creation. All rocks with fossils, however, must have been formed at the Deluge, since there were no living things when "God gathered together the waters into one place and let the dry land appear" (Genesis 1:9).

It was the rocks of the very high mountains which Steno believed were free from fossils. He did not know, as we do now, that the strata of the world's highest ranges, the Rockies, Alps and Himalayas are fossiliferous. Nor did he know that rocks once full of fossils may have lost all trace of them through that process of chemical change called metamorphism which rocks can undergo.

Steno had to meet several objections to his views con-



Fig. 4. Folded strata. Foldings like this may have occurred from very slow pressure after the strata were hard, or they may have occurred when the strata were soft mud, hardening taking place later.

cerning the geological work of the Flood. Some of his contemporaries said that the remains of no plants or animals could be preserved so long in the earth as the time that the Deluge of Noah required, if that were the cause of their burial. Steno's answer was that it all depended upon the conditions in which the burial of the organisms took place. If they were buried in the right kind of sediment and properly protected from erosion, the remains of the Deluge would last forever.

He gave the following interesting argument to show how long fossils must have been preserved in the rocks, regardless of how they were buried. He said, "That it is certainly true that the burial of many shell-fish which we find today must be traced back to the time contemporaneous with the universal Deluge, is proved by the following argument: It is sure that before the foundations of the city of Rome were laid, the city of Volterra was already great. But in exceedingly large stones which are found in certain places (in the remains of the oldest walls) at Volterra, shells of every kind are discovered, and not so very long ago there was cut from the middle of the forum a stone packed full of lined shells; from this it is certain that the shells found today in the stones had already been formed at the time when the walls of Volterra were constructed."

"And lest anyone should say that those shells only had turned to stone, or that, having been contained inside the stone, they alone have suffered no destruction from the tooth of time, we may say that the whole hill upon which the most ancient Etruscan cities were built rises on top of the deposits of the sea, placed one above another and parallel to the horizon; and in these deposits many strata abound in shell-creatures that are real and have suffered no change at all; so that it is possible to affirm that unaltered shells which we dig from them today were formed three thousand years and more ago. From the founding of Rome to our times, we count two thousand four hundred and twenty years and more. Who will not admit that many ages passed by from the time

the first men moved their homes to Volterra until it had grown to the large size it possessed at the time of the founding of Rome? If we add to these centuries the time that elapsed between the first sedimentary deposit of the hill Volterra, and the time when that very hill was left by the sea and men from other lands came to it, we shall readily go back to the very times of the Universal Deluge."

To this list of early geological thinkers in whose opinion the Flood did vast geological work, we add a few names. Agostino Scilla, a Sicilian painter, studied the fossil shells in the strata about Messina in Sicily, and, convinced that they were real shells, published in 1670 a treatise to prove it, with illustrations of the fossils drawn by himself. In explaining how these shells got into the rocks of Messina, he said that their burial was "brought about by most terrible inundations," which, he believed, were to be associated with the Universal Deluge. He argued that the manner in which the shells were deposited in the strata pointed clearly to the *sorting action of water*. He "imagined that in any great retreat or collection of waters, those [shells] of the same sort would, because of their agreement in figure, be jostled and put together by the motion of the water." The condition of the stratified rocks of Sicily was such as to indicate, said he, that "mighty torrents hurried such terrestrial matter as they met along with them, and, as the speed lessened, the said matter fell to the ground, *the largest bodies first, then the lesser, then the smallest*," so that finally similar species were left reposing together.

What this early geologist called attention to in the action of the Flood waters is one of the *most important features* of the Deluge theory, and can not be too strongly emphasized. The most common criticisms and objections against the Flood hypothesis are made by persons who are thoughtless or ignorant of the assorting power of water. Moving waters, whether large or small, invariably *sort* the sediments they carry, the completeness with which they do this depending on such factors as the speed

of the waters, the amount of sediment carried, and so on. Light and heavy particles of any kind, borne in floods produced by heavy rains and deposited, as countless observant persons have noticed, are always divided from one another according to their relative weights. The Deluge lasted over a year, in all of which time movements of water of varying speeds and dimensions were taking place continuously on the earth. Particles of clay, of chalk, of sand and other earths which, when first picked up by the Flood, were carried all mixed together, by the sorting action of water were so separated—like joined with like and unlike joined with unlike—that definite layers of sand or clay or chalk soon were produced. And as the Flood waters sorted the minerals they carried, so must they also have sorted in large measure *the organic remains* they bore, with the result that single types of fossils are generally found together in one stratum.\*

Jacobus Grandius of Venice, in 1676, published a treatise called "ABOUT THE TRUTH OF THE UNIVERSAL DELUGE AND THE REMAINS WHICH ARE FOUND AT GREAT DISTANCE FROM THE SEA." He told about the remains of marine shells in the Alps and said, "No other waters could have come there but those of the Deluge." In his opinion the world was much altered by the Flood.

About this time also a learned Jesuit, Athanasius Kircher, published a small treatise, "THE ARK OF NOAH." He drew a map in which he indicated the changes in the situations of the lands which the waters of the Deluge produced. Such speculations are no more valuable than similar speculations of modern evolutionary geologists.

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\*Prof. J. Henderson of the University of Colorado, in an article on the sorting power of water, printed in SCIENCE for Nov. 28, 1930, tells how, upon the shores of Bear Lake, Wyoming, immense numbers of shells are found after storms gathered together in layers three and four inches deep and twenty inches wide, and so perfectly separated from the sand by the action of the water that the shells can be scooped up in double handfuls practically without any sand whatever, and he says that these things cast light on many puzzling streaks of fossils in the sedimentary rocks.

To account for the large amount of water needed for the Flood, Kircher suggested that the chemical elements of the air were miraculously combined to form rain. This ingenious proposition, which offered a way out of an early difficulty for Flood geologists, has no need of being adopted today.

## CHAPTER III

### THE FIRST ENGLISH FLOOD ADVOCATES

WE TURN now to England, where, by the seventeenth century, a tremendous amount of interest had been awakened in geological speculation.

The first Englishman we can record who looked upon the Deluge as an event largely responsible for the present formation of the earth was Thomas Burnet, who published in 1681 a work called "A SACRED THEORY OF THE EARTH." As a treatise on the Flood it was largely fanciful, but not without some redeeming features.

The opinion that the Deluge was local, confined merely to the region of Palestine and Mesopotamia, was held by a few timid souls in Burnet's time. An Italian named Quirini, 1676, was one who advocated this view—the first man we have record of who did so. Burnet showed how contrary to the Scriptures and to common sense such an opinion was. One simple argument he gave seems to be unanswerable. Said he, "What need so much ado to build an ark to save Noah and his family, if he might have saved himself and them only by retiring into some neighboring country? Had this not been a far easier thing and more compendious than the great preparations he made of a large vessel, with rooms for the reception and accommodation of beasts and birds?"

An important problem for early Flood geologists was: Whence came the water necessary for so great an event as the Bible describes? In the world as they knew it there did not seem to be enough. Burnet endeavored to solve this problem. But before discussing how he dealt with the matter, let us consider what is now known as to the

amount of water that would be available for another universal Flood, if there should be one.

It is safe to say that no one knows how much water there is inside the earth itself, in underground springs and rivers. A leading modern geologist, R. D. Salisbury says,\* "The amount of ground-water is not definitely known, but the best estimates which have been made indicate that the water in the soil, rocks, etc., of the land probably would make a layer not more than 1,000 feet deep if spread over the surface of the land. Estimates have ranged from 3,000 to 100 feet." Nor does anyone know how much moisture is held in the air. Between what is in the air and what is inside the earth the amount of water in the world may be astonishingly great. It is, however, in the oceans that the waters are contained which would be ample for another universal Flood. Geographers\*\* say that the total land surface of the globe is about 55,697,000 square miles, while the total ocean surface is 141,243,000 square miles. The portion of land to water area on the face of the globe is about 3 to 8, or almost *three times as much water as land* (see Fig. 5, page 23). The area of the Pacific Ocean alone is 10,000,000 square miles greater than all the land surfaces combined. The average depth of the ocean waters is 12,000 feet, and is *twelve times* the average height of the land surfaces. The deepest spot in the ocean thus far fathomed is 31,614 feet. Hence the highest spot on the land, Mt. Everest, could be turned upside down without hitting the bottom by half a mile. Eight spots in the ocean thus far fathomed, some of them thousands of miles apart, are deeper than Mt. Everest is high. On the modern conception of the amount of water in the seas we may quote Schuchert and LeVene\*\*\*, "The volume of all the ocean water is *fifteen times greater* than the mass of land protruding above sea-level. If all the deeper parts of the ocean were filled by material up to the

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\*PHYSIOGRAPHY, 1927.

\*\*e.g., Murray and Hjort, "DEPTHES OF THE OCEAN," 1912, and "SMITHSONIAN INSTITUTE REPORT," 1912.

\*\*\*\*"THE EARTH AND ITS RHYTHMS," 1927.

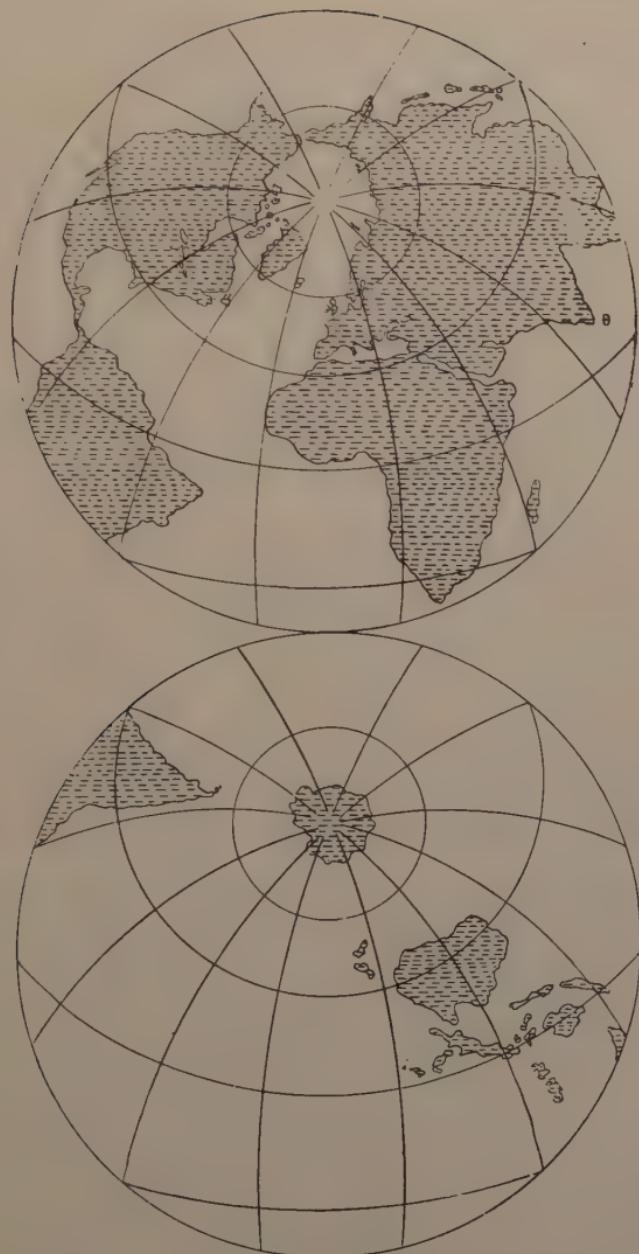


Fig. 5. Relative amounts of land and water areas on the surface of the globe. The upper is called the "land," the lower the "water" hemisphere. It has been suggested that before the Flood the land areas of the earth were united into one body, and the waters likewise "gathered together unto one place" (Gen. 1:9)

mean depth, it is said that there would result a universal ocean, covering the entire earth to a depth of one and a half miles." And they add, "These facts show, since the waters are mobile and cover three-quarters of the earth's unstable surface, why it is that the oceans are enabled so readily to overflow the lands upon relatively small changes in the elevation of the crust." It has also been estimated by modern geographers that if the ice caps on Greenland and on Antarctica were melted, the oceans would be raised 200 feet above their present level. Whether, therefore, there was a universal deluge or not, *educated people have no excuse for repeating the old objection that there was not enough water to produce it.* The ease with which the waters of the ocean could overflow the highest lands in tidal waves can be seen by reference to Figure 6 on page 25.

In contrast with what moderns have learned about the seas and lands, note what Burnet, who was representative of his day, believed. The land surface, he thought, was a mile in average height (five times greater than it is actually known to be), and the average depth of the seas was a quarter of a mile (about twenty-five times too small). It was these mistaken notions that led Burnet to hold that the "great deep" of the Scriptures was a large cavern or hollow somewhere in the earth. He called it the "abyss,"\* and said that it was from here that the Deluge

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\*Modern geologists delight in ridiculing the early conception of an "abyss." Poor grace is thus shown by them, in view of their own beliefs. The following opinions have been held in modern times by those supposed to know: (1) the center of the earth is a gas, due to the fact that the pressure at the center is thought to be so great that any metal must turn to gas; (2) the center of the earth is liquid or molten; (3) the center of the earth is part solid and part liquid; (4) the center of the earth is solid. An hypothesis looked on with favor in geological circles at the present time is the theory of "floating continents." The continents are said to be great islands resting on some peculiar fluid deep in the earth, and are drifting about. South America once broke off from Africa and drifted away. Iceland, Greenland and Antarctica were once near the equator and drifted to where they are. Thus the presence of fossils of tropical plants in the strata of these frozen lands is said to be accounted for.



Fig. 6. A line representing the land surface above sea level of the continent of Asia from the Arctic Ocean to the south of India. The approach to mountains is usually a long, gradual ascent, famous peaks themselves, when reached, not standing out much above the surrounding country. The Himalaya mountain area, highest in the world, may seem ridiculously low as represented on the line. In actual fact, however, it is almost three times too high. That is, the line is three times thicker than it ought to be. This appears from the fact that the length of the line represents about 5,000 miles, while the greatest thickness of the line represents less than 6 miles. It can be seen how easily a slight jar to the ocean bottom could send tidal waves across the lands.

waters came. Reference to the Scripture passages: Gen. 1:2; Job 41:31; Ps. 104:5, 6; Isaiah 51:10; 2 Cor. 11:25 and many others show that *tehom*, translated "the deep," means the *ocean* rather than a hollow filled with water within the earth. The passage "and the fountains of the great deep were broken up" probably means that the solid bottom of the oceans were torn by earthquake shiftings, upheavals and depressions.

As we have already said, Burnet's theory of the Deluge was fanciful and not in accord with the Scriptures. In his view there was on the prediluvian earth no sea, no mountain, no rain. The soil was watered from below, by percolating up from the "abyss" beneath. When the Flood came, the outer shell of the earth cracked and sank, permitting the waters of the "abyss," which was in the form of a band around a solid center, to overflow the land.

Burnet's theories raise several interesting questions. What was the make-up of the antediluvian world? How high were the hills? What was the soil like? What was the climate? Were there no rains as now, but only mists? Were atmospheric conditions such that a rainbow was never formed?

We come now to John Woodward, M.D., Professor of Medicine at Cambridge, a close friend of the great astronomer Sir Isaac Newton, beside whose body Woodward's lies in Westminster Abbey. Woodward's large collection of fossils forms the nucleus of the present Woodwardian Museum at the University of Cambridge; and the Woodwardian Professorship, established in his honor, is one of the great prizes sought by modern British scientists. He was the outstanding geologist of his day. His principal work on the Deluge appeared in 1695, entitled, "AN ESSAY TOWARD A NATURAL THEORY OF THE EARTH." He also wrote a "HISTORY OF FOSSILS," which was largely a catalogue of the fossils he had collected.

Woodward's convictions regarding the geological importance of the Flood were based on a close study of the geological status of England. Speaking in his "ESSAY"

about his studies he said, "The observations I speak of were all made in England, the far greatest part whereof I traveled over on purpose to make them; professedly searching all places as I passed along, and taking careful and exact view of things on all hands as they presented, in order to inform myself of the present condition of the earth and all bodies contained in it, as far as either grottos or other caverns, mines, quarries, coalpits and the like let me into it and displayed the sight of the interior part of it. . . Wheresoever I had notice of any sinking wells, or diggings of earth, clay, marl, sand, gravel, chalk, coal, stone, marble, ores or metals, I forthwith had recourse thereunto." In order also to know how things were outside of England, he drew up a list of questions which he sent to friends and others in all parts of the world.

The geological conditions Woodward thus learned existed were described by him as follows: The earth, all around the globe, appears, wherever it is laid open, to be wholly composed of strata lying on each other in the form of so many sediments *fallen down successively in water*. Those strata that lie deepest are ordinarily the thickest and those that lie above are gradually thinner up to the surface. There are *sea shells and teeth and bones of fishes buried in different sorts of strata*, not only in lax chalk, clay and marl, but even in the most solid stone. Those marine bodies are incorporated with the sand that constitutes the stone of the strata in such a way as together to compose one common mass. On breaking up the mass so as to part the shell from the stone, the stone is observed to have received an impression of the exterior of the shell so exact as to show that it had been applied to all parts of the shell, which the stone could not have been capable of had it not been then in a state of solution. Marine productions are deposited as well at the *bottom of the deepest mines* as to the very *tops of the highest mountains*. They are observed in some places in such *multitudes*, in bulk and quantity, as to equal if not exceed the sand or other terrestrial matter of the strata. There are shells buried in the earth that are of foreign origin, being *not the product of the neighboring seas* but of seas

a great distance away. There are often discovered in the depths of the earth shells that are not found living on any coasts, being doubtless such as naturally live only in the deepest recesses of the ocean. In all parts of the world, as well in countries the most distant from the seas as those that lie nearer them, the strata are compiled and the marine bodies disposed in them everywhere after the same method, and so, apparently, as to show things were reduced to this method *in all countries at the same time and by the same means*. There are lodged in the strata, bones, teeth and other parts of *land animals*, which are often of such kind as are *not natives* of the country in which they are thus found. There are also buried, even in the firmest and hardest strata, leaves of various kinds of vegetation, and sometimes whole trees, as well as such seeds as are durable and capable of being preserved, like nuts, pine-cones and so on. Many of the plants which are buried in the strata can grow at present only in climates entirely different from those in which their remains are entombed. Trees in great numbers and often very large are buried in some northern lands where, on account of the great bleakness and cold, no trees are now growing at all.

The last reference of Woodward was to the remarkable fact that in the stratified rocks of Greenland and Spitzbergen fossils of such plants occur as ferns, oaks, planes, magnolias, cinnamons, ginkos and breadfruits, the last mentioned growing today in India and South China. Similar fossiliferous conditions are reported from Antarctica. (See Fig. 7, page 29.)

In order to account for the geological conditions that exist throughout the earth, Woodward advanced the following propositions: “[1] That during the time of the Deluge . . . all the stone and marble of the antediluvian earth, all the metals of it, all the mineral concretions, everything, in a word, that had obtained any solidity, were totally dissolved and their constituent corpuscles all disjointed, their cohesion perfectly ceasing. [2] That all this sand, earth and the like, together with animal and plant remains were all assumed up promiscuously into the

U.S. GEOLOGICAL SURVEY  
Fig. 7. Fossil ferns and palms from the stratified rocks of Cape Lisburne, Alaska, 100 miles north of the Arctic Circle. Similar fossils are found in Greenland, Spitsbergen and Siberia



water and sustained in it in such manner that the water and bodies in it together made up a common, confused mass. [3] That at length all the mass that was thus borne up in the water was again precipitated and subsided towards the bottom. [4] That this subsidence happened generally, and, as near as possibly could be expected in so great a confusion, according to the laws of gravity. [5] That the matter, subsiding thus, formed the strata of stone, of marble, of coal, of earth and the rest, of which strata, lying one upon another, the terrestrial globe, or at least as much of it as is ever displayed to view, doth mainly consist. [6] That human bodies and the bodies of quadrupeds and other land animals, of birds, of fishes, both of the cartilaginous, squamose, and crustacean kinds . . . as also trees, shrubs and all other vegetables . . . were not precipitated till the last, and so lay above all the former, constituting the supreme or outermost stratum of the globe. [7] That these being thus lodged upon the rest, and consequently more nearly exposed to the air, weather and other injuries, the bodies would suddenly corrupt and rot; the bones, teeth and shells would all likewise rot with the rest in time, except those which were secured by the extraordinary strength and firmness of their parts, or which happened to be lodged in such places where there was great plenty of bituminous or other matter to preserve and, as it were, to embalm them. [8] That the said strata . . . lying thus each upon other, were originally parallel, plain, even and regular, and not interrupted and broken. [10] That after some time the strata were broken up on all sides of the globe . . . dislocated, and their situation varied, being elevated in some places and depressed in others. [11] That the agent or force which affected this disruption and dislocation of the strata was seated within the earth, and the irregularities and inequalities of the terrestrial globe were caused by this means. [12] That the natural grottos in rocks, and those intervals of the strata which in my observations I call the 'perpendicular fissures' are nothing but these interruptions or breaches of the strata. [13] That the more eminent parts of the earth, moun-

tains and rocks, are only the elevations of the strata; the lower parts of the earth—valleys and channels of the sea and the rest—are nothing but depressions of the strata. [14] That islands were formed and distinguished by the depression or sinking down of the strata lying betwixt each of them, and between them and the continent."

To Woodward belongs the credit for convincing men generally that fossils were the *relics of former living things*. Until his work on the Flood appeared, many men believed fossils were freaks of nature. Some said that fossils were produced by a certain "fatty matter," set into fermentation by heat, giving birth to fossil shapes. Some said they were the products of "the tumultuous movements of the stars," whatever those might be. Others said that "seeds" or "germs" of living things sank down into the rocks through pores, and there grew into fossil forms. Still others said that God created fossils just to puzzle men and test their faith.

Woodward's greatest difficulty in convincing men of the true nature of fossils was caused by those fossils which belonged to organisms—mostly marine—now extinct or supposedly so. His inability to match certain peculiar and enormous fossil shells\* with those of any living forms proved, so skeptics said, that creatures with such large and strange shells had never existed. Woodward met the argument with the statement that, however unlike any living shells some fossil shells might be, they ought to be regarded as having been once a part of organic life, because they had all the essential characteristics of true shells, and the same texture and constitution of parts as those fossil shells which can be matched with living forms. He also said that, although he was in no wise concerned to prove that every form of shell found in the rocks has its living counterpart (since that was not essential to the correctness of his thesis concerning the Flood), he might be able to do so if he could

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\*Fossil Ammonites, great spiral shells found profusely in the rocks of Britain, measure in some instances over three feet in diameter. These fossils are also found in the strata of the Himalaya Mountains, sixteen thousand feet above sea-level.

descend into the deepest parts of the ocean and bring up from thence all the creatures which have their home there, it being *from the ocean depths* that the peculiar fossils probably came, having been cast up on the shore by the Flood. "It is evident," said he "from the statements of divers and fishers of pearl that there are many kinds of shell-fish which lie perpetually concealed in the deep, screened from our eyes by that vast world of waters, which have their continual abode at the bottom of the ocean, without ever approaching the shore."

Woodward's way of accounting for supposedly extinct forms of marine animals found in the rocks is above reproach. Modern oceanographers confess that they have reason to believe that they catch in their nets but the smallest part of the forms of life which are in the depths of the sea. There may now dwell the Trilobites (see Fig. 8, page 33) whose remains are so abundant in the strata of many parts of the world, and which are supposed by modern geologists to have evolved and died out in the very earliest ages. "It is by no means improbable," says Heilprin\* "that many of the older genera, now recognized as extinct by reason of our imperfect knowledge concerning their true relationships, have in reality representatives in the modern seas."

The precious metals or ores now found in veins in the strata, Woodward maintained, were not formed till long after the Flood. At the close of the Deluge, he said, these ores were simply part of the strata, "being interspersed or scattered in single corpuscles among the sand or other matter of which the strata consist," and when cracks or dykes were formed in the strata, the scattered particles of the metals, being dissolved in some acid, filtered little by little from the strata into the cracks or dykes, and in time filled them with solid compounds. Woodward gave essentially the same explanation for ore veins as that offered by modern geologists.

Two features of Woodward's hypothesis are especially worthy of note. One had to do with the source of the

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\*GEOGRAPHICAL AND GEOLOGICAL DISTRIBUTION OF ANIMALS.



*Photo from the Smithsonian Institution*  
Fig. 8. Fossil trilobites from a stratum in the mountains of British Columbia. These creatures are supposedly extinct but may live abundantly at present in the depths of the seas.

vast amounts of sediments that have gone to make up the strata. This is what Woodward had in mind when he said that at the time of the Deluge every solid substance in the old world, every hard rock, marble and so on, was "dissolved" and taken up in the Flood waters. Just what he meant by "dissolved," or by what means it was accomplished, he did not state. That he did not mean a chemical dissolution, but rather a *mechanical disintegration* is shown by the fact that he said that sand was picked up and spread out by the Flood as sand.

Were such a thing required, it was no task for the Almighty to add a miraculous dissolution of the rocks of the old world to the specifically mentioned work of bringing on the waters. It is not necessary, however, to imagine any miraculous dissolution if we suppose a prediluvian earth unlike the present one in this respect, namely that it had no hard, stratified rocks beneath a shallow covering of soil, but a vast depth of *loose earth* almost universally over the world. (But compare this with Boszio's view, pages 115-116.) In the great plain of the Ganges in India there is today a depth of loose soil so great that the deepest borings have never yet struck solid bottom. Such a condition, if it was wide spread on the earth that was destroyed, would readily provide all the mineral substances of which the present strata are composed.

Woodward himself gave a description of the antediluvian earth that would make any miraculous dissolution theory quite unnecessary. He said, "Although one intention of the Deluge was to inflict a deserved punishment upon the race of men, yet it was not solely leveled against mankind, but principally against the earth that then was; with design to *destroy and alter* that constitution of it which was apparently calculated and contrived for a state of innocence, and to fashion it afresh and get it a constitution more nearly accommodated to the present frailties of its inhabitants. The said earth, though not indifferently and alike fertile in all parts of it, was yet generally much more fertile than ours is. The exterior stratum or surface of it consisted entirely of a kind of terrestrial matter proper for the nourishment and forma-

tion of plants, and this in great plenty and purity; being little or not at all entangled with an intermixture of mere mineral matter that was unfit for vegetation. Its soil was more luxuriant and teemed forth its vegetation *in far greater plenty and abundance* than the present earth does . . . that earth requiring little or no care or culture, but yielding increase freely and without any considerable labor or toil or assistance of human industry."

The other special feature of Woodward's hypothesis had to do with the *importance of gravity* in determining the manner in which fossils and mineral matters of the strata were deposited. His opinion was that "at the time of the Deluge, stone and all other solid minerals lost their solidity; and that the several particles thereof, together with those of the earth, chalk and the rest, as also shells and all other animal and vegetable bodies, were taken up into and sustained in the water; that at length all these subsided again promiscuously, and without any other order than that of the different gravities of the several bodies in this confused mass; those which had the greatest degree of gravity sinking down first, then those bodies which have a lesser share of it fell next, and settled so as to make a stratum upon the former; and so on in their several turns, to the lightest of all, which, subsiding last, settled at the surface and covered all the rest." He then went on to say that the organic remains which were buried in the sediment were so obedient to the law of specific gravity that fossils are now found in strata having the same weight as the fossils, that is, shells of the same specific gravity as sand are found in sandstone, shells of the same specific gravity as chalk being found in chalk and so on.

What Woodward said about the importance of gravity contained some truth. He went *too far*, however, for he seemed to regard specific gravity as the sole determining factor in the order in which light and heavy strata and fossils were deposited. It is undeniable, of course, that within the limits of any single Flood current in which objects and sediments were carried, those of similar weights fell together, the heavy first and the light last.

We have spoken before of the assorting power of moving water. If, however, a current carrying lighter material passed over an area and deposited its burden, and at *some considerable time later* another current from another direction with heavier materials passed over the same area and deposited its burden, the lighter would be found in the end at the bottom and the heavier on the top. Woodward apparently had the idea that all the sediments which now form the materials of the stratified rocks were carried in suspension in the waters of the Flood at one time and were dropped in rapid succession, whereas a more reasonable view, judging from the length of time the Flood lasted and the actual stratified condition of the earth, is that strata were being laid *in different places at different times*. It is probably that while one part of the world was being severely subjected to tidal actions, another far away was not even covered with water. While the Scripture says that all the high places of the earth were covered, it does not say they were all covered at the same time.

## CHAPTER IV

### EARLY ARGUMENTATION

THE theory that the Biblical Flood had changed the old earth and brought about its stratified condition was widely known and discussed by the close of the seventeenth century. It did not, however, find complete acceptance with everybody. Opposition to the idea was sometimes voiced, occasionally from quarters friendly to the Bible as well more especially as from those hostile to it. The most common objection raised, from whatever quarter, was usually based on the false notion men had as to the true nature of fossils.

Of those in England who opposed the Flood theory because they did not believe that fossils were the remains of former living things, the most prominent was John Ray, author in 1692 of "THREE PHYSICO-THEOLOGICAL DISCOURSES." Ray believed the Bible. He also believed that the Flood changed the world considerably. But his erroneous opinion about fossils led him to disbelieve in the Flood as the producer of the stratified rocks. Following are his main arguments against the Deluge, which we will consider for the light thus cast on the nature of that event.

If fossils are truly the relics of living things buried by the Flood, said Ray, many species, particularly of shell-fish, have then been *lost out of the world completely*, and there has thus been a "dismembering of the universe and rendering it imperfect," a thing which Providence would not allow. This argument had little weight with upholders of the Flood theory, for they answered correctly that there is nothing in the Bible or elsewhere to show

that the extinction of a species was not in accordance with the Divine will.

There is no doubt that some species have become extinct since the creative days. As has been previously said, some or all of the peculiar shell-creatures whose fossils are found may still be living in the depths of the seas. As for the rest, their extinction has a ready explanation in the Deluge, in that, if the Flood was a world altering event, *conditions since have not been suitable* for many animals which before the Flood had an environment exactly suited to their needs.

If fossils are real shells, asked Ray, how does it come to pass that those which are bivalves have the two shells separated sometimes and not in others? How Ray's opponents answered this we do not know, but were we to answer we would say that, in the going and returning of the Deluge waters, creatures might have become entombed *after a variety of experiences*. Some might have been buried alive and never disturbed thereafter. Bivalves, under these conditions, would be found today with their shells together. Others might have been buried once, died, in a few days or weeks been picked up again, been transported to some distant spot, and been buried there. In the latter case, especially if the burials and reburials occurred a number of times, it is natural to suppose that the two shells of bivalves would have become loosened from one another and in the end been buried apart.

If fossils are remains of former living things, said Ray, why are not other bodies—"of whales, sea-horses, all squamose fishes, and almost all the crustaceous kinds, as crabs and lobsters"—found as fossils? This was an early objection to the Flood by the infidel Voltaire, who also insisted that fossils were mere freaks of nature. Ray answered it himself when he said that possibly such remains might still be found.

Much progress has been made in paleontological discovery since Ray lived, and today it is known that there is *no type of lower creature whatever*, with the exception of birds, that have not been found as fossils in the *greatest abundance*, and even *some bird fossils* have been

unearthed. The absence of bird fossils in abundance is natural. Bird bones are exceedingly fragile and light, and would be left by the Flood on the uppermost part of the ground, where they would very likely be destroyed by erosion. To illustrate how later discovery has furnished the evidence that was lacking in Ray's time, we may quote what a recent geologist, T. W. David, has said about the Eurypterid, a sort of crab. The remains of this crustacean in Australia, he said, "are so abundant in a bed of limestone five feet in thickness that fragments, small and taken together, occurred at the rate of 200 for every square foot."\*

If fossil shells are real shells, said Ray, "they are found embedded in *horizontal layers* in the highest mountains, 'strata super strata,' in such a manner as necessarily to infer that they must have bred there, which is the work of time." Consequently, Ray said, since the waters of the Flood did not stand over the land for a long enough time for shell creatures to breed there, die, and let their remains accumulate, the shells in the rocks could not be real shells, and hence were not relics of the Flood.

What Ray's contemporaries said to this we cannot say, but it is an objection which deserves our special consideration. A modern geologist recently cited it as a fundamental argument against the Flood theory, saying that the condition Ray describes makes absolutely necessary the acceptance of the uniformitarian\*\* view of geology. The facts, however, as Ray presented them, do not require any uniformitarian conclusion, and *it is denied that any burial condition of fossils the world over requires any such conclusion.*

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\*NATURAL HISTORY, Vol. 29.

\*\*Such terms as "uniformitarian" and "doctrine of uniformity" refer to the supposition that the forces of nature have always operated in the same, slow, gradual, *uniform* manner in which they are operating today. They are the opposite of such terms as "catastrophic" and "doctrine of catastrophism," which refer to the hypothesis that the forces of nature have acted at one time or times in the past far more violently and hastily, from certain causes, than they are acting today. See pages 138-140.

Ray himself had not seen the strata he referred to. The shell-filled layers he had in mind are in the Alps, and his idea of them was drawn from Christian Mentzelius, whom he quoted as follows: "Not far from the mountain called Paterno, where the Bononian stone is gotten, about an Italian mile distant, is a huge hanging mountain, broken by the violence of the torrents, caused by the confluence of waters descending from the neighboring mountains after frequent showers, throwing down heaps of earth from it. In the upper part of this broken mountain are seen many beds or floors of all kinds of sea shells, much sand interposing between bed and bed, after the manner of *stratum super stratum*, or layer upon layer, as the chemists phrase it. (See Fig. 9, page 41.) The beds of sand interceding between these rows of shells are all distinct and separate from one another, and not stuck in any stone or cemented together, so that they might be singly viewed or separately handled with the hands. The cause whereof was their being lodged in pure sand, not intermixed with mud or clay, which kept the shells entire for many ages. Yet were these shells, by reason of the length of time they had lain there, easily resolvable into a purely white calx or ash." In our opinion, the condition here described by Mentzelius, shells in the rocks, layer upon layer—shells, sand, shells, sand, shells, sand—is just such as the movements of the Deluge waters would produce. A stream bearing sand and shells moving back and forth, or moving from side to side, or alternately fast and slow over one area for several hours or days would inevitably sort its material and deposit them in horizontal layers one above another, and we do not see what else could possibly do so.

Whether or not shells of mollusks do accumulate in layers on the shallow sea bottoms from age to age, there are fossils of other kinds of water-living animals which we are very confident did not become accumulated where they are under normal living conditions, but whose burials only an enormous catastrophe of some kind can explain. The fish in the stratified rocks of Ohio can be taken as an

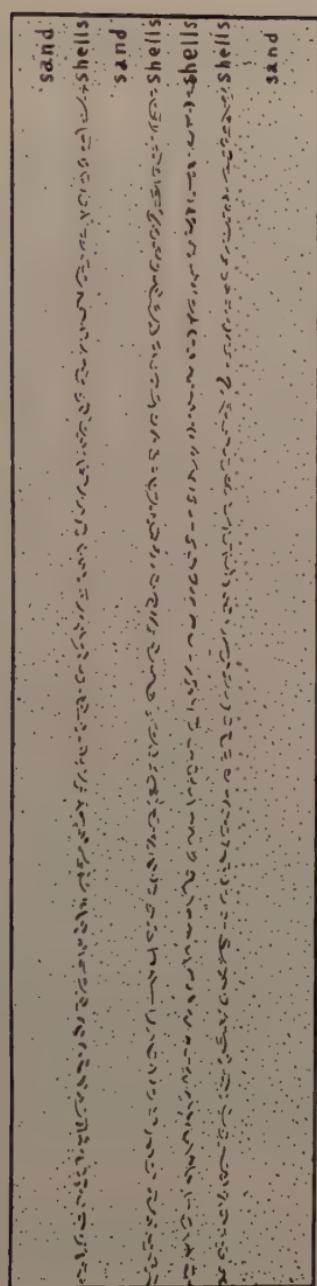


Fig. 9. Representation of the fossiliferous condition seen in the strata of the Alps as described by Mentzelius.

example. In the northern part of that state are strata of shale twenty to seventy feet thick. In this shale, which is called the "Cleveland-shale" from the place where it is best exposed, are found fishes of different sorts, *sharks* being the most common. From the number of these fishes whose fossils have been discovered, the number still buried must be very great. These fishes are entombed promiscuously at any height or depth in the strata, at five feet or fifty feet below the surface. The manner of their entombment tells an instructive story. Sharks five feet long are so interred that they are *pressed flat* from the top to bottom to the thickness of a quarter of an inch. The way they are buried points clearly to the fact that they were trying to swim in water laden with sediment, which finally settled too thickly about them for them to move, and so held them fast in their natural swimming position until, weighing heavily upon them from above, it flattened them out. (See Fig. 10, 11, pages 43, 44.) It can hardly be thought that these fish are in their native habitat, or died naturally where they bred and flourished, as uniformitarian geologists maintain regarding shells that are found in the strata. Only some catastrophe of the nature of the Flood can satisfactorily explain their mode of burial.

As a similar example may be taken the fossiliferous condition of the famous strata in England called "The Old Red Sandstone," described by Hugh Miller: "The fish-beds of the Upper Ludlow Rock abound more in osseous [bony] remains than an ancient burying-ground. The stratum, over wide areas, seems an almost continuous layer of matter; bones, jaws, teeth, spines, scales, palatal plates, and shagreen-like bristles, all massed together . . . The exuviae of at least *four platforms* of being lay entombed, furlong after furlong, amid the gray, mouldering mud-stones, and harder arenaceous beds, the consolidated clays, and the concretionary limestones . . . At this period in our history, some terrible catastrophe involved in sudden destruction of the fish of an area *at least a hundred miles from boundary to boundary*, perhaps much more. The same platform in Orkney as at Cromarty is strewed thick



*Photo from American Museum of Natural History*  
Fig. 10. Stratified shale in northern Ohio in which, at different levels,  
about forty different kinds of fish are entombed.

with remains, which exhibit unequivocably the marks of violent death. The figures are contorted, contracted, curved; the tail in many instances is bent around to the head; the spines stick out, the fins are spread to the full, as in fish that die in convulsions . . . in the ruin of this platform from ten to twelve distinct genera of fish seem to have been equally involved; and so suddenly did it perform its work that its victims were fixed in their attitude of terrorism and surprise." It can hardly be said that these fish are in their native dwelling place, after dying naturally where they bred and multiplied. Nor can this properly be said, we believe, of the fossil shell fish to which Ray referred in the strata of the Alps.\*



Photo from American Museum of Natural History

Fig. 11. Fossil shark taken out of the stratified rocks shown on page 43. The fish was compressed without distortion to the thickness of a quarter of an inch. The tail was not flattened, but remained standing almost at right angles. The conditions point to a burial alive.

A second important seventeenth century critic of the Flood theory was Edward Lhwyd, a man who, like Ray, believed that fossils were not the remains of any living

\*A recent item in the *New York Times* stated that in Fifeshire, England, a new fossil strata had been discovered which was astonishingly full of fish. The report said, "The fish were buried alive in such circumstances that after thousands of years they are still in an excellent state of preservation." Dr. E. I. White, of the Department of Geology of the Natural History Museum in South Kensington, is quoted as saying, "The black remains of the fossil fishes show up like exquisite carvings. The slabs are literally crowded with the beautifully preserved remains; on one occasion more than a thousand specimens were discovered on one square yard of sandstone."

things. We present his chief objections to Deluge geology from this point of view.

Lhwyd said, "As to the marine fossils, had these bodies been the spoils of the sea, brought on dry land by an inundation, they would either have been left on the surface of the earth, or have been lodged at no great distance under it: but I have found them buried (or enclosed) within solid marble on the face of broken sea-cliffs of the height of 200 fathoms and more from the top thereof to the bottom . . . nor was that only upon the face of the rocks, but even more or less *throughout the whole mass of them*." This objection of Lhwyd was met with the answer that the old world was uprooted by the Deluge *to an enormous depth* and the fossils were buried deep in the sediment.

Another of Lhwyd's arguments ran thus: "Now, although I can readily grant that the Deluge might have cast marine bodies into these and many other caves, yet can I not allow that it could ever fasten them to their roofs and sides." Lhwyd apparently did not see that if shells were buried deep in sediment, and caves were subsequently formed in that sediment, shells might be seen in the ceilings and sides of those caves just as well as along the sides of cliffs and pits.

"Another reason for my questioning whether all these things be the effects of the Flood," said Lhwyd, "is that the bones, horns, and hoofs of land animals are very seldom, if at all, found enclosed in solid marble or other stone; whereas, seeing all perished in the Deluge, the spoils of the land might be expected (in proportion) as well as those of the sea." If Lhwyd meant by this that land animals are found but seldom in the strata, he made a great mistake, as we shall see. That they are not found in equal numbers with sea animals is true, but this is *just what should be expected*. As Woodward said, land animals, on account of their lightness, would naturally be buried in the lightest and topmost sediments, and these sediments, being most readily disintegrated, would have considerably disappeared in the course of the centuries.

If, however, Lhwyd meant that land animal remains are not found in such solid stone as are marine shells, the answer is that there is good reason why they should not be. Sea shells would naturally be nearest the bottom of the Flood waters, where also the heaviest and purest sediments would be, and these, we should expect, would form the purest and hardest rock. Land animal remains are found, however, in *exceedingly solid strata*. The bones at Agate Springs, Nebraska, are encased in the hardest sort of rock—a fine, white sand cemented with carbonate of lime. Many of them are encrusted with the most beautiful, snowy crystals. (See Figs. 25-28, pages 94 to 99.)

Another of Lhwyd's objections ran thus: "The immense quantity we have of marine fossils seems in no wise to plead the origin of the Deluge: For we observe many thousands of great stones, and even broken pieces of limestone rocks throughout Wales and the north of England *almost wholly composed* of those vertebrae or broken pieces of the radii or fragments of Sea-stars [what we today call Crinoids or Sea-lilies (see Fig. 12, page 47)] . . . whereas 'tis very rare to find on our shores three broken radii or fragments of any sort of Sea-stars close together." The great abundance of fossil Sea-lilies and so on together in the strata, on which Lhwyd based this objection, can be used as something beside an argument against the reality of fossils and the Flood theory. It can be an indication that *the prediluvian ocean teemed luxuriously with such living things.*

Still another objection of Lhwyd was that if animals were buried by the Deluge, "We would not expect to find so much their single bones as whole skeletons." There are too many separated bones, he thought. There should be whole carcasses, the bones still held together. To this it might be said again that much would depend on the circumstances of burial. If drowned creatures were buried very soon, or without much violence from the waters, their skeletons would be found together, the various bones in their proper relation to one another. If, however, the bodies *became rotten* before burial, and were



*Photo from the Smithsonian Institution*

Fig. 12. Fossil crinoids (also called "sea lilies" and "feather stars") found in the rocks of Iowa. These animals, of which there are many varieties, live now only in the depths of the oceans, from 600 feet to a mile down. Yet they are found in immense quantities and in numerous varieties in strata all over the earth, even intersected with coal. A universal catastrophe must once have emptied out the ocean depths.

*jumbled in large masses* by the waters, or if burials and reburials took place *a number of times*, the bodies would be torn apart and the bones separated. Both burial conditions are known to exist. It is obvious also that the Flood picked up and buried old, dead and scattered organic remains as well as living forms.

As a third critic of the Flood theory, we may mention John Arbuthnot (1667-1735) a close friend of the satirical poet, Pope. His special hatred fell on Woodward, whom he attacked anonymously, charging him among other things with having plagiarized Steno. Arbuthnot was answered by John Harris, A. M., a Fellow in the Royal Society, in a publication "REMARKS ON SOME LATE PAPERS RELATING TO THE UNIVERSAL DELUGE AND NATURAL HISTORY OF THE EARTH," 1697.

Arbuthnot condemned Woodward's theory of a "dissolution" of all hard substances at the time of the Flood, saying that if the rocks were dissolved, why were not the shells also and all other bones that became fossils. Harris replied that by "dissolution" Woodward meant merely mixed with water—sand remaining sand, pebbles, pebbles, silt, silt, bones, bones.

Arbuthnot objected that "fossils of different weights are too often mixed when they should be sorted." Strange to say, a modern writer against the Flood theory has reversed the objection, saying that "fossils are too much sorted when they should be mixed." Harris explained how fossils in some cases would be mixed. In Flood waters of vast depth, "churning, rushing, boiling . . . bodies of all sorts, heavy and light, must be confounded and mingled together, without any rule or certainty. There must be then as well light bodies near the bottom of the fluid mass, as heavy ones at the top of it; and consequently, when the time of subsidence was come, all indifferently, as well light as heavy, would make toward the bottom of the mass. So that the light that chanced to be near the bottom must of necessity arrive at it and settle there some time before the heavy ones, which happened to be above in the higher part of that volume of

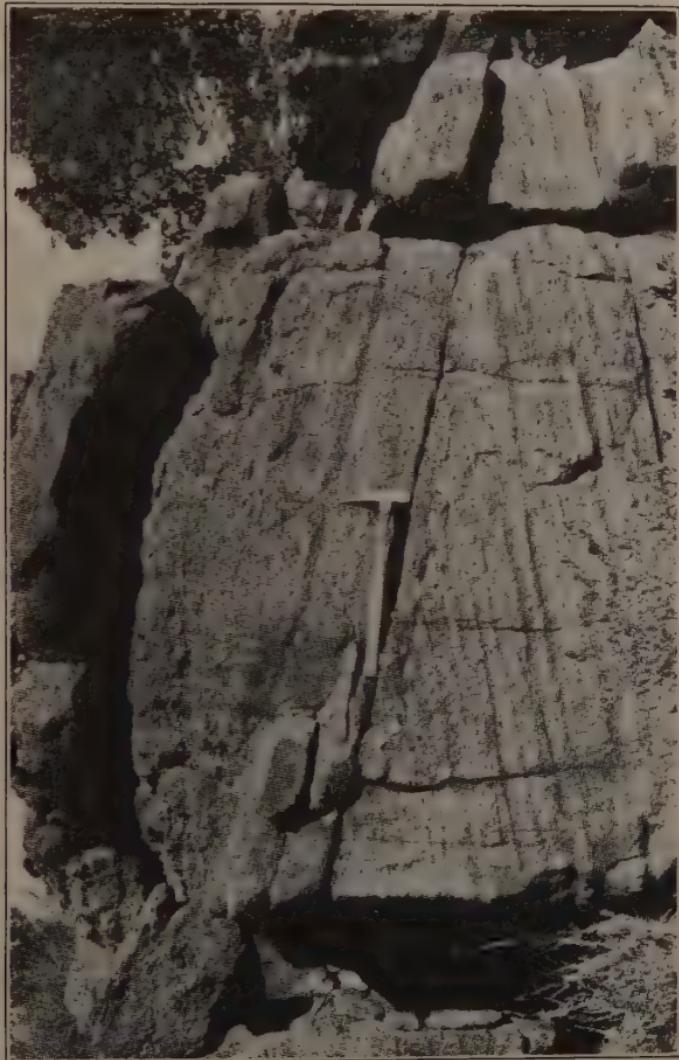


Fig. 13. A cross-bedded deposit of earth fragments of different sizes, the product of strong, heavily laden and varying currents.

water, could have traversed the whole thickness of it and rushed to the bottom."

Harris maintained that Woodward believed that the order of deposition of fossils and sediments were regular and according to the laws of gravity in general, but not universally so, "as near," he said, "as could be expected *in so great a confusion.*"

## CHAPTER V

### THE PERIOD OF ACCEPTANCE (1700-1800)

IN spite of all opposition on whatever grounds, the Flood won out as the cause of the stratified rocks and the fossils they contain, and students all over Europe began diligently to study the conditions of the earth in their home territories to see how the Flood had formed them. John Harris wrote in 1697, "All sober and judicious men are now convinced that the exuviae of sea animals, so plentifully found at this day in the strata of the earth, and in the most hard and solid stone and marble, are the lasting proof of the Deluge itself and of its universality."

In Switzerland J. J. Scheuchzer translated Woodward's book into Latin, and in 1708 wrote a work himself entitled "COMPLAINT AND VINDICATION OF THE FISHES" in which he published good pictures and descriptions of fossil fish found in the rocky layers of the Alps, and argued that they were entombed by the Flood. He also published drawings of the bent strata of the Alps, contending that these strata were originally horizontal and also much lower. They became bent, he said, when that part of the earth was elevated to cause the waters of the Deluge to run off. At that time the strata cracked in many places, and the immense waters flowing away widened and deepened the cracks to form the great Alpine valleys. Scheuchzer was followed in Switzerland by one Johann Gesner, who upheld his predecessor's views.

Among several German geologists of this time we may speak of D. S. Buttner, author of "SIGNS AND

WITNESSES OF THE FLOOD," 1710, and "FOSSIL CORALS,"  
1714.

Buttners carried on the battle in Germany in behalf of the genuineness of fossils which Woodward won in England. Drawings of fossils—bones of animals, teeth, shells, corals, fish—were published in his books, together with diagrams of the strata of the mountains of Saxony. Entombed all over the earth as a result of the Flood, he said, were leaves, shells, animal bones and fish. Buried trees had turned to coal. The earth before the Deluge was a beautiful thing. The hills were low and rolling, covered with a deep, fruitful soil. A daily mist watered the earth. There were no lightning and thunder-showers, no hail stones, no periods of drought. The earth was everywhere habitable. The Flood formed a *new and worse earth*. That event was the completion of God's primitive curse. Plants and animals thereafter degenerated in size and quantity. Buttners condemned those who liked "to measure the Flood by thimble-fuls." It was a *stupendous* affair, he believed. "One of the remote proofs of the profundity of the Flood we may obtain," he said, "if we should descend into the earth in certain regions and should examine or scrutinize the strata. We would observe how the tides or floods have laid down high banks a rod or half a rod high of different kinds of sand and earth, one on top of the other, and which have since solidified and hardened in place."

In England, as the century began, an important Flood advocate was William Whiston, M. A., professor at Cambridge. His work on the Flood, "A NEW THEORY OF THE EARTH," was first published in 1696 and went through five editions, each one an enlargement of the one before.

That the earth was destroyed by the Flood, according to the statement of Scripture, "I will destroy them with the earth . . . neither shall there be any more flood to destroy the earth," Whiston said, "is evident by the vast number of shells and other very strange things buried at the Deluge and enclosed in the bowels of the present earth and of its most solid and compact bodies."

While he approved of Woodward's general thesis as to the cause of the fossiliferous strata, Whiston took issue with him on some special points. He disagreed with him on the matter of a "dissolution." He said that that idea of Woodward's was more than his own observations required. There was no need of any sort of dissolution, he said, since "what now constitutes the present upper strata of the earth were, before the waters covered the earth, loose, separate and divided, and so floated in the waters among one another uncertainly."

Whiston likewise did not agree with Woodward as to the "absolute guidance of specific gravity" in causing the order of deposition of the fossils. He said that while in general the law of specific gravity was operative during the Flood, he knew of cases where a layer of materials of a higher specific gravity rested on a layer of materials of lower gravity. This matter we have previously discussed.

The many strata of earth, Whiston said, "appear now as if they had first been parallel, continued and not interrupted; but as if, after some time, they had been *dislocated and broken* on all sides of the globe, and had been *elevated* in some and *depressed* in other places; from whence fissures and breaches, the caves and grottos with many other irregularities within and upon our present earth, seem to be derived. Great numbers of trees and other plants also, at this subsidence of the mass aforesaid, were buried in the bowels of the earth, and such as very often will not grow in the places where they are now lodged. Many of these are pretty entire and perfect and to be distinctly seen and considered to this day."

Especially characteristic of Whiston is the suggestion he offered as to the manner in which the Deluge was brought on. This, he thought, might have been by means of a great comet which, passing near the earth at the propitious moment, so affected the earth by its powers of attraction that it set the earth to wobbling and so caused the waters in the seas and in the earth's interior to flow upon the land.

*Photos from U.S. Geological Survey*

Fig. 14. Samples of current-bedding found in stratified rocks.



Whiston's idea as to what the antediluvian world was like is worth noting. "The antediluvian earth," he said, "was much more fruitful than at present; and the *multitude of the vegetable productions much greater*. The ground was tender, soft and full of juices. The antediluvian air had no large, gross masses of vapor or clouds hanging for long seasons in the air. It had no great drops of rain descending in multitudes together, which we call showers, but the ground was watered by gentle mists or vapours ascending in the day and descending in great measure again in the succeeding night. The world was then free from violent winds, storms and agitations with all their effects on the earth and seas."

John Hutchinson, Esq., author of "MOSES' PRINCIPLES," 1749, may be named as a Deluge geologist of this time. He followed Woodward very closely, but disagreed with him, as did Whiston, on the absolute rule of gravity in making the deposition of the strata. Hutchinson believed the order in which the various kinds of strata repose on one another in the earth could most naturally be accounted for on the basis of tidal waves flowing in varying directions and *leaving bare the earth at different times*. He insisted that the universal Deluge, "though it was the extraordinary work of God, was performed by natural agencies, they being the instruments in the hands of God."

More important in this period than Hutchinson was Patrick Cockburn, M.A., who wrote in 1750, "AN ENQUIRY INTO THE TRUTH AND CERTAINTY OF THE MOSAIC DELUGE." By this time geographical explorations had been extended considerably, and Cockburn maintained that his predecessors had been much in error in supposing that there was so little water in the seas. Any globe or map of the world, Cockburn declared, would show that the land occupies scarcely one-third of the total surface of the earth. He said that the seas had been plumbed to the depth of three miles and in some places the bottom had not been reached. He surmised correctly that the depth of the ocean was greater than the height of

the highest point of land. He quoted Sir Walter Raleigh, a strong believer in the Flood, as supposing that the water of the oceans and of the interior caverns of the earth was enough to cover the earth thirty miles high. Cockburn himself believed there was certainly enough water in the ocean to cover the earth to a depth of two miles.

Speaking of the waters inside the earth, Cockburn listed a large number of historical instances when local floods had accompanied the cracking of the earth's surface at times of quakes, and said that such things were occurring all over the world simultaneously at the time of the Deluge.

The modern geologist, Suess,\* has told of a number of instances similar to those cited by Cockburn. Suess says that in Wallachia in 1838 the ground was rent by an earthquake, and from the fissures water spouted fathoms high; also that in Mississippi an earthquake occurred in 1812, and the water which filled subterranean cavities forced a passage for itself and blew up the earth with loud explosions, throwing up an enormous quantity of carbonized wood in jets from 10 to 15 feet high, while at the same time the surface of the ground sank and a black liquid rose as high as a horse's belly; and also that in the region south of Lake Baikal in 1862, the lids of all the fountains of a certain town were all suddenly shot into the air like corks from champagne bottles, and springs of tepid water rose in places to the height of more than 20 feet.

Cockburn closed his discussion of the amount of water available for a universal flood thus: "Hence the reader may perceive that one of *the grand objections* against a universal Deluge, viz., that it is incredible there should be such a quantity of water as to raise the Deluge to the heights mentioned in Moses, is easily answered, since it is evident to sense and reason that there are within and upon the earth a greater quantity of water by far than was necessary for the purpose."

Alexander Catcott, A.M., lecturer in St. John's, wrote

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\*"FACE OF THE EARTH."

in 1761, "A TREATISE ON THE DELUGE." Among the special features of Catcott's discussion was his argument to prove that the strata of mountain areas were *originally continuous, and formed level plains or plateaus.* "Now in order to show," he said, "that the strata in these mountains were once wholly continuous (see Fig. 15, p. 58), let a person first examine a single chain or ridge of them, running for ten, twenty, or thirty miles only (and they sometimes continue for several hundred) in which chain particular mountains are distinguishable from each other only by the separation of vacant spaces between their tops, reaching to different depths and at various distances; and suppose, upon examination, he should find that the strata in each of the tops were of the same kind, colour, thickness, etc., and lying in the same position, and only parted from each other by the vacant spaces between their summits, and that the strata underneath in the body of the mountain were quite parallel with those in the tops—would he not conclude that the uppermost strata were likewise once whole and united as well as those that are beneath? In short, if a person was to see a broken wall of a castle that had been in part demolished, he would certainly conclude that the breaches or vacant spaces in those walls were once filled up with similar substances and in conjunction with the rest of the wall, and could easily see with his eye the line in which the wall was carried, and in thought fill up the breaches and unite the whole; and in the same manner, if a person was to view the naked ends of a valley, and compare them with their correspondent ends in the mountain on the other side of the valley, he would manifestly perceive that the spaces between them was once filled up and the strata continued from mountain to mountain . . . for, when the strata of the earth were whole and entire and in conjunction with one another, and the vacancies that now occasion valleys, dales, etc., were filled up with their respective strata (which was during the height of the Deluge, before the waters began to retire), the earth must have been of one spherical form without mountains,

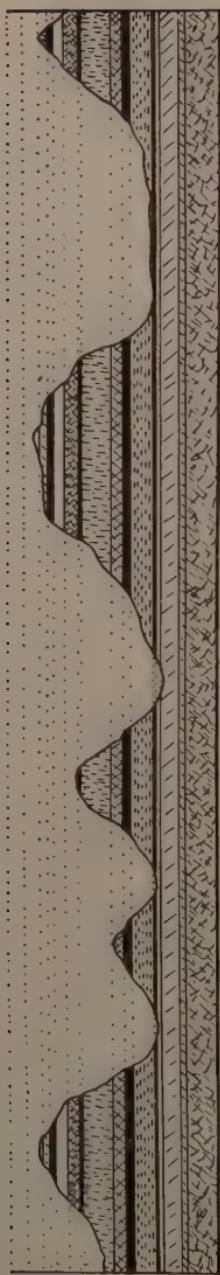


Fig. 15. Diagram of the strata of mountains as they exist generally throughout the world. From the top of a mountain peak in the highest mountain region of British Columbia, the writer has seen the strata continuous like this in all the separated peaks in every direction he could look. The strata were once perfectly continuous, and the whole region was a level plain.

hills, dales, vales, etc., and all the strata must have lain originally horizontally upon one another."

Catcott had a different view of the formation of mountains during and after the Flood from that of his predecessors, Woodward, Scheuchzer and Whiston, whose theory was that mountains were formed by the uplifting of the strata in some places and their depression in others. Catcott held that mountains were formed by *erosion*. "Mountains," he said, "are only eminences of the earth, caused by the excavation or scooping out of the substances or strata that formerly occupied those hollows which we now call valleys, dales, combs, etc. . . . This much is certain, that the strata in some of the highest ridges of mountains in England and Wales are horizontally posited, which is plain proof that the mountains in general might have been, and that they were, formed without uplifting or depression of the strata; and hence also it appears that the horizontal position is the original and natural position of the strata." (See Fig. 16, page 60.) Neither Catcott's or the others' view of the formation of mountains is entirely adequate alone. There are some mountains which are undoubtedly due to erosion only, and others which are due to uplifting and erosion. Such uplifting may have been caused by the buckling of vast thicknesses of strata by pressure due to expansion, or it may have been caused by the intrusion of igneous masses of rock from below, forcing the strata upward, bending and breaking them. It is not impossible that the cores of some mountains are the relics of the prediluvian earth. Solid masses of granite seem to underlie nearly all the earth's stratified deposits, and this basement-complex, as it is called by geologists, may be the remains of the earth "that then was."<sup>\*</sup> To the objection of one of his critics that mountains were before the Flood, Catcott answered, "M. Le Cat seems not to have considered that the mountains which were before the Flood and those that were after were *not one and the same*, but were formed at different times." The mountains mentioned as existing before the

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\*But there are many sorts of granites—some showing distinct marks of stratification.

*Photo from Union Pacific Railroad*  
Fig. 16. "The Great Cathedral," Bryce Canyon, Utah, a mountain formed first by sedimentation and then by erosion



Flood may have been quite unlike any we have today. The word "mountain" is a broad term. In some places the hills are called mountains. There are mountains today, like Etna in Italy, Fujiama in Japan, Ranier in America, which are of volcanic origin, formed of lava piled or still piling up about fissures which have broken through the fossiliferous strata. Such volcanic peaks were doubtless formed subsequent to the Flood.\*

Catcott maintained that the features of the landscape are just such as the Deluge waters would make in a final retreat from off the earth. From small to large the features he had in mind are (1) combs and glens (2) dales (3) valleys (4) plains. "And thus," said he, "does the whole clearly point out the effect of a flood of waters that formerly covered the mountain tops and retreated therefrom down to the ocean, forming high up, where its force was weakest, the lesser channels or gills and combs; and where several streams united, the dales; and where the currents that made the dales met and joined their forces, hollowing out the valleys; and where the torrents that scooped out the valleys opened and expanded themselves, there forming the wide low-land plains, the gradually declining sea-shore, and the sloping bosom of the ocean."

Catcott gave the cutting of the deep valleys in the mountain regions to the closing period of the Flood. A start was doubtless made then, but a far more considerable part of the digging out of the valleys was likely done in the centuries immediately succeeding the Flood, when abundant rains were falling and waters were draining off the earth in great quantities. There is abundant evidence that large inland lakes and seas, which are now dried up, once existed on many continents. The Gobi

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\*So-called Mt. Ararat in Armenia, on whose towering summit the Ark is said by an uncertain tradition to have landed, is an extinct volcanic mass, and was probably not yet in existence when the Flood ceased. The exact spot of the landing of the Ark is unknown. It was probably somewhere in the traditional region, but doubtless on a high plateau, since the Scriptures speak of the Ark as landing on the "mountains" (plural) of Ararat.

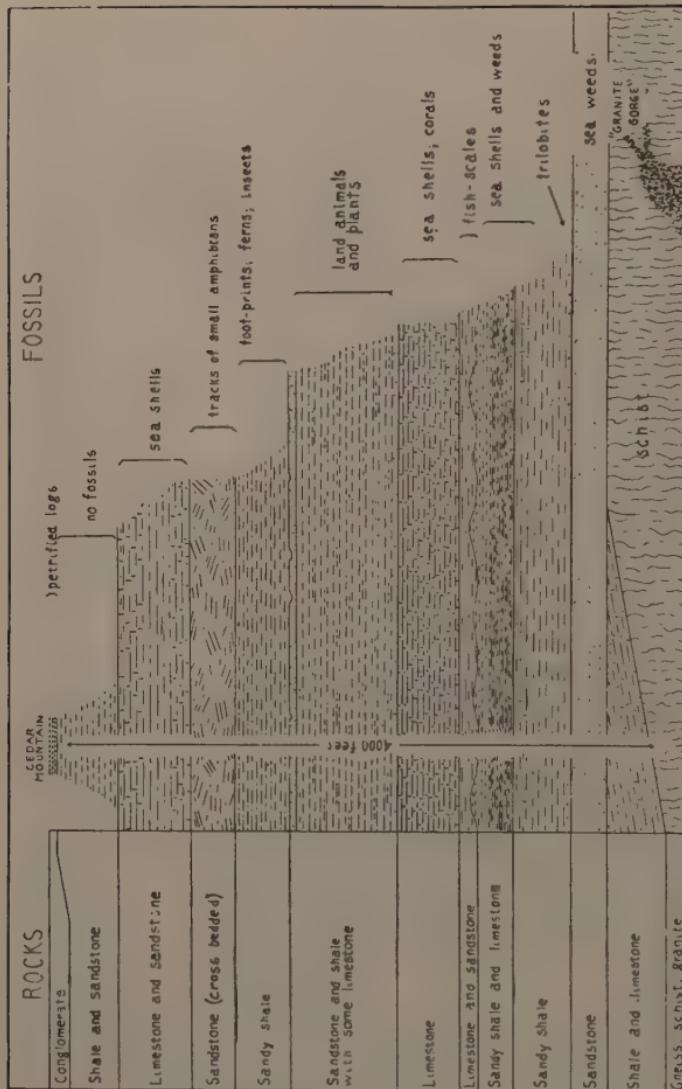


Fig. 17. Diagrammatic profile of the Grand Canyon, showing roughly the sorts of rocks of which the walls are composed, and the fossils they contain. Modern geology says that the land in this region has been lowered beneath the sea and raised half a dozen times, during each of which times new strata were laid. Flood geologists say the strata were all formed during the great Deluge. (After U. S. Interior Department.)



Photo by Fred Harvey

Fig. 18. The Grand Canyon of the Colorado. Note how the originally continuous strata have been parted by the canyon.

desert of Asia had such an inland body of water. The great Faiyum, a vast basin in the Lybian desert of north Africa has large terraces all around the edge, showing it was once an immense lake. So-called Lake Bonneville in western United States was once a great inland sea, of which Salt Lake is but the tiny remnant. A state of *equilibrium* for the earth and its climate, due to the soaked condition of the earth, and the altered oceanic conditions, was *probably not reached for many centuries*, and the earth was meanwhile subject to showers that fell long and frequently. Into the soft and newly laid strata,

not yet thoroughly consolidated, torrential rains cut and rapidly wore away vast amounts of their substance. In the same manner, essentially, as the mountain valleys are being dug out and widened by small rivers and torrents today, so they were dug in the first centuries following the Flood, only so much more speedily and effectively as there was then more "weather" and softer strata to work upon.

Not only deep ravines (see Figs. 18, 19 pages 63, 65) were being cut and wide valleys being formed, but fossils, entombed by the Deluge proper, or left exposed near the surface, were being washed out of their original burial places, carried by floods to lower places and buried again, and perhaps still again. No proper interpretation of the earth's geological condition, on the basis of the Flood, can fail to take into account the changes which the first thousand years or more that followed the Flood witnessed. *Too much importance cannot be given to what took place on the earth in the long readjustment period.*

Speaking of how the earth's strata give evidence of the Flood, Catcott said, "You may find streaks or seams of different substances proceeding on, as it were, horizontally, in nearly straight lines, 'till they have been met and opposed by other matter in a contrary direction; and at the point of conflux both species of water turned back and deflected in all the variety of wave-like dispositions that can well be imagined to have happened to two streams, meeting each other in opposite directions: and in short you may see *all the diversities of forms and figures in the solid that any kind of agitation in a fluid could possibly display.*" (See Fig. 14, page 54.)

"It is common to observe in places where different strata meet," said Catcott, "that there has been such an intimate mixture of both as could not possibly have happened without a free and easy interchange between them. Thus, for instance, in a country that abounds in chalk, where the chalk ends and a different soil and different strata begin (suppose that of free-stone) there is com-



Photo by Fred Harvey

Fig. 10. The Grand Canyon in winter, filled with fog, giving the illusion of a great river flowing in the canyon. If there was once much heavier rainfall in the now arid west, as there seems to have been, and the Colorado was a swollen stream many times its present size, or if the strata were newly laid and soft, the great ditch could have been dug in an incredibly short time. Neither the immense ages given by evolutionary geologists for the deposition of the strata nor for the digging of the canyon are necessary suppositions.

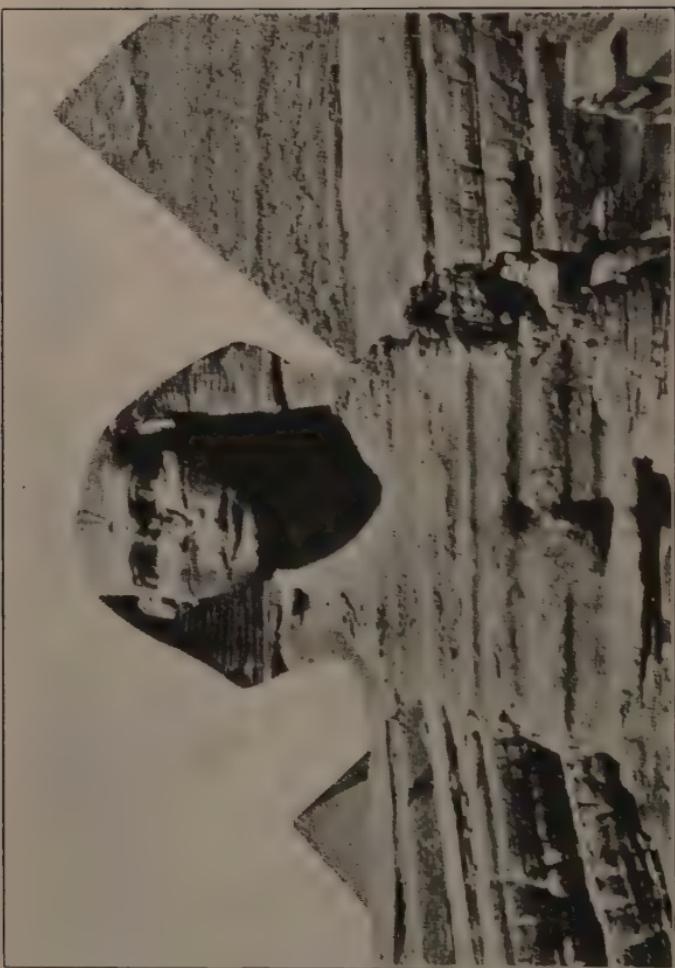
monly to be seen upon the edge of the two countries a kind of substance between chalk and free-stone, consisting chiefly of chalk upon the chalk-side of the country and principally of free-stone upon the free-stone country; so that on the one side there is a coarse sort of chalk, on the other a fine, soft species of free-stone; the former sort gradually coarser and coarser the nearer it approaches the free-stone, and the latter finer and finer, the nearer it is situated to the chalk. And thus I have observed for several hundred yards upon the surface of the earth, and for a considerable depth within it. A similar kind of conjunction or intercourse I have often seen between the strata of sand-stone and lime-stone, between flag-stone and iron-stone, and indeed every kind of strata where they happen to meet in considerable quantities. And generally, the greater the quantities that meet, the more the interchange appears to have been."

We conclude our discussion of Catcott's views with the following quotation from him. "Here then we appeal once more to Nature and find that there are, at this day, as evident, as demonstrative, as incontestable proofs of the Deluge over the face of the earth . . . as if it had happened last year . . . Search the earth; you will find the *moose-deer*, native of America, buried in Ireland; *elephants*, natives of Asia and Africa, buried in the midst of England; *crocodiles*, natives of the Nile, in the heart of Germany; *shell-fish*, never known in the American seas, together with the entire skeletons of *whales*, in the most inland regions of England; *trees* of vast dimensions, with their roots and their tops, and some also with leaves and fruit, at the bottom of mines . . . The pyramids of Egypt are reckoned to be some of the most ancient structures of the world, and yet the stones of which these pyramids consist abound with fossil marine shells and *corals* (as I have seen in several samples of these stones and have some by me given by Dr. Shaw), and these shells and corals are of the same kind with those that are now found in the regular strata of the earth in the neighborhood of these buildings." (Figs. 20, 21, pages 67, 68.)



Fig. 20. Strata of Egypt, rich in remains of sea animals. The Sphynx was hewn out of these strata.

Fig. 21. The Spynx.



## CHAPTER VI

### THE FLOOD AND THE FORMATION OF COAL

JOHN WILLIAMS, mineral surveyor, F. S. S. A., author of "THE NATURAL HISTORY OF THE MINERAL KINGDOM," 1789, is an eighteenth century geologist meriting a chapter by himself. We should like to present a complete review of his geological theories, but are compelled to confine ourselves especially to his exposition of the Deluge formation of coal.

His description of the coal strata, based on first hand observation, is highly instructive. "A seam or bed of coal," he said, "is a *real stratum* which is found to be as fully regular as any of those other concomitant strata in the coal field lying above or below the coal, or indeed of any other of the various strata which compose the superficies of our globe. (See Fig. 22, page 71.)

"There are in many coal countries, and in many coal fields, a considerable number of strata or beds of coal of various qualities and thickness, placed *stratum super stratum*, with a great variety of *other strata interposed* between them; and sometimes different strata or seams of coal are so near to one another that two, three, or more of them are cut through and worked in one pit. Every stratum of coal . . . stretches as far every way as the other strata which accompany it; and therefore it must be concluded that the strata of coal are *coeval* with the other strata which accompany them . . . These are all disposed one above another in regular order . . . and they all run parallel to one another to any distance; for if one of them suffer any interruption, disturbance or change, they generally all suffer the same, and when they have

got over such trouble or interruption, they all floor regularly again, so that the parallelism of the same range of strata is always preserved.

"Every stratum in a coal field is spread out to a vast extent . . . we may suppose of a mile or of several square miles . . . We often see the strata in different places upon the line of bearing bursting out and appearing today in rivers, rivulets, rocks, sears, etc. . . . From these observations it appears that every individual stratum in the whole range *keeps its station* where you see it placed, and that it spreads as wide and stretches as far as any one of those which are placed above or below it . . ."

"The stratum which is placed immediately above the seam of coal is properly called the roof of the coal, and the stratum immediately below is properly called the pavement of the coal. Now these three, that is the stratum of coal, and its roof and pavement, with the other concomitant strata lying above or below them, always preserve their stations and parallelism . . .

"In these [mines and pits] one will see a great number of the *different strata of stone and the other coal metals* (when I use the word metals, in treating of coal, I mean such strata of different colors and qualities as are commonly found accompanying seams of coal), *thick and thin, hard and soft . . .* (See Fig. 23, page 73.)

"In a considerable coal-field, there are a great number and variety of seams of coal . . . Some of these are of *very considerable thickness*, and others are *very thin*, perhaps not above two or three inches, and again many of them are of all the medium thicknesses between the two extremes . . .

"Perhaps these assertions may seem to intimate that all seams of coal are invariably regular in thickness, but I would not wish what I have said to be understood in that light. True it is that in common experience we find a seam of coal pretty regular and uniform in thickness when we have it fairly betwixt roof and pavement, and this in general will hold good . . . nevertheless, there are some circumstances and accidents which alter the case,



Photo by U. S. Geological Survey  
Fig. 22. Exposed coal formations, showing how coal seams lie in the earth. They are as plainly water laid as any other strata

and occasion the seam to vary considerably in thickness . . . Some coals are much more regular and uniform than others. I have seen many seams continue perfectly regular and equal in thickness for a considerable extent every way, and I have seen other seams so exceedingly variable that you could not depend upon finding the coal equally thick for twenty yards together in any part of the field, and in some seams you cannot find ten yards of it of equal thickness. (See Fig. 24, page 75.)

"But the principal and greatest of all the causes of these variations of the thickness of coal happens when the seam *approaches the extremity of the coal country*, where foreign strata commence of a quite different quality from the coal metals. The coal metals, and especially the coal seams, *always wear thinner and thinner* as they approach the outskirts of the coal country, as it may be called, that is the outer boundaries of the coal . . . In this case I have seen seams of five or six feet thick dwindle to so many inches, and even to less than so many inches at the extremity, where the coal metals ended entirely and other different classes of strata commenced . . .

"By observation and real experience we know that nothing in the world can be more *promiscuous and uncertain* than the way we find the thick and thin seams of coal blended together throughout a coal-field; and this fact of their being promiscuously blended together we know with absolute certainty, by cutting through a great number and variety of them in some extensive coal field, where we as often find a thick seam uppermost as a thin one, and a thin seam below as above a thick one. The truth is we can form no true notion of their disposition or order until we have cut through them or have had some other opportunity of seeing how they are disposed one above another . . . I have frequently seen three or four (and sometimes more) thin seams of coal placed next to one another, neither of which were anything near thick enough to work; and I have often found good, workable seams of sufficient thickness lying next to one another without any thin coals intervening betwixt them;



Fig. 23. Diagram showing the way anthracite coal seams and their associate strata lie in the coal region at Pottsville, Pa., along a shaft to a depth of 1,000 feet (after McFarlane). The thick, black lines represent coal. The spaces between represent slate, sandstone, fireclay, shale, conglomerate or various mixtures of these. It is estimated that to form the largest seam of coal, which is forty feet thick, green vegetation about two hundred feet in thickness would have to be pressed together.

and I have as often, perhaps oftener, seen the thick and the thin and middling seams blended promiscuously . . .

“Further, it is not only the seams of coal that are thus promiscuously blended together in the coal fields. *The various and different coal metals are also mingled together*, and with as much uncertainty, as to any rule or order of their stations, as the seams of coal . . .

“There are in most coal-fields a multitude and surprising variety of different kinds of strata accompanying and lying between the several seams of coal; and of this vast multitude and variety of quality, thickness and colour we find the hard and soft, thick and thin, the black and white, blue and gray, red and yellow, all the varieties of qualities, thickness and colour so *promiscuously* blended together that when we are sinking pits or driving mines through any of them, the most experienced do not know what is to come next. Though there should be twenty seams of coal in the same field, it is twenty to one but they shall be found to have twenty different roofs, that is, that stratum which is the immediate roof of one seam shall differ from the immediate roof of another seam in quality, colour, and thickness, in so much that perhaps no two out of the twenty shall be exactly alike . . .

“Many of our collieries in Britain are already very deep . . . and there are above *sixty beds or strata of coal*, thick and thin, cut through at Gilmerton . . .

“In some places where the seams of coal and their concomitant strata approach the outskirts or extremity of the coal country, I have seen the coal seams first begin to grow thin and troubled, even at a considerable distance and then, as they advanced nearer the extremity, grow more and more troubled and distorted, and at last, when they arrived at the extremity, the coal seams of several feet thick were *squeezed and dwindled away to hardly as many inches* . . .

“Coal has a very obvious and striking appearance of being *composed of vegetable substances*. I have frequently seen evidently the grain and other characters of

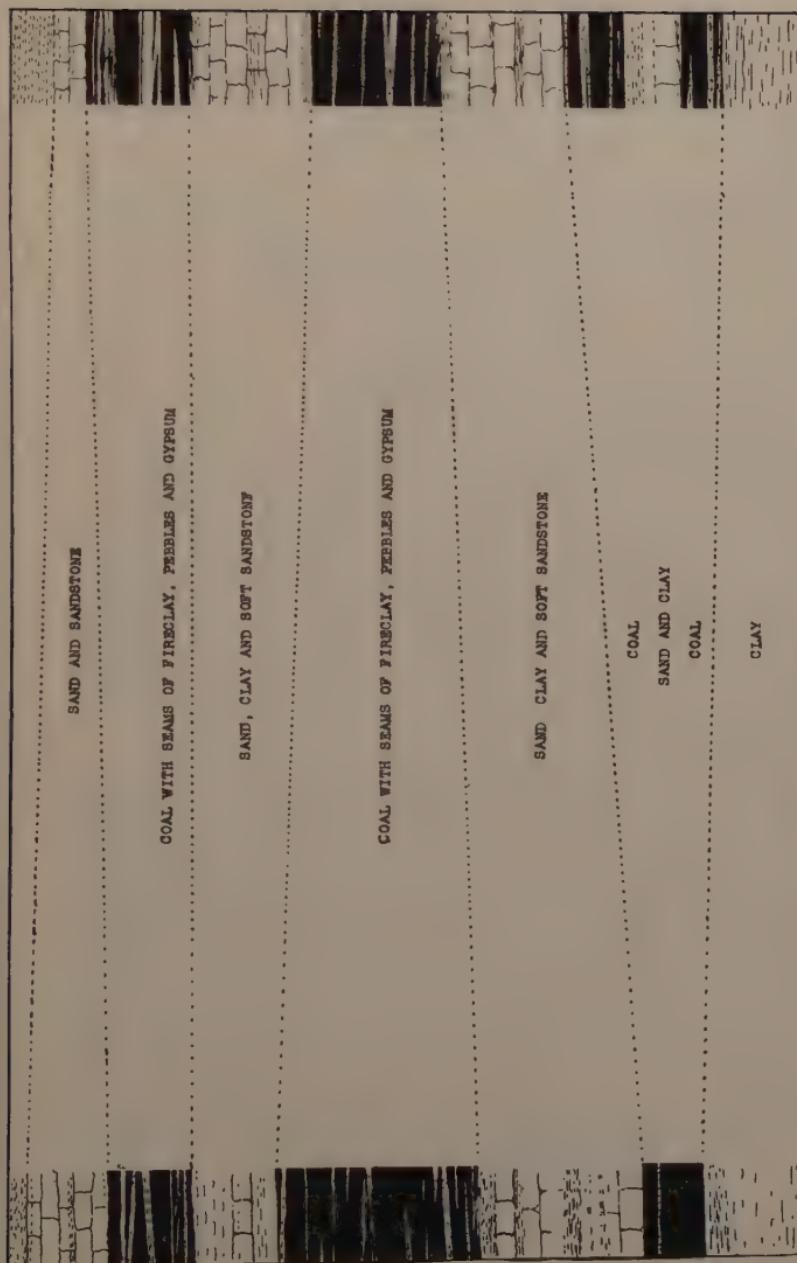


Fig. 24. Thinning out of soft coal strata (after Grabau and Crosby). Each vertical column represents a section, twenty feet apart, of identical strata of coal, as they are seen on the face of Pulpit Rock, near Colorado Springs. The dotted lines indicate the continuation of the various layers. Here is a form of cross-bedding which demonstrates the action of water in the formation of coal.

*wood* in several coals; and . . . in my natural history of the strata and rocks in general which compass the structure of the superficies of our globe, I have made it evidently appear, even to a demonstration, that *the antediluvian timber was the original of coal.*

"It will appear highly probable, from what is said in that history, that the greatest part of the antediluvian earth was covered with a *tall and luxuriant growth of timber*, and it is easy to conceive that so many millions of acres of tall timber formed into coal would produce a great quantity of that valuable fossil; and in this respect *the effect and cause exactly correspond* to one another; the quantity and variety of coal found within the superficies of the earth seem to tally with the immense quantity of timber which produced it. I am not the only person who has seen and observed the appearance of timber in coal. Several other gentlemen who are conversant in these matters have assured me that they have not only frequently seen evident marks and indications of the grain of timber in coal, but that they have also seen pieces of whole timber, which, though black as coal, yet not so dissolved or altered as to lose the original form and grain of a round piece of timber.

"Some of the coals indeed are remarkably *clean and pure* for such bulky fossils placed among numerous strata of heterogenous substances. These discover very little foreign matter in the composition of the stratum; but, on the other hand, many of them are blended and mineralized with various proportions of *stone, clay, pyrites and other heterogenous matter*, which debases and spoils the coals to such a degree that many seams are of an inferior quality and some of them rendered entirely useless . . ."

Having thus let this experienced miner tell us how coal and its accompanying strata lie underground, let us note how he thought these came to be formed. Said he, "Now every intelligent, unprejudiced naturalist, who has taken any notice of the order and disposition of the several strata in a coal-field, must acknowledge that those

several strata are spread out and formed, in the order we find them, *by successive tides or by similar streams of water*, bringing the matter and depositing it in regular strata. The order in which they are placed, *stratum super stratum*, promiscuously, in respect to the laws of gravitation: the heavy, the light, and those of medium weight being all blended together without the least regard to gravitation, make it evident that they were deposited in the order we find them by successive streams of water. Any other way of accounting for this deposition will not agree with the phenomena of nature . . . I observed before that the various strata found in coal-fields are as finely stratified, as regularly spread out, and as equally thick in continuation, as any class or assemblage of strata whatever; and I will now observe that the coal itself is likewise as fairly stratified, and as regular as any of its concomitant strata. Many beds of coal are so finely stratified that they really are of a *laminated structure*, the plates or different laminae being thin, and splitting regularly in leaves of equal thickness, the whole breadth of the largest masses. Now, this is a clear proof of the *agency of water in a gently flowing motion* . . . I observed already, when viewing the coal metals, that the laws of gravitation were not consulted in the formation of these strata: and therefor, it is necessary for us to acknowledge that they were formed by the flowing of *successive tides* . . .

"I have already made it pretty evident that the greatest part of the surface of the earth, before the Deluge, was covered with a luxuriant growth of tall timber, that this antediluvian timber is the origin of our pit-coal; and that it was a sufficient and an adequate source of all coals in the world. I am of the opinion that the antediluvian timber floated upon the chaos, or waters of the Deluge, until the strata of the highest mountains were formed, with much of the other strata in our sight, and that during the height of the Deluge, and at the time when the greatest part of the strata were forming, the timber was

*preparing and being fitted\** for being deposited in strata of coal; and that the coals, with their concomitant strata, were among the last that were formed. But how and by what means everything in this great work was fitted and carried on belongs to higher wisdom and intelligence than mine to explain. However, we may examine what we can see with our eyes, and what is to be seen we may investigate by the aid of philosophy; and it is allowable for us to draw such inferences as naturally and inevitably result from our observations and discoveries.

"Wheresoever I have seen the strata of the coal metals terminate and the strata of the mountain rocks succeed, whether in the longitudinal line of bearing or across the strata, the coal metals always ride uppermost; are troubled, confused, and good for nothing, and commonly dwindled away to little in thickness; whereas, on the contrary, the strata of the mountain rocks emerge from under the disturbed coal metals in full perfection of quality, strata, etc., and therefore I am obliged to conclude that the strata of coal, and their concomitant strata were among the last which were formed."

Tidal actions, produced by the gravitational effects of the sun and moon, played a principal part in William's theory of the Flood. "The weight and force of tides," said he, "which were perhaps *several miles in perpendicular depth*, have made mighty efforts to wash away the whole face of the dry and solid land, mix it again with the waters into a chaos . . .

"I am convinced, by the phenomena of the strata, that every stratum which we see regular was formed upon the then surface of the globe; that is, that the very part of the globe where a particular part of the stratum was made, *began to be dry land* before the next tide brought with it the matter which produced that stratum, and so on.

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\*It is probable that much of the prediluvian vegetation which went into the coal seams was rendered soft, pulpy or mushy and loose by the long agitation and the awful pressures of the Deluge waters and thus was made easily capable of being spread out on flat surfaces exactly like the materials of other sorts of strata.

stratum super stratum, tide after tide, until all the strata were completed. And perhaps *higher and lower, stronger and weaker tides*, might have been the cause of thicker and thinner strata, amongst those we call regular. We find the thick and the thin strata *very unaccountably and capriciously mingled*, unless we will allow such a natural cause as the difference of tide."

We now present William's explanation of irregularities in the originally level strata. He said, "Having thus far prepared my way, I will now proceed to account for the inequalities and breaks of the strata. When the then superficies of the consolidated parts of the globe began to rise so high or nearly so high as the surface of the water, so as the tide would begin to run and to form strata, the first as well as the last of these strata would be spread out even and smooth upon a large surface. Now the first of these strata would be spread out upon *a very unequal and insufficient ground*, which was . . . containing a great quantity of water in the composition of the sediment, and some of the bases and hollows would be much more humid and slimy than others; and therefore, when the weights of the super-incumbent strata were laid by succeeding tides above this unequal, terraqueous basis, and when the superior waters began to lessen in bulk and weight by the separation of the earthy and stony matter, and retreat by degrees to the present bed of the ocean, and much dry land began to appear between tides . . . it became necessary that the waters contained in the caverns and hollows, and in the humid sediment below the strata, should *find its way out*. The weight of the superior strata, as yet humid, soft and flexible, would *press hard upon the unequal ground below*; and this pressure of the superincumbent weight would in time become so great, that the water below must force its way out by breaking the superior strata in many places . . . a great quantity of water forcing its way out would make a large passage, and the violent manner in which this passage was made would greatly *disturb and distort* the strata about the rupture. When the water had forced

its way out with a violent eruption, the strata being still tender and humid, the aperture or cavern would, in whole or in part, be filled up by the falling in of the side or roof, which would disturb regularity and produce confusion and disorder a good way round . . . The great humid and tender strata would *bend and break* in many places, and sink down into the vacuities beneath . . . Where the interior vacuity was very deep, the part of the strata immediately above such vacuity would be depressed so low that the other parts would be turned nearly on edge. The strata would *dip and lean* into these interior lakes, gulf's and vacuities with all the varieties and degrees of slope, elevation and depression which we everywhere meet with . . ." (See Fig. 3, page 14.)

Having devoted so much space to this experienced Flood geologist, we will leave him with his remarks on the formation of mountains. "It appears to me that many of the great ranges and clusters of mountains were formed at first in a *great plain above*, and were *afterwards cut through and furrowed* . . . There is one very material circumstance which I have frequently observed, which greatly strengthens this opinion, and it is this. I have hinted before that I have traced the *same range of strata through several hollows*, and over several mountains in the Highlands, in the course of which investigations I have frequently traced the same individual stratum and a number of strata from the deepest gulf or hollow up to the summit of the mountains on both sides of the hollow; and where a river cut right across the strata, I could see perhaps several hundreds of them ascending gradually on both sides, and with easy acclivity from the bottom quite up to the tops of the hills; and this phenomenon is found all over the Highlands, where the rocks are bare or much cut and traversed by rivulets. The extensive countries of Abyssinia, Tartary, and New Granada are all of them a great height above the level of the sea, which appears to me as instances of such high land, but *not cut through to make mountains of . . .*"

Merely to make the history of the Flood theory more

complete, we mention a few others who, in the eighteenth century, wrote to uphold the Deluge as a great geological agent: in Italy, Constantini (1737); in Germany, Pluche (1732), Lehman, director of the Prussian mines (1756), Wallerius (1790); in England, Whitehurst (1778) and Brander (1766). From the last named we have the following statement showing the condition of geological thought in that day: "Various opinions have been entertained concerning the time when and how these bodies (fossils) became deposited. Some there were who conceive that it might have been effected in a wonderfully length of time by a gradual changing and shifting of the seas, etc. But the most common cause assigned is that of the Deluge."



## CHAPTER VII

### THE PERIOD OF WANING (1800-1850)

ALTHOUGH the Flood theory of geology was not without its assailants in the eighteenth century, and there were not wanting men eager to advance some other theory, the Deluge easily maintained its place as the most common explanation of the earth's geological state. The works of such men as Buffon (1749) and Hutton (1788) in behalf of the doctrine of uniformity, which modern geology has adopted, met with little favor. The reason for this was that the leading educators of the day were largely men of great religious faith, men who believed strongly in the Bible and did not hesitate to teach others to do likewise. A change came in the nineteenth century. As that century progressed, the control of education in Europe and America passed gradually out of the hands of such men into the hands of men more or less lacking in religious convictions, and even into the hands of men secretly or openly hostile to the Bible. The result was that the theory of uniformity, which had come down from the ancients and had been advocated to some extent in the sixteenth and seventeenth centuries, gained the upper hand, and the Flood theory fell into the background.

The nineteenth century began with the incoming of a new theory regarding the Flood, a theory that still held to the Flood as a universal watery catastrophe which destroyed all land animals and made strata on the face of the earth, but which added other features tending to weaken the old Deluge theory. This new idea originated in the mind of Baron Cuvier, famous professor in the University of Paris in 1799, who had successfully classified the fossil remains of the land animals found

buried in vast numbers in the strata of the Paris basin. After being taught for many years, this new idea was summed up by Cuvier in "AN ESSAY ON THE THEORY OF THE EARTH," 1817, and "DISCOURSES ON THE REVOLUTIONS OF THE SURFACE OF THE GLOBE," 1825.

Cuvier had the peculiar notion that the earth, since the creation, has undergone not one but many universal revolutions or cataclysms by water. The last of these was the Noachian Deluge. Said he, "Life has often been disturbed on this earth by terrible events—calamities which, at the commencement, have perhaps moved and overturned to a great depth the entire outer crust of the globe. Numberless living things have been victims of the catastrophies . . . Every part of the globe bears the impress of these great and terrible events so distinctly that they must be visible to all who are qualified to read their history in the remains which they have left behind . . . The last grand cataclysm [was] the Universal Deluge."

On what Cuvier based this opinion of a whole series of universal, watery catastrophies, separated by long intervals of time, it is not easy to see. *One catastrophe alone, like that of the Bible, is sufficient to explain all the earth's stratified conditions.* Because of his high standing in French scientific circles, many early nineteenth century geologists adopted Cuvier's idea, and they formed a large school called the "Catastrophists." Those of this school believed that the Deluge of the Bible was the last of a series of world wide floods in which all things were destroyed.

A well known member of this group of Catastrophists was Rev. William Buckland, President of the Geological Society of London. He wrote in 1823 a book entitled "RELIQUAE DILUVIANAE" (Deluge Remains), in which he argued for the Flood as a geological agent on the basis of certain animal remains buried in coverings of dirt on the bottom of caves\* in Europe and England, and on the

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\*The accumulation of the bones and dirt in these caves can be readily explained as having taken place by natural means during the thousands of years since the caves were formed in the strata deposited by the Flood.

basis also of the superficial gravel deposits in England and on the continent. The stratified rocks containing fish and shell fossils beneath the gravel deposits he attributed to the earlier catastrophies of Cuvier. When, however, Buckland became convinced by his friend Agassiz, the founder of the modern glacial theory, that the gravel deposits were glacial and not Flood deposits, he repudiated his earlier views.

A distinction should be made, in the opinion of the present writer, between the universal, fossiliferous, sedimentary deposits of the earth which were plainly formed by water, and those purely local gravel and boulder deposits of apparently *glacial origin*, such as led Buckland astray. (See discussion, pages 134-136.)

As another Flood geologist of the Catastrophic school we may name Benjamin Silliman, head of the Geology Department of Yale University. In his "GEOLOGICAL LECTURES," 1829, he said, "Respecting the Deluge, there can be but one opinion: geology fully confirms the Scriptural history of the event . . . *Whales, sharks, and other fishes, crocodiles and amphibians, the mammoth and the extinct elephant, the rhinoceros, the hippopotamus, hyenas, tigers, deer, horses, the various species of the bovine family and a multitude more, are found buried in diluvium at a greater or less depth; and in most instances under circumstances indicating that they were buried by the same catastrophe which destroyed them: namely a sudden and violent deluge.*" Silliman referred to the fact that "a skeleton of a whale lay on top of the mountain Sanhorn on the coast of the northern sea." The mountain, he said, "is three thousand feet high and there is no cause that could have conveyed the whale to that elevation except a deluge rising to that height." Thus he argued that the Deluge buried animals in the upper strata of the earth. Yet when he spoke of the lower strata which contain shell-fossils, he attributed their production to the earlier universal catastrophies of Cuvier.

Although Flood geologists of the Catastrophic kind were many in this period of the nineteenth century, thor-

ough-going Flood geologists, i.e., like Williams, Catecott, Woodward were not wanting. As one of these we may mention Thomas Rodd, who wrote in 1820 "A DEFENSE OF THE VERACITY OF MOSES." He argued emphatically that the Deluge of the Bible was able to form *all* the fossiliferous strata and there was no call for a theory of many catastrophies such as Cuvier supposed.

A new contribution to Flood geology was made, however, by Rodd. What occasioned the Flood, he believed, was God's sudden moving of the earth's axis from its original position. "This powerful shock," said he, "caused the waters of the ocean to roll from south to north and from east to west of every coast on earth, and a vast space of sea became firm land when the Flood ceased, leaving prodigious beds of sand and shells in many parts of the globe, whilst in others the sea greatly encroached upon the land. Numerous torrents, at the same instant, burst from the interior of the earth, the waters being roused by the motion to their deepest recess."

It is indeed a fact that the earth's axis of rotation is not perpendicular to the plane of its orbit today, but is inclined twenty-three and a half degrees from the perpendicular, and men have puzzled as to why, when and how this strange situation came to exist. Had God chosen to make a change in the position of the earth in the period of the Flood, here would have been a sufficient cause for the oceans to have over-run the land.

Another thorough-going Flood-geologist in this time was Granville Penn, author of "A COMPARATIVE ESTIMATE OF THE MINERAL AND MOSAICAL GEOLOGIES" 1825.

The great problem for all geological theories to explain, Penn said, "is that amazing phenomenon, the mingled remains of animal of different species and climates, discovered, *in exhaustless quantities*, in the interior of all parts of the earth; so that the exuviae of animal genera now existing only within the torrid zone, and those genera which no longer exist at all, are found confusedly mixed together in the soils of the most northerly latitudes. In examining the mineral masses of earth, the observer is

astonished at the prodigious quantity of the fragments of animals and vegetables which they contain. He will recall the order in which organic beings are now distributed upon the surface of the globe; some can only live in the bosom of the sea, others in fresh water; some are only to be found within the torrid zone; while there are others which would perish the moment they should be removed from the frigid zone; in a word, each species appears as it were fixed to an element, or climate, proper and peculiar to it. Whereas, in the strata of the earth *everything is out of its place*; the remains of animals which can exist only in the depths of the ocean are found kneaded into rocks which form the summits of the mountains; the bones of those which can live only in the torrid zone are buried in the frozen soil of the polar regions. Almost every where he will find relics of animals and vegetables different from those which now exist." The only satisfactory explanation of this peculiar situation in Penn's estimation was the Flood.

The Flood came on, Penn said, slowly, by the gradual swellings of the sea, or, what amounts to the same thing, by the gradual sinking of the land. The soil was loosened at the base of all plants and herbs, all woods and forests, and these, together with the whole animal creation, were carried off and buried. "But they would not," said he, "have been immediately submerged in the places where they were first seized. . . They would have floated for a longer or shorter time, and would have been driven by wind and currents in vast accumulated masses, and in various directions. How far they could have been transported before they sunk, and how distantly they might have sunk from the places of capture, are questions which must depend (1) upon the length of time bodies can float without sinking, which again must generally depend upon their bulk and the texture of their substance and integuments; and (2) on the power of the wind and currents for wafting and propelling floating bodies."

Special attention is called to Penn's emphasis on the "vast accumulated masses" which were carried about by the Flood currents. What immense quantity of vegeta-

tion a universal deluge would uproot should be judged not so much by the forests of temperate zones, as by the dense, impenetrable, tropical jungles, such as cover over a million and a quarter square miles in Brazil, and an even greater area in the valley of the Congo in Africa. It is not unlikely that the antediluvian vegetation—grasses, ferns, palms, vines and trees—floated\* in the Flood waters in what were like immense rafts or islands, hundreds and even thousands of miles in extent, and three or four hundred feet in thickness. Such a conception gives a satisfactory notion of the accumulation of the vegetable material found in the coal strata.\*\*

On the ability of the waters of the Deluge to jumble up the bones of animals in the manner in which they are often found, Penn spoke as follows: “The tremendous *concussions and collisions* which the framework of such vast aggregated masses of floating bodies must have sustained from the force and conflicts of the waves dashing against each other in their long and tempestuous traverse, and from the force likewise of the oceanic vortices which finally precipitated them downwards on their mineral beds and plunged them promiscuously within it, will be readily apprehended by contemplating the enormous power exercised by the same terrific agent in crashing and ingulfing the stoutest framework of floating vessels subjected to their fury [see again Penn’s description of the power of the tide on page 3], and the skeletons, thus variously and violently dislocated and fractured within their integuments, would have been prepared to separate their parts when the flesh and the integuments should eventually have perished.”

In “ORGANIC REMAINS OF A FORMER WORLD—AN

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\*The green vegetation doubtless soon became so “water-logged” that it sank to the bottom of its own weight and also from the added weight of the fine sediments which became attached to it in the muddy waters, and thus was easily buried.

\*\*Untold amounts of dead and rotted plants (peat, etc.), which had been accumulating in the thousands of years prior to the Deluge, might also have entered into the abundance of carbonaceous matter which the Flood entombed in the coal measures.

EXAMINATION OF MINERALIZED REMAINS OF THE VEGETABLE AND ANIMALS OF THE ANTEDILUVIAN WORLD: GENERALLY TERMED EXTRANEous FOSSILS," the second edition published in 1833, James Parkinson gave a long discussion of coal—its character and position in the earth—and attributed its formation to the Flood. Since his views were essentially those of Williams, whose theory of coal formation we have considered, we will not dwell on Parkinson's ideas in this respect except to note briefly his view as to the formation of petroleum by the Deluge.

Parkinson's theory was that in being covered over by an earthy layer of sediment in the Flood, the fresh vegetable matter of the coal strata was cut off from air, and being mixed with water and under great pressure from the strata above, none of its gases being able to escape, a peculiar fermentation set in, which converted the vegetable matter into a black, *pasty substance*. In the case of coal this paste eventually hardened and crystallized. In the case of petroleum the fermentation went further and converted the vegetation into *liquid form*.\* Because coals have gone through this fermentation process, he said, is why all traces of leaves and branches in the coal layers have been lost except on the *upper surface* of the superincumbent, earthy strata (called the "roof" of the coal), where the imprint of the *leaves and branches*, and sometimes *logs*, are often to be seen.

In speaking of coal formation Parkinson referred to a number of instances of trees being buried in the earth in such a way as not to be converted into coal, yet bearing witness to the Deluge. Taking as his authority Prof. Hollman of Gottingen, who had addressed the British Royal Society on the subject, Parkinson said that near the city of Munden, Germany, where the rivers Werra

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\*Modern chemists believe that petroleum has been made from decomposed organic matter, but whether animal or vegetable they are not sure. Most of them lean to the theory that buried animals, particularly fish and other smaller organisms which inhabit the seas in such vast quantities, form the basis of oil. Having somehow become buried, the decomposed remains of the animals have distilled or percolated through porous rock into pools.

and Fulda meet, several mountains successively rise. At the top of the loftiest of these, about 1,150 feet in height, are several horizontal strata of earth, and beneath these "so large a quantity of fossil wood as would almost exceed the belief of anyone who has seen it." Tree trunks were lying *massed together*, flattened more or less by the pressure from above. One trunk that was seen had the roots still adhering, and on another was a branch with traces of the leaves. All were heavily coated with pyrites, and in some cases the form of the wood was entirely converted into pyrites. "The quantity of this fossil wood appears to have been *prodigious*. The stratum, of which we have hitherto spoken, was about twenty feet in depth, the bottom resting on a stratum of stone about a foot in thickness. On piercing this, another stratum of fossil wood was found: to discover the depth of which several attempts were made. But although borers passed to the depth of thirty feet, they did not reach the bottom of this stratum. . . A difference was observable in the two strata, which merits our particular notice; the fossil wood contained in the upper stratum was of a light brown color; but in the inferior stratum it was of a much darker brown, verging on black. . ." And in the body of the same mountain were to be seen specimens of marble containing *bivalves and other marine shells, including sharks' teeth* of considerable size.

William Kirby, M.A., F.R.S., next to be considered, was President of the Royal Society of London. The seventh of the famous "BRIDGEWATER TREATISES" was written by him in 1835 on the subject, "The History, Habits and Instincts of Animals" in which he spoke thus in part about the Flood:

"As it appears to me that the scriptural account of the great Cataclysm has not been duly weighed, and its magnitude, duration, momentum, varied agency, and their consequences sufficiently estimated by geologists, I will endeavor as briefly as I can to call their attention, and that of Christian philosophers generally, to the most striking features exhibited by it. . ."

"In the seventh month of the Deluge . . . on the

seventeenth day of the month, the Ark rested on the mountains of Ararat, from which period the waters returned off the face of the earth, ‘*going and returning*,’ as it is in the Hebrew, but rendered in our translation by the word ‘continually.’ Almost all the ancient versions adhere to the literal sense, (going and returning) which seems important, for it indicates a *flux and reflux* of the waters, which would effect the deposition of the matters floating upon or suspended in them. Whether this flux and reflux partook of the nature of a tide, and was produced by the action of the moon, or whether it was occasioned by the wind . . . does not appear . . .”

Kirby correctly, it seems to us, regarded the first period of the Flood as the time when the old earth was destroyed, and the last period, when the waters were receding, as the period when the strata of the new earth were being formed. Said he, “When we consider what an infinite host of animals of every description must have perished in the diluvial waters, as well as the incalculable magnitude of the mass of vegetable substances that must have been severed by the violence of the conflicting waters on the earth’s surface, we see immediately that their deposition and sepulchre, as well as the putting together again of the dislocated remains of the primeval earth, must have been an important part of the office of the subsiding waters.”

Kirby’s view on another matter is worth noting. Said he, “It seems to have been the opinion of most modern geologists that fossil animals in general were natives of those districts or countries in which their remains have been discovered. But whoever takes into consideration the account, above detailed, which the sacred writings gives us of the universal Deluge and the prevalence of the waters above the summit of the highest mountains, will see at once . . . that they must have floated when the waters had reached and flooded all the elevations upon which they had taken their last refuge, and they must have drifted off north and south, and if there was an attended flux and reflux, they would have been carried by it backwards and forwards till they were deposited

some here and some there. . . Few indeed would be imbedded in their native country . . . though, probably, in some cases, those of the same species might congregate, and so floating together might be buried together. It has been remarked that no fossil elephants have been found in the countries that those animals now frequent. It seems, therefore, by no means certain that the gigantic Saurians now found in our southern coast, or the Mammoth or other gigantic pachyderms of Northern Russia or Nova Zembla were really natives of those regions."

Kirby went far in attributing earth-changes to the Flood. Said he, "From which (2 Peter 3:5-7) it may be gathered that the heavens and earth which are now different from the heavens and earth which were destroyed at the Deluge; and as the latter has evidently been reconstructed, and vegetable and animal remains have been mixed with the dislocated materials, and as it were *detritus* of the original world, so the *new atmosphere* might be, and probably was different, so as to be less friendly to health and longevity . . . *Animals, as well as man, might be affected by this change*, their bulk might be diminished, and other variations be produced in them which have not been ascertained. When God fixed the rainbow as the token of his covenant with Noah, the changes here alluded to in the atmosphere might be the *cause of the appearance, under certain circumstances, of that phenomenon*. Scientific men have judged it not improbable, without referring to this doctrine of Revelation, that changes in the composition of the atmosphere, according to circumstances, may have taken place."

In 1837 George Fairholme, a geographer, published a work of considerable merit called "NEW AND CONCLUSIVE PHYSICAL DEMONSTRATION OF THE FACT AND PERIOD OF THE MOSAIC DELUGE."

This Flood geologist discussed the depth to which the earth's surface is stratified. When measured, he said, "by our minute standards of feet and inches," the earth appears to be stratified to a prodigious depth. But that depth diminishes almost to nothing "when the real scale of miles, by which we compute the diameter of the earth,

is applied to them." How deep the earth's surface has a stratified condition is not known. Deep mines and the sides of high mountains indicate that the earth may be stratified in some few places to a depth of two miles. This may appear to be a greater depth of sedimentary deposits than the Flood could well produce. When it is realized, however, that the diameter of the earth is about 8,000 miles, the few miles down that the earth surface has a sedimentary formation is seen to be less by many times, in comparison to the diameter of the earth, than the thickness of the skin of an apple is to the diameter of the apple itself.

Fairholme described several burial conditions which, he thought, pointed clearly to the Flood. Quoting from "Six Months In North America" by G. Vigne, Esq., he said, "The fossil remains of about thirty animals now supposed to be extinct, have been found at Big-bone Lick; and Mr. Bullock conjectures that there are *many more remaining*. That these animals did not perish on the spot, but were carried and deposited by the mighty torrent, which, it is evident, once spread over this country, is probable from the circumstances of marine shells, plants, and fossil substances having been found not only mixed with bones, but *adhering to them, and tightly wedged in the cavities of the skull*. 'Those holes where eyes did once inhabit' were often stopped up by shells or pieces of coral, forcibly crammed into them." Quoting from another source, "The Geology Of Kemaon" by McClelland, Fairholme told of fossiliferous conditions in Asia. "Although elephants are too unwieldy to climb the mountains in a wild state," he said, "and have never been seen, even on the lowest side of the hills that bound the plain, yet I am assured that their fossil bones are found in the *highest elevations that man has attained in Tibet*. Interesting discoveries of bones of enormous quadrupeds are now in progress in the mountain provinces of the northwest of Kemaon, under the indefatigable zeal of my friend Dr. Falconer and Captain Cautley." On his own authority Fairholme wrote, "In the museum of Stugard may be seen a mass of diluvial clay from Constatt, in the

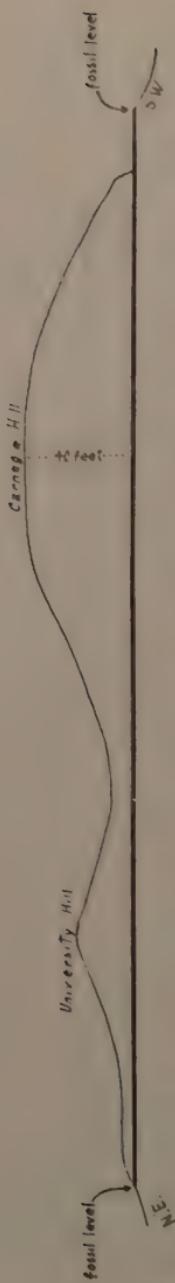


Fig. 25. A diagram copied from the showcase of the Museum of Princeton University, which contains a slab of fossils from a quarry at Agate Springs, Nebraska. The inscription accompanying the diagram says: "About 40 feet below the top of the hill a narrow layer, crowded with bones, runs all the way through the hill . . . The bone layer is 6 to 18 inches thick, and is almost everywhere crowded with the fossilized remains of extinct animals, of which the paired horned rhinoceros is the most abundant. Male and female, old and young, occur together, but with little association of parts." The hills were originally one with the main body of the level plain or plateau of Nebraska, and were formed by the erosion of the prairie by rains and flowing streams. The same strata as are in these hills are continuous with those in the body of other hills close by and in the body of the prairie itself.

See Fig. 26, next page.

*Photo from Nebraska Geological Survey*  
Fig. 26. The side of Carnegie Hill on the James Cook Ranch at Agate Springs, showing (at the level with the men) where the fossil stratum runs horizontally through the hills. How similar is a seam of coal (Fig. 22) to this layer of bones! Both were probably formed in the same way. See Fig. 27, page 97.



immediate neighborhood, of the dimensions of *only five feet square*, in which, however, are seen the tusks of *not less than thirteen different elephants*, of a great variety of size, and as it were, matted together along with the other fossil remains." Describing the strata of the valley of the Arno in Italy, *a very famous cemetery of land animals*, he said, "In this sandy matrix bones were found *at every depth*, from that of a few feet to a hundred or more. From the larger and more apparent bones of the *elephant*, the *rhinoceros*, the *megatherium*, the *elk*, the *buffalo*, the *stag* and so forth, naturalists were led, by the elaborate studies of Cuvier and other comparative anatomists, to the remains of the antediluvian *lion*, the *tiger*, the *bear*, the *wolf*, the *hyena*, the *rabbit*, and finally the more minute remains even of the *water-rat* and the *mouse*. . . In some places, so complete was the confusion, and so obvious the action of water in these fossil burying places, that the bones of many different elephants were brought into contact; and on some *oyster shells* were matted . . ."

Fairholme referred to the well known burial conditions of elephants in northern Siberia and elsewhere, but as we will speak of these fully in connection with a later Flood geologist (Howorth), we will omit what Fairholme said on the matter, except this, "Now, if we were desirous of pointing out any one strong point in the phenomena of the earth surface which seems more conclusively than any other to corroborate the record of a general deluge, we would not desire one more remarkable than the fact of the remains of innumerable elephants being scattered over the earth, invariably confined to the superficial deluvial bed, but so far from being peculiar to such tropical latitudes as they must have inhabited when in life that we now find them not only in *every latitude*, from the equator to the pole, but also at *every degree of elevation* from sea's level up to the alpine plains of Mexico and the glaciers of the Himalayas."

"*Dry rivers*," as he called them, furnished Fairholme with one of his main contentions for the geological



*Photo from Nebraska Geological Survey*

Fig. 27. Removing a bone slab from the fossil stratum at Agate Springs, Nebraska. The rock of the stratum is sand cemented with carbonate of lime. It is very hard. See Fig. 28, page 99.

theory he advocated. By dry rivers he meant great, long, river valleys which now have only comparatively small streams flowing in them, but which give the impression of having once contained vastly greater amounts of water. After pointing out how small streams of today, flowing in very gently sloping meadows, follow a serpentine course, making regularly alternating slopes and precipices at the turns, Fairholme said that, in places which he himself had seen, the earth's surface was just such as

to indicate that immensely large streams had once flowed there toward the ocean in the same serpentine manner, as well they may have done in the period immediately following the Flood. France, from the Vosges and Jura Mountains to the Atlantic Ocean, he said, is an almost level plain which slopes gradually westward, and the present Seine River flows across this plain in the bottom of a wide valley, where once an immense stream flowed a serpentine course. He was struck also, he said, during an intensive study of the valleys of Germany, with the innumerable great windings in the vale of the Neckar River and the regularity of such alternate slopes and precipices as described above.

What Fairholme called attention to in connection with "dry rivers" is a phenomenon that is *common throughout the world*. In and near Washington, D. C., there are evidences, in the form of horizontal terraces at different heights, that the waters in the Potomac Basin once flowed at levels 95, 160, 215 and 265 feet above where they are at present. Similar horizontal terraces, plainly formed by immense streams, are to be seen hundreds of feet above the present Spokane River in the State of Washington. The Thames in England has terraces 20, 50, 90, 150, 300 feet above sea level. Whatever the cause, it is undeniable that the world has everywhere had at some period in the past much more enormous rivers than it has at present.

An important class of evidence for the Flood which Fairholme presented had to do with the manner in which the earth's strata repose on one another. A study of the lines of contact between any number of strata reveals that the strata were evidently deposited one on top of the other *in rapid succession*. Each lower stratum was still soft and moist, and there was no chance given for it to lose its even surface before the next was laid on. In an event of the nature of the Flood, it is to be supposed that, in some instances, a newly laid stratum, if it were temporarily exposed to the rains, or if there should be some abnormal currents, would receive a few irregularities on its surface before another was deposited. In general, however, one stratum would be deposited soon upon the



Photo from Colorado Museum of Natural History

Fig. 28. Bones of rhinoceroses, camels, giant wild boars and others buried at Agate Springs, shown after removal of stone. Decay and repeated burials and re-burials of animals during the long siege of the Flood would put their remains into this state. It is estimated that the bones of about 9,000 complete animals are buried in one hill. Clear signs exist that the bone-layer once extended over a very wide area, wherefore it is likely that very many times that number of animals were once brought together by flowing water and buried there. A similar photograph of bones from Agate is found in the author's *AFTER ITS KIND*.

one below, and the line of contact between the two strata would be quite even and perfect. "This gradual passage from one sedimentary deposit to another as seen at the point of contact," said Fairholme, "is perhaps the strongest proof that can be advanced of the *uninterrupted and aqueous deposition* throughout the whole formation of the earth's strata." Said he, "These *insensible transitions* between the secondary rocks were first pointed out to me by an eminent professor of geology in Paris, during an examination under his guidance, of the strata of the Paris basin. . . Since my attention was thus called to this important point in the sedimentary deposits of the earth's surface, I have had ample opportunities, both in Britain and on the continents of France and Germany, of inspecting the junctions of almost all the formations; and I feel persuaded that there is no fact more clear in geology than this, *viz.*, that the upper surface of almost every formation was yet *soft and moist* when the superincumbent sediments were deposited upon it. This was clearly the fact in the case of all the tertiary strata around Paris; and the same may be seen in the Isle of Wight and in the southeastern cliff of England. Many similar junctions may be seen on the eastern coast of England in the secondary strata below the chalk. I have already alluded to a beautiful series of such transitions from the old red sandstone in Forfarshire, through the shist rocks, into the pure granite around Aberdeen. . . In complete accordance with this fact, we find similar proofs of uninterrupted deposition in the junction of all the individual strata of each formation or group. These strata vary from one inch or even less to four or five feet or more in thickness. On raising a bed of sand or limestone in the quarry we almost always find corresponding inequalities which plainly bespeak *the softness of the lower bed and the yet greater softness of the upper one*, at the period of their deposition. These equalities have frequently all the appearances which are seen on sand or mudbeds in existing waters."

As a further clear proof of such fast and uninterrupted deposition of sediments as would take place in the

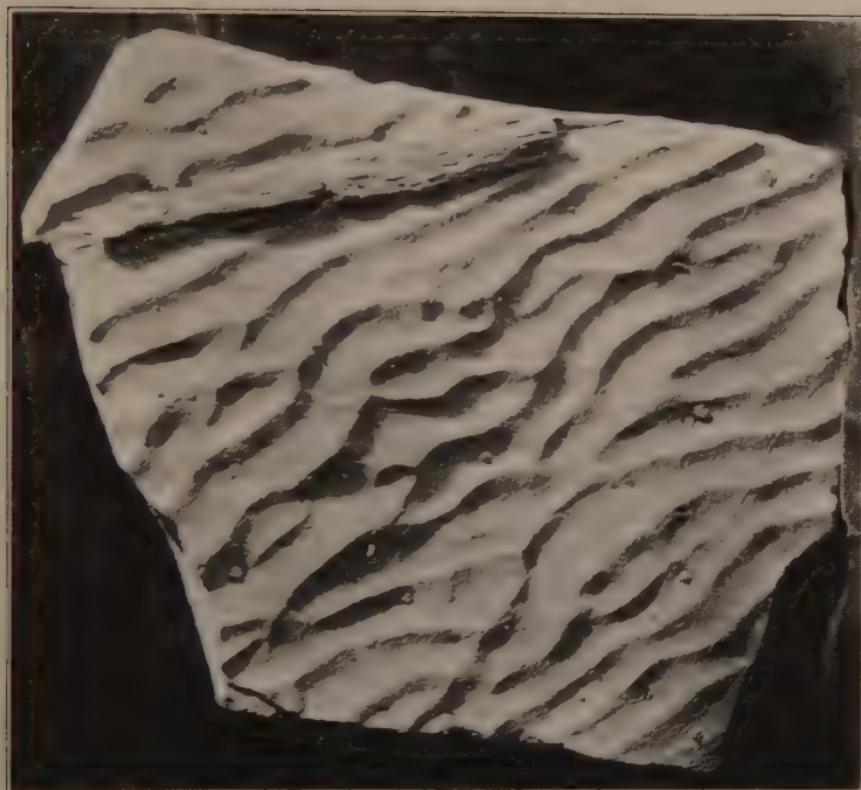


Fig. 29. Perfectly preserved ripple marks, such as abound in stratified rocks. Those shown above were found by the author in stratified shale in Alberta (see Preface). All sizes of ripples exist in the sedimentary deposits, from tiny ones up to gigantic ripples twenty feet from ridge to ridge. Their existence indicates the rapid deposition of the sediments which came to form the rocks, since the marks would have disappeared if they had not been quickly covered over with a layer of sediment. Note the stem of a jointed rush (*Equisetum*) lying across the ripples.

Deluge, Fairholme pointed to "ripple-marks" (see Fig. 29, this page). These irregular, wash-board markings, which form on the sandy bottoms of streams, lakes and oceans in storms or other disturbances, and which disappear as quickly as they come, have been preserved extremely numerously in the stratified layers of the earth in many kinds of stone. Some of these marks are small, evidently having been formed in shallow water. Others are immense, being found to measure over twenty feet be-

tween ripples or waves. These large ones were probably produced in deep waters agitated violently. Regarding the proofs of rapid depositions of the strata which these ripple-marks present, Fairholme said, "The marks of water-ripples are very frequent, and are often as distinct as on the present sea shore at the ebb of tide. Every one knows how evanescent are such marks, and that a few hours of sun, or wind, are sufficient to obliterate them. Such marks are never seen, however, in rocks, excepting at the partings of the strata; and they seem thus also to bespeak a certain periodical deposition, as of an ebb and flow, though we cannot discover in the existing waters any depositions at all similar in amounts with which to compare them. . ."

As he did the ripple-marks, so Fairholme also reckoned the "*reptile-tracks*" in the stratified rocks as proofs of the speedy deposition of the sediments. Said this author regarding these, "It is in such situations, and especially between the strata of the red sandstone formations, that in addition to the ripple marks above mentioned, various tracks of animals have from time to time been discovered. . . These fossil foot marks . . . may certainly be regarded as amongst the most remarkable and instructive of all the phenomena of our strata. . . In the case of the foot tracks we are brought almost into the presence of the living animal. . . We have also some faint idea even of the very scene on which he moved. That it was a mud bank, *periodically dry*, seems certain from the beds of a similar character above and below it in the quarry. That it was but a *short time* dry seems equally clear from the freshness of the foot prints. That the surrounding waters were extremely turbid we may plainly infer from the fresh and abundant deposits of sand on the very first subsequent flow. . . Where shall we look in existing nature for a situation where we might walk on mud beds *raised two or three feet higher* after each periodical flow of the tide, and this not one or two tides only, but for periods capable of thus accumulating sediments of some *hundreds of feet thick*."

The exact nature of the animals whose tracks have

been discovered so beautifully preserved in the solid earth's strata is uncertain, since they have become extinct. Most likely they were amphibious, the "sea-monsters" of Genesis 1:21 (Revised Edition). Their fossils are found in every continent, sometimes in enormous quantities. Says a modern geologist, "The dinosaurs of the Red River Valley in Alberta lived and died by the thousands,\* so that the skeletons are thickly scattered over the 'bad lands' along the river . . . They must have been as numerous as the hardy buffalo of a generation ago, but with much more variety of form and species." It is the skeletons which erosion has exposed which are scattered over the bad lands. Vast numbers are still within the strata. (Compare Fig. 2, page 11.)

The present writer offers some pictures taken by him of the locality where dinosaur foot prints were discovered in the great clay strata near Woodbridge, New Jersey (Figs. 30, 31, pages 104, 105). The clay of this formation, which spreads over hundreds of square miles and is mined over a wide area, is typically stratified. It is very solid, but can be cut with a spade. When the reptiles, whose tracks are on a layer of dark clay thirty feet below the surface of the ground, walked across that layer, it was either just out of the water or but slightly under it. But so soft must the clay have been on which the steps were taken, that had the tracks not been covered and filled in *almost instantly* with a sedimentary deposit of some sort, they would have disappeared. From a study of the strata in which the footprints occurred, it is apparent that a single current or tide quickly spread two feet of fine sand over the tracks, and another current or tide quickly spread two feet of fine clay again on top of the sand. This is just what might have happened if reptiles were swimming in the waters of the Flood and were occasionally seeking rest

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\*One of the great, unsolved puzzles for modern, evolutionary geology (but not for Flood geology) is the cause of the sudden and simultaneous extinction and burial of the great tribes of prehistoric reptiles all over the face of the earth.

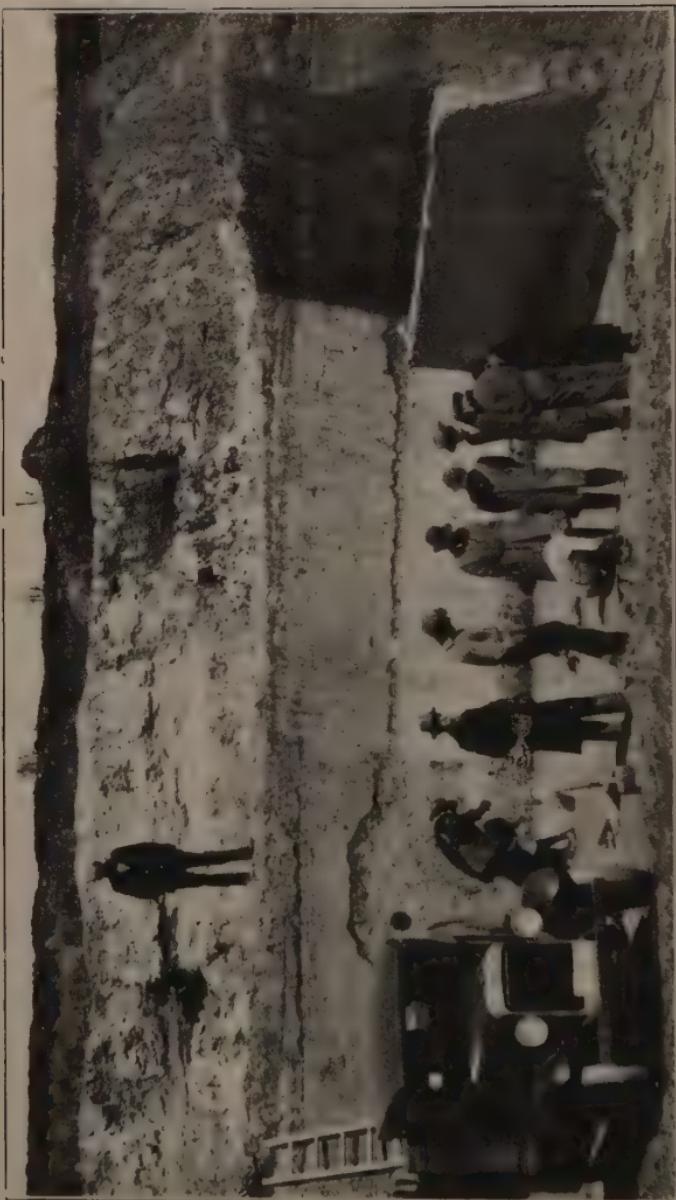


Fig. 30. Professional geologists from New York and New Jersey examining reptile tracks found in a soft clay stratum near Woodbridge, New Jersey. All of the geologists agreed that the footprints must have been quickly covered over with a protecting layer in order to have been preserved. The black layer in the clay at the level of the men's waists is full of carbonaceous matter. Perfectly preserved leaves of many kinds, even palms, together with branches and tree trunks are found in these strata. The author faces the camera.

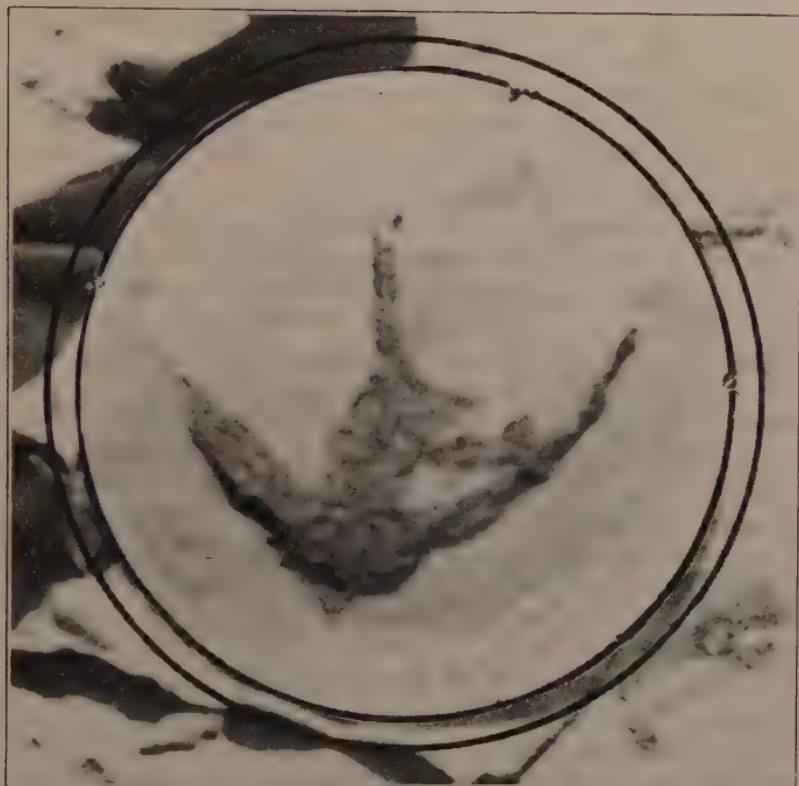


Fig. 31. One of the reptile tracks from the clay strata of New Jersey. The marks measured nineteen inches from the heel to the tip of the center toe. The animal walked on two feet and took steps over five feet long.

upon the newly laid strata when they were temporarily uncovered.

"SCRIPTURAL GEOLOGY" by Rev. George Young, D.D., author also of "A GEOLOGICAL SURVEY OF THE YORKSHIRE COAST," appeared in 1838. This very excellent work was devoted principally to an attack upon the rising uniformitarian and evolutionary theories of geology. In 1830 Charles Lyell, who has been called the "high-priest" of uniformitarianism, published the first volume of his "PRINCIPLES OF GEOLOGY," in which he advocated the views which Buffon and Hutton had sought in vain in the preceding century to promulgate. The scholastic

world was becoming ripe for uniformitarianism. Theological skepticism had gained rapidly over faith. So-called higher critics were attacking the Bible from a literary point of view, and the schools were in the hands of men much influenced by these attacks. When, therefore, Lyell, in a skillful fashion, began to teach the old uniformitarian ideas the world was ready to hear.

Young vigorously attacked the works of Lyell because of the *unwarranted assumptions* they contained. He denied it was philosophical arbitrarily to say, as Lyell did, that nature's ways have always been uniform and that "knowledge of modern changes on the earth is the key that unlocks the door to knowledge of the past." For all anyone knows to the contrary, said Young, geological or physical changes on the earth may have been at times in the past of *an entirely different sort* from what they are now, and may have gone on at *an entirely different rate*.

Young attacked the notion, which was being adopted in scholastic circles with the spreading of the evolutionary doctrine of organic development, that the fossils in the lowest, first-deposited strata are most unlike present, living forms, and that the fossils in the highest, last-deposited strata are most similar to living forms. In the lowest strata, said Young, there were many forms *identical with living types*, and in the highest strata forms that were *not to be matched with living forms at all*. These conditions, Young said, could be accounted for readily on the Flood theory. They are conditions which would arise if, in the prediluvian world, there were species which have since become extinct, and all species (those still living and those not) were buried simultaneously by the Flood.

Young also denied what was being assumed by Lyell and his followers, namely, that animals imbedded in the strata had surely lived, flourished and died in the same regions where their fossils now are found. He said they may have *drifted* from far distant regions, and that there was good evidence that they did so. He denied that any trees or vegetables found buried in the rocks or coal

measures anywhere grew in the places where their fossils now are buried, another assumption of Lyell. All fossiliferous strata, Young maintained, point unmistakably to a *rapid deposition* in great volumes of moving water. We quote a few passages from his work.

"When we," he said, "examine the aluminous or lias [limestone] strata, and their contents, the fact of their having been brought by currents forces itself on our notice. Here we see crocodiles and other large saurians; fishes, great and small, nautilites, ammonites, belemnites, and myriads of other shells, associated with trees and fragments of wood, and all, with few exceptions, lying parallel to the plain of the strata. Such an assemblage, and so arranged, could have been formed only by ocean currents, collecting these substances together, and depositing them in their places. Even the beds of sea shells give indications of the fact. In the marlstone bands, occurring in the lias of Yorkshire, there is a seam composed chiefly of oyster shells, about four or five inches thick, extending for many miles along the coast, being found where the marlstone beds appear, and reaching far into the interior, where it is seen in the front of the Cleveland hills. The shells of this seam are chiefly single shells, many of them are water-worn, all of them appear to have floated to their present positions, their flat sides being laid in the plain of the bed. No unprejudiced observer can affirm that this is an ancient oyster bed, in its original place and form; its contents must have been *drifted together* to produce this extensive and singular stratum."

The fact of the high state of preservation of fossil fish was an indication to Young of the Deluge, and not of uniformity. "It is well known," he said, "that scarcely any substance decomposes more speedily than fishes; so that when we find fossil fishes in a high state of preservation, we may be sure that the strata containing them were deposited so rapidly as not to allow them time to become putrid, till they were safely incased in their present matrix. Now, the fossil fishes in the carboniferous

strata, in the magnesium limestones, in the lias, in the oolite, in the chalk, and in some of the tertiary deposits, are often found in the finest condition, with no part of their structure injured; while we know that fishes left dead on the beach, or on the banks of rivers, begin to decay in a few hours. The inference to be drawn from these facts is well expressed in the words of Professor Phillips . . . ‘Struck by the contrast of these layers of fishes in ancient marine sediments with the few and scattered fragments which occur in modern deposits, M. Agassiz has conjectured that the rate of deposition of these ancient strata must have been almost inconceivably rapid.’ Mr. Phillips accounts for the sudden death of the fishes by supposing some remarkable change in the water; but the proper cause of their fine preservation was their being *so suddenly entombed in the strata.*”

Another indication to Young of the Deluge was the manner in which entombed remains were *pressed flat* by the weight of the layers above. He said, “Now, when we see fossil animals, such as the large saurians [reptiles] of the lias, crushed and broken, as under an enormous weight, it is plain that the strata containing them must have been formed so quickly that the lower beds had not come to harden before the weight of the new strata over them was sufficient to crush them. Illustrations of this occur in great numbers, both at Lyme Regis and at Whitby. Thus, the great crocodile in the Whitby Museum has evidently been crushed by the super-incumbent strata; the effects of pressure being visible, both on the head and the body, the bones of the one leg being practically sunk into those of the other. A fine specimen of the ichthyosaurus [a marine reptile] in the Museum, gives similar indications of violent pressure, the whole being crushed into a flat mass, and the ribs of the one side pressed across the spine, so as to form an angle with the ribs of the other side. [Compare Fig. 11, page 44.] But there is another peculiarity in this direction. The elegant curviture of the spine shows that it was *not the dead carcass* of the animal that was embedded in the strata; it was not in the

flaccid state of a dead and stranded fish, but must have been suddenly entombed *alive*; and, writhing in the agonies of death, it has twisted its body into its present handsome shape, as if, like a Roman gladiator, it would die gracefully. *Similar instances* have been noticed among the fossil fishes of Germany."

Most fossils, Young said, point to a *universally warm climate throughout the earth* at the time the organic remains were simultaneously buried, a climatic condition which was probably due to another location of the land and water surfaces of the globe in the prediluvian world than at present.

He said, basing his statements on Lyell, that if the highest mountains of today were transferred to the equatorial regions, and the most extensive oceans removed toward the poles, and fringed with a border of archipelagos, or clusters of islands, while lands of moderate height occurred in most of the intermediate spaces between these archipelagos and the equatorial mountains, then a temperature almost uniform would prevail throughout the world. The heat of the torrid zone would be modified by the height of the mountains, and the warmth of the temperate zones would so increase that they might be said to possess a tropical climate, and even the northern and southern archipelagos would enjoy a perpetual summer. Such an earth, said Young, having "no sandy deserts, no barren moors, no bleak and sterile hills; having the whole of the dry land clothed with rich vegetation adapted for the support and accommodation of an equal abundance of animal life," would account for the immense supplies of vegetable matter required for the coal strata and the inexhaustible stores of shells, corals, crustacea and land animals buried beneath the surface.

As a final statement from this author we may refer to the thinning out of strata. Were there a Deluge which produced the strata by a continued ebb and flow of its waters, individual and characteristic layers should exhibit a *gradual thinning out* until they disappear. The thin edges of different layers should wedge into one another,

the thin edge extending over or under the thick part of another. Such, said Young, is exactly the situation that exists in the earth as it is laid open in many places to geologists. (Compare Fig. 24, page 75.)

The first half of the nineteenth century closed with the appearance of *GEOLOGY AND GEOLOGISTS* in 1843, by Robert Maxwell MacBriar, in which he discussed and opposed the various theories of Lyell, Smith, Cuvier and others and maintained that what they pointed to in geology could be simply and without difficulty explained if one was willing to grant the truth of the Biblical record of Noah's Deluge.

All opposition to the newly rising "modern" theory, however, was in vain. Flood geology, based on faith in God's Word and the supernatural, was not the type of thing the world wanted, and henceforth it was ignored or ridiculed.

## CHAPTER VIII

### THE PERIOD OF ECLIPSE (1800-1931)

OUR tracing of the Flood in geological theory in this period begins with "VOICES FROM THE ROCKS," a work published anonymously in 1857, as a reply to High Miller's "TESTIMONY OF THE ROCKS," in which Miller endeavored to compromise between the Bible and the uniformitarian theories advanced by Lyell.

This author, like Fairholme and Young, pointed as proof of the Flood to the *rapid succession* in which each stratum evidently was deposited on the one below it. As proof of this rapid deposition, this author described several suggestive geological conditions. Said he, "Amongst the various phenomena which the indefatigable researches of geologists have lately brought to light, few have awakened more attention than the discovery of a vast number of fossil trees and plants, standing in some cases in an erect, and in others in an oblique position, and *piercing through successive beds of stone.*" As an example he cited the case of a tree found in a white sandstone quarry in England, called Craiglieth Quarry. The total length of the tree was upwards of eighty feet and, leaning at an angle of about forty degrees, it intersected *ten or twelve different strata of limestone.* Its diameter at the top was about seven inches; and it had been *flattened by pressure* at the base in such a manner as to measure five feet in its greater and two feet in its lesser diameter. There were no branches or marks of them on its bark; nor were there any roots. The bark had been converted into a thin coat of the purest and finest coal; and the whole, as it lay exposed in the quarry, presented the ap-

pearance of charred wood, forming a striking contrast in color with the white stones in which it lay. "Such an example," said this geologist, "must serve at once to show that but a very short time, indeed, must have been occupied in the formation of the whole quarry, and consequently of the whole coal formation which rests below it." The geologist said that the same sandstone strata as was in Craigleith Quarry topped the whole coal formation in all that coal district, and that it appeared that the sandstone strata were formed simultaneously with the coal strata.

Concerning another great tree, similarly penetrating upward at an angle several different layers of stone, this author said, "A few passing waves, or at least a few days of the agitated and turbid waters of the Deluge, must have been sufficient for the whole formation of the bed in which it is found."

Horsetails, rushes and other plants of the Equiseta family are very delicate and easily broken. Yet these plants are often found, said the author of "*VOICES, in the hardest sandstone, unbroken and intact.*" Concerning their burial thus the geologist said, "The accumulation of the transported sediment must have been so rapid as to prevent decomposition of the cortical portions of the plants, the wearing away of the superficial structure, or the bending of the stem beneath the current of the water. No one doubts that the bed of stone three feet thick, which encloses equisetum columnare at High Whitby, was laid by a single inundation."

The fact, said this geologist, that in coal formations fossil stems sometimes pass through a coal bed from the bottom into the strata above to a great height is indication and proof "that the formation of coal, under every circumstance, must be attributed to the progressive sinking and covering up of the diluvial vegetable ruin at the time of the Flood."

A similar rapid deposition of the strata, said this geologist, is shown by fish. Regarding those taken from quarries in England, he said, "The skeletons of these fish

. . . are often entire, and so closely packed on one another that many individuals are often contained in a single block. The thousands of specimens which are dispersed over the cabinets of Europe have nearly all been taken from one quarry. All these fishes must have died suddenly on the fatal spot, and have been *speedily buried* in the sediment then in the course of deposition. From the fact that certain individuals have even preserved *traces of color* upon their skin, we are certain that they were entombed before decomposition of their soft parts took place."

Modern squid and cuttle-fish have an interior sack of black fluid which they eject in the water to form a screen in which to hide. Regarding fossils of these creatures in the English rocks, this author says, "The cuttle-fish of Lyme Regis, again, must have been killed and entombed with inconceivable rapidity, for they still retain the dark fluid with which their ink-bags are filled when alive."

In 1868 George Twemlow, a scholarly major-general in the British army who had studied geological conditions in many lands wrote "FACTS AND FOSSILS ADDUCED TO PROVE THE DELUGE OF NOAH AND TO MODIFY THE TRANSMUTATION SYSTEM OF DARWIN."

As is suggested by the title, Twemlow's efforts were directed against the evolutionary geological teachings in the newly published works of Charles Darwin. "Have you ever," said Twemlow, "after heavy rains, observed streams carrying materials—say chalk and sand—down a slope, depositing each in distinct ridges, the heaviest first and highest in accordance with specific gravity and the lightest last and lowest, and then reflected, during the one hundred and fifty days in which diluvial waves passed over the earth and subsequent months of deposit what vast ridges of distinct materials may have been deposited, what deep valleys filled up? If so, you may be led to understand that the Almighty would *not require* the three hundred millions of years, specified by Darwin, for the accumulation of the stores of minerals deposited."

Twemlow described certain fossiliferous conditions

which, he held, Darwin's uniformity theory could not explain. We quote a few of his statements: "M. M. Larlet and Gaudry state that the commingled masses of bones at Pakermi, near Pantelicus, in Greece, belong to denizens of different countries and climates, which could only have been brought and massed there by a Flood. They include the rhinoceros, giraffe, ox, mastodon, hyena, lion and monkey.

"The plain of Tibet is found on examination to be a deposit which has attained its present level of fifteen thousand feet without any sensible disturbance of the horizontality of the beds in which it was originally laid out. Bones of *elephants*, *rhinoceroses*, *horses* and of some other large, undetermined ruminants are found embedded in these strata.

"At an apparent fault which intersects the southern extremity of the Coplow basin are found large masses of fused matter, mussel shells, coal and oysters in conglomerate masses.

"All the great rivers of Germany have, like those of the Necker, yielded fossil bones of the elephant. Those especially abutting on the Rhine are too numerous to mention. But of all parts of Europe, that in which they are found in greatest numbers is the valley of the Arno, where we find a *perfect cemetery of elephants*.

"They [elephants] have been found deeply embedded in the sides of the rivers Neruddah, Godavery, Pygen Gunga in East India."

A masterly treatise in behalf of the Deluge theory appeared in Germany in 1877, entitled "GEOLOGY AND THE FLOOD." Its author was a Jesuit scholar named Athanasius Bosizio.

Bosizio, like all other upholders of the Scriptural theory vigorously attacked the uniformitarian, evolutionary theory. The doctrine of organic evolution was fully accepted in professional geological circles in Bosizio's time, and fossils were being used everywhere by geologists as supposed guides or indices to the ages of the various strata. This use of fossils Bosizio objected to as

*so much nonsense*, since the theory of organic evolution had not been established and was, in his opinion, a gross error. We will speak more about this unwarranted use of fossils in a later chapter.

The teaching of the geologists of Bosizio's day (as also in our day) was that, if different sorts of strata lie today on top of one another in a given locality, it means that sediments had been brought to that spot by different rivers and ocean currents after the sediments had been eroded in different "ages" from widely separated and unlike land surfaces. Such a teaching, Bosizio insisted, was gratuitous, since the presence of different sorts of strata one above another could be accounted for more satisfactorily if one assumed *different waves or currents flowing from different directions in an event like the Flood*. In the Jura Mountains of the Alps, for example, Bosizio said, many strata are to be seen reposing one above another. As these strata are examined from the bottom of the mountain to the top, they are seen to change their character abruptly several times, both in respect to minerals and the fossils they contain. "We see from this," said Bosizio, "how that paleontological fact, so often noticed, of the *sudden disappearance of certain fossil kinds* in the same locality in the overlying deposited strata is very definitely and clearly explained as a simple and natural result which the Flood catastrophe produced."

While his work was largely intended to show the absurdities and unwarranted assumptions of modern geology, Bosizio's book offers us a few suggestive ideas as to the actual workings of the Flood. Woodward had said that the surface of the old, prediluvian earth was "dissolved," possibly by some special act of God, so that the materials of its surface could be taken up as sediment in the waters of the Flood. Bosizio, in contrast, stressed the *naturally destructive power of the Flood waters alone* to crush and undo (ausmachen) the primitive earth.

In the Flood the land was covered to a depth, Bosizio estimated, of at least 16,000 feet. At the bottom of such a mass of water there would be a pressure of over fifty

*tons to the square foot* when the water stood still. When it flowed fast and pressed against elevations, the pressure might be increased to *two or three times* that much. Such a mass of water, moving violently over the surface, would play utter havoc with the earth. Solid sandstone hills would be pulverized by the awful force and weight. Resistant masses of other kinds of rock, like ancient coral reefs, which had been built up in the centuries before the Flood, would be shattered into small fragments. These fragments, spread out in layers, would form the so-called "limestone-breccias" and similar strata (see Fig. 13, page 49) which are so difficult for uniformitarian geologists to explain.

A point especially emphasized by Bosizio was that the geological work of the Flood continued in a large variety of forms for probably *hundreds of years* after the time it ended for Noah. A condition of stability came only gradually to the newly formed earth. For centuries, Bosizio believed, the strata contracted and settled to form basins and hollows in some places, while it expanded and buckled to form hills and mountains in others. Upon the earth were left by the Flood immense inland seas. From these, and the water soaked strata, evaporation was very great, and rains fell constantly. Great streams flowed in many directions, and they, cutting into the sides of hills and highlands, undermined them at their bases, with the result that immense masses of strata fell or slid sideways into the channels of the streams, thus daming back the waters and forming new inland lakes. These lakes, bursting their dams at later times, caused new floods and the formation of new stratified deposits, or redeposits of the old fossils and sediments. Vegetation which had sprung up became buried under new sediments to become fossils. Bosizio supposed, and not without the possibility of being correct, that while the land was free of water where Noah debarked, so that in Noah's view "the earth was dry," *elsewhere* for centuries the water may have been still in its process of "going and returning" from off the earth.

In the same year, 1877, that Bosizio published his work in Germany, a similar work was published in England called "SKEPTICISM IN GEOLOGY." It was written by one who signed himself Verifier, but who was in reality John Murray, the publisher of the books of Lyell and Darwin. Murray, like Bosizio, upheld the Flood negatively, by attacking the rival theory of uniformity. He left untouched the subject of the chronology of the fossils which Bosizio dealt with, but attacked very effectively Lyell's theory of erosion and the distribution of sediments upon the ocean bottoms, denying that land sediments ever get beyond the continental shelf. Williams, in the eighteenth century, when Hutton put out his views of slow deposition on the ocean bottoms, had previously raised the same objection, saying that sediments carried down by rivers to the ocean merely served to extend the land at the rivers' mouths.

A word of explanation is necessary in introducing the last Deluge geologist of the 19th century. Up to the present time the scholars we have considered were all sincere believers in the Bible as the Word of God. Henry H. Howorth, M.P., F.S.A., M.R.A.S., the Flood-geologist now to be considered, was of a different type. His attitude toward the Bible as a divinely inspired book and a true record of the past was decidedly hostile. He spoke of the Creation account in Genesis as a "crude cosmological hypothesis." He said it had "no authority whatever." It was "pernicious" to regard it as divinely inspired truth. And what is true of the Creation account is true of the Deluge account as well. Still, he said, though the Deluge record is not to be regarded as divinely inspired history, it cannot be disregarded entirely. There are traditions of a great flood to be found among "widely separated peoples, between whom there has been no intercourse," which point unmistakably to an event in history of the nature of that told about in the Scriptures. The Biblical Deluge record is worthy of consideration as one of these traditions. The event told about in these traditions, Howorth declared, was of very great magnitude

and extent. It was practically universal, but not entirely so. There was no ark as the Biblical and other traditions say. "While the Flood," he said, "was exceedingly widespread, considerable areas escaped, and from these insular areas man, animals and plants spread out and reoccupied those districts that had been desolated." Where these areas that "escaped" were located Howorth did not say. Inasmuch as he described the burial conditions of animals in practically every part of the world, it is hard to make out where he believed the location of these "escaped" places were. Aside from his hostility to the Bible as an inspired record, however, Howorth may be considered as an outstanding Flood geologist.

As is to be judged from the title of his large book, "**THE MAMMOTH AND THE FLOOD**," published in 1887, Howorth's argument for the Deluge was based principally on the manner in which elephant\* remains are found in Siberia. (See Fig. 32, page 119.) Howorth undertook by means of the mammoth to prove: "In the first place, that a *very great cataclysm or catastrophe* occurred . . . by which that animal, with its companions, were overwhelmed *over a very large part of the earth's surface*. Secondly, that this catastrophe involved a widespread flood of waters which not only killed the animals, but also buried them under continuous beds of loam or gravel. Thirdly, that the same catastrophe was accompanied by a very great and sudden *change of climate* in Siberia, by which the animals which had previously lived in fairly

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\*Evolutionary geologists call the mammoth an extinct species, but with little reason. Mastodons were little larger than the modern Indian elephant and were otherwise identical in structure. They had a thicker covering of hair than do most of the modern elephants, but since, as we know, there is a very great variation within other species with respect to amounts of hair (Mexico has a hairless variety of the dog), it is most reasonable to suppose that the mammoth was but a variety of the modern elephant. The same sort of thing is true of the rhinoceros, whose remains are so plentifully mixed with the elephant's. We know now only the hairless variety of rhinoceros, but the hairy ones buried on so vast a scale were probably a simple variety of this living species.

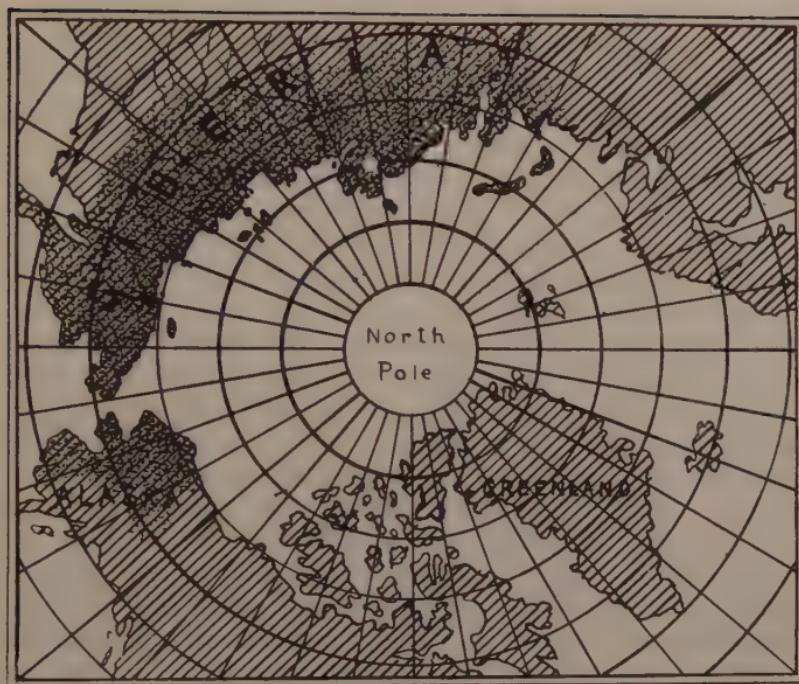


Fig. 32. The Arctic regions (dotted) where the remains of elephants, rhinoceroses, bison, horses, sheep and other animals are found buried.

temperate conditions were frozen in their flesh under the ground and have remained frozen ever since.” By proving these he would establish, not that the Bible was true (he didn’t care for that), but that the theory of uniformity was false.

“There is perhaps no inquiry,” said Howorth, “in the whole range of Natural History more fascinating or romantic than that which deals with the mammoth and its surroundings. Even children and unsophisticated people have their imagination stirred when they read how in the dreary and inhospitable wastes of northern Siberia, where neither tree nor shrub will grow, where the land for hundreds of miles is covered with damp moss barely sprinkled for two months with a few gay flowers, and during the rest of the year is locked in ice and snow, and where

only the hardiest polar animals . . . can live, there are found below the ground *huge hoards of bones of elephants and other great beasts* whose appetites needed corresponding supplies of food. But our interest rises to the highest pitch when we are told that this vast cemetery not only teems with fresh bones and beautiful ivory tusks, but with the carcasses and mummies of the great animals so well preserved in the perpetually frozen soil that the bears and wolves can feed upon them."

The sources from which Howorth drew his information regarding fossil bones that are in the stratified earth of this vast, desolate region is worth recording. They include the works of Pallas, who, in exile in Siberia, observed conditions, and when he came back wrote a full account of what he saw; the reports of Wrangell, after whom Wrangell Island is named; the reports of such travelers as Strahlenberg, Witzen, Muller, Klaproth, Father Avril, Erman, Hedenstrom, Betuschef, Bregne, Gmelin, Brandt, Antermony, Liachof, Kusholof, Chamisso, Maljuschkin, Ides, Baer, Schmidt, Bell, Tatischof, von Schrenck, Olfers, Laptef, Sarytschef, Motschulsky, Middendorf, Schtscukin, Maydell. To these must be added official documents of the Russian Government.

We will endeavor to present Howorth's picture of the fossiliferous conditions of northern Siberia, reminding the reader of Howorth's hostile attitude toward the Bible and of the saying, "Truth is stranger than fiction." For when the facts are stated they are of such a nature as to be *almost incredible*.

Siberia is a vast territory having a coast line bordering on the Arctic ocean of over two thousand miles, and having rivers that are equally that long. The whole country is a plain, as level in general as the Dakotas and Montana. With the exception of a few hillocks, practically the only irregularities are those caused by the great rivers which wind their way through the broad expanses. As is the vast plain of America's west, so is the immense level waste of Siberia stratified. The strata beneath the surface of Siberia are composed chiefly of sand, which would

be sandstone if it were somewhat more consolidate than it is. In some places the sand is mixed with layers of clay, and also of gravel. The sands and clays are usually light colored, but sometimes they are browned or blackened by the various forms of vegetation which have been buried in them. On account of the continual cold in Siberia the year round, its strata remain *perpetually frozen* to an enormous depth, only a few feet of soil on the top thawing out for a few weeks in summer. While the sandy and clayey strata, when dug into, seems dry, they are in fact very moist, the moisture not being apparent because the ground is so hardly frozen. And through the strata of this vast territory, from Bering Strait to European Russia, the remains of many kinds of quadrupeds are so abundantly buried as to astonish everyone who becomes acquainted with the facts.

Starting with the islands in the Arctic Ocean along the coast north of Siberia, Howorth said that every one of them contains in their strata abundant animal remains. There is a group of islands off the coast, in the Arctic Ocean, called New Siberia. Concerning one of these, the Island of Laikov, a small island about fifty miles square, Howorth said its soil "*is almost composed of fossil bones.*" Concerning another of these islands, called Kotelnoi, which is over a hundred miles long and fifty miles wide, *the same thing is true.* Howorth quoted a visitor to this island named Hedenstrom, who said that so plentifully were elephants buried beneath its surface, that, as he walked along on the island for half a mile, he counted ten elephant tusks sticking out of the ground. This general condition existed throughout the whole island. As well as elephant fossils, skulls and bones of *rhinoceroses, horses, bison, oxen, and sheep* were also observed scattered over and imbedded in the earth of the island. Concerning still another island of this group, Howorth quoted Hedenstrom to this effect: "In one island is a lake with a high bank, which splits open in the summer when the sun melts the ice and discloses heaps of tusks, mammoth bones, bones of rhinoceroses, and buffalo. In other

parts of the island bones and tusks are to be seen projecting from the ground."

Hundreds of miles to the eastward of the islands called New Siberia is another group called Bear Islands. Here the same condition of abundant fossil remains exists. The explorer Wrangell was Howorth's authority for saying, "The soil of Bear Island consists only of sand and ice, *with such quantity of mammoth bones that they seem to form the chief substance of the island.*" With the bones of the mammoth in this island were also many bones seeming to be from the bison.

The sea off the north coast of Siberia is very shallow, and about the islands especially are mud-banks, barely protruding above the surface of the sea. Whenever there is a storm, said Howorth, fresh supplies of bones are left exposed on these mud-banks. This fact indicates that the *strata forming the bottom of the sea* off the coast of Siberia is also full of bones.

Turning from the islands to the mainland of Siberia, Howorth said that the same situation was found to exist there, no matter where one went. *The whole coast line* has elephant remains embedded in the strata of the shore. The arctic coast of Siberia is nearly all the year round covered with ice cliffs caused by the freezing of the ocean spray, but wherever the actual shore is exposed beneath the ice cliffs, bones are seen to be plentifully embedded in the earth. Thus the fossiliferous condition continues as one works his way inland from the ocean into the vast, level interior of Siberia.

Siberia being generally level, it is only as a rule where the rivers have cut their way through the plain, thus, exposing the interior of the earth, that what is hid there has been discovered. But without exception, *wherever these rivers are*, bones of elephants, rhinoceroses, horses, cattle, sheep and other quadrupeds are found to be entombed in enormous quantities.

The largest river of Siberia flowing into the Arctic Ocean nearest to European Russia is called the Obi. This river has cut its way through the foot hills east of the

low Ural Mountains, and in the strata of these foot hills everywhere fossil elephants are found in greatest abundance. The next great river of Siberia emptying into the Arctic to the east of the Obi is the Yenissei. Concerning the buried animals revealed in the strata along the sides of this river, Howorth said, "Pallas tells us that *the mammoth bones which fall out of the cliffs . . . are so numerous that on decomposing they form a substance called 'osteocolli'* [i.e., 'bone-glue']. The next great river eastward toward Alaska emptying into the Arctic is the Lena. It is a vast stream which twists and turns to make a course of over two thousand miles. The natives who live in the region of the Lena River make a living traveling up and down that river in boats, gathering up the ivory tusks that they see *sticking out of the cliffs* on the sides of the river and which they find fallen to the edge of the water. This occupation is followed by those who live by other streams. The traveler Middendorf, said Howorth, traveled the River Yenissei in a small steamer in 1875 and reported that that steamer carried a load of one hundred elephant tusks.

A branch of the Lena is the Vilui, and, at the place where the Vilui and the Lena meet, the bottoms and sides of the rivers are loaded with teeth and tusks of elephants, rhinoceroses and other creatures which have been washed out of their banks and carried down to that point by the streams. Where the Lena empties into the Arctic, there a piling up of bones, which have fallen from the banks and been carried down stream, also occurs.

To the eastward of the Lena are two smaller, but nevertheless large streams, emptying into the Arctic. These are named the Indigrika and the Kolyma. Where these two rivers have cut their banks, said Howorth, there too an abundance of bones have become exposed from their burial places in the strata. Between these rivers there are places which have been discovered having so many elephant remains that, said Howorth, "*the ground might be said to consist entirely of mammoth bones.*"

The great Siberian peninsula which almost touches

Alaska is called the Chukchi Peninsula. It is a high, level plain with enough irregularities, due to small streams and hillocks, to reveal the contents of the strata. *All this vast peninsula*, said Howorth, is rich in fossil bones. So plentiful are the remains of animals that the natives use bones, which contain fatty matter, for fuel. Elephants and rhinoceroses form the bulk of the fossils of this region. Alaska, Howorth said, has long been known to be the burial ground of many large species.\*

Summing up his discussion of the wide extent to which elephants and other large species are buried in Siberia, Howorth quoted Pallas as follows: "There is not in all Russia, from the Don as far as the extremity of the Peninsula of the Chukchis, a river or stream, especially those flowing in the plains, on the banks of which or in the beds of which there have not been found bones of elephants or other animals foreign to the climate."

We would have our readers clearly understand what Howorth also emphasized, namely, that *the modern rivers of Siberia have nothing whatever to do with the astounding burial conditions there.* We say this because attempts have been made by uniformitarian geologists, who cannot believe that a vast cataclysm like the Flood killed and buried all the animals whose remains exist today in the soil of Siberia, to show that the remains were buried in some natural way after they had drowned in the rivers.

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\*The following interesting news item from the NEW YORK WORLD for June 1, 1930, came to the present writer's attention as he was recording Howorth's account of the animals buried in Alaska: "Fairbanks, Alaska, May 31—Well preserved skeletons of lions, elephants, mastadons, horse, bear, bison, moose and various rodents have been uncovered here by the two huge gold-dredging machines cutting into the fossil-filled muck which overlays the gold bearing gravel. For more than a hundred years engineers, prospectors and miners in Alaska have encountered tusks, bones and skulls of extinct Pleistocene animals, exposed in the banks of rivers . . . The gold mining dredges now being pushed deep into the old earth have years of work ahead, and already the scientific results greatly surpass expectation. To date the collection recovered include the largest number of different animals ever found in one field."

The rivers are only important because it is their digging each season into the strata of the vast plain of Siberia which *exposes the animals buried in those strata*. Without the assistance of those rivers, and the eroding power of the waves along the coast, the awful secrets of the Siberian earth would be totally hid from man. Howorth said, "The remains in Siberia . . . are chiefly found where the banks of the rivers present lofty precipices of sand and clay, from which circumstances Pallas very justly observed that, if sections could be obtained, similar bones might be found in *all elevated lands* intervening between the great rivers. Strahlenberg has stated that whenever any of the great rivers overflowed and cut fresh channels during floods, more fossil remains of the same kind are invariably disclosed . . . Wrangell has said that the best mammoth bones, as well as the greatest number, are found at a certain depth below the surface, usually in clay hills, more rarely in black earth. The more solid the clay, the better the bones are preserved. Experience also has shown that more are found in *elevations situated near high hills* than along the low coast or flat tundra."

The number of animals that are buried in Siberia must be *stupendous*. Some conception can be gotten from the fact that since the year 900 A. D. men have made it a business of collecting the ivory tusks of that region and selling them in China, Arabia and Europe. In a case where a record could be secured, Howorth said that in one period of twenty years tusks from at least 20,000 elephants were taken from one Siberian "mine" to the markets of Europe during the nineteenth century. Considering the vast area over which the remains of elephants are scattered, and the numbers in which they are known to exist in many places, it does not seem improbable that *five millions or more* of these great animals perished in Siberia in the watery cataclysm which caused their end. How any region could furnish nourishment for so vast a multitude of pachyderms, to say nothing of the other creatures whose bones accompany those of the elephants of Siberia, can best be explained by the sup-

position that the prediluvian world in which they feasted was *wondrously rich in vegetation*.

In the southern part of Siberia, far inland from the sea, Howorth says, only the bones of the destroyed creatures are found. But in the northern part, where the ground is frozen all the year around, not only the bones are discovered, but the *flesh also*, and often in such a state of preservation that *the red meat remains*, and is suitable for food for dogs and wolves. Whole carcasses have been found with eyes which still retain their glassy stare. When the stomachs of the animals have been examined, the kinds of vegetation which they had eaten before they died can be made out.

It might seem at first incredible that these creatures could have been destroyed so long ago as the Noachian Deluge, but a moment's thought will show why it is not. The bodies of men and animals buried within the Arctic Circle, where they remain frozen always, never decay. Howorth says that the bodies of men buried in the far north are as fresh thirty years after burial as they are the day of their death. Bacteria cannot work under frozen conditions. If the world stands that long, and conditions remain the same, the carcasses of the animals in Siberia will perhaps stay as they are for a million years.

Chiefly elephants and rhinoceroses seem to be buried in Siberia, the reason for this being that their remains are large and more easily noticed. Bison, cattle, horses, sheep are also numerous. Doubtless a comparative anatomist could identify bones of many other smaller species. In one instance, Howorth records, a *whale mummy* was found entombed with elephants. Speaking of the mixture of land and water creatures in the strata of Siberia Howorth says, "Similar evidence is forthcoming from the deposits where the mammoth's remains occur further inland, and where we find marine shells which clearly evidence the former presence of the ocean. This was known to Pallas, and has been confirmed amply by Middendorf and others. Thus the former describes the

occurrence near Ust Tatarskoi on the Irtish of numerous shells, mostly fossilized, but others preserving their horny pellicles, and in some cases containing traces of the mollusk itself. In these *same layers* were found the bones of elephants and many other animals . . . Pallas himself found several remains of both elephants and buffaloes *in situ*, and also the heads of *great fishes* and pieces of cellular bones not recognizable."

Howorth's principal argument for the Flood was based on the state of affairs in Siberia. But he went elsewhere in his discussion and showed that similar conditions, demanding the hypothesis of a watery catastrophe, existed *generally throughout the world*. The same sort of destruction that overtook the animals buried in Siberia, he said, overtook those buried in Europe. Speaking of the elephant in England he said, "Its remains are very uncommon in Northern Britain and Wales. They become more abundant as we approach the southern parts of the country and get near the North Sea; and so abundant are they under the water between the coasts of Norfolk and Dunkirk that the place has been called '*the burial ground*' by the sailors. This abundance extends into Belgium, and the Royal Museum at Brussels is especially rich in them."

In Tuscany, Italy, immense numbers of elephants are entombed in a stratum *beneath another of entirely different fossil content*, and these strata, said Howorth, show no signs whatever of ever having been disturbed. Steno, in the seventeenth century, was aware of the presence of elephant bones in the earth in Tuscany, but he thought they were the remains of creatures brought over by Hannibal for the Punic Wars, which died and were buried by him. The large number of elephants now known to be entombed in the strata of Tuscany makes that explanation impossible. There is a chalk\* cliff in Tuscany, said Howorth, overhanging the sea, in which the remains of

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\*Chalk is composed largely of the remains of tiny organisms which accumulate on the bottom of the sea.

*elephants, hippopotami, rhinoceroses, hyena and other species are exposed.*

In southern Europe and in northern Africa different sorts of animal fossils are met with. Hippopotami bones become abundant. They are found in Greece, Algeria and in the islands of the Mediterranean.

Sicily particularly abounds in hippopotami remains. For the refining of sugar lamp-black is used, and this can be made from bones. For the securing of lamp-black the hippopotami bones buried in Sicily have been mined for centuries. Said Howorth, "Professor Ferra states that within the first six months 400 quintals [40,000 pounds] were procured from San Ciro. The great majority belonged to two species of *hippopotamus*. In one heap, out of several ship-loads sent to Marseilles, De Christol, an able paleontologist, found that in a weight of thirty quintals all the bones belonged to *hippopotami*, and with the exception of a few *Bos* [cattle] and the *Cervis* [deer] in the thirty quintals he examined Christol found 300 stragali [ankle-bones], so that there must have been in the whole deposit 4,000 stragali, representing 2,000 individual *hippopotami*."

From Europe Howorth moved to the Americas, India, New Zealand and Austria, and from many sources of information described the burial conditions of animals found in those lands. To enumerate his descriptions of these conditions would be tedious. In fact his book is tedious for that reason—he presents such a mass of information all of the same nature.

Regarding the cause of the fossiliferous conditions of Siberia, Howorth said that the ignorant natives in that land believed that the beasts whose fossils are found there lived underground and worked their way about like moles, by means of the great tusks they possessed. The more educated natives, however, believed that the animals were the remains of those buried by the Flood. This was the explanation also of the great explorer Pallas.

The catastrophe which accomplished the burial con-

ditions he described was believed by Howorth to be the Noachian Deluge. He thus argued for that catastrophe against the theory of uniformity: "When nature," he said, "puts a term to an animal's life in her normal way, it is exceedingly seldom she does so when the animal is young. Animals do not die naturally in crowds when young, and yet we find remains of quite young animals abounding in all classes from mammoths to mice. How are we to account for this fact, save by summoning an abnormal cause? How again can we account for the fact that the mummied animals found in Siberia seem to have been *in robust health, stout and strong?* Is this, again, consistent with a natural death? Again if the death was natural and other carnivorous animals abounded, would the corpses be left to the useless duties of decay, as they must have been since the bones are ungnawed, and (when the flesh is preserved) the flesh uneaten? One cause, no doubt, of the scarcity of remains of animals which are dying at present, where animal life abounds, is the diligence of the scavengers. What were they doing . . . to pass by these myriads of corpses, and in so many cases not to leave a toothmark anywhere, and in fact to leave their own bones with the rest? Surely this points clearly and unmistakably to the fact that the animals, or the greater part of them, died together. If the remains were the silent chronicles of centuries of time and generations of life (as uniformitarians suppose) we should assuredly have found some or a large portion of the bones would have been gnawed, but this is not the case, and it points strongly to their death having *been more or less simultaneous.*

"The most obvious cause we can appeal to as occasionally producing mortality on a wide scale among animals is a murrain or pestilence, but what murrain or pestilence is so completely unbiased in its action as to sweep away all forms of terrestrial life . . . the fowls of the air, and the beasts of the field, elephants, and mice, rhinoceroses and frogs, bison and snakes, tigers and land snails, and this not in one corner only, but, as far as we

know, over the *whole length of two continents, irrespective of latitude or longitude?* The problem has only to be stated thus to make it obvious that a murrain or a pestilence, again, would not collect herds of incongruous animals in the same place, and kill them all together, and bury them . . .

"The fact of the bones occurring in great catches or deposits, in which various species are mixed pell-mell, is very important. If animals die occasionally from natural causes . . . different species do not come together to do so, nor does the lion come to take his last sleep with the lamb. The fact of finding masses of animal remains of *mixed species*, all showing the same state of preservation, not only points to a more or less contemporary death, but is quite fatal to the theory that they ended their days peacefully and by purely natural causes . . .

"This exhausts the various natural processes in which animals come by their end in large numbers. Suppose we could trace the actual mortality to one or the other, we should only have solved half of the problem. The more perplexing half, namely, the burial of the remains in undisturbed beds of tough clay and gravel, as we find them buried and protected everywhere, would clearly be entirely beyond the power of any of these causes to compass. It was because, when the animals perished, they were *at once* buried and covered in, that the weather could not reach them, and that they remain intact.

"If they had been exposed to the air and to the severe transitions between mid-winter and mid-summer which characterize arctic latitudes, they would have decayed rapidly; but their state of preservation proves that they were covered over and protected ever since, and this along many degrees of longitude, and by continuous, undisturbed beds of clay and gravel. Every effort to find any still operating cause by which the bones could be so protected and covered in by clay, or gravel, or mud, far away from the great rivers, and in more or less raised mounds and hillocks on the tundra, has utterly failed . . . However ingeniously and with whatever subtlety we may

deal with our evidence, the facts constrain us therefore to one inevitable conclusion, namely, that the mammoth and its companions perished by some wide-spread catastrophe which operated over a wide area and not through the slow process of the ordinary struggle for existence, and that the greater portion of the remains we find in Siberia and Europe are not the result of a gradual accumulation under normal causes for untold ages, but the result of one of Nature's hecatombs on a grand and wide-spread scale, when a vast fauna perished simultaneously."

Howorth then proceeded to discuss what the nature of the catastrophe which killed and buried the mammoth and its companions was. Said he, "We want a cause that should kill the animals, and yet not break to pieces their bodies, or even mutilate them; a cause which would in some cases disintegrate the skeletons without weathering the bones. We want a cause that would not merely do this as a widespread plague or murrain might, but one which would bury the bodies as well as kill the animals, which would take up gravel and clay and lay them down again, and which could sweep together animals of different sizes and species, and mix them with trees and other debris of vegetation. What cause competent to do this is known to us? Water would drown the animals and yet would not mutilate their bodies. It would kill them all with complete impartiality, irrespective of their strength, age or size. It would take up clay and earth, and cover the bodies with it . . . Not only could it do this, but it is *the only cause known to me capable of doing the work on a scale commensurate with the effects we see in Siberia.*"

There are two factors which undoubtedly account for the abundance of well preserved fossil remains in Siberia as against the relative lack of these remains found in the rest of the world. These two factors are the perpetually frozen condition of Siberia's strata and its almost total lack of rainfall or snowfall. Doubtless other regions on the face of the globe would today display fossiliferous conditions comparable to Siberia in respect to the abun-

dance of land animal fossils they possess if those regions had had Siberian conditions since the Flood. The reason Siberia stands so far ahead in this respect is that its strata have been *solidly frozen* since the time of the Deluge, and there have been no forces of erosion capable of wearing away the soft, sandy, upper, frozen strata in which the elephants, rhinoceroses and other creatures are entombed. In more southern lands, where the earth is warm, and rains fall, the uppermost strata (in which land animals were buried) have on the whole long since wasted away under the erosive action of the elements. In Siberia there are, in respect to rainfall, almost desert conditions. The uppermost strata, therefore, have remained. Siberia doubtless shows us the world's surface as it was immediately after the Flood, except of course for the arctic vegetation which covers it.

The twentieth century has produced thus far one very outstanding advocate of the Flood, George McCready Price, author of "FUNDAMENTALS OF GEOLOGY," 1913; "THE NEW GEOLOGY," 1923; "THE EVOLUTIONARY GEOLOGY AND THE NEW CATASTROPHISM," 1926, and "THE GEOLOGICAL AGES HOAX," 1931. These volumes thoroughly expose the vain suppositions and arguments of the modern theory.

Leaving the absurdities of modern geology, as pointed out by Price and others, to a later chapter, we present here a few of the most important positive ideas as to the probable nature and consequences of the great catastrophe of Noah which Price's works present.

In Price's opinion the earth attests that *regular as well as irregular tidal actions* accompanied the Flood. There are found numerous instances in the rocks of all sorts of fairly regular sedimentary depositions, e.g., first shale and then limestone, then shale and then limestone, then shale and then limestone, one above the other; or shale and then coal and then shale and then coal in regular order. Regarding these apparently *rhythmic alterations* Price has said, "Throughout the whole geological series, this is one of the most common of phenomena;

and it falls very appropriately within the scope of our hypothetical explanation, when we remember that every tidal action means four movements of the waters each day, two flows and two ebbs. And it should be remembered that any abnormal action of the tides, while it might arise suddenly, could not subside in a similar sudden manner, but would necessarily be prolonged through weeks and perhaps months; with all the inevitable consequences of the ocean's repeatedly transgressing over the lands, and just as repeatedly regressing from them, and all the while performing an untold amount of geological work."

As a striking support of the Deluge theory, Price cited the mixture of certain limestones with coal. Limestone is formed chiefly from accumulations of organic remains of sea animals, shells, corals and so on. The crinoids are sea animals, living at the present time only in the clearest water at depths of from 600 feet to a mile. They do not live in shallow waters near the shore. Yet strata containing fossil crinoids (see Fig. 12, page 47) are extremely numerous over the whole earth. In the "Lower Barren Coal Measures" of Pennsylvania a four foot stratum, formed of the remains of crinoids, is *mixed with layers of coal and shale*. "How did it get there?" asks Price, and answers, "It seems self-evident that nothing but a wholly abnormal occurrence, a disturbance of the oceans to their very bottom, is sufficient to explain these conditions."

A condition readily accounted for by the Deluge, said Price, is the *complete disappearance of many forms of life from parts of the world where they once probably dwelt*. The fossils of horses identical with our present domestic horse exist in uncounted thousands in the deposits of the Americas from Alaska to Patagonia. Yet no horses were in America when the white man came, and had to be imported. Fossils of elephants, rhinoceroses, and camels identical with old world forms are in the deposits of America, though they do not dwell here now. Remains of the monkey-like lemurs, which are now native of Madagascar only, are abundant in North

American earth. Instances of the same kind can be multiplied over the face of the whole globe. Speaking of the disappearance of these and other creatures from regions where they once may have been numerous, Price, said, "How did such an assemblage of animals all become extinct together? The diluvialist has an easy explanation, in saying that none of these happened to get back to this part of the world after the great disaster; but how can we account for these facts with even moderate probability on the basis of uniformity and evolutionary geology?"

The beginning of the twentieth century produced a Flood geologist we name for a special reason, George F. Wright, author of "ICE AGE IN NORTH AMERICA," 1889 and "SCIENTIFIC CONFIRMATIONS OF OLD TESTAMENT HISTORY," 1906. He advanced the unique theory that the Noachian Deluge followed and was caused by the Ice Age. His theory was that the glaciers of the Ice Age melted so suddenly that the melting caused the drowning of the world. The idea met with little favor. It was a fruitless effort to combine the theory of the Flood with the theories of modern geology.

But Wright's faith in an ice age raises a question which is worthy of consideration: Was there an ice age or anything that might receive that sort of a name? While the present writer is in no wise concerned to establish the fact, he is of the opinion that *following the Deluge* which produced the earth's strata, there was a period when snows piled up in enormous thicknesses in certain parts of the world, especially in the northern hemisphere and in the higher mountain areas. The relics of the immense post-diluvian snows are still to be seen in some mountainous places and in the continental ice fields of the two polar regions. Certain superficial deposits above the stratified rocks, and composed in a large measure of materials—stones and boulders—torn from the stratified rocks after their consolidation, which the writer has examined, seem to be accounted for by assuming the shoving and melting actions of immense fields of snow or ice.

It is probable that in the Deluge the arrangement of

the land and water areas of the globe was radically altered. If so, the old ocean currents were destroyed and new ones had to be formed. These and other physical changes inevitably produced new atmospheric conditions everywhere. Cold air currents and warm swept about in peculiar ways. Warm, moisture laden currents meet cold currents, and where they met cyclonic conditions were set up. Heavy rains and snows fell in some parts of the world, and desert conditions resulted in others. Conditions also might have changed from century to century. During this time, who knows but what the earth was overhung in large territories with heavy clouds, which, like a dense roof or ceiling, prevented the sun's rays from coming through? If snow fell in northern climes and in high altitudes, as it would under such clouds, the sun's rays, being unable to break through to warm the earth, would not melt the snow, and it would accumulate in great thicknesses. If those clouds hung over parts of the world almost continually, year in and year out, departing only occasionally and soon returning, bringing snow so deep and heavy in the winter months that the cold, cloudy summers could not melt them off, the inevitable result would be the formation of glaciers. Under the possible abnormal atmospheric conditions following the Flood, so heavy may have been the snows in some regions that many hundreds of feet could not measure the thickness of a single winter's fall.

Whether such an ice age did follow the Flood in the places where ice seems to have covered the earth in great sheets, i.e., in northern North America and northern Europe (missing Alaska and northern Siberia, the latter the coldest spot on earth) we cannot say. We believe it did. But while those of the modern school of geologists have no good explanation to give for such a disruption of the world's supposedly uniform course as to produce abnormal conditions of cold and moisture in certain peculiar spots, Deluge geologists may have in the Flood *the very explanation necessary*. A famous glaciologist, Croll, has said, "By far the most important of these agencies, and the one which mainly brought on the Glacial Epoch, is

the deflection of the ocean currents," and another has said, "Not cold, but heavy snow fall, makes an Ice Age." What better explanation why the ocean currents should be deflected and abnormally heavy snows should fall can there be than the Deluge?

We may consider, therefore, that if there was a "glacial period" on this earth, subsequent to the formation of the strata, the Flood may be regarded as the cause of it. As the Deluge is the key that best solves the puzzle of the formation of the stratified rocks, so full of the remains of living things from land and sea, so it may be also the key to unlock the puzzle of the probably glacial phenomena.

To the foregoing list of men who, since 1850 have contended for the Flood theory of geology and written to uphold it, we add the following: Debryne (1856) in France; Keil (1860), Phillipi (1867), Dieterich (1869), Zugler (1876) in Germany; Macarius (1869) in Lithuania.

## CHAPTER IX

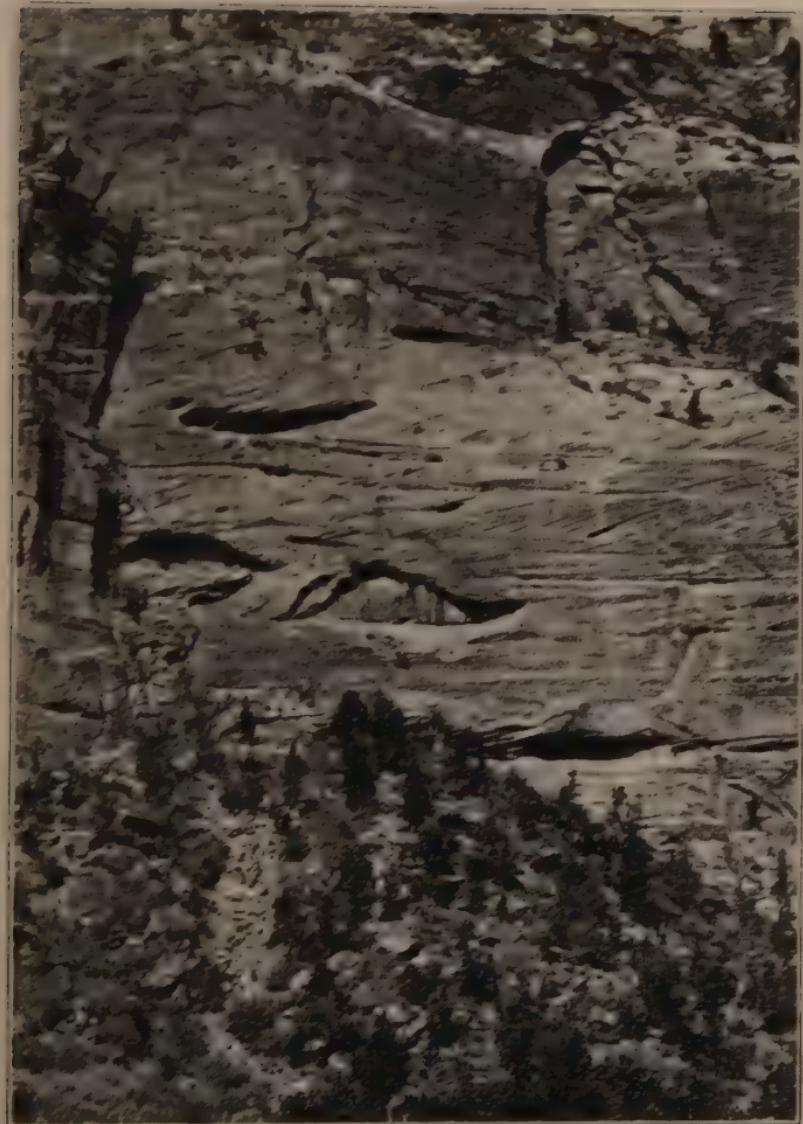
### MODERN GEOLOGY

AS long as the Bible as the Word of God, an inspired record mercifully given to men as a revelation of the Divine work and will, held a prominent place in the thinking of scholars, and God's supernatural interventions in the world's affairs were acknowledged to have occurred at various times in the past, the Deluge theory of geology had the ascendancy among men. But when, through the influence of the rising school of destructive Biblical critics, faith in God's Word and in God's interventions became less and less common among educators, and any reference to the supernatural or Biblical in matters of history or science was scoffed at by them as ignorance or superstition, the Flood theory was cast aside. What is called "modern" geology has eclipsed Flood geology because of a dislike for those supernatural elements which are the backbone of Christianity. The Flood theory of geology has not been abandoned because it does not satisfy actual geological conditions. There is nothing known about the earth's geological state today which makes the Deluge theory any less satisfactory an explanation of the fossiliferous strata than in the days when the leading scholars of the world accepted it. Rather the contrary—there are facts known now about the geological conditions of the earth, remarkably supporting the Flood theory, which Williams, Catcott, Harris and the others never dreamed of. It is a *disregard for God and the sacred record of his acts*, and nothing else, which has caused the discard of the Flood theory to take place. In view of this fact it is well for believers in the Bible to understand

fully the theory which has now superseded the Deluge theory in popular education.

Modern geology, one aspect of it at least, is distinctly *not modern*. Woodward, as early as the seventeenth century, recognized this fact. He said, "Some are of the opinion that the sea frequently fitted and changed its place; that several parts of the globe which are now dry land and habitable, lay heretofore at the bottom of the sea and were covered by it . . . but the sea, in tract of time, retreating thence, betook itself into new quarters, gaining as much ground on the opposite coasts as it lost upon those . . . I must needs freely own that when I first directed my thoughts this way, 'twas a matter of much admiration to me to find that a belief of so many changes and so great alterations in the earth had gained so large a footing and made its ground so many ages in the world, there being not the least sign or footsteps of any such thing upon the face of the whole earth; no tolerable foundation for such a belief in nature or history. But I soon saw very well that the moderns generally entertained it merely upon credit and traditions of the ancients." *Pythagoras, Aristotle, Strabo, Pausanias were the ancients who first taught the theories of the earth's geological history which have come down to us as "modern" contributions to geological knowledge.*

According to the modern theory, the strata were formed by erosion from ancient continents, the eroded materials being carried down to the seas by rivers, and spread out in horizontal layers on the beds of the oceans. These layers in time rose with the elevation of the ocean bottoms and became lands, while the waters they displaced in rising overflowed other continents, which sank. The different parts of the world have thus been see-sawing up and down, slowly and imperceptibly, throughout hundreds of millions and even billions of years, and so far as the theory is concerned, there is no prospect of any end. *Evenness or uniformity* has characterized nature in all its past actions, the same evenness and uniformity that characterizes it now. No vast catastrophies have ever oc-



*Photo from Union Pacific Railroad.*

Fig. 33. Cross-bedded strata seen in a cliff of the sandstone mountains of Zion National Park, Utah. Such cross-bedded formations in rocks are common throughout the world. One must decide whether such strata are composed of sands which were accumulated by winds during long ages in ancient deserts, as uniformitarian geologists say, or if they are composed of sands deposited by great sand-laden currents in a deluge, as upholders of the Flood theory of geology say. We believe the evidence greatly favors the latter hypothesis. Arrow points to cliff-dwellings, which show the relative size of the current-bedded strata. Picture taken with a telephoto lens.

curred. The principle of uniformity does not allow for them.

And yet, the fossiliferous strata bear unmistakable evidences of great catastrophes. The way fishes by the millions are entombed in the rocks of England, Scotland, Wales, Germany, Switzerland, the American Rockies; the way elephants and rhinoceroses are buried by the millions in Alaska, Siberia, England, Italy, Greece; the way hippopotami are buried by the thousands in Sicily; the way reptiles are buried by the millions in western Canada, the United States, South America, Africa, Australia, to mention only a portion of such instances, absolutely require the explanation of great catastrophes for their elucidation. Many modern geologists, familiar with the facts, admit there must have been something abnormal in the way the death and burial of these animals came about. They hold to catastrophism where this principle cannot but be acknowledged. They admit that catastrophes occurred, but insist, without proof, that they were unrelated, and that long intervals intervened between them. We ask, "Why multiply catastrophies when one alone will do?"

While, as we said, the one aspect of modern geological theory (uniformity) is not new, the other important aspect is. This is the assumed principle of *organic evolution*, which was "put across" in the last century by Darwin. *The theory of evolution has become united with the theory of uniformism to form the philosophical structure upon which modern geology rests.*

In maintaining the principle of uniformism alone modern geologists would have trouble enough with the facts and evidences of nature, but, married to the principle of evolutionism, uniformism has gotten modern geology into a veritable *snag of absurdities*.

According to the principle of evolution, during the millions of years the continents were see-sawing up and down, a gradual development of life was proceeding upon the face of the globe. The first evolved forms were very simple and jelly-like. These gave rise to other forms

which were more complex; these, in turn, gave rise to other forms still more complex; and these in their turn gave rise to other forms still more complex, and so on until all the existing types of plants and animals were produced. The course of this supposed organic development has been charted by evolutionists. And this theory of organic evolution is combined with the theory of uniformism in a unique way. It is assumed that each new type of life as it evolved left traces in the strata being deposited on the ocean bottoms, and when, therefore, today, a stratum of rock is found in which is embedded a particular fossil, that stratum is labeled early or late (old or young) as the fossil is supposed to have evolved early or late in the evolutionary course of development. Certain simple types of shell-fish (e. g. Crinoids, Trilobites) are supposed to have evolved early, "Cambrian" is the name given to strata containing the remains of these supposedly first evolved creatures, and such strata are said to be hundreds of millions of years old. Elephants, deer, tigers, monkeys, man are supposed to have evolved late. Therefore any sedimentary deposit which contains the fossils of these creatures is called late. "Pleistocene" is the name given to the strata containing the remains of these supposedly last evolved animals, and such strata are said to be only a million or so years old. (See "Geologic Column" in Fig. 34, pages 144, 145, which should be read from the bottom to the top.)

*Fossils, then, regarded under the arbitrary assumption that all life has evolved from simple to complex forms, enables one, it is said, to tell the age of any rock or stratum in which fossils or organic remains occur.* All one needs, in order to tell the supposed age of a stratum, is to be told what fossils it contains. One does not need to go out and see the stratum in its actual position in the earth. One merely needs to be told in his study what fossils that stratum has, and, if he knows how organic life supposedly has evolved, he can tell in his study the exact age of that stratum.

The mineral composition of a stratum has no value in

determining the age of that stratum in modern geology. *Whether a stratum is soft or hard, sandstone or shale, black or white, loose or solid makes no difference.* Some coal strata in the world are said to be very "young." Others are said to be very "old." What determines the matter in the minds of evolutionary geologists is the kinds of plants the coal strata contain, whether they are simple or complex in structure. Age is determined only by organic remains.

As an illustration of the fact that mineral composition has nothing to do with determining the age of a stratum, we may cite the clay strata shown in Figure 30, page 104. Those clay strata are soft. Above the soft clay strata lies a red, sandy stratum so hard it is like iron in some spots and is entirely different from clay. The soft strata, on the basis of the fossils they contain, are said to be "Cretaceous." The hard stratum is called "Pleistocene." (See again the "Geologic Column," pages 144, 145.) Hardness or mineral composition of strata, has, therefore, no value for modern geology in determining the age of strata. All depends on the contained *fossils*, viewed in the light of the evolutionary supposition.

Nor does actual *position in the earth* have any certain value in determining the age of a stratum, i. e., whether it is above or below any other stratum. Certainly one would expect that a horizontal layer of rock, reposing on top of a horizontal layer below it, is younger than the one below. One would naturally assume (as Steno early did) that the uppermost layer was deposited *after* the lower, and that the uppermost is therefore the younger of the two. But this is not the case necessarily in the eyes of modern geologists. *With them the lower may be the younger in spite of its position.*

The order or relation of two different strata or groups of strata is not always what evolutionary geologists like. A stratum having very simple fossils (the kind supposed to have evolved early) is often found *on top* of another stratum having very complex fossils (the kind supposed to have evolved late). When strata are found thus, in

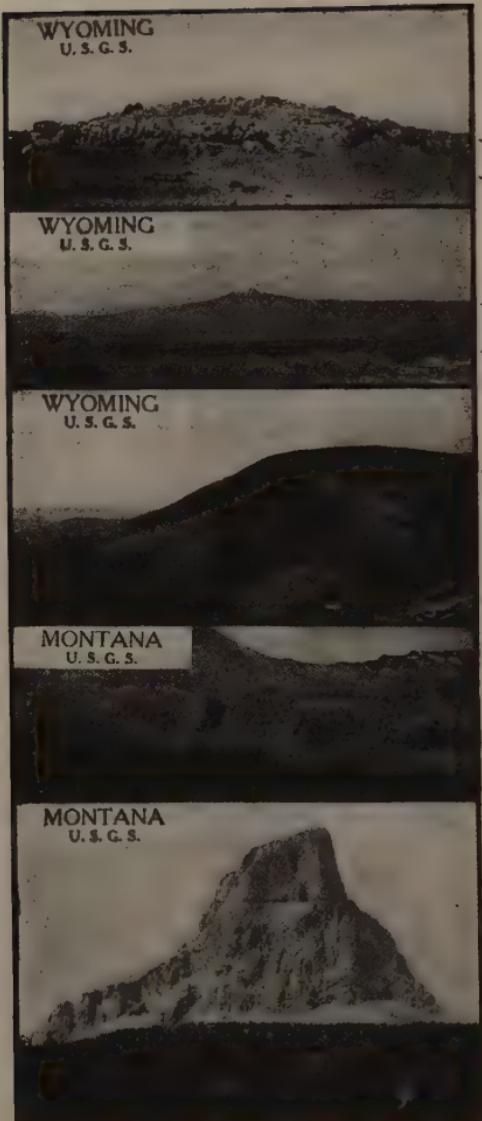
what is to evolutionary geologists the wrong order, it is said by them that they have clear proof that the strata have *reversed their relative positions* since they were originally deposited. What is now on the bottom was once on the top, they say, and what is now on the top was once on the bottom. That this is no false statement of modern geological theory on the part of the present writer is shown by the simple, naive, yet representative remark of the well known modern geologist, Geikie: "We may even demonstrate that strata have turned completely upside down if we can show that fossils in what are the uppermost layers ought properly to lie beneath those in the beds below them."\* 'Ought properly,' that is, if the strata are to show an evolution of life from the most simple forms to the most complex.

That such interchanges in the position of strata ever did actually take place there is *not the least shadow of proof* in either nature or history. Numerously, and over immense areas, these "upside-down" conditions for modern geology exist. (See Fig. 34, pages 144, 145.) In one section of the earth, comprising part of Montana, Alberta and British Columbia, an "upside-down" condition ("Algonkian" and "Cambrian" on top of "Cretaceous") covers 7,000 square miles.\*\* Fantastic explanations are offered to explain how such reversed orders of strata could come about, but the explanations have failed to carry weight even with many evolutionary geologists themselves. Speaking of some of these upside-down situations, the president of the geology section of the British Association for the Advancement of Science, W. W. Watts, said that the explanations given to account for them are "so hopelessly inadequate that we sometimes feel compelled to doubt whether the facts are really as stated," adding, however, "But the phenomena have now

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\*Text-book 1903, page 837.

\*\*Special attention is called to the size of this particular area, of which the writer has made a special study, because it is the practice of modern geologists to try to minimize the importance of the immense tracts in which the earth's strata are wrong for them.



### GEOLOGIC COLUMN

Present

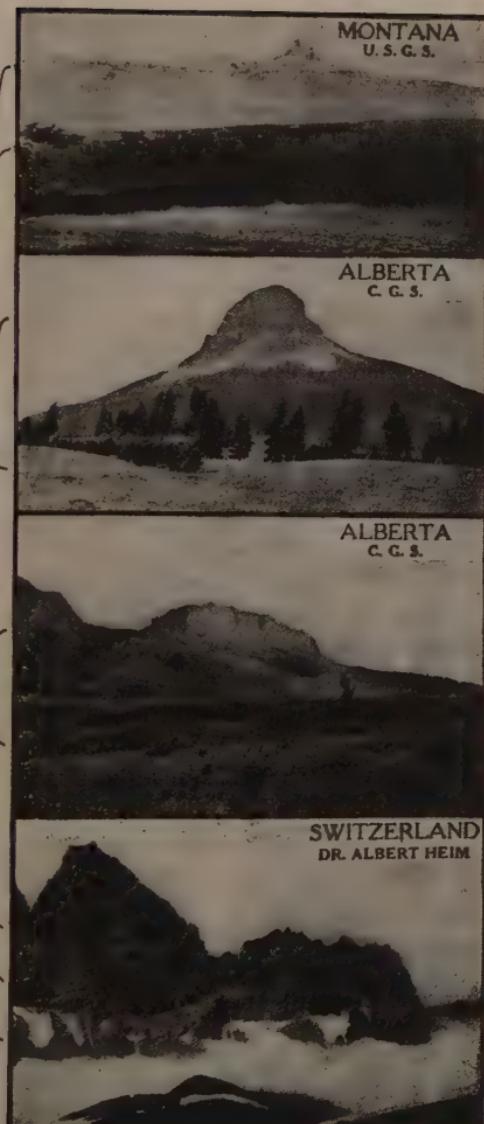
Pleistocene	10,000,000 yr old
Tertiary	100,000,000 yr old
Cretaceous	200,000,000 yr. old
Jurassic	300,000,000 yr. old
Triassic	400,000,000 yr. old
Permian	500,000,000 yr. old
Carboniferous	600,000,000 yr old
Devonian	700,000,000 yr old
Silurian	800,000,000 yr old
Ordovician	900,000,000 yr old
Cambrian	1,000,000,000 yr. old
Algonkian	

Archaeans

Fig. 34. A few of the immense tracts of land where strata are upside down for modern geology, but perfectly natural for Deluge geology. Because fossils of plants or animals, supposed, on the basis of their simplicity, to have evolved early are in strata on top of others containing fossils of plants or animals supposed to have

## GEOLOGIC COLUMN

Present
Pleistocene 10,000,000 yr. old
Tertiary 100,000,000 yr. old
Cretaceous 200,000,000 yr. old
Jurassic 300,000,000 yr. old
Triassic 400,000,000 yr. old
Permian 500,000,000 yr. old
Carboniferous 600,000,000 yr. old
Devonian 700,000,000 yr. old
Silurian 800,000,000 yr. old
Ordovician 900,000,000 yr. old
Cambrian 1,000,000,000 yr. old
Algonkian
Archaean



evolved much later, it is said by modern geologists that the original positions of the strata have been reversed. Napoleon well said, "It is strange what men can believe, as long as it isn't in the Bible." Illustration from AFTER ITS KIND.

been so carefully observed and in so many districts, that any real doubt as to the facts is out of the question."

Attention can not be too emphatically called to this ridiculous feature of modern geologists' belief, viz., *for no other reason than that the strata are in the wrong order, on the basis of a supposed organic evolution, the strata are said to have reversed themselves.*

Rather than believe that strata have turned upside-down or changed their position in any way, how much more simple it is to assume that they were all produced by the Flood, which deposited them upon one another haphazardly, *without regard to whether simple fossil forms were being buried above complex fossil forms or not.* As a matter of fact, this is just the picture that the fossiliferous strata present. Any two sorts of fossil-containing layers may be found in contact, above or below the other, regardless of what the fossils in them may be like—just as the Flood would naturally deposit them. Price has given a long list of specific examples of this\* to establish a law which he has formulated, called the Law of Conformable Stratigraphical Sequence: "*Any kind of fossiliferous beds whatever, 'young' or 'old,' may be found occurring conformably on any other fossiliferous beds, 'older' or 'younger.'*"

It is, of course, to be granted that, in general, the remains of the simpler forms of organic life are found buried today in the lower strata of the earth's stratified surface, and that, in general, the more complex forms of organic life are found in the upper strata. The lower strata of the earth, on the whole, contain the remains of shell-creatures and other simply constructed marine forms, while the upper strata, on the whole, contain the remains of four-footed animals and other complexly constructed land forms. This situation is, seemingly, in accordance with the modern evolutionary theory of geology. But is it not also *in exact accordance with the Flood theory?* If the Flood buried the fossils, where would simple marine

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\*See especially his "EVOLUTIONARY GEOLOGY AND THE NEW CATASTROPHISM, 1926.

forms (shells, corals and so on) naturally be buried? Being heavy, they would naturally be buried in the lowest strata. Where would fish be buried? Naturally, in strata higher than shells. Where would land animals be buried? Naturally, in the very topmost strata. Hence, while the situation as it exists is in accordance with the evolutionary theory, it is also exactly in accordance with the Flood. The Flood theory, however, has this great point in its favor: Where simple organisms are found buried in strata on top of complex organisms, its advocates do not have to postulate colossal, unevidenced reversals of the strata to account for those conditions. *They can leave matters just as they are and explain them simply.*

Woodward, referring to the "modern" theory that the lands were sinking and rising and the oceans were fitting into new places as the unending ages rolled around, said that there was "not the least sign or foot steps of any such thing upon the face of the whole earth; no tolerable foundation for such a belief, either in nature or in history." We believe he is correct. By any "tolerable foundation" he meant anything more than mere hearsay or unverified or inadequate statistics. That Norway was sinking slowly beneath the sea was a common statement by Lyell and those of his school in the first half of the nineteenth century, and, by getting people to believe it, they advanced their theory. But as far as any one knows today to the contrary, Norway may have risen since instead. Along all the shores of the ocean, throughout the world, local cave-ins or sinkings may occasionally take place because of the weakness of the underlying strata, as they do also sometimes locally far inland. But to base statements that whole continents or large parts of continents are rising or falling in accordance with the modern theory on such trivial occurrences as these *is to say what no one actually knows to be the case.*

The modern theory of the formation of coal is that coal was formed by a forest growing in a spot for thousands of years, dying and accumulating its remains, until the forest sank slowly below the sea and became covered

with thick layers of sediment, after which the spot rose as slowly again, raised another forest, then sank slowly again, and so on as many times as there are strata of coal one above another. As there are in some coal formations more than fifty distinct coal seams one above another (see Fig. 23, page 73, where there are twenty-five), this would mean that fifty different forests grew on the same spot and were each at different times buried. The various sorts of coal metals—shales, sandstones, limestones, conglomerates—which intervene between the coal seams themselves would indicate that, after each new forest had sunk below the level of the sea, sediments from different continents or elevated surfaces poured in and settled upon the successive forests. But how each forest could be grown time and time again during millions of years on a level as closely parallel to the one below and above it as the coal strata almost invariably are, and *not get more out of line with the others*, is a conundrum.

Another serious difficulty with the modern coal-formation theory presents itself. We quote Price. "That the 'pulsating crust' could rise and fall *ad libitum* was regarded as being eminently reasonable during the first half of the nineteenth century, for then everyone thought our earth to be fluid inside. However, since the demonstration of the earth's remarkable rigidity, this traditional explanation of the rise and fall of the crust has taken a much more doubtful cast." *The earth is as rigid and solid within as steel*, according to the latest researches, and hence can not go up and down at present in the manner the modern theory calls for. Since this is so, it is hard to believe that it has continually see-sawed up and down to change lands into oceans and oceans into lands repeatedly, as we are told.

Flood geologists have invariably and emphatically denied that the coal measures, or any other strata, have ever produced trees *in situ*, that is to say, trees standing deep in the earth in the exact spots where they grew. Literally millions of tree trunks are believed, on the basis of known facts, to be buried beneath the surface of the earth in the strata of the rocks. The vast majority of those

unearthed are lying prone, level with the face of the earth. In some comparatively few cases they are held in an upright position in the strata, or at angles between horizontal and vertical. But these are only such positions as a universal flood could be expected to produce. It would have been a strange Deluge indeed that could tear up billions of trees and vegetables of every size and description and bury them in the earth, and yet deposit none of them in an upright position. Trees carried by floods with their roots attached almost invariably float with the root end much deeper in the water than the leafy end. Lyell, in his "MANUAL," said, "It is well known that in the Mississippi . . . where thousands of trees float annually down the stream, some sink with their roots downward and become fixed in the mud." Since this is true in a flooded river, it can be expected that it would be true also in a universal Deluge. Thus those cases of trees upright in the strata made much of by modern geologists are easily accounted for on the Flood basis. Instances have been reported of trees being embedded in the strata of the rocks upside down, *the bulky end at the top, and the thin, small end at the bottom.* Only a flood can account for this.

In addition to the glaring faults in the modern theory already spoken of, others have been pointed out. In the words of a last century Flood geologist, "The absence of the erosive agency of water, as manifested in cutting out valleys and gorges in the under strata of the earth, is fatal to the theory that each formation has successively emerged from the sea and become the surface of the habitable world." The criticism, in short, is this: When level strata stand out in the open air above the surface of water, as the strata which form the present continents do, they invariably erode. The rain falls and gathers in streams, which cut away valleys and gullies of various sizes and shapes. According to the modern theory, immense ages have been consumed in the formation, elevation and lowering of each principal formation of strata. During such immense ages, the elevated and exposed strata of each formation should then have become cut

up into the same sort of surface irregularities as the present land surfaces possess. Hills and valleys and every other sort of unevenness we see about us in the world should have come into those ancient formations of strata, which, according to the theory, at various times during the untold ages since the world began, have all been land surfaces. Yet these unevennesses in the supposedly so-ancient strata are absent from the lines of contact between them and those spread over them. There is *no sign*, such as one would expect to find, and which would be so easy to detect, that immense ages had intervened between the deposition of any two contacting strata. "What we want to see," said the geologist just quoted, "is a plain instance of valleys excavated, and mountains formed in the ancient strata of the earth as we find them existing in the present day in every country of the globe. Until then we take leave to reject the theory that various stratified formations of the earth were deposited at vast intervals of time from each other and, after having each in succession constituted for an indefinite period the surface of the world, were again submerged beneath the sea to receive another deposit. To this notion the parallelism of the beds over large regions of the earth stands in complete opposition."

"Conformable" is the term used in modern geology to describe the condition which exists when two strata lie evenly in contact, the one on top of the other, as if the two were deposited quickly, with no evidences of erosion in between. And "conformability" is *the general rule in nature between all strata*, even though an intermediate stratum or two, assigned by modern geologists to other "ages," are absent.

The different "ages" when strata are supposed by modern geologists to have been laid on the sea bottoms are named in order in the so-called geological column shown on page 144. Since the one "age" supposedly followed the other, the strata of each "age" should follow the other in regular order. So one would naturally think. But strata which are said by modern geologists to be of "Carboniferous Age" are, it is admitted by them, found to rest

in many places on the earth on strata of "Ordovician Age," and strata of "Plesistocene Age" found to rest on strata of "Permian Age," and strata of "Cretaceous Age" on strata of "Devonian Age," evenly and smoothly. Bosio in the last century, and Price in this, have called attention to many instances of this. Where such things occur, i. e., where two strata, supposed to have been deposited in "ages" that did not follow one another in natural succession, thus lie evenly together as if they were deposited in very rapid succession, modern geologists say there exists a "disconformity" or a "deceptive conformity." *The blame for deceiving men is put on nature*, not on the method by which time values are given to the strata. Flood geologists do not need to place the blame anywhere for the way the strata lie. They can take things just as they are and explain them simply.

Before ending our discussion of modern geology, something should be said about the methods of modern geological leaders in making their calculations of the age of the earth, particularly that method which is based on the disintegration of radioactive elements, by which the earth is estimated to be close to two billions of years old. The method is this: The element, uranium, is said to be changing, by radioactivity, into lead. The rate at which the change proceeds is said to be exceedingly slow. A fragment of rock containing uranium and lead is selected and taken to represent the whole earth. The amount of lead in the fragment is measured, and, on the assumption that all the lead was originally uranium and became changed into lead at the present, slow rate, the length of time it took to accomplish the transformation is computed and said to be the minimum age of the earth.

We have here another illustration of the manner in which modern geologists base so much of their teaching on unnecessary, and often false premises. The above method of estimating the age of the earth, which is said to be the only dependable method, is subject to the following criticism. Granting that uranium is now changing into lead, who knows that all the lead in any piece of ore was originally uranium? Some or most of the lead may have

been lead always. Furthermore, who knows that the rate of change from uranium into lead has always been the same and as slow as it is at present? If either the rate was once very rapid, as it may have been, or if much of the lead, supposed to have been originally uranium, was created lead, as it may have been, there is no need of postulating immense ages for the formation of that lead. Deny the unproved assumptions of those who argue, by any method whatever, that the earth is millions of years old and their conclusions fall.

We do not look forward to a time when the Flood theory will be restored to its old high place in geology. To believe it possible that the Deluge, which the Scriptures say was a judgment upon sin, was so stupendous that it wiped away a world surface and made a new one one must *know God*, and as leaders in education seem to be coming to know Him less and less, there does not seem to be much prospect of a change. High school and college boys and girls, *pathetically ignorant* of all the vain and empty suppositions involved in the modern theory, will continue to be taught the views inherited from the heathen Greeks. Believers in God will, however, continue to find satisfaction in seeing everywhere in nature testimony to the Biblical record of the Flood.

## CHAPTER X

### WORDS WITHOUT KNOWLEDGE

IN closing our study of the earth's testimony to the Flood, attention ought to be given to some objections which have, on various grounds, been raised against the grand idea of this book. We have in the previous pages referred to one or two.

It has been objected that the record of the olive branch brought back by the dove shows that the Flood came and went so gently that not even the vegetation was destroyed, let alone great layers of earth deposited. To this it may be said that the existence of a single green olive leaf on a destroyed earth can be explained by the fact that it was eight weeks after the ground was seen by Noah when the leaf was brought back. In much less than eight weeks, in moist ground and under a warm sun, seeds might easily germinate and sprout enough to produce a single leaf. Or it might be said that olive leaves are oily and endure water very well. Theophrastus, in his "HISTORY OF PLANTS" and Pliny in his "NATURAL HISTORY" give accounts of olive trees with leaves beneath the waters of the Red Sea. Olive trees or branches may have floated on the Flood waters and been left green upon the surface of the newly made earth.

It has been objected that the ark was not large enough to carry two of every kind necessary to preserve a seed of living things for the new world. It is interesting how the Bible's enemies would load the ark with seals, sea-lions, amphibious reptiles and other animals which were never in the ark at all. Few who make this objection have ever seriously considered the carrying capacity of

the ark. As this is a common and a serious objection in the minds of many, we will consider rather fully a treatise on the ark written in 1892 by Charles A. Totten, Professor of Military Science and Tactics at Yale University, entitled "THE FLOOD THE FACT OF HISTORY."

The dimensions of the ark, Totten said, are given in the Bible as 300 cubits long and 50 cubits wide and 30 cubits high. It had three decks. (See Fig. 35, page 155.) Regarding the cubit as 18 inches, the floor space on one deck, 450 feet long and 75 feet wide, would be 33,750 square feet.\* On the three decks of the ark there was then a total of 101,250 square feet of deck space. But, since it was likely that the small and medium sized animals were put in cages in tiers one above another, not only the floor space but the cubic space also must be considered. The cubic capacity of the ark, at eighteen inches as the measure of the cubit, was for each deck 500,000 cubic feet, or 1,500,000 for the three decks.

However, Totten said, it is not at all certain that the cubit of the ark was eighteen inches. There never was any definite length for the cubit in ancient days. Different cubits existed. Most common was "the cubit of the elbo," i. e., the distance from the elbow to the finger tips. There was also "the cubit of the arm pit," or the distance of the whole arm. Naturally these lengths varied with the size of the person measured. The cubit varied from age to age, and from country to country. Ancient Egypt had two lengths for it at different times. One was the length of a new born child; the other was the length of the king at a certain age. After a long discussion of the archaeological evidences, Totten said, "We may say that a cubit of 20.7 inches (about) was the standard of measure of the Egyptian, and also of the Assyrian, Chaldean, and Babylonian Empires." But he also pointed out that definite lengths for the cubit may have been assigned for specific constructions. Moses was directed to work according to a pattern "shown" him. The so-called great cubit of

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\*A regulation football field, which has a field of play of 42,000 square feet, is wider but not so long as the ark.

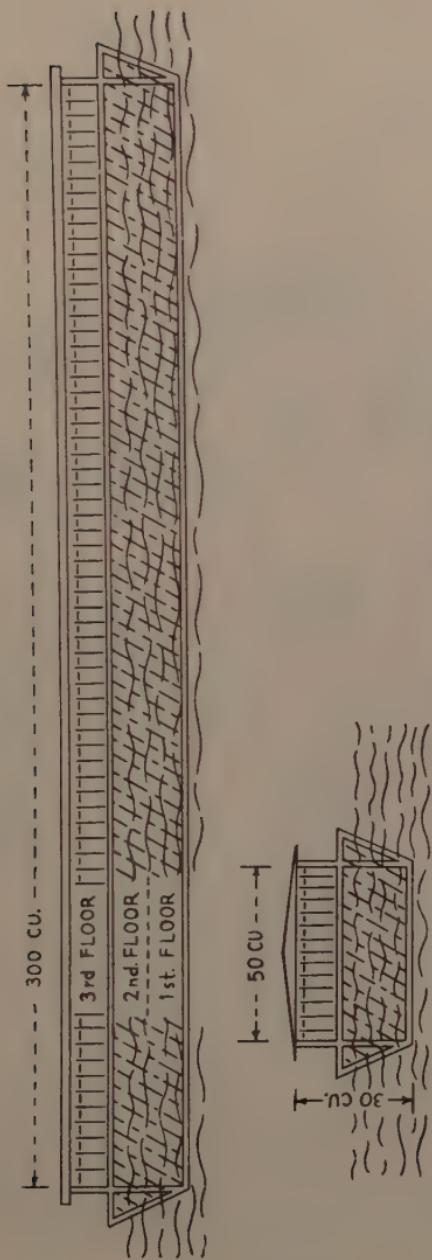


Fig. 35. Side and end views of the Ark, according to the dimensions given in the Bible (after Totten).

Ezekiel, revealed to him by God, was an ordinary cubit plus a hand's breadth (Ez. 43:13), or about two feet. Twenty-four inches was what Totten thought the length of the cubit of the ark likely was.

Supposing this to be so, the ark was 600 feet long and 100 feet wide and 60 feet high,\* having a carrying capacity of 3,600,000 cubit feet. Pointing out that an ordinary cattle car on a railroad carries, of cattle, 18 to 20 head; or of hogs, from 60 to 80 head; or of sheep from 80 to 100 head, Totten said, "Ten thousand of such cars, duly proportioned, could be stowed in Noah's ark." Concluding his discussion of the size of the ark, he said, "Such was the capacity of Noah's ark, a ship whose dimensions have, from general misunderstanding of their true significance, been persistently ridiculed as unequal to their task. Certainly there was room in such a craft for 100 menageries larger than Barnum, 'the great American showman,' ever saw in his wildest reveries, and room to spare for food."

It should be remembered that large species are comparatively few, even including those that are now extinct. Dr. Howard Osgood, in the Sunday School Times for February 6, 1892, discussing the animals that could have found accommodation in the ark, said that the highest estimate of the land mammalia at present is 290 above the size of the sheep, 757 from the sheep to the rats, and 1,359 smaller than the rats. *The average size is about that of a cat*, a pair of which would require less than three square feet of space. Of course, the non-mammalia which are strictly land animals must be added to this, but they are mostly small. How many species the ark carried depends on how one regards a species. The so-called "splitters" in biology make many species. The "lumpers" make few. The present writer regards a species as a group of members which can freely interbreed and produce fertile offspring. (See Fig. 36, page 157.) Hence all dogs, wolves, coyotes, jackals and dingos (all of which are perfectly interfertile) needed to have only one

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\*Some modern ocean vessels are over 1,000 feet long.

pair to represent them in the ark. Judging also from cross-breeding relations which are known to exist, it is quite likely that all lions, tigers, pumas, leopards, jaguars, wildcats, ocelots, and other "cats" were all represented in the ark by a single pair.

So large was the ark, which Noah was allowed a hundred and twenty years to build, that when critics have realized its size they have promptly gone to the other ex-



Fig. 36. Animal species, as God created them, have a tremendous power of variation, or of producing new forms. (See the author's discussion of Natural Species and Mutations in the Appendix to the third edition of *AFTER ITS KIND*.) A single pair of dogs represented all types of dogs (including wolves, jackals, coyotes) in the Ark. A single pair of cattle represented all types of cattle, and so on. Not every variety of species was in the Ark, but only a representative pair out of which an enormous variety of forms could come. An understanding of the relation of varieties to natural species takes all strain from the Bible record of the cargo of the Ark. Many fossil forms, thought now to represent extinct species, may have been but varieties of living species.

treme and said that Noah could not have built such a ship. "Indeed," said Totten, "such is human inconsistency, I doubt not that when the full significance of our figures . . . is comprehended, the very reverse will be the hue and cry, and that, in lieu of finding its capacity too small, it will be scouted as exaggerated beyond all reason." He therefore dwelt at length on the marvelous scientific and architectural skill of the ancients, as shown by the wondrous exhibitions of carving and metal works with gold and precious stones which have been unearthed, and by their unmatchable genius in building the pyramids.

Just to suggest the ability of the ancients in the line of construction, we may refer to the words of some reputable scholars regarding the ancient Egyptians, who may be taken as typical of other ancient folks. Ferguson, in "*HISTORY OF ARCHITECTURE*" says, "No one can possibly examine the interior of the Great Pyramid without being struck with astonishment at the wonderful mechanical skill displayed in its construction. The immense blocks of granite brought from Syene, a distance of five hundred miles, polished like glass, are so fitted that the joints can scarcely be detected! Nothing can be more wonderful than the extraordinary amount of knowledge displayed in the construction of the discharging chambers over the roof of the principal apartment, in the alignment of the sloping galleries, in the provision of the ventilating shafts. All these, too, are carried out with such precision that, notwithstanding the immense superincumbent weight, no settlement in any part can be detected to an appreciable fraction of an inch. Nothing more mechanically perfect has ever been erected since that time." Commander F. M. Farber, U. S. N., in "*MECHANICAL TRIUMPHS OF THE ANCIENT EGYPTIANS*" says, "The mechanical problems in connection with the construction of the pyramids of Cheops are interesting, but the executive ability shown by its construction is more to be admired than the mechanical problems which that ability was able to overcome. Professor Rawlinson thinks that Cheops must have been divinely inspired simply to conceive of so wonderful a creation, so absolutely perfect in all its parts; but the

man who was able to carry out the conception is deserving of more credit than he, for few men could have had a more difficult task since the world was created. To plan the great work, to lay it out, to provide for all possible emergencies and accidents, to see that the men were all continuously and profitably employed, that the means of transportation was ample and always in order, that the commissariat did not fail, that the water supply was ample and conveniently disposed, that the sick relief was on hand, that the master workmen were not discontented, the journey men not idle, and the apprentices all disciplined; combine all these and many other sources of care and irritation and we have a sum total which would tax the ablest organizer that has ever lived." R. Engleback, Chief Inspector of Antiquities of Upper Egypt, said regarding the raising of the great obelisks, "Though modern research robs the Egyptians of the magical powers attributed to them, it makes them more admirable in the eye of the practical man, as it shows that they could do, with the most primitive means, feats or engineering which we, with some 3,000 years of mechanical progress, are barely able to copy." True, building pyramids and raising obelisks is not building an ark, and Noah was much older than the pyramids. But it shows that the ancients had just such ability as to do what many moderns say could not be done.

How Noah obtained the animals for the ark is a question many raise. A little of the wisdom of old St. Augustine might be offered to skeptics on this score. "As to another customary inquiry of the scrupulous . . . those persons who are moved by this difficulty are to be reminded that the words 'every creeping thing of the earth' only indicate that it was not needful to preserve in the ark the animals that can live in the water, whether the fishes that live submerged in it, or sea-birds that swim on its surface. For Noah did not catch the animals and put them in the ark, but gave entrance as they came seeking it. For this is the force of the words, 'They shall come unto thee' (Gen. 6:19, 20)—not, that is to say, by man's effort, but by God's will."

We might well quote Augustine also on another point:

"Another question is commonly raised regarding the food of the carnivorous animals . . . we know how many animals whose food is flesh eat also vegetables and fruits . . . What wonder is it, therefore, if that wise and just man was instructed by God what would suit each, so that without flesh he stored provisions for each species? And what is there which hunger would not make animals eat? Or what could not be made sweet and wholesome by God, who, with a divine facility, might have enabled them to do without food at all." Eating very little would have kept animals in the ark alive, which was all that was necessary. They may have slept almost continually, after the manner of bears hibernating.

An objection raised is that the ark would have been capsized if the Flood was so great as to stratify the earth. Not necessarily. The violence was at the bottom, not at the top of the waters. No doubt the ark was carried far away from where it was built, but it floated for months calmly on the sea. It was a sea-worthy ship, "bulkheaded," to use the expression of Totten. It was also the special object of God's care.

An objection has been raised on the score that, had the whole globe been submerged, the sea would have destroyed every fresh water fish. To this we reply that a difficulty of a similar sort is thus raised against geologists who dote on evolution. It is said by them that all perch (a fresh-water fish), for example, have had a common evolutionary origin. But if they originated in one spot, how, we may ask, did they become distributed in lakes and streams of almost the whole world, where, indeed, they now are? How did they cross salt water? And the same is true of many other fresh-water creatures which are said by evolutionists to have had a common origin.

Recent discoveries in genetics have removed any difficulties along this line for Flood geologists. These discoveries show that mutant varieties of fresh-water fish may arise which, if put in the sea, would live. In a single lake of several billion perch, for example, who can say that there are not a few mutant varieties which

could live in the sea? This objection is idle to those who know that many salt water species enter fresh water to feed and spawn, and the young grow to considerable size, before returning to the ocean. There are both fresh and salt water salmon, and there are other fresh water species that are known to go out the mouth of one river into the ocean and up into another stream.

According to the sacred record, the purpose of the Flood was to punish and destroy men. The question is asked: Where are the fossils of these men? Why are they not discovered as are the relics of prediluvian plants and animals? To this objection various answers have been given: (1) The remains of strictly land animals are by far the least abundant of all fossils. The vast majority are shells and remains of sea creatures. This is because land animals were buried generally in the uppermost and lightest strata. These strata have since largely weathered and disappeared. The antediluvians were buried in the same general manner as the land animals and their remains have weathered away. Proportionately there were countless more of each animal species than of the human, and we should therefore not expect to find one human remain for many thousands of remains of lower types of animals. (2) Searchers have not gone into the earth, even where countless animal bones are known to be buried, sufficiently to say that there are not many human remains among them. The places where fossils have been searched for on the face of the earth are but infinitesimal specks compared with the vast areas still undisturbed where human remains may be concealed. Surprising discoveries of fossiliferous conditions are constantly being made, and startling conditions may yet be revealed regarding burials of antediluvians. (3) Human remains have been found in such places as they may have been buried in the Flood. (4) *It was God's deliberate purpose to leave no vestige of prediluvian man remaining.*

With some persons the time of the Flood, as that event is dated in the margins of some Bibles, may present a difficulty in the way of accepting the hypothesis upheld in these pages, for to them it appears that greater geolog-

ical changes of volcanic, glacial, local diluvial, metamorphic and erosive sorts have gone on in places on the earth than could well have taken place in the approximately four thousand years which Usher's chronological interpretation of the Bible allows. To this it may be said, first, that it is impossible for us to know how fast some changes, of which the earth gives clear evidence, have gone on. There is nothing against the idea that there may have been wide volcanic actions on the earth contemporary with wide glacial phenomena. In fact, modern geologists of standing have suggested that volcanic actions in one place have been the underlying cause of glacial phenomena in another. No one knows how rapidly great erosive and chemical actions were taking place in and on the strata after the Flood. But if there should be any difficulty here for anyone, it should be said that the date 2348 B. C. or anywhere near that date is *not* definitely presented in the Bible for the time of the Flood. That date, which is printed in the margins of many Bibles, rests upon an interpretation of Old Testament genealogies which began with Bishop Usher of Armagh in 1650 and has been widely held since, but which need not be accepted by any lover of the Scriptures. Usher's dates are based upon the supposition that there has been no abridgement, or shortening by the omission of generations, in the early genealogical tables of the Bible. Such a supposition, however, may be erroneous. Many generations may have been left out in those early genealogies, as we have definite knowledge that they have been left out in later Biblical genealogies. For all anyone can know from the Bible itself, and that is the only source of information available, the Flood may have taken place far, far more remote in time than any of us suppose.\*

The acceptance of the Flood as the explanation of the stratified rocks, however, does away with all need of inter-

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\*For information about the uncertainty that must surround the setting of primitive dates see the articles by Dr. W. H. Green in *Bibliotheaca Sacra* for April, 1890, entitled "Primitive Chronology."

preting the days of the week of creation (Gen. 1) as "ages" rather than the ordinary days, which the record seems to indicate they were, since what the modern geologist teaches millions of years were required to accomplish the Flood could have done in a brief time.

Difficulties may be conceived in connection with the Deluge theory of geology. Certainly, however, one does not get rid of difficulties by accepting that theory which a religious skepticism has put in its place. The words of Cockburn, written two hundred years ago, may aptly be cited: "No man departs from the Flood theory upon pretense of avoiding any absurdity therein supposed, but that he ran himself upon the necessity of believing greater absurdities than any he pretended to avoid."



## APPENDIX I

### 1. THE SIGNIFICANCE OF FLOOD TRADITIONS

The existence among all races of stories or traditions of a great flood which destroyed all mankind has long been known and regarded by those familiar with them as a remarkable confirmation of the truth of the Deluge account in Genesis. The reasons for this are as follows:

1. It is recognized, even by those who place no reliance on the authority of the Bible, that the races of mankind have been dispersed from a common center in Asia. (See Fig. 37, page 166.) Such anthropologists as Andrews, Hrdlicka, Osborn are outspoken in their contentions that Africa, North and South America and the Islands of the Pacific have been peopled by men whose ancestors dwelt originally some place in central Asia. Such a view is exactly in accord with the teachings of Scripture, and we can do no better here than to quote what one outstanding scholar, Melvin G. Kyle, has to say. "The theory of this location [i. e. valley of the Euphrates] of the point of departure of the dispersion of the race, as indicated by the record of the Bible and by facts ascertained through research, is all but universally held. It can not be said that it is yet definitely substantiated, but it is receiving culminating corroboration along ethnological and philological lines. Wherever it is possible to trace back lines of migration of the early nations mentioned, or to gather notes of direction from the traditions of various peoples, it is always found that the ultimate direction is toward a comparatively small area in western Asia. . . . Of the first dispersion of the human race over the surface of the earth we know absolutely nothing aside from the statements of the Bible. Of speculation, scientific theory, there is much that is reasonable; but of real historic statements there is nothing else that presents even a reasonable claim. The second dispersion, however, [i. e. after the Flood] as recorded in the Bible, is being exactly, and as investigation progresses, more and more fully confirmed by the results of archaeological research. That from a central point, somewhere in Mesopotamia, the Hamitic branch of the race migrated to the southwest, the Japhetic branch to the northwest, and the Semitic branch 'eastward' toward the 'land of Shinar,' is indisputable. As the details of these race movements

emerge from obscurity, the meager account in Genesis is not discredited; rather, little by little, it is being confirmed. Not all the subdivisions of the race are positively identified at the place in which they appear on the map of Biblical geography, but of many of them there can be little doubt and they correspond to the lines of emigration laid down in Genesis X."

2. On the assumption that there was such an event as is described in the Bible, the existence of Flood traditions among the widely separated and primitive peoples is just what is to be expected. It is only natural that memories of such an event would be carried with men wherever they migrated after the Flood, if all men were sprung from those who were the sole survivors. Deeply engraved upon their minds the event—its character and cause—would be. It is reasonable to suppose that the story of the event was rehearsed in the ears of children of the survivors again and again, and made the basis of both parental and priestly warn-



Fig. 37. Theoretic dispersion by land of the human race after the Deluge.

ings against offenses against the deity. The annual religious ceremony among the Mandan Indians of America, as described by Catlin, (page 184 ff.) can only be satisfactorily explained in this light.

3. Assuming the Biblical record to be correct, the general similarity between the widely scattered accounts is readily accounted for. The only alternative to the theory that there was one single flood catastrophe, universal as far as the human race is concerned, which is the basis of all the Deluge legends, is that there were many separate local floods each of which is the basis of a different flood account. This alternative has this chief objection: namely, that the remarkable similarity in the Deluge

legends is not accounted for. The accompanying chart (Fig. 38, page 169), which is based on the legends recorded in this book, shows graphically the points of similarity between all the Deluge tales. It is to be noticed from the chart that there is almost complete agreement in the three main features: (1) an ark as a means of safety; (2) a universal destruction of living things by water; (3) a seed of mankind preserved. It is also to be observed that all other less essential features are grouped around these three central features in a manner that is sufficiently haphazard to indicate just what is natural, namely, that what one account lost another retained and vice versa. If each Deluge legend has a purely local basis how is this similarity to be explained? How, for example, is it to be explained that in seven widely scattered regions (see chart) some animal, usually a bird, is sent out to discern the state of dryness of the earth?

It might be said that the similarity apparent in the traditions is to be accounted for on the basis that through Christian missionary activity the Biblical Deluge story has spread into the lands from which the traditions have been gathered, and been taken up by them and applied to themselves locally. There are four objections to this idea: (1) Other Biblical events, such as the passage of the Red Sea, the crossing of the Jordan, the destruction of Sodom and Gomorrah, the standing still of the sun, the story of Jonah are all sufficiently remarkable and supernatural to be taken over by the various peoples into their own mythology and made their own. If the Flood idea came that way, why not these others also? No trace of them is found. A tradition of a sort of confusion of tongue is found together with the Flood tradition among certain peoples. This is natural, since the confusion of tongue preceded the dispersal of the races. (2) If through missionary activity the Biblical story has become the basis of the universal Flood traditions it is strange that these traditions are not more like the Biblical story in matters of detail, and consequently more like each other. As can be seen from a reading of the traditions, the nature of the offenses against the deity, for which the Flood was brought, are in no two accounts alike, but differ from pulling the deity's hair to killing a favorite bird. Why this variation? Why should a coyote be sent out to discern the dryness of the ground, as in the tradition of the Papagos Indians of Mexico, instead of a dove, as in the Biblical? Why, as in the Michoan legend should it be a humming bird? Why, as in the Hindu legend, should the ark be tied to a tree? Why, as in the Lap legend should the survivors be a brother and a sister, who later ceased to recognize each other and consorted? Why, as in the Scandinavian legend, should the water of the Deluge be the blood that ran from the wound of the giant or god, Ymi? (3) The Flood legends gathered and presented in the ensuing pages were collected by men whose chief interests were anthropological. They had no interest in establishing the truth of the Biblical

account, and they were concerned to secure native traditions, not traditions given to the natives by missionaries. Thatcher, Catlin, Emmerson, Bancroft, Kingsborough, by whom the American legends were collected, were students of the native races and nothing more. What concern did Berossus, Pindar, Appollodorus, Ovid have with establishing any Biblical record or statement? Lucian in fact, from whom we have our record of the Syrian deluge account and the ceremony associated with it, was a scoffer at all traditional religious ideas. His account of the Syrian belief regarding the flood is recorded with a sneer at the Syrians for having it. Christian missionary influence as the explanation of the universal flood traditions must be rejected.

4. The assumption of the truth of the Deluge account of Genesis offers a satisfactory explanation of the fact that the more ancient a tradition is, and the more close geographically to that central place in Asia where the Bible says the ark landed, the more reasonable and sane is the legend, the more generally like the Biblical account, and vice versa. It is well known that a story loses in accuracy each time it is told, and this accounts for the general situation as it exists. An incident related by Rev. John Inglis serves to illustrate why some legends have become so different from the Biblical narrative. A native of one of the islands of the New Hebrides was once listening to a missionary reading the Biblical account of the Flood. In the midst of the reading the native said, "Stop, that is almost the same as what we have been told." He then related his tradition. "But," he added, "your fathers, having written an account for you, while ours only told it to their children, yours must be more correct than ours."

PRINCIPAL FEATURES  
OF THE  
BIBLICAL RECORD

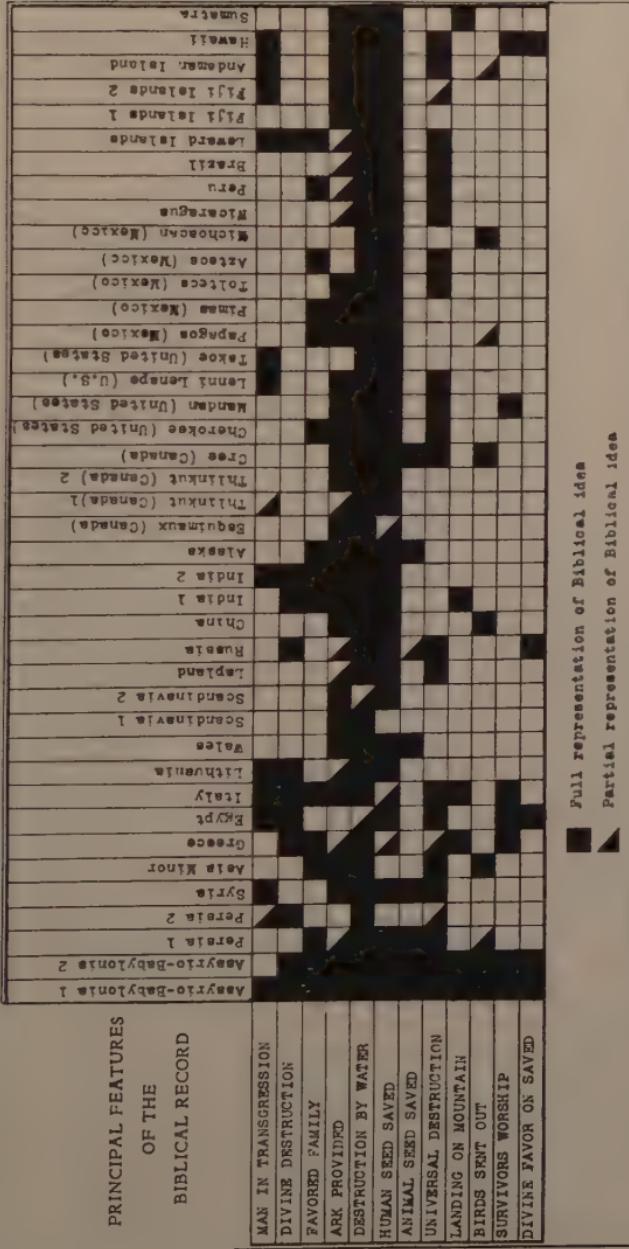


Fig. 38. Chart showing the representation of the principal ideas of the Biblical account of the Deluge in non-Biblical traditions

## APPENDIX II

### 2. FLOOD TRADITIONS

Only a small portion of existing traditions are here presented. Larger collections have been made by Lenormant, Andree, Winternitz, Gerland, Frazer, to which the interested student should refer.

#### ASSYRIO-BABYLONIAN

(A) Two ancient Assyrio-Babylonian legends are in existence. The one we first give is the oldest non-biblical Deluge record known. It is one of several divergent accounts which were in existence in Assyria and Babylonia in ancient times. Three similar copies of this flood record were inscribed on tablets and placed in the library of the palace in Nineveh by order of the Assyrian King Asshur-bani-pal (668-626 B. C.). The tablets themselves state at the close of the inscriptions that the flood record they present was copied from an older tablet. This older tablet evidently was read with difficulty in the 7th century. The account here presented was restored from the three copies made by order of Asshur-bani-pal. That the account existed in the same form earlier is certain, for fragments of it have been found which were written in the time of Ammizaduga, the fourth successor of Hammurabi, king of Babylonia, who is believed on good evidence to have been Abraham's contemporary, Amraphel (Gen. 14:1). The tradition runs as follows:

"I wish to reveal to thee, Izdubar, the history of my preservation, and tell thee the decision of the gods. The town of Surippak, a town which thou knowest is situated on the Euphrates, was already ancient when the gods determined to cause a deluge. The great gods were there: Their father Anu, their counsellor, the warlike Bel, their throne-bearer Adar, their prince Ennugi, the Lord of the unsearchable wisdom. The god Ea sat, however, with them in council and announced their determination.

"Man of Surippak, son of Ubara-Tutu, said he, leave thy house, build a ship, despise property, and save life. They will destroy the seed of life. Bring into the ship the seed of life of every kind. The ship which thou shalt build ..... yards in length be its measure, and ..... yards of similar size its breadth and its height. [The dimensions of the ark on the ancient tablets have either disappeared or are difficult to decipher. George Smith, the first to decipher the inscription, thinks the dimensions were 600

cubits long by 60 cubits in height and width, and this is generally agreed to by those who have deciphered the tablets.]

"When I received this, I spoke to Ea, my Lord, 'O Lord, what thou has therefore ordered, if I should carry it out, then they will laugh at me, the people and the elders.' Ea opened his mouth and spake, said to his servant, to me 'Every one who transgresses against me and ..... verily I ..... and I will the wide heavens ..... judge will I above and below. Then shut not thy door until the time shall come that I will send thee word. Then enter in through the door of the ship, bring into the interior thy store of corn, all thy property and goods, thy family, thy servants and thy maids, and thy relations. The cattle of the field, the wild beast of the field, and what ..... I will send to thee, that they all may wait at the door.' Hasisadra opened his mouth and spake. He said to Ea, his Lord, 'O My Lord, nobody has ever built a ship in this manner upon the land ..... may I see ..... and the ship ..... upon the land ..... as thou hast ordered.'

"Then built I accordingly the ship, and provided it with the means of sustenance. I divided its interior into ..... divisions. I looked to the joints and filled them up. Three sars of pitch I poured over its outer side, three sars of pitch over its inner side.

"All that I had I brought together. All that I had in silver I brought together. All that I had in gold I brought together. All that I had in living seed I brought together, and all this I brought upon the ship. All my male and female domestics, the cattle of the field, the wild beasts of the field, also all my relations I let embark. As now the sun brought on the appointed time, then spake a voice, 'In the evening will the heavens rain destruction. Enter into the interior of the ship and shut thy door! The appointed time has arrived,' spake the voice. 'In the evening will the heavens rain destruction.' With terror I looked to the going down of the sun on this day, the day which for the embarkation was appointed. Fear had I, yet I stepped into the interior of the ship and shut the door behind me, in order to close up the ship. To the Buzur-shadi-rabi, [the steersman,] I gave over the great erection together with its cargo.

"Then as soon as the dawn appeared a dark cloud appeared on the horizon. In the midst of it Raman [the storm god] let his thunder crash, while Nebo and Serru rushed on before, the throned bearers strode over mountain and valley. The mighty pestilence god unchained the whirl-wind. Adar let the canals ceaselessly overflow. The Anunnaki, the spirits of the great subterranean waters, brought floods. The earth caused to tremble through their power. Raman's billows-swell reached even up to the heavens. All light lapsed into darkness.

"The earth they devastated as they carried thereby war against men. The brother looked not anymore after his brother. Men

concerned themselves no more about one another. In heaven the gods feared themselves before the deluge, and sought refuge. They ascended up to the heaven of the god Anu. As a dog upon his bed the gods cowered down together on the lattice of the heaven. Istar screamed like a woman in travail. Then cried the sublime goddess with a loud voice, 'Everything is turned into slime. This is the calamity I had announced before the flood. Therefore have I before the gods announced the calamity, the war of annihilation against men have I announced. I, however, did not bring men forth for this purpose that they like a brood of fishes should fill the sea.'

"Then wept the gods with her over the Anunnaki. Upon the spot the gods sat mourning. The lips they pressed together. Six days and seven nights maintained wind, flood and storm the upper hand. The flood, which had carried on war like a mighty army, quieted itself. The sea abated. The storm and flood ceased.

"I sailed through the sea lamenting that the dwelling places of men were turned to slime. Like trunks of trees floated the corpses about. A crevice I had opened, and as the light of day fell upon my countenance, then I quivered all through and sat myself down weeping. Over my countenance flowed my tears. I sailed through the lands, which were now a fearful sea. Then emerged a piece of land twelve measures high. Towards the land of Nizir sailed the ship. The mountain of the land of Nizir held the ship fast and let it no more loose. On the first, on the second day the mountain Nizir held the ship fast and on the 3rd and 4th day the mountain Nizir held and on the 5th and 6th day the mountain Nizir held. At the breaking of the seventh day I took a dove out and let her fly. The dove flew here and there, but there was no resting place. Therefore she returned again back. Then took I a swallow and let her fly. The swallow flew here and there; but as there was no resting place, so she returned again back. Then I took a raven and let it fly. The raven flew away, and as it saw the waters falling it came again near the ship, as it waded cautiously. But it did not return back again. Then let I all out to the four winds. A sacrifice I offered. I erected here an altar. Upon the height of the summit of the mountain even seven adagur-vessels I set up. Under them I spread calmus, cedarwood, and riggir. The gods inhaled the savour. Like flies the gods collected themselves over the offerer.

"When the goddess Istar came up she lifted up on high the great bows which Anu had made according ..... these gods. 'By the jewels of my neck' she said, 'I will not forget these days. I will think of them and they shall not be forgotten forever. The gods may come to the altar. Bel shall never come to the altar, because he has acted inconsiderately and has caused the deluge, and has given over my men to destruction.'

"When the god Bel came up and saw the ship, he stopped. Full of anger was he filled against the gods and the Igigi, the spirits

of heaven. ‘What soul has then escaped? No man shall remain alive in the destruction.’ Then opened Adur his mouth and spoke. He said to warlike Bel, ‘Who except Ea can have known the matter? Ea knew and has informed him of all.’

“Then opened Ea his mouth and spake. He said to the warlike Bel, ‘Thou art the warlike leader of the gods. But wherefore, wherefore hast thou acted so inconsiderately and caused the Deluge? Upon the sinner let his sins fall. Upon the wicked let wickedness fall. Be thou entreated, that they may not be destroyed. Be gracious, that they may not ..... In place of again causing a deluge, let hyenas come and diminish mankind. In place of again causing a deluge, let a famine occur and depopulate the land. Instead of again causing a deluge, let the pestilence god come and diminish mankind. I have not communicated the determination of the great gods. A dream I sent to Hasisadra and he understood the determination of the gods.’

“Then Bel became reasonable. He stepped up into the interior of the ship, seized my hand and lifted me up, lifted up also my wife and put her hand in mine, turned himself to us, stepped between us and blessed us. ‘Hitherto was Hasisadra a mere man. Now, however, shall Hasisadra and his wife together be raised to the gods. Hasisadra shall dwell in the far land at the mouth of the rivers.’ Then they took me and translated me into the far land at the mouth of the rivers.”

(B) Closely allied to the flood account which we have considered is the record which was current in Babylonia in the time of Alexander the Great. This account was recorded by the Babylonian priest and historian, Berosus (250 B. C.). Berosus derived his account of the flood from the sacred books of Babylon and introduced it into a history which he wrote for the use of the Greeks. His work has perished, but the story of the flood is preserved entire in the works of Eusebius. It is shorter than the document found on the tablets of the royal library at Nineveh, and is as follows:

After speaking of the nine ante-diluvian kings (which correspond to the nine great ante-diluvian patriarchs of the Bible before Noah) Berosus continues thus :

“Obartes Elbaratutu [the ninth ante-diluvian king] being dead, his son Xisuthros [the Noah of the account] reigned eighteen sares [64,800 years]. It was under him that the great Deluge took place, the history of which is told in the document as follows: Cronos [Ea] appeared to him in his sleep, and announced that on the fifteenth of the month Daisios [the Assyrian month Sivan—a little before the summer solstice] all men should perish by a flood. He therefore commanded him to take the beginning, the middle, and the end of whatever was consigned to writing, and to bury it in the City of the Sun, at Sippara; then to enter into it with his family and dearest friends; to place in this vessel pro-

visions to eat and drink, and to cause animals, birds, and quadrupeds to enter it; lastly to prepare everything for navigation. And when Xisuthros inquired in what direction he should steer his bark, he answered, 'toward the gods,' and was enjoined to pray that good might come of it for man.

"Xisuthros obeyed, and constructed a vessel five stadia long and five broad; he collected all that had been prescribed to him, and embarked with his wife, his children, and his intimate friends.

"The Deluge having come, and soon going down, Xisuthros loosed some of the birds. These, finding no food nor place to alight on, returned to the ship. A few days later Xisuthros again let them free, but they returned again to the vessel, their feet full of mud. Finally, loosed the third time, the birds came no more back. Then Xisuthros understood that the earth was bare. He made an opening in the roof of the ship, and saw that it had grounded on the top of a mountain. He then descended with his wife, his daughter, and his pilot, who worshipped the earth; raised an altar, and there sacrificed to the gods; at the same moment he vanished with those who accompanied him.

"Meanwhile those who had remained in the vessel, not seeing Xisuthros return, descended too, and began to seek him, calling him by his name. They saw Xisuthros no more; but a voice from heaven was heard commanding them piety toward the gods; that he, indeed, was receiving the reward of his piety in being carried away to dwell thenceforth in the midst of the gods, and that the same honor was shared by his wife, his daughter, and the pilot of the ship. The voice further said that they were to return to Babylon, and, conformably to the decrees of fate, disinter the writings buried at Sippara in order to transmit them to men. It added that the country in which they found themselves was Armenia. These then, having heard the voice, sacrificed to the gods and returned on foot to Babylon. Of the vessel of Xisuthros, which had finally landed in Armenia, a portion is still to be found in the Gordyan Mountains in Armenia, and pilgrims bring thence asphalt that they have scraped from its fragments. It is used to keep off the influence of witchcraft and as to the companions of Xisuthros, they came to Babylon, disinterred the writings left at Sippara, founded numerous cities, built temples, and restored Babylon."

## PERSIA

(A) A Persian legend is preserved in the Zendavesta, the original document of the religion of Zoroaster, whose age is unknown, but who was likely older than Moses. The Zendavesta is still used by the Parsees as their Bible and prayer-book. In this ancient Persian document we read how Yima, the primitive father of mankind, was warned by Ahuramazda, the good deity, that the earth would be destroyed by a deluge. The god bade him make himself a place of refuge, a garden of square shape, protected

by a boundary, and there put the germ of men, animals and plants to preserve them from destruction. When the inundation presently came, the garden of Yima and its contents were alone preserved, and the announcement that safety was at hand was taken thither by the bird Karshipta, sent by Ahurzmazda.

(B) Another story, curious in outline, has been preserved from ancient Persian folklore. It runs as follows: Ahuramazda, [the good deity] determined to destroy the Kharafstras i. e., the evil being created by Angromamyus [the author of evil]. Testrya, the genius of the star Sirius, consequently came down to the earth in the form of a man, and caused it to rain for ten days. The waters covered the earth, and all the evil beings were drowned. A violent wind then came and dried up the ground but there still remained some germs of the evil beings which could still reappear. Testrya again came down in the form of a white horse, and produced a second deluge, causing it to rain for ten days. To prevent him completing his work the demon Aposha took the form of a black horse and went to fight him.

## SYRIA

In the ancient city of Hierapolis, in northern Syria, there was a beautiful temple. Lucian (120-180 A. D.) tells us in his *DIALOGUES ON THE SYRIAN GODDESS* that this temple was said by the Hieropolitans to be built by Deucalion Sisythes (a form of the Xisuthros in Berossus' account) in whose time the great flood happened. Lucian says that the Greek account of the flood ran thus

"Not one of us now living is descended from the original race of men, who all perished. We, numerous as we are, are no other than a second race sprung from Deucalion [the Noah of this and other accounts]. The aborigines were full of pride and insolence unfaithful to their promises, inhospitable to strangers, deaf to supplicants. Hence they were overtaken by a great disaster. The earth suddenly opened its sluices, heavy showers of rain fell, the rivers swelled, and the sea arose until the waters everywhere prevailed, and every mortal except Deucalion, who on account of his virtue and piety, was saved to give birth to a new race of men. He put himself with his wives and children in a great chest, and thereupon there came to him boars and horses and lions and serpents and all kind of land animals. He took them all in, and all the time they were with him Zeus [the supreme being] ordered it so that they did no injury, but lived together in harmony."

To this account of the Greeks, Lucian says that the Hieropolitans add that at the time of the flood of Deucalion a large chasm or crack was made in their country to absorb the waters and that Deucalion raised altars and built a temple to the goddess Hiera, close to the chasm. Lucian says he had the hole pointed out to him. "When I saw it," he says, "it was a small one, but how big it may have been formerly, I cannot say. However, as a

proof of what the citizens of Hierapolis say, water is brought twice a year from the sea to the temple, not only by the priests, but by the whole country, far and near, by Syrians, Arabians, and great multitudes beyond the Euphrates. It is emptied in the temple and runs into the opening below, which small as it is, takes in such a quantity as is truly amazing. This, it seems, was a law of Deucalion, to perpetuate the memory of his deliverance from the general calamity."

### ASIA MINOR

The ancient town of Apamaea in Phrygia had a style or pillar erected in it with an ark carved on the style, all based on the legend that there had been a universal flood and the ark rested on that spot. The people in the neighboring Phrygian town, Iconium, had the same pretensions as to where the ark landed. The authorities of Apamaea, in the third and second centuries before Christ, had coins made, some of which are still preserved



Fig. 39. Coin struck by the ancient citizens of Apamaea. Noah and his wife are debarking from the ark, which has the Greek name Noe on it. A dove with an olive branch flies above the ark.

(see Fig. 39) on the one side of which was represented an ark open and in it the patriarch saved from the Deluge and welcoming a bird; on the other side the pair leaving the ark to take possession of the earth. On the ark appears the name Noe.

### GREECE

All the Greek traditions are connected with the name Deucalion. The first mention of the Flood in Greek literature is found in the Odes of Pindar (522-433 B. C.). Deucalion and Pyrrha, his wife, come down from Mt. Parnassus, where the ark is said to have landed, built their home, and produced the stony race called the Laoi. "They tell us," he says, "that the mighty waters overwhelmed the dark earth, but that the sea-waters, at Zeus' behest, suddenly received an ebb." Plato, in his *Critias*, says that Attica is only a remnant of its former self—the land having been changed by the great destruction of Deucalion. The fullest Greek account

of the Flood was written by Appolodorus (150 B. C.). Following is his account :

"Prometheus had a son, Deucalion, who reigned in Pthiotis, and married Pyrrha, daughter of Spimethus and Pandora. Because Zeus wished to destroy mankind of the iron-race, Deucalion, by the advice of Prometheus, made a coffer or box, in which he put all the necessities of life, and withdrew into it with Pyrrha. Zeus, having caused a great rain to fall, the greater part of Greece was inundated, and all men perished except a few who sought refuge on the tops of mountains. It was then that the mountains of Thessaly were cloven asunder. All Greece outside the Peloponnesus and the Isthmus was inundated. Deucalion, having been tossed about by the sea for nine days and nights, at length came ashore at Parnassus. The rain having then ceased, he came out of his coffer and offered a sacrifice to Zeus Phyxios, who sent Hermes to ask him what he wanted. He replied, 'To people the earth.' By order of Zeus he and his wife then threw stones behind them. Those thrown by Deucalion become men, while those thrown by Pyrrha become women, whence they are metaphorically called Laoi."

Another Greek tradition has it that one called Ogyes (the word has been traced back to the ancient Sanskrit "augha", which means "flood"), the oldest king of Boetia, who belonged to the earliest age, escaped with some companions in a boat from a deluge which reached to the sky. At Athens there was a celebration of this flood. It was called Hydrophoria, and was similar to the ceremony at Hierapolis. Near the temple of Zeus Olympicus was shown a great fissure by which, Pausanias says, the waters escaped after Deucalion's deluge. Each year, on a day called the day of mourning for the dead, the people poured water into the hole.

## EGYPT

Africa furnishes the most meager supply of Flood traditions. It is a mistake, however, to say that it has no Flood traditions. Manetho, about 250 B. C., who occupied a place in Egypt similar to that of Berosus in Babylon, states in his HISTORY OF EGYPT that there was a world wide watery catastrophe in which one called Toth was saved. Before the cataclysm Toth inscribed on slabs of stone in sacred language the principles of all knowledge, and after the catastrophe translated the writing into a common language. Livingstone found in Africa a highly civilized tribe called the Bermegai, which possessed a tradition of the Deluge. What has been called by the translator, Sir Gaston Maspero, "a dry deluge story" is the "Legend of the Destruction of Mankind," engraved on the walls of a chamber in the tomb of Seti I. The long story has all the general features common to Flood traditions; the impiety of men, the divine anger and council to destroy, the saving of a remnant of mankind, all except the destruction by

water, and Maspero has said that in the Egyptian religion the water-god, the god of the Nile, was a beneficent god, and as the Egyptians did not wish to have him connected with a destruction of mankind, they changed the tradition.

## ITALY

The Latin poet, Ovid (B. C. 43-17 A. D.), in his *METAMORPHOSES*, tells how Jupiter, having determined to destroy the impious race of men sprung from the blood of the Titans, proceeded to do so by a great flood, the details of which are described in poetic rhetoric and vivid imagination by the poet as follows:

"At once he [Jupiter] shuts the north wind in the caverns of Aeolus and all those blasts which dispel the clouds drawn from over the earth, and then he send forth the south wind. With soaking wings the south wind flies abroad, having his terrible face covered with pitchy darkness. His head is loaded with showers. The waters stream down his hoary locks. Clouds gather upon his forehead, his wings and the folds of his robe drip with wet. As with his broad hand he squeezes the hanging clouds, a crash arises, and thence showers are poured in torrents from the skies. Oris, the messenger of Jove, clothed in various colors, collects the waters and bears a supply upward to the clouds.

"The standing corn is beaten down, and the expectations of the husbandman, now lamented by him, are ruined, and the labours of a long year prematurely perish. Nor is the wrath of Jove satisfied with his own heaven, but Neptune, his azure brother, aids him with his auxiliary waves. He calls together the rivers to which, soon as they entered the abode of their ruler, he said, 'I must now employ a lengthy exhortation. Pour forth all your might, as the occasion requires. Open your abodes and, each obstacle removed, give full reign to your streams.' Thus he commanded. They return and open the mouth of their fountains and roll on into the ocean with unobstructed course. He himself struck the earth with his trident, on which it shook, and with a tremor laid open the sources of the waters. The rivers breaking out rushed throughout the open plains and bear away together the standing corn, the graves, flocks, men, houses, and temples, together with their sacred utensils. If any house remained, and, not thrown down, was able to resist ruin so vast, yet the waves rising aloft, covered the roof of that house, and the towers tottered overwhelmed beneath the stream. And now sea and land had no mark of distinction. Everything now was ocean. And to the ocean the shores were wanting. One man takes possession of a hill. Another sits in a curved boat, and plies the oars there where lately he had ploughed. Another sails over the standing corn, or the roof of his country house under water. Another catches fish on top of an elm tree. An anchor, if chance so directs, is fastened

in a green meadow, or the curving keel comes in contact with the vineyards now below them; and where the late slender goats cropped the grass, there unsightly sea-calves are now reposing their bodies. The Nereids wonder at the graves, the cities, and the houses under water. Dolphins get into woods and run against the lofty branches and beat against the tossed oaks. The wolf swims among the sheep. The wave carries along the tawny lions. The wave carries along the tigers. Neither does the power of the lightning-shock avail the wild boar, nor his swift legs the stag now borne away. The wandering bird, having long sought for land where it may be allowed to alight, its wings failing, falls down into the sea. The boundless range of the sea had overwhelmed the hills, and the stronger waves beat against the heights of the mountains. The greater part is carried off by water. Those whom the water spares long fastings overcome by the scantiness of food. Parnassus, with two summits, advances higher than the clouds. There Deucalion (for the sea had covered all other places) bore in a ship with the partner of his couch, first rested. They adored the Corycian nymphs and the Deities of the Mountains and the prophetic Themis. Jupiter, seeing the world overflowed with waters, and that but one man remains out of so many thousands, both guiltless and worshippers of the gods, disperses the clouds, and the showers being moved by the north wind, earth and heaven behold each other again. He bids the ruler of the deep blow his resounding trumpet to call back the waves to the streams. As soon as it touched the lips of the god, dripping with his wet beard, and having sounded the retreat, it was heard by all the waters both of the earth and sea, and it stopped all those waters by which it was heard. The sea again has its shores. Their channels receive again the full rivers. The rivers subside. The hills are seen to come forth. After a length of time the woods show their naked tops and retain the mud left upon their branches. The world was destroyed and Deucalion beheld it was empty. He and Pyrrha determined to address the gods, and were bidden by Themis to cover their heads, loosen their garments, and to throw behind them the bones of their great mother. At first they refuse, not understanding the phrase. But presently they throw stones behind them, which become men and women respectively."

#### LITHUANIA

The Lithuanians have a tradition that the god whom they called Pramzinas, seeing the earth was filled with disorder, sent two giants, Wandu and Weyas (the water and the wind), to ravage it. These in their fury overwhelmed everything, and only a few men escaped on a mountain. Presently Pramzinas, taking pity on them, while eating some celestial nuts, let fall a shell upon the mountain, and in this shell the men took refuge. Then the giants respected these men. Having escaped the disaster, the men dis-

persed, and an aged couple alone remained in the desolated country. They were much troubled at having no children. Pramzinas sent comfort to them, and bade them jump over the bones of the earth. The couple jumped nine times, whence sprang nine other couples, who became the ancestors of the nine Lithuanian tribes.

### WALES

The Welsh people have two legends. One was that there was a destruction caused by a flood by the overflowing or disruption of Llyn-Llion (lake of waves, i.e., sea), which drowned all men but Dwyfan and Dwyfach, who were saved in a ship. It was by them the land of Prydian was repeopled. Another legend tells of a ship, Nefydd-Naf-Neifion, which bore a pair of all kinds of living creatures at the time of a flood when the lake Llyn-Llion broke.

### SCANDINAVIA

The Norwegian people are supplied with a number of Deluge legends of peculiar mould. A glimpse of a flood is caught in the Edda of Saemund, "The Vala's Prophecy"; "Then trembles Yggdrasil's ash yet standing, groans that ancient tree, and the Jotun Loki is loosed, the shadows groan on the ways of Hel [goddess of death], until the fire of Surt has consumed the tree. Hyrm steers from the east, the waters rise, the mundane snake is coiled in jotun-rage. The worm beats the water and the eagle screams; the pale of the beak tears carcasses; [the ship] Naglfar is loosed. Surt from the south comes with flickering flame; shines from his sword the Valgod's sun. The stony hills are dashed together, the giantesses totter. Men tread the path of Hel, and heaven is cloven. The sun darkens, earth in ocean sinks, fall from heaven the bright stars, fire's breath assails the all-nourishing, towering fire plays against heaven itself."

We read in the Voluspa that "Bor's son slew the giant Ymi, and when he fell, so much blood ran out of his wounds that the whole generation of the Rime-orges was drowned in it, save one, who escaped with his household. He went into an ark or bin, with his wife, and so they were saved. From them came the generation of the Rime-orges."

### LAPLAND

The Laps say that people dwelt in their land before God overwhelmed the world. There had been a time when Jubruel wandered to and fro upon the earth, so that water from lakes and rivers had gone over the whole land, and all the human race had been drowned with the exception of a boy and a girl. These two God had taken under the arms and carried to a high mountain, which was called "basse varre," the holy mountain. When the danger was over, God let them go their way. They separated

and each of them went his own way with the intention of finding out if there were no other people besides themselves. After they had wandered for about three years they met again and recognized each other. They again parted and three years more elapsed before they met again. Again they recognized each other. But when they met the third time, after the lapse of another three years, they no longer recognized each other. They thereupon consorted together and had children, and from them are descended all the men who now live upon the earth.

### RUSSIA

The Voguls in the Ural Mountains of Russia have this legend: "After seven years of drought the great woman said to the great man, 'It will rain presently. How must we save ourselves? The other giants are assembled together in a town to take counsel. What must we do?' The great man said, 'Cut in two a hollow poplar, and make two boats. We will then weave out of willow roots a cord 500 cubits long. We will fasten one end of it to the ground and the other end to our two boats. A man, with his children, must enter a boat, and must cover himself with ox-hides, and prepare provisions for seven days and nights, which must be put under his covering. In each boat we will put pots with liquid butter.' Having thus assured their own safety, the two giants went through various towns to persuade people to make boats and cords like they had done. Those people who listened to them they taught how it should be done. Others preferred to find some place of vantage whereby they might save themselves, but this was in vain, for the great man, who was their elder, assured them that no such place existed anywhere. 'We shall presently be overtaken by the holy waters. For two days has the noise of the surging been heard. Let us enter the boats without delay.' The earth was presently submerged. Those who had not built boats perished. It was the same with the people who had made their cords too short, and the same with those who had not taken enough butter to lubricate the cords and prevent them rubbing against the boats. On the seventh day the waters began to abate, and the survivors thereupon landed. But, alas! There were no longer on the earth trees nor plants. Animals and fish had disappeared. On the verge of starvation the survivors prayed Numitarom to re-create animals and fish, trees and plants, and their prayer was granted."

### CHINA

It is told in the Hihking, one of the ancient Chinese classics, that Fuhi, the reputed founder of Chinese civilization, escaped the waters of a deluge, and reappeared as the first man at the reproduction of a renovated world, accompanied by his wife, his three sons and three daughters.

On a Buddhist temple in China the traveler Gutzlaff reports that he saw "in beautiful stucco, the scene where Kwanyin, the goddess of mercy, looks down from heaven upon the lonely Noah in his ark amidst the raging waters of the Deluge, with the dolphins swimming around him and the dove, with an olive branch in its beak, flying toward the vessel."

## INDIA

The oldest and simplest Deluge legend of India is found in the Rig Veda, a collection of ancient Hindu poems and hymns. This legend is earlier than the 9th century B. C.: "One morning they brought to Manu some water to wash in, and, when he had washed, a fish remained in his hand, which addressed him in these terms, 'Protect me and I will save thee.' 'From what wilt thou save me?' he said. 'A deluge will sweep away all creatures. It is from this I will protect thee,' the fish replied, 'While we are small we live in great danger, for fishes eat each other. Preserve me, therefore, in a bowl. When I grow too large for this, put me in a larger basin, and when I am still larger turn me into the ocean. Thus shall I be saved from destruction.' Presently it became a great fish and said to Manu, 'In the very year in which I shall attain my full growth the deluge will happen. Build thyself a ship and adore me. When the waters rise, enter into the ship and I will save thee. Fasten the ship to a tree, so that the waters may not enter it whilst thou art on the mountain, and when the waters settle down thou canst descend.' As the waters settled down, Manu settled down too. And this was called 'the descent of Manu' on the Mountain of the North. The Deluge had carried off all creatures, and Manu alone remained."

Another East Indian legend runs thus: "Satyavrata, the man who loved justice and truth, king of the Dasar or fishermen, was one day bathing in the river Critamala. Vishnu (the deity) appeared to him in the shape of a small fish, which, passing from one water to another, gradually became larger, until Satyavrata ended by putting it in the sea. Then Vishnu addressed his astonished worshipper, and said, 'In the course of seven days all creatures which have wronged me shall be exterminated by a flood, but thou shalt be saved in a great ship marvelously built. Take, therefore, all kinds of useful vegetables, and then do thou embark with the seven Rishies, thy wife; and their wives. Embark without fear, and thou shalt see God face to face, and He will answer all thy questions.' After having spoken he disappeared, and the earth was submerged by a continual rain. Thereupon Satayavrata, who reflected on the divinity, saw a great ship floating on the waters. He entered in and followed out exactly the order of Vishnu, who, having taken the shape of an immense fish, attached the ship to his immense horn by a great octopus, which served as a cable."

## NORTH AMERICA

"It is a very remarkable fact," says Alfred Murray, "that we find traditions of the Deluge in America coming infinitely nearer that of the Bible and the Chaldean religion than among any people in the old world." While this statement is somewhat exaggerated, it is true that there are many legends strikingly similar in general outline to the Genesis account. A number of them, moving from the north to the south, will be considered.

(1) A traveler named Henry reported that among the Koluishes of Alaska there is a tradition that formerly the father of the Indian tribes lived toward the rising sun. Having been warned in a dream that a deluge would desolate the earth, he built a raft on which he saved himself and family, and all animals. He floated for several months on the water. The animals, who could then talk, complained and murmured against him. A new earth at length appeared. He thereupon alighted with all the animals, which then lost the power of speech as a punishment for their complaining.

(2) From the Esquimaux who lived between the river Collville, West of Makenzie, and Cape Bathurst the following legend was derived:

"The water having poured over the terrestrial disk, human dwellings disappeared. The wind carried them away. They fastened several boats to one another. The waves traversed the Rocky Mountains. A great wind drove them. Presently the moon and the earth disappeared. Men died of a terrible heat. They also perished in the waves. Men bewailed what happened. Uprooted trees floated about in the waves. Men having fastened boats together trembled with cold. Alas, men were enclosed under the tent without doubt. Thereupon a man, called Son of the Screech-owl, threw his bow into the sea. 'Wind, this is enough. Be Still!' he cried. He thereupon threw his ear-rings into the water. It is enough and the end had come."

(3) The Thlinkuts, an Indian tribe inhabiting the Pacific Coast of Canada have the following tradition: "Yehl, the creator of the tribe, was at feud with his uncle, who wished to destroy him. The latter, being baffled in several attempts, was beside himself with fury, and with a potent curse swore he would bring a deluge on the earth. Well content to perish himself, so long as he involved his rival in the common destruction, the flood came. The waters rose, but Yehl clothed himself in his bird-skin and soared up to heaven, where he struck his beak into a cloud and remained till the waters were assuaged."

A tradition among the Thlinkuts, as reported by Bancroft, is used to account for the diversity of language among them, revealing a dim recollection of the tower of Babel. It runs thus: "There was a great flood. Many persons escaped drowning by taking refuge in a great floating building. When the waters fell, this

vessel grounded upon a rock and was broken into two pieces. In the one fragment were left those whose descendants speak the Thlinkut language. In the other remained all those whose descendants employ a different idiom."

(4) The Crees of Manitoba tell of a universal deluge caused by an attempt of the fish to drown Woesachootchacht, a kind of demigod, with whom they had quarreled. Having constructed a raft, he embarked with his family and all kinds of birds and beasts. After the flood had continued some time he ordered several water fowl to dive to the bottom. They were all drowned. But a muskrat, having been dispatched on the same errand, was more successful, and returned with a mouthful of mud.

(5) Among the Cherokee Indians is found this legend: "A dog for several days ran about the banks of a river, looking intently at the water and howling piteously. Its master, having tried to drive it into the house, the dog began to speak, and foretold a coming calamity, saying that his master could only save himself and his family by throwing it into the water, where it would fetch a boat in which the master could take shelter, but that there was not a moment to be lost, for a terrible rain was impending, which would produce a tremendous inundation in which all mankind would perish. The man did as the dog advised him, and thus saved himself and his family, who again replenished the earth."

(6) A remarkably clear and significant tradition is preserved in ceremony by the Mandan Indians, as reported by the early English traveler, George Catlin. He reported that in the center of the village was an open space, or public square, 150 feet in diameter and circular in form, which was used for all public games and festivals, shows and exhibitions. The lodges around this open space fronted in, with their doors toward the center; and in the middle of this stood an object of great religious veneration, on account of the importance it had in connection with the annual religious ceremonies. This object was in the form of a large hogshead, some eight or ten feet high, made of planks and hoops, containing within it some of their choicest mysteries and medicines. They called it the "Big Canoe."

On the day set apart for the commencement of the ceremonies a solitary figure was seen approaching the village. During the deafening din and confusion within the pickets of the village, the figure discovered on the prairie continued to approach with a dignified step, and in a right line toward the village. All eyes were upon him, and he at length made his appearance within the pickets, and proceeded toward the center of the village, where all the chiefs and braves stood ready to receive him, which they did in a cordial manner by shaking hands, recognizing him as an old acquaintance, and pronouncing his name Hu-Mohk-Muck-A-Nah (the first or only man). The body of this strange personage.

which was chiefly naked, was painted with white clay, so as to resemble at a distance a white man. He entered the medicine lodge, and went through certain mysterious ceremonies.

During the whole of this day Nu-Mohk-Muck-A-Nah (the first or only man) traveled through the village, stopping in front of each man's lodge, and crying out until the owner of the lodge came out and asked who it was, and what was the matter. To which he replied by narrating the sad catastrophe which had happened on the earth's surface by the overflowing of the waters, saying that "he was the only person saved from the universal calamity; that he landed his big canoe on a high mountain to the west, where he now resides; that he has come to open the medicine lodge, which must needs receive a present of an edged tool from the owner of each wigwam, that it may be sacrificed to the water; for," he says, "if this is not done there will be another flood, and no one will be saved, as it was with such tools that the big canoe was made."

Having visited every lodge in the village during the day, and having received from each such a present as a hatchet, a knife, etc., he placed them in the medicine lodge; and, on the last day of the ceremony, they were thrown into a deep place in the river—"sacrificed to the Spirit of the waters."

Among the sacred articles kept in the medicine lodge, Catlin relates, are four sacks of water in the form of a tortoise lying on its back. "These four tortoises, they told me," Catlin says, "contained the waters from the four quarters of the world—that those waters had been contained therein ever since the settling down of the waters." The big canoe in the center of the open space, he was informed, was a representation of the ark.

(7) The Lenni Lenape Indians have the following tradition: "Long ago came the powerful serpent, when men became evil. The strong serpent was the foe of the beings, and they became embroiled, hating each other. Then they fought and despoiled each other, and were not peaceful. And the small men fought with the keeper of the dead. Then the strong serpent monster brought the snake-water rushing. The wide waters rushing wide to the hills, everywhere spreading and destroying. At the island of the turtle was Manabozho, the grandfather of men and beings. Men and beings all go forth on the flood of waters, moving afloat every way, seeking the back of the turtle. The monsters of the sea were moving and destroyed some of them (i.e., the people). Then the daughter of a spirit helped them in a boat, and all joined saying, 'Come, help, Manabozho, the grandfather of beings, of men, and turtles.' Much frightened, Manabozho prayed to the turtle to make them well again. The waters ran off. It was dry on mountain and plain. The great evil went elsewhere by the path of the cave."

(8) The Indians of the vicinity of Lake Tahoe say that there

was a time when their tribe possessed the whole earth and were strong, numerous, and rich. But a day came on which a people rose up stronger than they and defeated and enslaved them. Afterwards the Great Spirit sent an immense wave across the continent from the sea, and this wave engulfed both the oppressor and the oppressed, all but a very small remnant. When the deluge was over taskmasters made the remaining people raise up a great temple so that they of the ruling caste should have a refuge in case of another flood. And on the top of this temple the masters worshipped a column of perpetual fire.

### CENTRAL AMERICA

(1) The Papagos, an Indian tribe inhabiting the northwest corner of Mexico, tell the following story: "There was a great flood from which Montezuma, a great divine hero, escaped with his friend the coyote. Before the flood came, the coyote had prophesied its coming, and Montezuma hollowed out a boat for himself, keeping it ready. The coyote also prepared a boat for himself, gnawing down a great cane by the river bank, entering it and stopping up the end with gum. So, when the waters rose, these two saved themselves and met again on dry land after the flood had passed away. Montezuma, anxious to know how much dry land remained, sent the coyote off on four successive journeys, to find exactly where the sea lay toward each of the four winds. From the west and from the south the answer came swiftly, 'The sea is at hand.' A longer search was made toward the east, but there too sea was found. On the north only was no water found, though the faithful messenger almost wearied himself with searching. In the meantime the Great Spirit, aided by Montezuma, had again repeopled the world, and animals and men began to multiply."

(2) The Pimas, another tribe in Northern Mexico and Southern California, relate that a certain prophet was warned by an eagle that a deluge was coming, but the prophet laughed at him. A second warning came from the same bird, which was also unheeded. The eagle came a third time, saying the whole Gila valley would be laid waste. Still he gave no heed. Then there suddenly came a peal of thunder and an awful crash, and a green mound of water raised itself over the plain. It seemed to stand upright for a second, then, cut incessantly by the lightning, it flung itself upon the prophet's hut. When the morning broke there was nothing to be seen alive but one man, if indeed he were a man. Szenkha, the son of the Creator, has saved himself by floating on a ball of gum or resin. On the waters falling a little, he landed near the mouth of the Salt River upon a mountain, where is a cave which can still be seen, together with the tools and utensils Szenkha used when he lived.

(3) The native Mexican historian, Ixtlilxochitl, states, "It

is found in the histories of the Toltecs that this age and the first world, as they call it, lasted 1,716 years; that men were destroyed by tremendous rains and lightning from the sky, and even all the land, without the exception of anything, and the highest mountains were covered up and submerged in water fifteen cubits (caxtolmolatli); and here they add other fables of how men came to multiply from the few who escaped from this destruction in a 'toptlipetlocali,' which nearly signifies a closed chest; and how, after men had multiplied, they erected a very high 'zacuali,' which is today a tower of great height, in order to take refuge in it should the second world (age) be destroyed. Presently their



Fig. 40. Copy of a design on the famous Calendar Stone or Stone of the Sun, which was used by the ancient Aztecs as a calendar and sundial. This stone was originally a part of the wall of the ancient temple of Tenochtitlan, which was in existence when the Spaniards came to Mexico. The design, scholars think, represents an ark with Noah and his wife and animals in it.

languages were confused, and, not being able to understand each other, they went to different parts of the earth. The Toltecs, consisting of seven friends, with their wives, who understood the same language, came to these parts, having first passed great land and seas, having lived in caves, and having endured great hardships in order to reach this land; they wandered 104 years through different parts of the world before they reached Hue Hue Tlapalan, which was in Ce Tecpatl, 520 years after the Flood."

(4) A very ancient Aztec flood legend was translated by Abbe Brasseur de Bourbourg from the Aztec document called the Codex Chimalpopoca. "When the Sun Age came, there had passed 400 years. Then came 200 years, then 76. Then all mankind was lost and drowned and turned to fishes. The waters and the sky drew near each other. In a single day all was lost, and Four Flower consumed all that there was of our flesh. The very mountains were swallowed up in the flood, and the waters remained, lying tranquil during fifty and two springs. But before the flood began, Titlachahuan had warned the man Nota and his wife Nena, saying, 'Make no more pulque, but hollow a great cypress, into which you shall enter in the month Tozoztli. The waters shall near the sky.' They entered, and when Titla-

cahuan had shut them in he said to the man, 'Thou shalt eat but a single ear of maize, and thy wife but one also.' And when they had each eaten one ear of maize, they prepared to go forth, for the water was tranquil."

(5) The Michoacan legend has it that Tezpi was saved in a great flood with his children, several animals, and a quantity of grain. When the waters subsided he sent out a vulture, which began to feed on the carcasses lying about and never returned. He then sent out other birds including a humming bird, which returned to him with some green leaves.

(6) Father Bobadillo (1538) collected from the Indians of Nicaragua a tradition that before the present race of men lived, the world was overwhelmed by water and all became sea. A pair escaped in heaven, who afterward returned to earth, arranged affairs as we find them, and from them mankind was regenerated.

## SOUTH AMERICA

(1) Peru supplies the following: A shepherd and his family noticed that his flock of llamas looked sad, and seemed to study the stars. On inquiring from them, they pointed to six stars close together, and declared that they were a sign that the world would shortly be destroyed by a deluge. He thereupon collected his llamas and his children, and took them to the summit of the mountain Ancasmarca, where a crowd of other animals had already sought safety. Scarcely had they reached the summit when the sea broke its bounds and rushed over the land. As the water rose higher and higher, filling the valleys and covering the plains, the mountain refuge rose with it, floating on its surface like a ship. This lasted five days, during which the sun was hidden and the earth was in darkness. On the 5th day the waters began to subside and the stars to reappear. The earth was repeopled by the descendants of the shepherd of Ancasmarca.

(2) Brazil furnishes the following: There was a flood in which one family escaped. It was the old sage Tamanduare. He, being endowed with great knowledge, escaped the flood (according to some natives in a boat, according to others by mounting a palm tree). His family consisted of two people, himself and his sister, who was also his wife. From these two the race was renewed.

## PACIFIC ISLANDS

(1) The Leeward Islands furnish this tradition: "Shortly after the first peopling of the world by the descendants of Taata (their Adam), Ruahatu, the ocean god was reposing among the coral beds in the depth of the ocean in a sacred spot. A fisherman lowered his hook among the branching corals at the bottom, and his hook became entangled in the hair of the sleeping god. In an instant the god, aroused from his slumbers, appeared at the surface, and after upbraiding him for his impiety, declared the land was criminal, or convicted of guilt, and should be destroyed.

The affrighted fisherman prostrated himself before the god of the sea, confessed his sorrow for what he had done, and implored his forgiveness, beseeching him that the judgment announced might be averted, or that he might escape. Ruahatu, moved by his penitence and importunity, directed him to return home for his wife and child and then proceed to a small island called Toamarama. Here he was promised security amid the destruction of the surrounding islands. The man hastened to his residence and proceeded to the place appointed. They reached it before the close of the day, and as the sun approached the horizon, the waters of the ocean began to rise. The inhabitants of the adjacent shores left their dwellings on the beach and fled to the mountains. The waters continued to rise during the night, and the next morning the tops of the mountains alone appeared above the widespread surface of the sea. These were afterward covered, and all the inhabitants of the land perished. The waters subsequently retired, the fisherman and his companions left their retreat, took up their abode on the main land, and became the progenitors of the present inhabitants.

(2) A Fiji Islander flood tradition runs thus: After the islands had been peopled by the first man and woman, a great rain took place, by which they were finally submerged, but before the highest places were covered by the waters two large double canoes made their appearance. In one of these was Rokova, the god of the carpenters. In the other was Rokola, his head workman. These picked up some of the people and kept them on board till the waters had subsided, after which they were again landed on the island. The persons saved, eight in number, were landed at Mbenga, where their god is said to have made his first appearance. By virtue of this tradition the chiefs of the Mbenga take rank before all others, and have always acted a conspicuous part among the Fijians.

Another Fiji Island legend, as reported by Williams, is that the cause of the flood (which some natives say was partial, some universal) was the killing of a favorite bird of the god Mdengei, by his two evil grandsons. These, instead of apologizing for their offense, added insolent language to the outrage, and fortifying themselves in the high town in which they lived, defied the god to do his worst. The angry god then gathered the dark clouds together and caused them to burst, pouring streams of water down upon the doomed earth. Towns, hills, mountains, were successively submerged. The rebels, however, secure in their superior height, looked on without concern. At last the terrible surges invaded their fortress and they cried in distress. A god taught them how to build a canoe and thus save themselves. Williams says that all the natives agree that the highest places were covered and the remnant of the race saved in some kind of a vessel, which was at last grounded by the subsiding waters on Mbenga.

Hence the Mbenga draw their claim to stand first in Fijian rank.

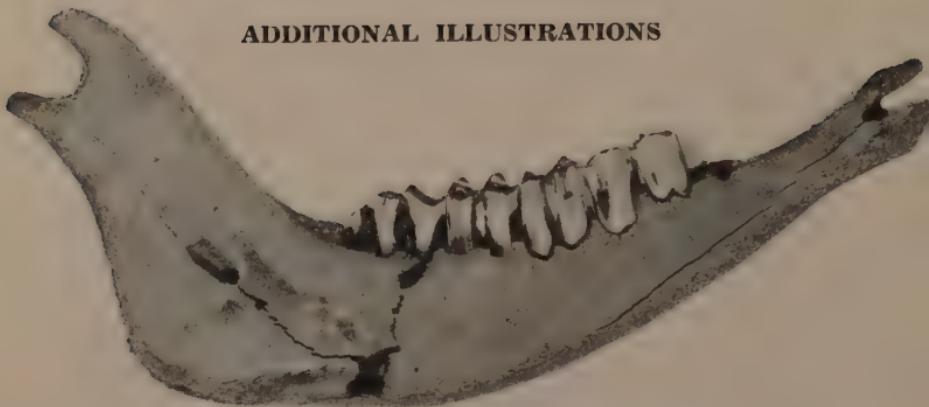
(3) From the Andamans, a negroid, pigmy race of the Pacific Islands comes the following: "Puluga, the creator of all things, was angry with the first human beings whom he had made, and sent a great flood, which covered the whole land and destroyed all living. Four persons, two men, Lo-ralola and Po-ilola, and two women, Ka-lola and Re-malola, who happened to be in a canoe when the catastrophe came, were able to effect an escape. When the waters subsided, they found themselves near Wotaemi, where they landed and discovered every living thing on the earth had perished. But Puluga recreated the animals and birds. In spite of this, however, they suffered severely in consequence of their fires having been extinguished and they could devise no means of repairing their loss. At this juncture one of their deceased friends appeared in their midst in the form of a bird, Lu-ratut. Seeing their distress he flew to the sky (moro) where he discovered Puluga seated beside the fire. He thereupon seized and attempted to carry away in his beak a burning brand, but the heat rendered the task impossible and the blazing brand fell on Puluga. He, incensed with pain, hurled it at the intruder. The missile missed its mark and fell near the spot where the four survivors were deplored their condition. As Lu-ratut alighted in their midst at the same moment, he gained the full credit of having removed the chief cause of their distress. Puluga explained that they had brought the deluge upon themselves through their wilful disobedience of the strict injunctions he had laid down, and which had always been observed by their forefathers. And he intimated that a repetition of their transgression would inevitably lead to their destruction."

(4) The Hawaiians say that long after the time of Kumuhonua (the first man), the earth became wicked and careless of the worship of the gods. One man was righteous, Nu-u. He made a great canoe with a house on it and stored it with food, taking plants and animals into it. Then the waters came up over all the earth and destroyed all of mankind except Nu-u and his family. When he came out upon the land after the waters had subsided, he looked up and saw the moon, and thought that it was Kane (the great god), so he worshipped it. This displeased Kane and he came down on a rainbow and reproved Nu-u, but he did not punish him, for Nu-u did this by mistake. When he returned to the sky he left the rainbow behind him in token of his forgiveness.

(5) According to the National Geographic Magazine, the Menangkaban natives of Sumatra have a tradition that Noah landed on their Mount Marapi, and to this day they make their thatched houses in the shape of an ark or galley with a peaked prow at each end and set on stilts.

## Additional Illustrations and Index

## **ADDITIONAL ILLUSTRATIONS**



**Jaw-bone of a land animal from a stone quarry near Papillion in eastern Nebraska with its matrix of limestone carefully removed.**



**Upper shell of a turtle from near Chedron in western Nebraska with its matrix of limestone removed.**



**Lower shell of the same turtle.**



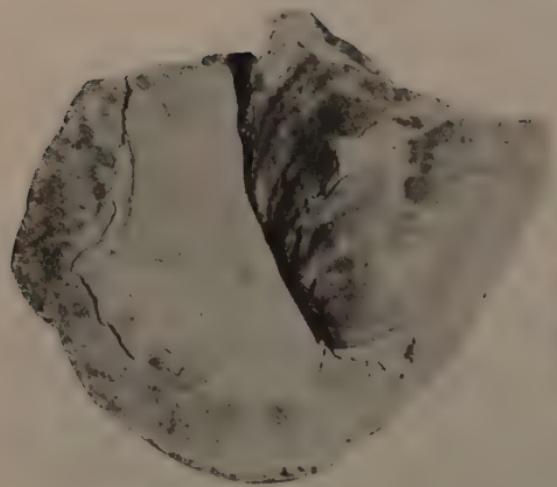
**Part of a straight-shelled cephalopod found at Buffalo Gap  
in western North Dakota.**



**Another larger straight-shelled cephalopod.**



**A coiled cephalopod.**



**Pelecypod (clam).**

The author is indebted to his friend, Ray Lamb, of Pampillion, Nebraska, a life-long collector of fossils, for the pictures shown here.

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