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The Geological Implications of Genesis CH 1-11

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THE GEOLOGICAL IMPLICATIONS OF GENESIS CH. 1-11.

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by
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The writer's presentations do not violate any clear teachings of Scripture, but since many of his conclusions are speculative, approval of the thesis in no wise is to be understood to imply agreement with all the author's views.

Approved by George J. Fleck
Alfred von Rohr Sauer

INTRODUCTION

This thesis is written on the premise that God has given man two books from which he may learn to know Him, the book of nature and the Holy Scripture. There can be no contradiction between these two books. Where men have affirmed contradictions between them, e.g., on scientific grounds, they either misinterpreted scientific data or the words of Scripture.

Our thesis holds furthermore, that while Scripture was not given to serve as a textbook of science, but to make men wise unto salvation[1], and to teach them how to live in this world as children of God[2], it nevertheless contains numerous statements with important scientific implications. The first eleven chapters of Genesis abound in such passages, with implications particularly for the sciences of geology and biology.[3]

It is the avowed aim of this thesis to treat these passages exegetically so far as that is necessary in order to point out their geological implications.

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[1] 2 Tim. 3, 15.

[2] Ps. 119, 9.

[3] It is difficult if not impossible to treat these sciences separately, because of the wealth of fossils imbedded in the sedimentary rock strata within the earth.

Gen. 1, 1. 2.

"In the beginning God produced the heavens and the earth. And the earth was desolate and empty, and darkness (was) upon the surface of the deep, and the Spirit of God (was) hovering over the surface of the waters."

These verses teach in clear language the creation[1] or forming of the heavens[2] and the earth by an act of God. Whether or not God used pre-existing materials this passage does not say. The word בָּרָא in itself would not preclude the idea,[3] since it is used repeatedly in Scripture in contexts where a creatio ex nihilo is clearly not intended, e.g. Josh. 17, 15,[4] and Is. 65, 18.[5]

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1 בָּרָא, according to Gesenius, A Hebrew and English Lexicon of the Old Testament, Thirty-sixth Impression: "to cut, to cut out, to carve, to form, to create, to produce."

2 שָׁמַיִם, "the skies, the heavens, the firmament."

3, 4, 5 In his "The Babylonian Genesis", pg. 76 f. Alex Heidel states his conclusions which correspond with those of the writer of this thesis as follows: "Genesis, chapter 1...predicates a creation out of nothing (creatio ex nihilo), that is to say, it asserts that by the sovereign will and power of God matter was brought into existence from vacuous nothing at the creation of the universe.

"This idea, however, cannot be deduced from the Hebrew verb בָּרָא, 'to create', as it has been done... the idea of a creation out of nothing is a connotation which has been read into בָּרָא."

The writer then shows that the "creatio ex nihilo" is a necessary deduction from the whole account.

How true is Heidel's remark that the creatio ex nihilo does not lie in the basic connotation of the word בָּרָא may be seen from the following passages.

Josh. 17, 15. "Go up to the forest and cut out (וּבָרֵאתָ Piel form of בָּרָא) for yourselves there in the land", etc.

Is. 65, 18. "Behold I am creating (Qal Ptcp. of בָּרָא) Jerusalem a rejoicing." Jerusalem was already there, therefore a creatio ex nihilo cannot be intended here.

The thought that God used pre-existing materials in the creation of the world is, however, precluded by Hebr. 11, 3.[1] We have here, therefore, the beginnings, not only of the form, but of the matter of heaven and earth.

Instead of, "And the earth was desolate and empty",[2] some translate,[3] "And the earth became desolate and empty", and they understand this to mean that a once glorious earth was destroyed and rendered desolate and empty by a great catastrophe connected with the fall of Satan and the evil angels.

According to this view what follows Gen. 1, 1. 2. would refer, not to an original creation, but rather to a re-creation of the earth, and many of the fossils of extinct monsters would belong, not to the present, but to a former creation.

Others, troubled by the claims of geologists as to the great age of the earth,[4] wish to place an immensely long period of time between Gen. 1, 1. 2. and Gen. 1, 3 ff, so that the earth was already old when God said, "Let there be light".

It is true that the Bible, at times, in its narrative, passes

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[1]Hebr. 11, 3. "By faith we know the world to have been prepared by the Word of God, so that not out of things which can be seen has that which is seen become."

[2] תֹּהוּ וָבֹהוּ .

[3]cp. Harry Rimmer, Modern Science and the Genesis Record, pg. 30 ff.

[4]Dunbar, Historical Geology, pg. 21-29. This elaborate discussion of the manner in which geologists seek to establish the age of the earth ends with the conclusion, pg. 29: "It is clear that the earth is more than 2,000,000,000 years old."
For a similar conclusion see Longwell, Knopf, Flint, Textbook of Geology. pg. 2.

over periods of time without expressly indicating that it does so. Luke 2, 39, we are told that after Jesus' presentation in the temple, "when they had performed all things according to the law of the Lord, they returned into Galilee, to their own city." However a comparison with Matth. 2, 22.23 reveals the fact that the return to Galilee came, not immediately after the presentation in the temple, but after the return from Egypt, which cannot well be placed before the presentation.[1] We cannot but conclude, therefore, that St. Luke is speaking of the return to Nazareth which followed, not immediately after the presentation of the Child, but after His return from Egypt.

However Scripture itself forbids us to place a long period of time between Gen. 1, 1.2. and the rest of chapter 1. In Ex. 20, 11 we are told, "In six days Jehovah made the heavens and the earth, the sea and all that is in them, and He rested on the seventh day." This passage includes the creation of the heavens and of the earth in the work of the six days, and both the view of a world destroyed in connection with the fall of the angels, and the other of a long period of time between verses two and three of Genesis 1 are ruled out.

The purpose of our thesis demands that we discuss here briefly the term תְּהוֹם in the setting in which it stands in Gen. 1, 2. A fuller discussion of the term is reserved for Gen. 7, 11.

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[1]Cp. Edersheim, The Life and Time of Jesus the Messiah, Vol. 1, pg. 204. "Shortly after the Presentation of the Infant Savior in the Temple, certain Magi from the East arrived in Jerusalem....."

The term here does not yet denote the ocean, as it does later,[1] for the ocean had not yet been formed. Rather, we must conclude from verse 9, where God commands the waters to gather themselves together into one place and to let the dry land appear, that the whole surface of the earth was covered with water, and that תְּהוֹם here stands for the primordial waters swirling[2] over the whole face of the earth.

Gen. 1, 9-13

"And God said, Let the waters from under the heavens gather themselves together to one place, and let the dry appear; and it was so. And God called the "dry" "land", and the collection of the waters He called "Seas". And God saw that it was good. And God said, Let the earth cause to sprout green herbage bearing seed, fruit trees (Heb. sing. collect. here and often in the following.) bearing fruit, according to their kind, which (have) their seed in them upon the earth; and it was so. And the earth brought forth green herbage, bearing seed, after its kind, and trees bearing fruit which had their seed in them according to their kind; and God saw that it was good. And it was evening; and it was morning, the third day."

The work of the third day of creation was a stupendous accomplishment, geologically speaking. God commands the waters under

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[1]See our discussion of תְּהוֹם רַבָּה under Gen. 7, 11.12.

[2]According to Gesenius, Op. cit. the word תְּהוֹם is a poetic word, properly signifying 'a mass of raging waters', so called from their noise and roaring.

the heavens (clearly the waters of the תְּהוֹם Vs. 2, which still covered the earth) to be gathered together in one place, this place to be known thereafter as "seas". On that very same day also grass, herbs, and fruit trees were created. The earth must, consequently, on this same third day, have become fit at least for plant-life.

Now the imagination of man is staggered at the thought of what must have taken place on this third day of the hexaemeron. To drain a flooded earth, -no less a thing had to be done,- certainly required, according to the simplest laws of physics, that high and low places should develop, so that the water might drain from the higher into the lower places, in order that the great ocean basin might develop. This called for mountain formation and for the formation of a vast depression in the earth's surface. And since mountains, at least mountains as we know them, generally have cores of hard igneous rock,[1] once clearly molten by heat, and the ocean bottom is underlaid by basalt,[2] a black, igneous rock, also once molten, but cooled far more quickly, and therefore far more dense than the lighter granites and other igneous rocks which form the cores of our mountains,[3] it seems imperative that

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[1]Compare the whole chapter in Longwell, Knopf, Flint, Text-book of Geology, pg. 378 ff. on The Origin and History of Mountains.

[2]Longwell, Flint, Knopf. Op. cit. pg. 173. "Presumably the continental masses stand high because they are made of light granitic rocks, and the deep-sea areas are depressed because they are formed of heavy basaltic rocks."

[3]Longwell, Flint, Knopf. Op. cit. pg. 402. "Intrusion of the heated magma, combined with the folding and mashing of the strata, causes profound metamorphic effects over wide areas. Invading masses of this character are an especially conspicuous feature of the Coast Range in western Canada, where granitic rocks are exposed in a continuous belt 1100 miles long."

we believe, that on this third day of the creation mountain and ocean formation took place with all that this implies.[1]

The question at once arises in the thinking reader's mind, whether all this work was finished in the short span of a twenty-four hour day,- whether, even granted that the mountains had risen to their full height in twenty-four hours, all the waters could have reached the sea in that short time, seeing that water traveling even as slowly as twenty miles an hour exercises tremendous destructive force.[2] One is constrained to say that under the laws of nature

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[1]This does not mean that we subscribe to the view of many geologists that the earth began as an incandescent globe and had to cool for millions of years before life could come into being on it. Also today there is proof of great heat in the interior of the earth, as shown by the high temperatures in many mines, and by the hot springs found in many places on earth. The heat which pushes up mountains is deep down in the earth, as also some of the most modern geologists assume (see the quotation from "The Blister Hypothesis" by C.W. Wolfe below, pg.57f). It is no more unthinkable that living creatures should have been upon earth while heat deep down in the earth was helping to shape the earth's contours than it is that life should exist on earth now while active volcanoes and geysers are found in some places and some deep mines have temperatures almost unbearably hot for the miners who work in them. Our assumption that mountain formation with all that this implies was going on on the third day of creation is not at all in conflict with our other assumption that Genesis is wholly trustworthy when it reports that on the same day on which God created the sea, He also created plant-life. Cp. Gen. 1, 9-13.

[2]Longwell, Knopf, Flint, Op. Cit. pg. 43. "Laws of Erosive Power. "Having examined the factors that control stream velocity, we can now turn to the effect of increased velocity on erosive power. Two relationships are important here. The first concerns transporting power or 'competence'. If the velocity of a stream be doubled, the diameters of rock fragments it can move are increased four times. In other words, the maximum diameter of the individual rock fragments a stream can move varies as the square of the velocity (assuming that all the fragments have the same specific gravity). The second concerns abrasive power. Calculations have shown that doubling the velocity of a stream increases its abrasive power at least four times, and under certain conditions as much as 64 times. In other words, abrasive power varies between the square and the sixth power of the velocity.

"These laws not only explain the vastly greater erosion accomplished by swift streams than by slow ones under normal conditions, but they show clearly why exceptional floods, greatly increasing velocity by increasing volume, have such tremendous

as they operate today it seems impossible that the whole earth should have been drained in twenty-four hours. Yet Gen. 1, 11.12 testifies that God on this day also created grasses, herbs and trees.

Many earnest Bible readers who deeply and earnestly desire to believe the word of God, feel that here they must help themselves by assuming that in this case "day" means, not a solar day as we know it, but a long period of time, a thousand, or even thousands of years. Their arguments are too well known to need stating here. We gladly grant that the Bible at time uses the term "day" (Hebr. "yom") in the sense of a longer period of time.[1] However the

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destructive power. The volume of the Colorado River measured at Yuma, Arizona, during a flood in 1921, was 155 times its normal volume. Again, when the St. Francis dam near Los Angeles gave way in 1928 and flooded the valley below, huge blocks of concrete weighing up to 10,000 tons each were moved by the escaping water. In India, during the Gohna flood in 1895, which lasted just four hours, the water picked up and transported such quantities of gravel that through the first thirteen miles of its course the stream made a continuous gravel deposit from 50 to 234 feet thick."

Floods as we know them, even very destructive floods, hardly advance at the rate of a hundred miles a day. If all the water actually drained from the continents in twenty-four hours on the third day of creation, then some of it, e.g. from the interior of Asia, must have traveled two thousand miles or more in twenty-four hours. When we try to figure the probable destructive force of such immense masses of water traveling at such an unheard-of speed, the mathematics passes beyond human comprehension.

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[1]for Pg. 8. Of a fairly impressive list of passages of this nature I am quoting the following: Ps. 110, 3. "Thy people shall be willing in the day of Thy (the Messiah's) power." This passage parallels the quotation in Webster's New International Unabridged Dictionary, where the following is quoted to show the use of the term "day" for a specified period or age: "Great among the Hellenes of his day. Jowett (Thucyd)." Amos 9, 11. "In that day (Heb. yom) I will raise up the tabernacle of David," etc. This prophecy was fulfilled, according to Acts 15, 16, in the bringing of the Gentiles into the Christian Church. This again was not accomplished in a day of twenty-four hours, but in a long period of time, in which sense the word "day" should, consequently, here be understood.

Bible itself seems to forbid that understanding here. First of all this day had a morning and an evening, therefore daylight and darkness. If we assume that the day was a long period, then logic would demand that we assume a long period for the night also. Since this manifestly fits neither the thinking of the people in question, nor the case in point, the proponents of the meaning "period" for "day" in Genesis 1 have no case.

Their case looks even worse when we compare Ex. 20, 11. In the three preceding verses God speaks plainly of days of twenty-four hours, six days for labor, and the seventh for a Sabbath of rest. And then He continues, "For in six days the Lord made heaven and earth," etc. It seems hardly good exegetical procedure to take the first as ordinary days, and the days of verse 11 as long periods of time. Yet the difficulty of draining the whole earth in twenty-four hours according to known laws of nature remains.

We propose the following solution, which, we believe, is not out of harmony with Scripture, and which will explain some geological phenomena far better than all the evolutionary theories under the sun have ever done, with their hundreds of millions of years, which are intended to explain the formation of the orderly ancient rock strata deep within the earth, with their strange masses of marine fossils, which in succeeding strata give way to fossils of a far different kind,- strata which at the very bottom have been so completely metamorphosed by heat from underneath, that scientists often cannot tell just where the igneous rocks

leave off, and the sedimentary strata begin.[1]

We observe first of all that, when God created man, He did not at once create many people, but one pair, and said, "Be fruitful, and multiply, and fill the earth." Scripture does not say that in the case of the animals He created only one pair of each kind, but it does indicate that He did not at once fill all available space with life, for in the case of fowl and water animals at least we are told Gen. 1, 22, "And God blessed them saying, Be fruitful, and multiply, and fill the waters in the seas, and let fowl multiply in the earth."

Since it is evident from the passages cited that God, in creation, began a work which was to continue, it should also be permissible to assume, that in draining the earth the Lord did not finish the task in twenty-four hours, but merely began a work which continued, for months, for years, or even for centuries, while on the first day (the third day of the hexaemeron) only so much of this work was finished as was necessary in order that the

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[1]Le Conte, Elements of Geology, Pg. 228. "There is a third class of rocks, intermediate in character between the ordinary sedimentary and the igneous rocks... The rocks of this class are stratified, like the sedimentary, but crystalline, though never glassy, and usually non-fossiliferous, like the igneous rocks. They graduate insensibly on the one hand into the true unchanged sediment, and on the other into true igneous rocks of the granitic type.

"Origin.-Their origin is evidently sedimentary, like other stratified rocks, but they have been subsequently subjected to heat and other agents which have changed their structure, sometimes entirely destroying their fossils and even their lamination structure, and inducing instead a crystalline structure. The evidence of their sedimentary origin is found in their gradation into unchanged fossiliferous strata; the evidence of their subsequent change by heat, in their gradation into true igneous rocks. For this reason they are called metamorphic rocks.

"Position.-All the lowest and oldest rocks are metamorphic."

rest of the work of creation might proceed. Then, as more land gradually emerged from the waters which were forming the seas and became habitable, plant life, which is peculiarly fitted to spread quickly, overspread the land from the seeds which the original plants bore, and the multiplying animals, finding their table spread, followed.

It should not be thought that this understanding will run into difficulty with Genesis 4. Every passing day increased the area of dry land, and, after all, no one knows, nor for that matter, needs to know how long it took before all areas of the globe had emerged from the waters and the seas held all of the original הָאָרֶץ.

Far from causing difficulty elsewhere, our understanding of the draining of the earth can help to clear up what might otherwise appear as a difficulty in Genesis 2, namely the name "Eden".

Gen. 2, 8

"And Jehovah God planted a garden in a pleasant place, eastward, and there placed He the man whom He fashioned."

Already the old exegetes realized that the term "Eden" is not really a proper name, as it came to be regarded in time, but that עֵדֶן in Hebrew means "pleasantness", or "a pleasant place". Now, if we understand human language correctly, then calling this a pleasant place distinguishes it from other places which were not yet pleasant. It appears reasonable to conclude that this was an "eden" because it was already well drained, while other portions of the globe were not yet properly drained and therefore not such

fit places for the habitation of God's foremost creatures.

If we have read the sacred record correctly and drawn our conclusions properly, we are in a position to explain much in the fossil world, with which unbelieving geologists have sought to harass believers in the divine inspiration of the Scriptures.

Geology bases many of its conclusions on the fossil record of the strata within the earth. The oldest strata, we are told, (oldest because lowest of all strata, although by no means found everywhere on earth),[1] contain no fossils. These strata are the so-called Archaean. These rocks are in many instances overlaid by the so-called Palaeozoic rocks, these in turn by the Mezozoic, etc. Now geologists tell us that, while the lowest and therefore oldest rock strata laid down by the action of water contain no fossils, later strata do contain fossils, the earlier of these chiefly mollusks and other invertebrates, still younger strata fish, until finally the mammals and man appear in the youngest strata.[2]

From the succession of rock strata within the earth's crust together with the fossil forms imbedded in this succession of strata geologists and biologists have postulated an evolution of higher forms of life from lower, covering hundreds of millions of years. They deny that man and the higher mammals existed contemporaneously with the strange creatures whose fossils lie imbedded

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[1]Longwell, Knopf, Flint, Op. Cit. Pg. 8. "Three-fourths of the land area of the globe is underlain by sedimentary rocks." Ibid. pg. 391. "On the east side of the Appalachians the sedimentary strata do not exist."

[2]See the Time-Scale of Earth History in Longwell, Flint, Knopf, Op. Cit. Pg. 493.

in the oldest, often highly metamorphosed sedimentary strata, because no fossil men or fossil mammals have been discovered in these particular strata.[1]

If our understanding of the Biblical account is correct, we can offer a far simpler explanation of the fossil forms in the succeeding strata, an explanation wholly in accord with the facts of science and with the statements of Scripture.

We have assumed previously that on the third day of creation God started the process of separating the waters from the land, a process which, however, was not finished in twenty-four hours, but may have continued for centuries. After all, to drain the whole earth without wrecking it, was a tremendous task.

This drainage must have begun the formation of the unnumbered rock strata within the earth's crust. As portions of the earth rose above the waters of the □יָם and others sank to form the ocean floor, broad flood-plains must have developed, and it was in these broad flood-plains that the first sedimentary strata must

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[1]Very interesting admissions about the great variety of species of both flora and fauna in very ancient fossil-bearing strata are found in Le Conte, Elements of Geology, pg. 310 ff. We quote from pg. 313. "At the end of the Archaean (the most ancient) times-when the Archaean volume closed-we find, if any, only the lowest Protozoan life with possibly sponges. But with the opening of the next era, apparently with the first pages of the next volume, we find already all the great types of structure except the vertebrata. And these are not the lowest of each type, as we might have expected, but already trilobites among Arthropods, and Cephalopods among Mollusca-animals which can hardly be regarded as lower than the middle of the animal scale.

"We must not hastily conclude, however, that these widely divergent and highly-organized types originated together at once. We must remember that between the Archaean and the Palaeozoic there is a lost interval of enormous duration. Evidently, therefore, the Primordial fauna is not the actual first fauna. Evidently we have not yet recovered the leaves in which is recorded the gradual differentiation of these widely-distinct types. All this must have taken place during the lost interval."

have been laid down, for wherever there is drainage, there are sediments, and wherever there is sedimentation, sedimentary rock may be formed.[1] This process of sedimentation and of sedimentary rock formation therefore began on the third day of the hexaemeron, before there were any fauna upon earth. When animal life appeared on the fifth day of the hexaemeron, fossils were not immediately formed, for death had not yet entered the animal world. It was, however, not long before sin, and with it death, came into the world. One should expect that the first fossils encountered in the Archaean rocks would be, not elephants and human beings, but those very animals which frequent shallow seas, which were slowly receding before the rising land, and of these again not the nimble fish, but the stationary sponges and the lumbering mollusks. This assumption agrees quite closely with the facts.[2]

Nor need we be perplexed by the fact that in higher, and therefore younger strata the so-called higher forms of animal life appear. For one thing, the animals had to be fruitful and multiply and fill the earth. In the very nature of the case some animals multiply far more quickly than others, and these are the so-called "lower" forms. It is therefore the lower forms which would take over the field most quickly, only to meet competition from, and to be eaten by the more slowly spreading, but stronger and more predatory forms, as these multiplied and overspread the earth. Last of all we should expect to find fossils of mammals, which reproduce sparingly com-

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[1]See "Limestone Deposits from Rivers" in Grabau, Principles of Stratigraphy, Pg. 341 f.

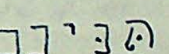
[2]Note 2, Pg. 12.

pared with the lower forms of life, and live correspondingly much longer.

This explains far better than all the evolutionary theories ever could the sudden appearance of high forms of flora and fauna in the rock-strata without any apparent antecedents. They appear, not when they have evolved from lower forms, but when they have multiplied and overspread a certain area.

Gen. 1, 20-23

"And God said, Let the waters swarm with swarms of living animals, and let fowl fly over the earth upon the face of the firmament of the heavens. And God created the great sea-monsters, and every living animal, the crawling things with which the waters teem, after their kind, and every winged fowl after his kind; and God saw that it was good. And God blessed them saying, Be fruitful and multiply, and fill the waters in the seas, and let the fowl multiply in the earth. And it was evening, and it was morning, the fifth day."

This account is most important for an understanding of geology. On the fifth day God creates the aquatic animals and the birds. The aquatic animals are not created beginning with a few primitive species, which are then to evolve, culminating finally in fish and in large sea animals. Rather, on the fifth day God creates them all, including the great  translated by the A.V. as "whales", by Smith-Goodspeed as "sea-monsters", by DeWette, "See-fische".

Significant in these verses is the Hebrew word 

translated in the A.V. as "the moving creature". But the Hebrew verb שָׁרַץ, from which the noun שֶׁרֶץ is derived, means rather "to crawl", in the sense of "to teem", "to swarm". Therefore Smith-Goodspeed translates, "Let the waters teem with shoals of living creatures." DeWette very appropriately renders it, "Es wimmele das Wasser vom Gewimmel lebendiger Wesen."

Geologists who demand almost endless periods of time for the formation of the earliest strata of sedimentary rock, and for the "mountains" of calcareous fossil rock[1] in certain portions of the earth would do well to read Gen. 1, 20, and remember how fast this שֶׁרֶץ multiplies.[2]

Add the fact that the climate was favorable, the food supply adequate, and it is evident that the שֶׁרֶץ must have multiplied infinitely faster then than now, when so many untoward

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[1]See the chapter on Fossil Reefs in Grabau, Op. Cit. pg. 417-445.

[2]On this subject Dr. Harry Rimmer, Modern Science and the Genesis Record, pg. 244 ff. remarks: "Every living creature that moveth. This is, in Hebrew, literally, 'the rapidly multiplying creatures'. In all the literatures of the world, this is the most marvellously concise and conclusive description of the creatures that dwell in an aqueous enviroment! There is no exception to this; the creatures which inhabit the waters are the most rapid multipliers in the world...

"A female mackerel lays about five hundred thousand eggs at a time... So if we start with just one pair of mackerel, and all their progeny escape the dangers of sea life and come to maturity, the mackerel would in ten years fill all the oceans on the face of the globe. The ocean is deep as well as wide, parts of the Pacific being over thirty-two thousand feet in depth... Yet in ten years the progeny of one pair of mackerel would fill all the oceans so full that we could walk from continent to continent, and from island to island, dry shod, on the backs of living mackerel.

"The herring are even more literal in their obedience to the divine order, and their fecundity is even more startling. If the progeny of one pair of herring were unchecked for twenty years, in that time they would equal the bulk of the entire globe."

conditions in nature tend to retard reproduction.

Of the size and complexity of the earliest known fossil birds we shall have something to say under Gen. 3, 14.

It should be noted that the fowl was to fly "over the earth", not above the waters in which they had their origin. According to verse 22 the fowl was to multiply "on the earth".

This will go a long way to explain why birds, which were present contemporaneously with the low forms of water animals, having been created on the same day with these, are not found in a fossilized state mingled with sponges and mollusks in the sedimentary strata of an early date. They lived and died, for the most part, on the land. Therefore also they were normally not fossilized, but decayed, flesh and bones, as they normally do today. Only when a bird had an accident, and ended up in the water, would there be a chance that its skeleton might be fossilized among the עוף which was dying and being fossilized in an orderly array there.

Gen. 1, 24-25.

"And God said, Let the earth bring forth living animals (Hebr. Sing. Collect.) after their kind, domestic beasts, and reptiles, and the wild beasts of the earth after their kind; and it was so. And God made the beasts of the earth after their kind, and the domestic animals after their kind, and all the reptiles of the earth after their kind; and God saw that it was good."

This passage brings us face to face with the argument, which has raged violently since the days of Charles Darwin, concerning the origin of species. Evolutionists hold the well known theory

that species have changed considerably through the ages, many going to the extreme of holding that all life developed over periods of hundreds of millions of years from an original one-celled animal. Few would follow Darwin today in all his reasoning, but by and large the theory is that of Charles Darwin.

Creationists on the other hand usually maintain that God created the "species", and that this passage teaches their view in unmistakeable words.

Lest we argue to no point at all, and both sides completely misunderstand each other, let us see first of all what scientists understand by the term "species". "Species" is a Latin word which has been taken over in its exact Latin form into English. It means "outward appearance", "shape", "form".

In biology it means, according to Webster's Unabridged Dictionary of 1934,

> "A category of classification lower than a genus or sub-genus, above a sub-species or variety; a group of animals or plants which possess in common one or more characteristics distinguishing them from other similar groups, and do or may interbreed and reproduce their characters in their offspring, exhibiting between each other only minor differences bridged over by intermediate forms (see sub-species) and differences ascribable to age, sex, and polymorphism, individual peculiarity, or accidents, or to selective breeding by man; a distinct kind or sort of animal or plant.
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> "Until the acceptance of the theory of evolution, a species was regarded as being the offspring of a single specially created ancestor or pair; hence, each species was considered as definitely separated from other species, and usually as unchanging from one generation to another."

This is a formidable definition indeed of the term "species". It reveals the deep cleavage between the understanding of most scientists on the one hand and of many theologians on the other hand concerning the meaning of the term "species".

How fast and loose scientists tend to play with the term may be illustrated by an example in the Science Section of the December 19, 1949 issue of the newsmagazine "Time". Speaking of the work of Entomologist Thomas Elliott Snyder of the U. S. Department of Agriculture on termites, Time says among other things the following:

> "When Snyder joined the Department of Agriculture in 1909, the most up-to-date termite catalogue available was one published five years earlier in Belgium. The Belgians had catalogued 400 species. When Snyder published his definitive work on U. S. termites in 1935 (Our Enemy the Termite; Comstock Publishing Co., Inc.), the number of classified species had jumped to 1,915. Last week in Washington, the Smithsonian Institution was selling Snyder's latest work, a paperbound, 490-page publication entitled, Catalog of the Termites (Isoptera) of the World-a revised classification of 1,932 species..."
>
> "Snyder believes that his latest catalogue only scratches the surface. His best guess on the ultimate number of species which may be discovered: almost 5,000."

We have no quarrel with scientific men if they want to use the term "species" in this fashion. That is their privilege. One should, however, understand that this definition and usage is far different from that generally used by churchmen when they wrote against the evolutionary theories.[1]

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[1]The confusion in the use of the term "species" and the loose manner in which the term has often been applied by scientists was clearly recognized and discussed by Dr. Theodore Graebner in his book, God and the Cosmos, Ed. 1932. We quote from Pg.191 ff.

"The three definitions printed above agree in this that they make the ability to interbreed the outstanding mark of the idea species. The species accordingly is limited by the ability to produce fertile offspring. However the varieties may differ, if their mating has this result they are but variations within the species. It is known that often a new variety was called a species which did not meet the conditions here demanded. An actual new species must show some new character which no ancestor possessed, and must show that this new character will breed true under all circumstances and persist through continuous transmissions. There must be difference of form, structure, and habit to constitute a new species. Nevertheless, a great deal of uncertainty has developed regarding the

In our great museums one may see, not only different "species" of cattle, such as Musk Oxen and others, but also different species of bisons, antelopes, horses and other animals. According to such a loose use of the term "species" one might justly call the Jersey cow one species, the Brahma cow another, and the Santa Gertrudis still another, with similar classifications for the rest of the breeds. They certainly have noticeably different characteristics which are too generally known to need describing here. Yet evolutionists and creationists alike will agree that all these are des-

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classification of a given variety. To one student it will appear as a distinct species, while another would classify it as a variety. There has also been a great deal of complaint that species have been multiplied beyond necessity. Mr. Wells refers to 'over three thousand five hundred separate species of ants already known to science, each one a biological unit pursuing its own independent path, incapable of interbreeding with any other.' Accordingly, these are genuine species. But Dr. W. T. Calman, President of the Section of Zoology of the British Association and Keeper of Zoology at the British Museum, said at the Association meeting in 1931: 'The number of described species of animals has been estimated at something in the neighborhood of three-quarters of a million. It is not improbable that between a quarter and a third of that number would be suppressed as synonyms or put aside as "species inquirendae" by careful monographers, and that in many groups the proportion would be far higher... Bateson also remarks: 'We may be certain that numbers of "recognized species", if subjected to breeding tests, would immediately be proved to be only analytical varieties.'

"The cause of this undue multiplying of species is not far to seek. So immense is the variety of animal and plant life, and so restricted man's opportunities for tracing their life histories, that the relation of one animal form to another, of one plant form to another, may easily be interpreted in different ways.

"In recent years there has been a growing disinclination of scientists to state clearly what they mean by the term species. Instead of the clear statements given at the head of this chapter, they have cultivated a very indefinite terminology when offering an answer to the question-What is a species? Wells maintains that only one definition is unassailable. It was proposed by Dr. Tate Regan at a recent meeting of the British Association, and it runs: 'A species is a group of animals that has been defined as a species by a competent systematist.' This of course means nothing at all. In popular language it would read: 'A competent specialist in the field can call anything a species he wants to, and we must accept it as such.'"

cended from common ancestors and would soon revert to more primitive types, if allowed to interbreed at will.

In fact, it has been demonstrated that certain animals which were formerly thought to be not only different species, but far removed from one another biologically, can be successfully interbred and should therefore go back to a common ancestor. We mention the notable and successful efforts, well known to cattle-men, to produce a hardy breed of cattle for farming in sub-Arctic regions by crossing Shorthorn cattle with the hardy American Bison.[1]

What bearing has all this on Gen. 1, 24, 25? The text merely says: "And God said, Let the earth bring forth living animals after their kind, domestic beasts, and reptiles, and the beasts of the earth after their kind; and it was so. And God made the beasts of the earth after their kind, and all the reptiles of the earth after their kind; and God saw that it was good."

Let the evolutionist see that his view that everything started from a one-celled animal, and that the higher orders of fauna are developed from this, is flatly contradicted by this passage. And let those churchmen who maintain that this speaks of "species" as the term is understood, take one look and see that the divisions in the animal kingdom which are mentioned here are certainly not the divisions which are called "species" nowaday, but are in reality infinitely wider classifications.

Only three divisions are actually mentioned, namely <u>cattle</u>,

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[1]See Webster's <u>New International Dictionary</u>, Unabridged: <u>Cattalo</u>: A hybrid between the bison, or American Buffalo, and domestic cattle, hardier than the latter.

by which are understood what we often call the domestic animals, the creeping thing, which must include such widely differing creatures as reptiles and insects, and the beast of the earth which stands for what we call wild animals.

How many subdivisions there were in each of the three large divisions mentioned we have no way of knowing, for Scripture does not tell us. Nor does Scripture say anywhere that the creatures which God made on the sixth (and for that matter on the fifth) day of creation did not change any in appearance, structure, or functions. On the contrary, we propose to show on the basis of subsequent passages that the Bible plainly indicates for all who will read it with an open mind that tremendous changes did, and must have taken place in the creature world.

The question concerning the nature of these changes, and the time and manner in which they took place, will occupy us in connection with the exegesis of some of the remaining passages.

Gen. 1, 26-28

"And God said, Let us make man in our image, according to our likeness, and let them rule over the fish of the sea, and over the fowl of the heavens, and over the domestic animals, and over all the earth, and over all the reptiles that crawl upon the earth. And God created man in His image, in the image of God did He create him; male and female He created them. And God blessed them, and God said to them, 'Be fruitful and multiply, and fill the earth, and subdue it, and rule over the fish of the sea, and over the fowl of the heavens, and over every living thing that crawls upon the earth.'"

Evolutionists who are consistent with their theories teach, either the descent of man from the ape, or as is frequently the case today, the descent of both man and the apes from a common, ape-like ancestor.[1] However, according to Scripture, the first man was not an apeman, but must have surpassed modern man in perfection of body, soul, and mind, because he was created in the very image of God, which, for all the arguments which have raged from olden times about the nature of the divine image, must have been something spiritual, because God is a spirit and not flesh and bones as we are. Man was to be ruler over the animal world, a thing which sets him apart from what we usually call the animal world, as something infinitely higher.

If this passage indicates, or even tolerates evolution, it can only be evolution in reverse.

Gen. 1, 29-30

"And God said, Behold, I have given you every green thing that bears seed, which is upon the face of the whole earth, and every tree which has in it the fruit of the tree, bearing seed; to you it shall be for food, and to every living thing of the earth, and to every fowl of the heavens, and to every creeping thing upon the earth, which has in it the breath of life, every green plant (shall be) for food. And it was so."

This passage teaches in plain language that the first, and

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[1]The past and present status of the thinking of scientists on this question is discussed in the Encyclopedia Britannica, Ed. 1947, Vol. 14, sub "Man".

the intended diet of man and of beast was vegetarian. The death of animals to satisfy the hunger of man and of other animals was not a part of God's original creation. This is recognized by commentators like Keil[1] and Leupold.[2]

The fact that man and the animals as originally created, also the חַיַּת הָרֶ֫, a term so often used in later Scripture of wild and ravenous animals,[3] were herbivorous, certainly implies that tremendous changes must have taken place in the creature world after man fell into sin. Today herbivorous animals and birds have very different characteristics from the carnivorae.

On this subject, Alfred Sherwood Romer, Professor of Zoology at Harvard University says,[4]

> "The major changes which have been brought about in mammals of carnivorous habits are concerned with the teeth. The carnivore has to make its kill mainly with its teeth, and has to pierce stout hide, cut tough tendons and hard bones. On the other hand, flesh is comparatively simple to digest and need not be well chewed. We find, in relation to this, that in the more strictly flesh-eating forms grinding molar teeth have been reduced almost to the vanishing-point. A cat, for example, has no chewing power whatever. Dogs and their kin, adhering less strictly to a carnivorous diet, have kept all their molars except one upper pair and have retained some grinding surface in their cheek teeth; the bears have veered sharply away from the flesh-eating habits of their ancestors and have redeveloped considerable chewing powers.
>
> "The front part of the dentition is highly developed. The incisors are highly useful in biting and tearing; the canines, or 'dog teeth', are long and pointed stabbing weapons in all flesh eaters. Such cheek teeth as are left generally have sharp ridges and pointed cusps rather than flat surfaces.

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[1]Keil, Biblical Commentary on the Old Testament, Edinburgh 1866, Vol. T, Pg. 65.

[2]Leupold, Exposition of Genesis, Wartburg Press, 1942 Pg. 98 f.

[3]Cp. Gen. 37, 33; Deut. 7, 22.

[4]Romer, Man and the Vertebrates, Pg. 135.

> In all typical carnivores there has developed on either side of the jaw a very specialized pair of teeth called 'carnassials', which function in an important way in cutting hard pieces of food (notice e.g., how the house cat works a bone around to the side of the mouth to crack it). One of the upper teeth (the last premolar in living forms) and the lower tooth in back of it become very large and much elongated, with a sharp fore and aft ridge. The two teeth do not meet directly in a straight chopping motion but pass each other, the upper tooth to the outside, acting as a pair of shears which can crack and slice very tough materials."

The well developed molars of the herbivorous animals, and the fourfold stomachs of the herbivorous ruminants, are deemed too well known to need description here.

Thinking people cannot help asking here, "What happened when animals began to eat each other?" There certainly must have been deep changes in the structure of the teeth and digestive systems of those animals which became meat eaters.

Let those who argue that the animals are exactly the same as they were when God created them on the fifth and sixth day of the hexaemeron ponder this. Vast changes must have taken place. The Bible itself indicates times,[1] when vast changes must have come, although we are unable to say with certainty whether these changes came with complete suddenness, or gradually over many generations. The writer inclines to the view that the changes came somewhat gradually, and will bring evidence for this view in the final chapter of this thesis, in the discussion of the changes in the lifespan of man after the flood.

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[1] See our discussion of Gen. 3, 14 below. Cp. also Gen. 1, 29 f. with Gen. 9, 3.

Gen. 3, 14.

"And Jehovah God said to the serpent, Because you have done this you are cursed more than all domestic animals, and more than the beast of the field; upon your belly you shall go, and shall eat dust all the days of your life."

With this passage we have come to the hither side of the great bringer of change in the creature world, both animate and inanimate, since the creation, namely the fall of man.

The words which have geological, because paleontological, implications are in the curse upon the serpent. "You are cursed more than all domestic animals," etc.

Not all translators have found the sense which we have given above in the words כִּי־עָשִׂיתָ זֹּאת אָרוּר אַתָּה מִכָּל־הַבְּהֵמָה וּמִכֹּל חַיַּת הַשָּׂדֶה. DeWette[1] translates, "Verflucht seist du von allem Vieh"; Leupold[2] "Cursed art thou from out of the number of all the animals," etc. He comments on the following page, "The use of the preposition 'min' bears close watching. Although it may be used to express a comparative, and so grammatically one might arrive at the meaning, 'cursed above all animals' (A.V.) yet nothing indicates that all animals are cursed. The extent of the curse should not be spread beyond what the circumstances actually warrant; for the present only the serpent and the ground are cursed."

We take issue here with Leupold, not as though we considered

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[1] Op. Cit. Gen. 3, 14.

[2] Exposition of Genesis, pg. 160.

his translation impossible, for grammatically it is very well possible, even as all the other translations previously cited are possible. But if the curse is not pronounced upon all animals in this passage, then there is no curse on the animal world on record, and the curse goes into operation, Gen. 3, 21, where animals must have been killed to provide clothing for Adam and Eve, before it is announced. It is simply a fact, evident and operative ever after the fall of man, that the "creature was made subject to vanity", Rom. 8, 20. We believe that this is implied in the מִן of this passage.[1]

The result of the curse upon the serpent is this: "Upon your belly you shall go and shall eat dust all the days of your life." We refrain from an exegesis of the words, "Dust shall you eat," etc. as not necessary for our present purpose. However the words, "Upon your belly you shall go," are highly significant. If going upon his belly is the result of a curse upon the serpent, then it is evident that the serpent was not thus created, but was at first equipped for a more honorable mode of locomotion. The simplest conclusion is that the serpent was created to walk on legs, as were many other creatures, and that these members were forfeited as a result of the part which the serpent played in the fall of man.

Interesting in this connection is the observation of naturalists that the skeletons of some snakes unmistakeably show rudimentary

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[1]For a discussion of the preposition מִן to express comparison see Gesenius-Kautzsch, Hebrew Grammar, Oxford 1910, pg. 429 f.

feet.[1]

It will not be amiss to observe that such a change as the loss of legs, and the change from walking to crawling, is a tremendous change, involving profound alteration of physical structure. Those who argue that the species must be precisely the same today as when God first created the animal world should take note of this passage. The serpent is, as we understand this passage, cursed a b o v e all cattle. The curse brought structural changes to the serpent. If this is accepted one ought not to deny the likelihood that the lesser curse (but a curse nevertheless) which fell on the rest of the creature world was also accompanied by physical changes in the creatures so cursed. Death now enters the animal world, Gen. 3, 21. And while the Bible does not say that at this time the animals already began to prey upon one another, there are certainly strong reasons for believing that they did. It was, for instance, not many years before Cain rose up and slew Abel, his brother. Granted that the curse and death hit the animal world before it struck man himself, it appears reasonable to suppose that mortal strife also showed itself in the animal world before such strife became a problem among men in the days before the flood.

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[1] On this subject Raymond Lee Ditmars, Curator of Reptiles in the New York Zoological Park writes in the Reptile Book, pg. 209: "Both of the families embraced in this chapter (i.e. the Blind Snakes and the Dwarf Boas) are essentially tropical. Of the Blind Snakes--Glauconiidae, two typical representatives extend northward from Mexico into the extreme southern United States. Of the Boidae--a family of great constrictors (Boas and Pythons)--four small, rather degenerate species are found in North America. In form and habits these families are widely different, but both show vestiges of a pelvis and hind limbs. With the Glauconiidae--though the rudiments of the pelvic girdle and the hind limbs are most pronounced of any living snakes--the hind limbs are quite concealed. On most of the species of Boidae the rudimentary hind limbs are visible externally, as claw-like spurs; these protuberances are movable and represent the tip of the limb."

We conclude, then, that the process which changed animals, which were created to be herbivorous, into carnivorae, was begun here, and that changes involving teeth, fangs, and digestive organs,[1] and, as a result of diet, also appearance, began here, and that, because they were sparked, not by blind chance but by the curse of God, these changes happened with relative speed, although it is not necessary to assume that they were completed in a moment's time, or even in the course of one generation.

It is surely not amiss that we comment briefly on the nature of the changes which must have taken place in the animal world. No unbiased student who takes the account in Genesis seriously will deny that these changes were changes for the worse. They represent deterioration. If they are to be called evolution, then certainly it was evolution in reverse, and not from lower to higher, as Darwinism would have it.

With this agree the records in the book of nature. Le Conte, Elements of Geology, a college text during the first decade of the present century, and still full of valuable information, though thoroughly evolutionistic, gives pictures of the skeletons of birds which in his time were the earliest known birds according to the geological principle "the lower the stratum, the older".[2] These pictures show far more highly organized birds for that ancient time than any birds the world can boast today. The Archaeopteryx Macroura[3]

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[1]See quotation from Romer, Man and the Vertebrates, pg. 24 of this thesis.

[2]Le Conte, Op. Cit. pg. 462, 507-510.

[3]Ibid. pg. 462.

had a long tail skeleton, such as no present-day bird has, and must have been a sight. Also it had toothed jaws, which no bird of our time possesses. On pages 507-510 the same author gives some remarkable pictures of bird skeletons, some of which were found in the upper cretaceous, and some in lower strata, many of them showing immense size and all of them teeth. The author uses them for more than they are worth in behalf of the evolutionary theory. It does not seem to have occurred to him that they testify to evolution in reverse.

That the testimony of the rest of palaeontology is similar anyone can see for himself, if he is willing to compare the zoological and botanical specimens of ancient times in any good museum with their puny and deteriorated descendants today.[1] One of the most enlightening but also depressing experiences in this respect is to compare the skeleton of the largest fossil elephant known to science in the Museum of Natural History at the University of Nebraska with the skeleton of a modern elephant (not fossilized) at his side.

What has been said about a few examples could be multiplied over and over again from palaeontology.

Gen. 3, 17. 18

"And to Adam He said, Because you have listened to the voice of your wife, and have eaten from the tree which I commanded you, saying, You shall not eat of it, -Cursed is the ground for your

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[1]These facts were clearly recognized and stated by Dr. Theodore Graebner in God and the Cosmos. See the chapter on "Evidences of Degeneration", pg. 264 ff.

sake; with toil you shall eat of it all the days of your life. And briars and thistles shall it cause to sprout for you..."

Two expressions here deserve study, as having geological implications. The first is "Cursed is the ground for your sake", and the second, "And briars and thistles shall it cause to sprout for you."

The question is whether these two expressions are two ways of saying one and the same thing, or whether two separate things are involved. The commentators help little here, since at least those consulted by this writer speak in generalities about the evils that came into the world because of sin,

It seems to this writer that the text itself indicates two things, a curse upon the ground itself, and the announcement that the ground will henceforth bring forth thorns and thistles for Adam.

In speaking of the curse upon the ground we are perhaps assuming too much if we think at this time of deserts and other sterile country. We prefer to believe, both on the basis of Scripture and of geology, that these are a later development.[1] We have often wondered whether we should not here think of a slow but steady impoverishment of the soil as the continents were uplifted (see our comments of Genesis 1, 9) by erosion and leaching out of minerals, which were then deposited in the seas of ante-diluvian times to form some of the earth's older sedimentary strata. This leaching

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[1]Desert conditions develop when very high mountains cut off certain land areas from moisture-laden winds. Cp. Dunbar, Op. Cit. pg. 344. We propose to show in a discussion of Gen. 7, 19. 20 that the highest mountains on earth were not as high in pre-diluvian times as they are now.

would be a real hindrance to man's agricultural efforts, but it must not have been sufficient to keep men from attaining the ripe old age of nine hundred years and more, which Genesis ascribes to them. It was a curse upon the ground, but not so devastating a curse as that inflicted at the time of the flood.

The "and" (Hebr.) which introduces the announcement that the ground shall henceforth bring forth briars and thistles for Adam appears to indicate that the growth of thorns and thistles is something in addition to the curse upon the ground itself. The cursed ground is to bring forth, in hindrance of man's cultivative efforts, "briars and thistles." It is a fact that ground too poor to raise crops will still produce weeds. However it is also a fact, that weeds thrive best on rich ground, and it was to be expected, -a fact many commentators appear to have overlooked, -that the weed problem of man before the flood must have been most severe, because, compared with today, the ground was more fertile.

To the problem treated in this thesis belongs the question of the origin of briars and thistles. Were they created by God before or after the fall? No evidence can be adduced from Scripture that there was any new creation in the physical world after the hexaemeron. But there is, as we have already seen, every evidence that the creatures were changed for the worse after the fall. We have discussed some of the things which must have happened in this respect in the animal world, and we have no right to assume that similar things did not happen in the plant world. In fact, we should be most surprised if there were no indications that they did. We have here a very strong indication that they did. Just as

ravenous beasts were originally created to be harmless grass eaters, but were changed after the fall by a curse upon the animal world, so were plants, which were originally created to be beautiful and beneficial to man, changed for the worse after the fall. Here also there is not development from lower to higher, but deterioration.

Gen. 3, 21

"And unto Adam also and to his wife did the Lord God make coats of skins, and clothed them."

This passage is discussed in connection with the subject of our thesis because it shows the earliest reference in Scripture to actual death, as having taken place. Death had been threatened to man, Gen. 2, 17, and pronounced upon him, Gen. 3, 19. But it invades the animal world before it strikes man. The animal world, created for the pleasure and service of man, shares his curse, and tastes the depth of its bitterness long before man himself. We may be certain that from this time on death was a common occurrence in the animal world. The fossils bear witness to this fact, for while the very oldest sedimentary strata, as geologists testify, contain no demonstrable fossils,[1] they are overlaid by younger strata which show increasing deposits of fossil fauna in great numbers, testifying to the reign of death which must have come over the animal world soon after it made its appearance on the globe.

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[1]For a full discussion of this question see Dunbar, Historical Geology, pages 123-126.

Gen. 4, 8

"And Cain spoke to Abel his brother, and it happened, when they were in the field that Cain rose up against Abel his brother and killed him."

We have no record in Scripture to show just how long after the creation the death of Abel took place. But we do know from Gen. 5, 3 that it was less than 130 years after the creation, for it was when Adam was 130 years old that Seth was born, whom Eve pronounced a substitute for Abel, whom Cain had killed. On the other hand it must have been long enough after the fall, so that Cain and Abel had a chance to grow to manhood and enter upon a life's calling, for Scripture reports that Cain was a farmer and Abel a shepherd.

This passage is included here because it offers an opportunity to discuss what to many students is a vexing problem. It is a fact that no human skeleton has ever been found in the lower sedimentary strata of the earth, while all but the very oldest strata teem with fossils of animals. From this fact it has been argued that man was not on earth when these strata were laid down.

In view of some known facts this is a very poor argument. It is a fact, not disputed, we believe, by anyone, that the earliest known fossils are marine fossils, and that the strata in which they are found were laid down on the bottom of shallow seas, which must have teemed with marine life.

We have already shown how well this fits our understanding that the earth was slowly drained, beginning with the third day of creation. Because minerals were being leached out of the earth,

or, possibly, because the waters of the תהום (Gen. 1, 2) were charged with minerals, sedimentary rocks were constantly being formed, and animals were fossilized in them.

Meanwhile man was living in comparatively small numbers on the land. Since men lived to be nearly a thousand years old, there were but few deaths among them during the first thousand years of man's existence upon the globe. We may be certain that, since man had also then great self-respect, and death was a dreadful calamity, he buried his dead, not in the slime of the Cambric sea, where his bones could be fossilized for the anthropological section of a twentieth century museum of natural history, but in some manner befitting his dignity. Decent burial according to widely varying rites was man's custom as far back as history can be traced.[1] And burial would normally lead to decomposition not only of the flesh, but in time also of the bones of men. "Dust thou art, and unto dust thou shalt return." Gen. 3, 19.

It may not be amiss, here, to speak briefly of the fossil men that have been found. Johnson[2] has an interesting chapter on the quest for fossil man. He speaks quite freely of the pithecoid character of some of the ancient human skulls unearthed in modern times in Europe and elsewhere. Apart from the fact that the finds are not very plenteous, and that they represent only small parts of skeletons, in many cases only part of a single skull, it never seems to have occurred to many glib writers about prehistoric man,

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[1]See Encyclopedia Britannica, Ed. 1947, Vol. 7, pg. 96. "Dead, Burial of the."

[2]Johnson, The Bible and Early Man, The Declan X. McMullen Co., New York 1947, pg. 33-59.

that the record of Scripture and of palaeontology in other areas speaks clearly and unmistakeably of deterioration, and that there could be a possibility that the skulls with the so-called pithecoid features might be the result, not of evolution in the Darwinian sense, but of deterioration and degeneration, such as has cursed the world of flora and fauna ever since the earth, created in perfection, was vitiated by sin.[1]

Gen. 4, 22

"And Zillah, she also bore Tubal-Cain, a hammerer of every cutting instrument of brass and iron."[2]

This passage has important implications not only for the history of human culture, but also for geology. It knows, not only of brass and iron, but also of a man who forges articles of all kinds of copper and iron both.

Evolutionistic historians would convince us that in the various ages of mankind paleolithic, neolithic, bronze and iron followed one another in orderly array. Scripture, however, here presents a vastly different picture. True, Israel in the days of Moses was in the bronze age[3] even as were Greece and other ancient peoples of that day. But in this passage we hear of a bronze and iron age, if we wish to call it that, running simultaneously in the days be-

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[1] See footnote pg.30.

[2] This is the translation of Gesenius, Op. Cit. sub נְחֹשֶׁת. The celebrated Lexicon never translates נְחֹשֶׁת as bronze, but only as copper or brass.

[3] This is evident from the many references to brass from the time of the exodus on.

fore the deluge. It cannot be denied that this is in complete harmony with what we hear later about the building of the ark. Such a conveyance could not have been built with stone implements; it presupposes bronze, or better still, iron.

Now the plain statement of this passage is that Tubal-Cain was a hammerer of every cutting instrument of brass and iron. This presupposes that brass and iron were known, that they were in plentiful supply, and that there was a felt need for tools fashioned of these metals.

A geologist is bound to be interested in the source of these metals in the days before the flood, a point which seems to have escaped exegetes. Were there miners of iron and copper ore among the Cainites? Certainly these metals must have been derived in some form from the ground. If mining in the sense of today was practiced, it certainly indicates a high state, not only of intelligence, but also of civilization among the descendants of Cain.

We suggest, not as something proved or demonstrable, but as something probable and worth considering, the possibility that the mode of occurrence of both copper and iron was different before the flood than it is today. Today the ores of both metals occur in beds, the copper always molten by heat, the iron ore the result of sedimentation.[1]

In our study of the passages dealing with the flood we shall show that it is wholly reasonable to believe that the flood dis-

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[1]Dunbar, Op. Cit. Pg. 114 f. "The Pre-Cambrian rocks of the Canadian Shield have yielded iron, copper, nickel, silver, and gold beyond the dreams of Midas. The iron is the sole sedimentary deposit, the other metals occurring in association with the igneous rocks."

solved the earth's surface to a great depth and laid down the ingredients in such a way that the original mixture was permanently and irrevocably destroyed. It appears possible that man before the flood did not need to "mine" copper and iron as these minerals must be mined today, but that he was able to gain them with relative ease from the soil, perhaps washing them out in a manner similar to the sluicing operations of the gold diggers in California in the middle of the past century.

Gen. 6, 13

"And God said to Noah, The end of all flesh has come before me, because the earth is full of violence from them; and behold, I will destroy them with the earth."

The final words of this passage, "I will destroy them <u>with the earth</u>" have the deepest implications for geology.

It must be noted that some translators and critics want to change the sense of the words here. Smith-Goodspeed translates, "I am going to exterminate them <u>from</u> the earth." There is a similar translation in the margin of the A.V.

So far as this writer is able to find there is linguistically not the slightest excuse for ever translating the Hebrew "eth" with "from". Leupold aptly remarks, "The critics did not expect the phrase 'with the earth' and so subject it to severe criticism. It makes too good sense to call for criticism."[1]

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[1]Leupold, <u>Op. Cit.</u> pg. 269.

Dillmann[1] interprets, "...die Geschoepfe zugleich mit der Erde, welche von ihnen so uebel verwandelt worden ist und einer Erneuerung bedarf: es ist an die Erdoberflaeche, z.B. Pflanzenwelt, Ortschaften, Bauwerke zu denken." This shows a lack of understanding of the true destruction of the earth's crust wrought by the flood. Keil, in his commentary on Genesis, does not touch the question. DeWette[2] translates correctly according to the Hebrew: "Ich will sie verderben mit der Erde."

When we come to the passages which speak of the forty days' rain and of the breaking open, and later closing, of the fountains of the great deep, we shall understand how apt is the announcement, "I will destroy them with the earth," and how thoroughgoing must have been the destruction, not merely of the plant world and of the works of men's hands, buildings, cities and the like, but also of the earth's crust to an appreciable depth.

THE UNIVERSALITY OF THE FLOOD

(Gen. 6, 17; 7, 3; 7, 19-23; 8, 21)

Anyone who reads the theological writings produced during the nineteenth century and treating of the Biblical Flood must be struck by the number of avowed defenders of the Scripture who treat the flood as a minor episode in the history of the world and of man and seek to limit the flood and its effects to a relatively small area in Asia, preferably to Mesopotamia, the admitted cradle of the human

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[1]Dillmann, Die Genesis, sechste Auflage, Leipzig, 1892. Pg. 139.

[2]Op. Cit. Gen. 6, 13.

race.

We cite a few examples. Edward Hitchcock, D.D., L.L.D., President of Amherst College, and Professor of Natural Theology and Geology, could write in 1851:

> "The first difficulty in the way of supposing the flood to have been literally universal, is the great quantity of water that would have been requisite.
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> "The amount necessary to cover the earth to the tops of the highest mountains, or about five miles above the present oceans, would be eight times greater than that existing on the globe at this time. From whence could this immense volume of water have been derived?"[1]

Hitchcock gains other arguments against the universality of the flood from the supposed number of species of animals which, according to his idea, must have been in the ark if the flood was universal, and from the present distribution of animals and plants on the globe. His reasoning especially concerning the number of species shows once again how completely worthless and foolish all the talk about "species" has become in the light of the facts that have been discovered through the science of genetics and through modern breeding experiments. Theologians and scientists alike have often talked nonsense on this question.[2]

Hugh Miller, a contemporary of Hitchcock and a famous Scottish geologist, who thought of himself as a defender of the Scripture, argues at great length against the universality of the Noachian Deluge,[3] and quotes from theologians who support his views. He

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[1]Hitchcock, Religion of Geology and its Connected Sciences, Philipps, Sampson and Co., Boston 1851. Pg. 128.

[2]See footnote pg. 19f. of this thesis.

[3]Testimony of the Rocks, New York 1857, pg. 282 ff.

argues against the universality of the flood from the nature of the fossils in the so-called drift, which had been adduced by some theologians as an argument for the universality of the flood.[1] The fallacy here seems to be that the theologians misread the geological data. The so-called "drift" should be assigned to an age that is post-diluvian rather than diluvian. The diluvian deposits are to be sought under rather than in the drift.

Hugh Miller also argues against the universality of the flood from the size of the ark. Being under the spell of the idea that Noah must have found a place in the ark for all that scientists up to that time had pronounced as species, which even then ran into the hundreds of thousands, he pronounced the ark entirely too small to contain them all, and he argues from the number of species and the size of the ark, that the flood must have been partial.[2] This theory, we repeat, has been completely deflated by modern breeding experiments which have very successfully crossed different "species" of animals, such as domestic cattle with bisons and buffalos of various kinds, to mention only one family of animals.[3] Such arguments should carry no weight with men of any degree of scientific understanding today.

To show to what lengths otherwise intelligent and Christian men can go when they are under the spell of what scientists call species, we quote from Miller, Testimony of the Rocks,[4]

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[1]Miller, Op. Cit. pg. 329 ff.

[2]Miller, Op. Cit. pg. 335 ff.

[3]See footnote under Gen. 1, 24.25.

[4]Op. Cit. pg. 340 ff.

"Buffon confounded the African with the Asiatic Elephant. We now know that they represent two well marked species, Elephas Africanus and Elephas Indicus; and that an ark which contained the ancestors of all animals would require to have its two pair of elephants, not the one pair only, which would have been deemed sufficient eighty years ago. Again with respect to the rhinoceros, Buffon was acquainted with the single horned animal, and had heard of the animal with two horns: and so, though by no means certain that the 'variety was constant', he yet held that two distinct species might possibly be established. But we now know that there are six species of rhinoceros (seven according to the 'Physical Atlas'...) and that, instead of possibly four, at least twelve, or more probably fourteen, animals of the genus would require, on the hypothesis of a universal deluge, to have been accommodated in the ark. Buffon even held that the bison of America might be identical with not simply the aurochs of Europe, which it closely resembles, but even with the European ox, which it does not resemble. But it is now known, that while the European aurochs are provided by nature with but fourteen pairs of ribs, the American bison is furnished with fifteen. Of each of the ruminants that divide the hoof, there were seven introduced into the ark; and it may be well to mark how, even during the last few years, our acquaintance with this order of animals has been growing, and how greatly the known species, in their relation to human knowledge, have in consequence increased. In 1848 (in the first edition of the 'Physical Atlas') Mr. Waterhouse estimated the oxen at thirteen species; in 1856 he estimates them at twenty-seven. In 1848 he estimated the goats at fourteen species; in 1856 he estimates them at twenty. In 1846 he estimates the deer at thirty-eight species; in 1856 he estimates them at fifty-one."

For an evaluation of these and similar "estimates" we refer the reader back to our discussion of the whole "species" question.[1] The young science of genetics and the modern breeding experiments between the "species" of oxen show up the old "species arguments" against the universality of the flood for precisely what they are worth.

To these and similar arguments against the universality of the flood we oppose the clear statements of Scripture: Gen. 6, 17: "And I, behold, am bringing the deluge of waters upon the earth, to destroy

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[1]See pg. 18f. of this thesis.

all flesh which (has) in it the breath of life from under heaven; everything that is in the earth shall die." Gen. 7, 3: "Also of fowl of the heavens, seven, seven, male and female, to keep seed alive upon the face of the whole earth."

It is difficult to see why it should have been necessary to put animals into the ark at all, if the flood had been partial and not universal, since the animals from other parts of the world would again have filled a limited area desolated by the flood. Hugh Miller[1] seeks to discredit the force of this argument by the counterargument that, when once a species has been exterminated in some part of the country, it does not come back.

It appears that Miller has failed to see the difference between the cases he has in mind and the case of a partial flood. In instances where some enemy has extinguished a species in a certain area the species cannot reestablish itself, because its enemy, which has driven it out, holds the field and will not permit it to re-enter. If the flood was the enemy that destroyed the species in the Mesopotamian valley, where the limited Noachian Deluge is supposed to have taken place, the enemy was gone when the waters had receded, and the species would promptly return from outside the Mesopotamian valley.

Gen. 7, 19-23. "And the waters became exceedingly strong upon the earth, and all the high mountains which are under all heavens were covered. Fifteen cubits from above (i.e. measured downward from the surface of the water to the submerged mountain tops[2] did

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[1] Op. Cit. pg. 307 ff.

[2] Gesenius, Op. Cit. sub הרים .

the waters grow strong (i.e. "rise") and the mountains were covered. And all flesh died that moved upon the earth, among birds, and domestic animals, and wild beasts, and all the creeping things that teem upon the earth, and every man. Everything which (has) the breath, the spirit of life in its nostrils of all which was in the dry land died. And there was blotted out everything that existed (i.e. lived) which was upon the surface of the earth, from man, to domestic beast, to creeping thing, and to bird of the heavens, and it was blotted out from the earth, and there was left only Noah, and what was with him in the ark."

In this passage we have the only limitation which Scripture itself places upon the flood. It does not, as some theologians have taught, say that the flood destroyed also all those animals whose natural habitat is the water, but "all which was in the dry land died."

Gen. 8, 21.

"And the Lord said in His heart, I shall not add to curse again the ground because of man, for the purpose of the heart of man is evil from his youth, and not will I add again to smite all life as I have done."

This passage teaches that in sending the flood God cursed the ground. This also points to a universal rather than a partial flood. It indicates that the flood produced changes for the worse in the ground. These changes are found, not in the Mesopotamian valley alone, but all over the earth.

Therefore we decline to accept the view that Scripture here

permits us to assume a figure of speech in those expressions in the story of the flood which speak of the whole earth, and to assume that the whole is named while only a part is really meant.

We do not deny that instances of this kind occur in Scripture. We have often been struck by them in passages like Acts 2, 5 and Gen. 41, 56.57. It is plain to the thinking reader that hyperboles are intended in those passages. In the case of the flood story all indications are away from hyperboles. Scripture teaches nothing less than the universality of the Noachian deluge.

Gen. 6, 15

"And this is how you shall make it (namely the ark), three hundred cubits the length of the ark, fifty cubits the width, and thirty cubits the height."

We have before referred to the fact that even theologians have pronounced the ark too small to contain all the animals which it had to contain if the flood was universal. It is not difficult to figure the approximate size of the ark. There were in it, according to Gen. 6, 16 three floors or stories. We take the cubit to have been about 18 inches. The length of the ark was, therefore, 450 ft., the width 75 ft. There were three floors. This would give the ark a floor space of 101,250 sq. ft., or slightly less than the area of a standard city block (300 x 400 ft.). The height of the rooms could hardly have been more than 13 or 14 ft., because allowance had to be made for stout ceiling joists and heavy floors.

In this area Noah had to find room for eight people, all the animals that needed to be in the ark, and a year's food supply

(Gen. 6, 21). The food supply would occupy by far the most of the available space, for, as any farmer knows, a cow needs about six tons of hay annually. Similar figures would have to be considered for other animals,-feed to the extent of six to ten times the weight of the animal.

It is no wonder that people who believe that every "species" of animal, as scientists use the word species, had to be in the ark, find the ark too small. But people who have studied passages like Gen. 1, 24.25, and have followed modern breeding experiments, need to have no fear that the ark could not hold both the living creatures indicated in Scripture and the food "to keep seed alive upon the face of the whole earth."[1]

Gen. 7, 11. 12

"In the six hundredth year of the life of Noah, in the second month, in the seventeenth day of the month, on this day were all the fountains of the great deep opened,[2] and the windows of the heavens were opened, and the violent rain was upon the earth forty days and forty nights."

This passage is of the greatest fundamental significance for a correct understanding, not only of the physical aspects, but also of the unspeakably great physical consequences of the flood both for the earth's surface, and for the physiology of plants, animals, and

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[1]Gen. 7, 3. See also our discussion of Gen. 1, 24.25 on pages 17 ff. of this thesis.

[2]So Gesenius, Op. Cit. sub בקע. "Niph. 2. Pass. of Kal no.2, to be opened, as fountains Gen. 7, 11."

even of man himself.

Our first task will be to arrive at a true understanding of the expression, "All the fountains of the great deep were opened." And for this purpose our first task will be to define correctly the expression תְּהוֹם רַבָּה rendered in the A.V. and otherwise "the great deep." The expression has been variously understood by commentators.

Dillmann[1] comments on the breaking up of the fountains of the great deep: "Der nach unten gebannte Teil des Urwassers, 1, 20, welcher unter der Erde lagert (s. zu 1, 9), u. durch geheimnisvolle Quellen dem Festland und Meer Wasser zukommen laesst. Indem diese sonst verstopften oder nur maessig fliessenden Quellen barsten, drangen die Urwasser herauf und schwellten unmaessig Meer, Fluesse usw., als kaeme das Chaos wieder."

A similar view is expressed in Rupprecht, Bible History References: "Fountains of the great deep- All the fountains heretofore shut up inside the earth."[2]

This view seems to have become the prevailing view in the conservative Lutheran Church in America.[3]

A different view is expressed by Gesenius who says,[4] תְּהוֹם, a poetic word, pr. 'a mass of raging waters', so called from their noise and roaring; spec. the sea, ocean the deep, Gen. 8, 2. Job 28, 14. 38,6. 6,30. Ez. 26, 19. 31,15 Jon. 2, 6. Hab. 3,4;

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[1] Dillmann, Op. Cit. Pg. 144.

[2] Op. Cit., Vol. I, Pg. 30.

[3] See also Leupold, Op. Cit. Pg. 295 f.

[4] Op. Cit. sub תְּהוֹם.

more fully תְּהוֹם רַבָּה the great deep. Gen. 7, 11. Ps. 36, 7. Amos 7, 4. Is. 51, 10. More rarely of any other mass of waters, as those covering the earth at the creation, Gen. 1, 2. Ps. 104, 6; or the subterranean waters, the deep, the abyss, whence spring fountains and streams, Gen. 49, 25. Deut. 33, 13."

It should be noted that Gesenius understands the word of subterranean waters in two passages only, namely Gen. 49, 25, and Deut. 33, 13, both of which passages speak of the blessings of Jehovah. Both places appear to refer to the blessings of abundant spring or well water.

The other passages Gesenius refers to the waters of the ocean, except Gen. 1, 2, where the ocean was not yet created. However here also the waters are those which were soon to become the ocean. It should be noted specifically that Gesenius understands the expression תְּהוֹם רַבָּה in Gen. 7, 11, the passage under our present discussion, of the ocean.

So also Alex Heidel, of the Oriental Institute of the University of Chicago,[1] understands it. Comparing the Hebrew תְּהוֹם with the Babylonian Ti'amat, Heidel writes: "Ti'amat, as we have seen, is a mythical personality. Such significance the Old Testament תְּהוֹם never has. It is nothing but a designation for the deep, the sea, the ocean, or any large body of water."

This understanding of תְּהוֹם is strongly supported by synonyms for the ocean in other ancient and modern languages. In English the New Century Dictionary is authority for "deep", the

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[1] The Babylonian Genesis. The University of Chicago Press, 1942, Pg. 84 f.

sea or ocean (poetic). In Latin Harper's Latin Dictionary lists as one of the meanings of "altum": the high sea, the deep, the sea. In Greek, Ebeling, Griechisch-Deutsches Woerterbuch maintains sub 'bathos', that the word is used for the "Hohe See" Eph. 3, 18. And Appleton's New Spanish Dictionary gives as one of the meanings of "profundo": the sea.

The name "deep" (תְּהוֹם) is peculiarly appropriate for the ocean, which is 13,000 ft. deep on an average, and reaches, in the famed "deeps" off the Philippine Islands a depth of more than 35,000 ft.[1]

What, then, does it mean, when in Gen. 7, 11 we read: "On this day were all the fountains of the great deep opened?" Without doubt there is a picture or figure of speech when the same passage says that "all the windows of the heavens were opened". This is a poetic way of saying that it rained in torrents. We should then, be willing to admit that there is a poetic picture also in the expression, "all the fountains of the great deep were opened", and understand that everywhere the great deep, the ocean, poured out its waters over the land, and cease to look for mystical,[2] and mythical[3] sources of water inside the earth.

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[1]Longwell, Knopf, Flint, Op. Cit. pg. 173.

[2]Dillmann, Op. Cit. pg. 144. "Geheimnisvolle Quellen".

[3]Longwell, Flint, Knopf, Op. Cit. pg. 8. "Although the sedimentary rocks preponderate in the visible part of the (earth's) crust, they are essentially a veneer, a mile or less thick on the average."

Ibid. pg. 83.84. "The subsurface water occupies a comparatively shallow zone within the earth's crust. Our actual knowledge is limited by our observation of the deepest wells, which, penetrating two miles (Now deeper: Kramer) of the crust, show that water can

The waters within the earth are found in the sedimentary rocks, which are in many instances saturated with water. The sedimentary strata are on an average only one mile thick, though in some places they are considerably thicker. Assuming a porosity of 30 per cent for all sedimentary rock strata, a percentage far too high, all the waters in the earth so far as they are known to science would furnish only about 1500 ft. of the necessary water to cover the globe. Actually they would furnish much less.

We understand, then, in complete harmony with the usage of Hebrew and other languages, that the "great deep" is the ocean, and that the opening of the fountains of the great deep is the pouring out of the waters of the ocean over the land.

The geological implications of such an understanding stagger the imagination, but they also solve a number of pressing problems in connection with the story of the flood and the present condition of the earth's crust.

One of the questions which troubled exegetes in times past with

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For Pg. 49. occur at least at those depths. But laboratory experiments made to simulate conditions at much greater depths tell us that several miles below the surface the weight of the overlying matter exceeds the crushing strength of rocks, and that open spaces and subsurface water therefore can not exist at such depths... Rock character governs the amount (of water) the rocks will absorb... All the rock material that composes the outer part of the Earth's crust is porous in some degree, but the porosity at any one place depends on the character of the material. Loose unconsolidated sand and gravel such as are found in the deposits of many streams and lakes have porosities as high as 30 per cent of volume. When such deposits are cemented to form sandstone and conglomerate, their porosity is reduced to about 15 per cent, whereas the average shale has a porosity of about 4 per cent."

regard to the flood story is the question where enough water would come from to cover the earth in the manner in which Scripture says that it did.[1] Consequently some of them denied the universality of the flood.[2] With our understanding of the opening of the fountains of the great deep the answer to the question as to the origin of the waters of the flood is very simple. The water came from the ocean, for the most part.

To depend on rain alone and on the waters within the earth will leave us far short of the necessary amount of water. Assuming that only half the water to cover the world the height of Mt. Ararat (approximately 17,000 ft.) had to come from rain, while the other half (which we have seen to be impossible) came from within the earth, we should have to assume that it rained over 200 ft. during each 24 hour period of the forty days. This rain would have to extend over the whole globe, including the ocean. If this much rain fell, it would also have to evaporate, and what is more, it would have to evaporate in a little over half a year. This would require a different set of natural laws from those in operation today.

If, now, we assume that the opening of the fountains of the great deep signifies the overflowing of the ocean and add torrential rains for forty days and forty nights, we get some sensible mathematics. Geologists have estimated (and we have no cause for mistrusting either their mathematics or their motives) that, if the surface of the earth were made perfectly level, including the bottom

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[1]Hitchcock, Op. Cit. Pg. 128. "The first difficulty in the way of supposing the flood to have been literally universal, is the great quantity of water that would have been requisite."

[2]So Hitchcock, Op. Cit. Pg. 128 f.

of the ocean, the waters of the ocean would stand 8600 ft. deep all over the globe.[1]

Add a necessary corollary, that, if the opening of the fountains of the great deep means the overflowing of the oceans, then the stopping of the fountains of the great deep, Gen. 8, 2, must mean that the waters of the ocean went back into their place, and it is easy to see that the earth could be dried during the time of slightly over half a year assigned by Genesis to this process, (Cp. Gen. 8, 4. and 8, 14), for the greater part of the water would not need to evaporate, but only to return to the ocean from whence it had overflowed, when once the fountains of the great deep were stopped, a process which could very well be accomplished in the half year assigned to it by Scripture.

But those who are not geologically trained, and to whom this is a new idea, will ask how the ocean could possibly overflow. Let us start with some fundamentals of geology. The surface of the earth, as we know it, is composed of earth and of sedimentary rocks, -that is, rocks laid down by wind and/or water. This part of the earth varies in thickness, although it is on an average less than one mile thick.[2] It is definitely not, as Hitchcock, whom we quoted previously, says, six miles thick, over half or two-thirds of our existing continents.[3] Drilling for oil has brought to light the

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[1]Longwell, Knopf, Flint, A Textbook of Geology, Vol. 1. pg. 5. A similar figure is quoted by Grabau, Principles of Stratigraphy, pg. 7.

[2]Longwell, Knopf, Flint, Op. Cit., pg. 8.

[3]Hitchcock, Op. Cit. pg. 125.

fact that it is much thinner in many places, in some even less than the average mile. In some places it isn't there at all, but the naked igneous rock protrudes at the surface. Again, in a few places it is thought that the so-called lithosphere or crust of the earth is more than six miles thick, although man has to date not succeeded in drilling wells to this depth. As reported in the Encyclopedia Britannica, Ed. 1947, sub Petroleum, the deepest oil-well up to the year 1944 in Pecos Co., Texas, was drilled to a depth of 15,270 ft. or approximately three miles. Deeper wells have been reported since.

Under the sedimentary rocks are the so-called igneous (once molten) rocks, in the case of the land as a rule granite. Under the bottom of the ocean there is thought to be basalt, a dense, black, igneous rock.[1]

According to the views of the older evolutionary geologists these igneous rock masses like granite, basalt and others are the result of the fact, that the earth was once a molten mass, unfit for any kind of life. According to this view it was only when the earth had cooled for ages and ages, and the granites and other igneous rocks had decayed, yielding clays and other minerals, that life could originate and be sustained on the earth. Successive submersions and other forces are supposed to have laid down sedimentary rocks on the granite out of the decomposed granite.

All this would truly take millions of years. The strange thing,

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[1]Longwell, Knopf, Flint, Op. Cit. pg. 173. "Presumably the continental masses stand high because they are made of light granitic rocks, and the deep-sea areas are depressed because they are formed of heavy basaltic rocks."

however, is, that when you study the sedimentary rock systems, and come to the lowest strata, geologists themselves must admit that often they cannot tell where the igneous rock leaves off and the sedimentary begins, because the sedimentary rock has been completely metamorphosed by heat from the igneous rocks beneath, so that it is inextricably fused with the igneous, fossils and all.[1]

One cannot but conclude that the igneous rocks are in this case later than the sedimentary rocks. Instead of the earth having been in a molten state, and then having cooled, and permitted life to originate, the true state of affairs appears to have been that first there was life, and fossil bearing rocks were laid down, and afterward part of the interior of the earth became molten and fused the sedimentary, fossil-bearing strata with heat from underneath.

We are ready to draw some important conclusions. In discussing Gen. 1, 9[2] we mentioned that the draining of the earth at the creation must of necessity have been accompanied by mountain formation. This, in turn, is usually accomplished by magma, molten rock within the earth, pushing upward in certain places, forming

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[1]Le Conte, Op. Cit. pg. 228. "Their (referring to metamorphic rocks) origin is evidently sedimentary, like other stratified rocks, but they have been subsequently subjected to heat and other agents which have changed their structure, sometimes entirely destroying their fossils and even their lamination structure, and inducing instead a crystalline structure. The evidence of their sedimentary origin is found in their gradation into unchanged fossiliferous strata; (emphasis ours) the evidence of their subsequent change by heat, in their gradation into true igneous rocks. For this reason they are called metamorphic rocks... All the lowest and oldest rocks are metamorphic."

See also Grabau, Op. Cit. pg. 773: "...metamorphism is undoubtedly most marked in pre-Cambric and in early Palaeozoic rocks...

[2]See Thesis, pg. 5 ff.

basins for the water to gather.[1] When such a basin had begun to develop it would tend to continue to develop until a balance between land and water had been established. Water on molten rock would tend to cool the molten mass rapidly. This would then form the dense basalt with which geologists believe the ocean bottom to be underlaid.[2] The edges of the basin would offer ever more surface to be rapidly cooled, and therefore to sink, until the process was complete. Thus we would get the warm Cambric seas of which geologists speak so much,[3] and which they tend to push hundreds of millions of years into the past.

What, then, would be necessary to produce the Noachian Deluge, as we view it? All that would be necessary would be that the forces which caused and regulated the heat under the earth's crust would get out of hand, and would melt again the granite and basalt under the earth and ocean and create a sub-terranean and sub-oceanic mass of magma, on which the continents would sit, and in which they would gradually sink like a heavy object in a bucket of thick molasses, and you would have "all the fountains of the great deep opened", the sea pouring her waters over the land, chaos returning. To drain the earth after the cataclysm, order and equilibrium would have to be re-established in the vast sub-terranean heat forces, and earth and ocean would once again resume their places. All this could very well happen in the time allotted by Scripture to

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[1]Longwell, Knopf, Flint, Op. Cit. Pg. 378 ff. The Origin and History of Mountains.

[2]Longwell, Knopf, Flint, Op. Cit. Pg. 173.

[3]Dumbar, Op. Cit. 140 f. Le Conte, Op. Cit. Pg. 310 f.

the Noachian flood. And a by-product of such an occurrence would be the baking of the pre-diluvian fossil-bearing strata by magmatic heat from underneath, as the metamorphism in the most ancient sedimentary strata testifies.[1]

Not only does such an understanding offer a plausible explanation of the flood itself, -but it also explains some other problems which exegetes generally do not attempt to explain.

We think here particularly of the erosive power of such a flood, and of its effects upon the earth's crust. We think also of the means of melting a large part of the earth's sub-crust, and of the effects of such a catastrophe upon the life of every living thing, from the lowliest lichen to man, the crown of God's creation.

Let us speak first of the probable source of power,-for we have become accustomed, through study of the ways of God both in Scripture and in nature, to believe, that God works through means,[2] in His greatest works and in the least. And we believe that the melting of the masses beneath the earth's crust was accomplished by means, just as much as the even greater miracle, the conversion of the sinner, which is not a destruction, as was the deluge, but a new creation, is accomplished by the Holy Spirit through the means of grace.

Since it appears that the granitic masses underneath the earth's sedimentary crust were melted after at least many of the older sedimentary strata had been laid down, as shown before,[3] we ask what

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[1] See Thesis, Pg. 54, Note 1.

[2] The flood itself, in which God used water as the means of accomplishing His purpose, Gen. 6, 13. 17, bears out this contention.

[3] Thesis, Pg. 54.

force known to man could have produced the necessary heat to accomplish this vast melting of rock masses. We are bound, since Hiroshima,[1] to think of atomic power, which has been able to vaporize steel towers and to wipe out tens of thousands of people together with their homes with fierce heat in a matter of seconds.

Lest this appear arbitrary, let us remember that atomic materials are gained out of the bosom of the earth. No one knows how large amounts of such materials may yet be hidden in the earth, or to what depths they may be found. Man has managed to harness atomic power to a degree. How much better and how much more purposefully could the Creator Himself harness it, and cause it to do His bidding!

This is not merely the idea of a dreaming exegete who is putting forth some new ideas about the Noachian deluge. On Nov. 17, 1948, the Associated Press[2] carried an item about a brand new theory, the so-called blister-theory, proposed by Dr. Bailey Willis, geologist of Boston University. According to this theory atomic energy in the form of radioactivity is active at depths of 50 to 100 miles beneath the earth's surface, and this energy is thought to be responsible both for the formation of mountains and of the ocean bottom.

In June, 1949, the Scientific American carried an article entitled, "The Blister Hypothesis", by C. W. Wolfe, one of the Geologists mentioned in the Associated Press report referred to above.

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[1]At Hiroshima the first atomic bomb to be dropped in actual warfare was exploded over the city, August 6, 1945.

[2]Reported in the Wichita Eagle.

In this article, on pages 16 and 18, the writer makes the following statements of import for our discussion.

> "A considerable part of geology is based on information supplied by rocks in mountainous regions. These masses of rock are thrust up from ordinarily inaccessible depths to places where they may be observed. Erosion and other processes have then laid bare rocks formed in the geologic past, which tell us much about the history of the earth. For all the work that is based on mountains, however, there is little to explain the origin of mountains themselves. This article presents a new theory of mountain-building developed by the author.
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> "The basis of the author's theory is that the initial forces of mountain-building are supplied by heat that is trapped in pockets within the earth's crust and the region immediately below it. These pockets become huge "blisters" of expanding rock which push upward and raise the overlying material. The blister hypothesis, in the author's opinion, accounts for many things we know about mountains of the geologic past and present. It will not tell us everything about mountains, but it will bring fresh insight to the problem...
>
> "There is...a clear-cut need for a new approach that will help account for actual geologic data. The blister hypothesis is presented as a possible answer to many unsolved problems associated with the formation of mountains. It is believed that the phenomena to be described are now actually taking place more than 10 to 15 miles but less than 400 miles below the earth's surface.
>
> "In parts of this zone, heat is generated faster than it can be dissipated by conduction or radiation. <u>The source of the heat is assumed to be the nuclear disintegration of radioactive elements</u>..."

Whatever of this new theory may prove tenable in the long run, and whatever may be modified by further study and discovery, the idea of atomic energy active beneath the earth's lithosphere is in beautiful harmony with the facts of metamorphism in the oldest sedimentary rock strata, and with what we had previously concluded must be the true understanding of Gen. 1, 9 and Gen. 7, 11.

Before we continue with another passage we should occupy ourselves with another geological implication of Gen. 7, 11.12,

one which the exegetes at our disposal have not touched, -that of unspeakable erosion and even dissolution of the soil which must have been caused by the flood.

Dillmann writes:[1] "Die Flut der Bibel konnte bei ihrer kurzen Dauer wesentliche und allgemeine Umgestaltungen der Erdrinde nicht bewirken und hat sie auch nicht bewirkt. Nach der biblischen Erzaehlung wurden die Berge von den Wassern bedeckt und kamen nach deren Ablauf wieder zum Vorschein (7, 19f. 8, 4f); die Erde brauchte nur abzutrocknen, um ihre alte Gestalt wieder zu haben."

Against this conception of the effects of the flood upon the earth we propose to show in a measure at least what the happenings of Gen. 7, 11 and of the year which followed must have done to the earth's surface.

The sacred text tells us that on one and the same day all the fountains of the great deep were broken up, and the windows of heaven were opened. On one and the same day the waters of the flood began to rise, coming from the sky in torrents, and inundating the land from the overflowing ocean.

From Gen. 7, 17, "And the flood was forty days upon the earth, and the waters increased and lifted up the ark, and it was lifted on high from off the earth," we conclude that it took forty days for the waters to reach their maximum height. The human imagination is too frail to get more than a faint picture of what must have happened to the earth's crust to a great depth by way of erosion and even dissolution in the process. We have seen personally an instance where thirteen inches of rain in time of one week tore

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[1] Op. Cit. Pg. 131.

away several feet of topsoil from one sloping field, and dumped the debris onto a level field below.

Whenever there are prolonged periods of heavy rains in mountainous regions fear grips people's hearts, because such prolonged rains often bring terrible landslides which bury the works of man's hands, if not man himself with house and home, and whole towns.[1]

What fearful havoc water can wreak upon the soil is graphically illustrated by an article in the Reader's Digest.[2] This article tells how in certain sections of Utah heavy rains in the mountains turned the earth into mud which flowed like lava. We quote the following to show in a small measure what rains such as are indicated in the flood story in Genesis could accomplish by way of destruction of the earth's crust:

> "High up on a mountainside the cloudburst strikes bare patches of earth. As the water rushes down ravines it picks up more earth, stones, uprooted vegetation. Gullies add more material to the flow when their banks are undercut. A current of fearful stuff that looks like thick cement starts downhill. Every foot of slope gives it more momentum; when it reaches the bottom of the canyon the narrow walls act like a nozzle on a hose and multiply its power.
>
> "The area struck that August day runs northward from a village called Centerville past another one called Farmington. In a single hour the flows spread over some of the richest farms in Utah. They filled irrigation canals; crushed houses, barns, schools; buried railroad lines and highways under rocks and mud. They deposited boulders weighing up to 200 tons. In some areas the deposit was six feet deep..."

What fearful destruction, then, must have been wrought upon the earth's crust when it rained, and not only rained but poured, for forty days and forty nights, and at the same time the ocean

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[1] On the question of landslides see Longwell, Knopf, Flint, Op. Cit. pg. 33 f.

[2] Reader's Digest, December, 1949, pg. 89 ff.

was overflowing violently, sweeping away the dissolved surface of the earth! To what depths within the earth's crust this must have gone! How completely the earth's surface, for hundreds of feet down, and perhaps much more in places, must have been dissolved and carried away by the mighty rush of waters! Whole strata of sedimentary rock, laid down in the orderly processes that prevailed in the first draining of the earth after the creation must have been torn loose and eroded away and ground to bits and carried who knows where! Here, we hold, is part[1] of the explanation of the fact that many strata, which one should expect to find in certain areas on the earth, are missing. They were torn away during the Noachian Deluge. Here, also, we may find at least part of the explanation of the many apparently badly eroded strata deep within the earth's crust, and covered later by strata of far different fossil content.[2] When the events described from Gen. 7, 11 onward took place, the pre-diluvian strata must have been torn unmercifully by the waters, only to have other strata laid down upon them when the flood was ready to lay them down. We shall have more to say on this point at the proper place.

Gen. 7, 19.20

"And the waters became exceedingly strong upon the earth, and all the high mountains which are under all heavens were covered. Fifteen cubits from above did the waters grow strong, and the

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[1]For more comment on "missing" strata see our comments below, on Gen. 8, 1-5. 13. 14.

[2]On this subject see Longwell, Knopf, Flint, Op. Cit. pg. 322 ff.

mountains were covered."

We have previously quoted this passage in connection with the question of the universality of the flood. We wish to treat it here from a different angle. It causes some difficulty for the interpreter. The passage states that "all the high mountains which are under all heavens were covered".

The ark, we are told ch. 8, 4, rested on the mountains of Ararat. The time when the ark came to rest is given as the seventeenth day of the seventh month. Since, according to Gen. 7, 11, the flood began on the seventeenth day of the second month, it is clear that the ark rested about 150 days after the flood began. These must be the 150 days of Gen. 7, 24, during which the waters "prevailed". Ch. 8, 2.3 tells us that the Lord stopped the fountains of the great deep, and at the end of the 150 days the waters were abated. Putting all these statements together, we cannot but conclude that the ark came to rest almost immediately upon the stopping of the fountains of the great deep. The waters must have begun to fall, and the ark, which had just been able to clear the summit of the highest peak when the waters were at their height, now rested upon this mountain.

Ararat[1] is approximately 17,000 ft. high. Now the question arises, "And what about those mountains which are higher than Mt. Ararat?" According to a tabulation in the World Book Encyclopedia[2]

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[1]Ararat, in the Bible, is properly a region in Armenia. (Gesenius, Op. Cit. sub אֲרָרָט .) We assume with Leupold and other commentators that the particular mountain on which the ark rested was the peak known as Masis or Ararat, the highest peak in the region.

[2]See World Book Encyclopedia sub "mountain".

there are in the world about thirty peaks that are higher than Mt. Ararat, a few as high as 29,000 ft., therefore more than two miles higher than Ararat.

Leupold, in his commentary on Genesis, writes on this question:

> "Mt. Ararat (or Mt. Masis) has an altitude of 16, 916 ft., whereas peaks in the Himalayas rise about 29,000 feet, and others, too, surpass Mt. Ararat; how can the fact that Mt. Ararat was submerged point to the submersion of these peaks? We hold that the solution lies in this that those few peaks that rise above Mt. Ararat were unknown both to the people in the days of the flood as well as to contemporaries of Moses. All the mountains they knew were covered. In any case, as Keil indicates, such mountain peaks in relation to the whole earth would amount to mo more than a few pin-points on a globe, and are disregarded because of the limited horizon of the ancients."[1]

While the matter may not be worth a long argument, it may be well to show that, if our understanding of the breaking up of the fountains of the great deep is correct, (and certainly both the language of Scripture and the condition of the earth's crust indicate that it is), then there is every reason to believe that, with the passing of the flood, and for many years, and perhaps centuries thereafter there were adjustments going on in the earth's crust, risings in one place, settlings in another, until the magma within the earth was stabilized. This could easily have caused some mountain ranges to rise to heights to which they had never risen before, and the height of those peaks which are higher than Ararat may well be considerably greater today than it was before the flood. In fact, if we believe that deserts are post-diluvian, then we are compelled to believe in extensive mountain formation as a result of the flood, because it is mountains that cause deserts,

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[1]Leupold, Op. Cit. pg. 302.

by interfering with moisture-bearing winds and clouds.[1]

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[1]On high mountains as the cause of deserts see Huntington and Cushing, Principles of Human Geography, John Wiley and Sons, Inc., New York, 1934. Pg. 274 ff.

"How Relief Influences Rainfall. (a) The Example of California. Aside from cyclonic storms and the great equatorial belt of low pressure, the relief of the lands is the chief cause of rainfall. When a wind reaches a mountainous region the slopes force it to rise. As we have seen in the equatorial belt of low pressure and elsewhere, rising air expands, cools, and loses part of its capacity to hold moisture. Hence clouds form, and rain or snow falls. A good example is seen in the western United States... Where the westerly winds, laden with water from the Pacific Ocean, strike the low hills at San Francisco the rainfall increases from 18.5 inches to about 23 because the air rises and hence grows cool. Beyond the hills the rainfall decreases a little, but on the slope of the Sierras, where the air once more ascends, it increases rapidly to more than 50 inches. Still higher the rainfall diminishes again, as is usually the case on the windward slopes of high mountains. This is because cool air is less capable of holding moisture than warm air. Hence a drop of temperature from 50 degrees to 40 degrees, let us say, causes much less precipitation than a drop from 70 degrees to 60 degrees, provided the percentage of humidity is the same in both cases at the start. Beyond the mountains part of the air descends the eastern slope. The descent compresses and warms it, so that its capacity for moisture increases and it sucks up moisture instead of giving it out. Hence at the eastern base of the Sierras there would be practically no rainfall were it not for occasional cyclonic storms which raise the air to high levels. Thus Reno gets six inches of rain and Wadsworth a little over four.

"Regions like Nevada, lying to the leeward of the mountains and thus sheltered from rain-bearing winds, are said to be in the 'rain-shadow'. Places in a rain-shadow get little rain, just as places in an ordinary shadow get little sunlight. The rain-shadow often causes deserts where scraggly little bushes at wide intervals replace the splendid forests which lie at the same altitude on the windward side.

"(b) The Wonderful Effect of the Himalayas on Rainfall.-The Himalayas furnish the most remarkable example of the effect of mountains on rain. The southerly monsoon winds from the Bay of Bengal bring an abundant supply of water which they deposit as they rise over the lower slopes of the mountains. At a place called Cherrapunji, 4000 feet above the sea and not far north of Calcutta, the average rainfall each year is 466 inches. Compare this with the part of the United States east of the Mississippi where the average is only a little over 40 inches. In 1861 the enormous amount of 918 inches, or 76½ feet, actually fell at Cherrapunji. More than a third of this, or 372 inches, fell in July alone, and 42½ inches in one day...

"At higher altitudes on the same side of the Himalayas the

The problem is infinitely more complex, scientifically speaking, than exegetes, untrained as they quite generally are in the sciences, have thought in the past. But the findings of science are not against the Scripture, but rather, they explain passages like Gen. 7, 19.20, which, without these findings, exegetes are at a loss to explain.[1]

Gen. 7, 24

"And the waters were strong upon the earth one hundred and fifty days."

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rainfall greatly diminishes. The air has lost so much moisture that it cannot give up much. Hence here, as on the windward slope of every mountain, the rainfall increases only up to a certain level after which it decreases. Beyond the Himalayas the air has been so robbed of moisture that vast regions in Central Asia are deserts. They lie in the world's greatest rain-shadow."

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[1]Longwell, Knopf, Flint, Op. Cit. Pg. 401. "As the steps in mountain history become clearer...it is found that much of the actual elevation occurred at a distinctly later time than the folding and thrusting. After the Rocky Mountain deformation in the early Tertiary time, the folded and faulted area was eroded to a nearly even surface at a low altitude; and the present great heights in the Rockies are due to vertical movements in the late Tertiary. Similarly, after much of the thrusting and folding was complete, the Alps had only moderate height, and the sea washed the flanks of the range both on the north and on the south. In very recent geologic time a vertical movement of the entire mountain belt carried the Alpine summits to great height. The Andes and the Himalayas have had a similar history."

The same author in the same work writes in a similar vein on pg. 5. "The position of the deeps near the continental masses suggests that the deeps, like the highest mountains, are of recent origin, since otherwise they would have been filled with waste from the lands."

The same writer, by contrast, in the same volume, Pg. 26, designates the comparatively low Appalachian mountains as "old" mountains.

The waters were strong, that is, they were in the ascendancy, or held sway. This expression describes the waters from the mement they began to rise, until the moment they were ready to begin falling. The one hundred and fifty days of Genesis 7, 24 are counted, as a comparison with Gen. 7, 11 and Gen. 8, 3.4 shows, from the day the fountains of the great deep were opened. We believe that we are interpreting correctly when we say that it took forty days for the waters to reach their full height, and that they stood at this height for 110 days. Here are important geological implications of a far-reaching nature.

We have shown in our discussion of Gen. 7, 11 what vast erosion and dissolution of the earth's crust to a great depth must have taken place as a result of the forty days' rain and the tidal waves which lashed the loosened soil of the sinking continents. When the ruin was complete after forty days, there followed 110 days during which the waters were at their height, neither rising nor falling.

What, geologically speaking, would happen during this time? Any creek bottom farmer could tell us that the muddy waters would now start clearing. They would begin to dump their load of dissolved earth and minerals, burying under them masses of uprooted vegetation, and the remains of drowned creatures. The waters would not dump their load in the same succession in which they had picked it up, but specific gravity and other factors would cause similar particles to settle together, so that there would be beds of various materials interchanging with each other. Under certain conditions one class of particles, e.g. sand, would settle, under other condi-

tions another. It is well known to scientists that lime, for instance, can remain suspended in water in heavy concentration for a long time when the water is charged with carbon dioxide, such as would be caused by decay of plants or animals in the water. However, when a change in temperature of the water, or some other cause drives off the carbon dioxide from the water, the lime precipitates, i.e. sinks to the bottom, very rapidly.[1]

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[1]Longwell, Knopf, Flint, Op. Cit. Pg. 216. "The solubility of calcium carbonate (lime to the non-scientific reader: K.) is extremely sensitive to the amount of carbon dioxide present in the water, and anything that will decrease the content of the carbon dioxide in a saturated solution of calcium carbonate will consequently cause immediate precipitation of calcium carbonate. Rise of temperature drives off some of the carbon dioxide and thus causes calcium carbonate to precipitate; removal of the carbon dioxide by plants (algae), which under the influence of sunlight are able to utilize the carbon dioxide as a source of carbon in building their tissues, is another cause of precipitation; and certain groups of bacteria, by producing ammonia, which combines with the carbon dioxide, can cause precipitation."

That the waters of the Noachian Deluge may have been saturated with lime ought to be clear to the thinking Bible student. According to Gen. 6, 13 God was destroying man with the earth by means of the flood. The earth, therefore, emerged from the flood in incomparably worse condition than it had been before the flood. Now it is well known that the quality of the ground depends to a great extent on the presence of the minerals so necessary for plant-life. And among these necessary minerals lime holds a very high place. This is evident from the fact that farmers in many portions of the earth cannot grow abundant crops unless they lime their soil. For this reason many farmers grind limestone to powder and haul it onto their fields as fertilizer. The good earth which God originally created must have had an abundant supply of lime. The flood, which, as we have seen, dissolved the earth to a great depth, must have destroyed the mixture, and have caused the minerals of the earth to precipitate separately, causing the lime-particles to settle together and to form some of the earth's vast lime-stone beds.

Whether all the waters of the flood were at one stage of the flood heavily charged with lime we are not able to say. Lime-stone, according to the findings of geologist, is found on about two-thirds of the land-area of the globe. It is said to be absent between the Appalachian Mountains and the eastern coast of our country.

The waters of the deluge, warmed by magma from underneath and abounding in masses of drowned plants and animals, must have generated and at times discharged an immense amount of carbon dioxide. This in turn must have caused the lime in the waters of the flood to precipitate in great quantities at certain times. So must have been formed certain immensely thick limestone strata within the earth.[1]

That these strata must have been formed quickly, and not during millions of years, as geologists often maintain, ought to be clear to any unbiased observer. There have been found in some of these thick limestone formations large fish, their shapes perfectly preserved, every scale in place. The Museum of Natural History of the University of Nebraska shows a panel of petrified fish, thus perfectly preserved, in lifelike positions. If the record here means anything at all, it means that these fish were caught in a large area where the lime was precipitating heavily and quickly so that they were choked by it, and were petrified, so to speak, not because they died, but died because they were petrified, their gills and inwards filled with lime even before they were dead.

It is not our purpose here to go into this matter too extensively. We have aimed to show what, geologically considered, would have to be expected when a flood which had dissolved the surface of the earth to a considerable depth came to a standstill for 110 days, and the waters of that flood abounded in decaying plant and

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[1]We by no means assume, as theologians have sometimes done, that all limestone strata were formed by the flood. Many limestone strata were evidently laid down in lakes, and some in rivers. Such formations can originate even today.

animal matter which gave off much carbon dioxide. It would cause an amount of sedimentation which taxes the human imagination beyond its limits to envision. We are not of those who believe that all or nearly all sedimentary deposits on earth are from the Noachian deluge. We firmly believe that many sedimentary deposits were laid down before the flood, and many after. We have seen them formed before our own eyes. But we maintain that some of the thickest deposits of limestone and other minerals within the earth stem from the Noachian deluge, and that any geologist who believes what he reads in Genesis Chapter 7 will acquiesce.

Gen. 8, 1-5. 13. 14.

"And God remembered Noah and all the living creatures, and all the domestic animals which were with him in the ark; and God caused a wind to pass over the earth, and the waters subsided. And the fountains of the great deep were stopped, and the windows of the heavens, and the violent rain from the heavens was restrained. And the waters returned from off the earth, going and returning, and the waters diminished from the end of one hundred and fifty days. And the ark rested in the seventh month, on the seventeenth day of the month on the mountains of Ararat. And the waters were going and departing to the tenth month; in the tenth (month), on the first of the month were the heads of the mountains seen.

"And it came to pass in the six hundred and first year, in the first month, on the first day of the month, the waters were dried from upon the earth, and Noah removed the covering of the ark, and he looked, and behold, the surface of the ground was dry. And in

the second month, in the seventeenth day of the month, the earth was dry."

We have shown before that from the time the flood broke upon the earth, Gen. 7, 11, to the time it began to recede, as told in our present passage, was 150 days. It was two months and thirteen days, from the seventeenth day of the seventh month to the first day of the tenth month before the tops of the mountains could be seen. We do not know how much lower the mountains in question may have been than Mt. Ararat, but we judge that very much water had by now left the earth. For it was only three months later, on the first day of the first month of the following year, that Noah looked, "And behold, the surface of the ground was dry." Gen. 8, 13. The statement in verse 14, "In the second month, in the seventeenth day of the month, the earth (הָאָרֶץ) was dry," gives the date when Noah and his charges left the ark.

The two statements appear to hang together as follows. On the first date the water had disappeared, but the surface of the earth was not yet safe for man and beast to occupy. After all, even small floods sometimes leave morasses in which man and beast might perish; how much more so unspeakable a flood as the deluge of Scripture! Therefore Noah and his charges of man and beast were not permitted to leave the ark for nearly two months after the water was all out of sight, in order to give the surface of the ground an opportunity to dry sufficiently in order that man and beast might walk without perishing in the muck. That also gave vegetation in the earth a chance to make a new start, so that the former inhabitants of the ark might find food.

There are rather deep geological implications in this passage. The first might be called meteorological rather than geological, but the two sciences are very much interrelated.[1] It concerns the wind which God made to pass over the earth, Gen. 8, 1. The wind points to a meteorological disturbance, for winds, as is well known are caused primarily by changes in the temperature of the atmosphere.

More important is a careful consideration of the purpose which this wind served. As children we thought that this wind dried up the waters.[2] However theologians should not think as children in matters involving science. Comparing Gen. 7, 11 with Gen. 7, 24 and 8, 14 we find that it took less than eight months for that vast mass of water to disappear. If it had had to disappear by evaporation, it is likely that it would still be evaporating.

Harking back to our explanation of the breaking up of the fountains of the great deep, in our discussion of Gen. 7, 11.12, we call attention to the fact that Genesis 8, 2 says that the fountains of the great deep were stopped, and the windows of the heavens, and the violent rain from the heavens was restrained.

If the breaking up of the fountains of the great deep signifies thr raising of the ocean bottom and the sinking of the continents in a subterranean and suboceanic sea of magma[3] then the stopping

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[1]References to past climates, different from those of the present, abound in textbooks of geology. Cp. Dunbar, Op. Cit. pg. 161 f; 321 f; 378 f.

[2]Rupprecht, Bible History References, Vol. 1, pg. 31. "Made a wind to pass over the earth.-The wind scattered the clouds and caused the waters to evaporate."

[3]See our discussion of Gen. 7, 11. 12.

of the fountains of the great deep must logically mean that the ocean bottom again sank to its place, and that the continents rose. This would permit a swift receding of the waters, and it must have been swift, if a wholly submerged earth was dry less than eight months later, as Scripture testifies that it was.[1]

This, however, again has geological implications that stagger the imagination. With the lowering of the ocean bottoms and the rising of the continents a mighty press of waters toward the re-forming oceans would result, which would tear with devastating fury across deep and still soft strata laid down by the flood. Immense sections of the newly laid strata would be torn away by the fury of the receding waters and the materials rolled in wild confusion in the direction of the currents. The conglomeration of still soft rock masses would be carried along, only to be dumped elsewhere along the path of the current as it slowed.

If the rise of the continents was not constant, but intermittent, there may have been times of vast destruction of newly formed strata, and again attempts to build other strata on the wreckage, with more ruin and destruction on top of the previous wreckage.

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[1]In our discussion of Gen. 1, 9-13, which speaks of the draining of the earth after the creation, we have assumed (Thesis, pg. 9 ff.) that God merely started the process of draining the earth on the third day of the hexaemeron, and that the process may have continued for centuries. Here we find that after the flood the earth was drained in a matter of a few months. The difference is readily explainable in the purpose which God had in mind in each case. In the drainage of the earth after the creation God had no intention of destroying the surface of the earth, which, according to the laws of nature as we know them, would have resulted if the earth had been drained too quickly, on account of the well-known destructive force of rushing water. In the draining of the earth after the flood the waters might well drain away swiftly, because it was God's avowed purpose to "destroy the earth with a flood," Gen. 6, 13.

It will not be amiss to add a few words about the implications of erodibility for a surface of earth, left in the condition in which it must have been left, if we believe the record of Genesis. It was an earth which, according to Gen. 6, 13, was a ruin of its former self. The good earth which God had created had been dissolved by water,-many of its most precious minerals, so necessary for life and health of both man and beast, had been washed out and dumped into sedimentary beds, which would slowly harden into rock, instead of being mixed with the soil, as they were at the first. The clay had formed immense clay beds, and the sand, needed to render the clay friable and porous, had been deposited in separate strata which would presently harden into sandstone. The whole was not yet clothed with plant-life, and plants, which would come from hardy seeds[1] which had defied the action of the waters, would have a hard time re-establishing themselves in surroundings vastly different from what they had been accustomed to.

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[1]Though the resurgence of plant-life on an earth, all of which must have been under water for at least 110 days, and parts of it much longer, presents something of a problem to the human mind, both Scripture and natural science shed at least some light on the problem and point to a possible solution.

The reference to the olive leaf, which the dove brought to Noah, Gen. 8, 11, indicates that not all vegetation had perished in the waters of the flood.

Also it is known to natural scientists that among seeds there are always some which can defy the action of water far more effectively than others. Sweet clover plants, for instance, bear seed of three degrees of hardness. The softest kind is affected by water very readily, the medium hard less readily, and the hard seed must be acted upon by water for a long time before the hard wax coating, with which is covered, is dissolved, and the seed can sprout. Consequently some sweet clover seeds lie in the ground for years, even under ordinary moisture conditions, before they sprout.

Alfred Russel Wallace, Island Life, Third Edition, MacMillan and Co., London 1902, states, "Another class of somewhat heavier seeds or dry fruits are capable of being exposed for a long time to sea-water without injury." Pg. 257.

Such a surface of the earth must have been subject to the most violent erosion from wind and rain that man can imagine. Today, when a farmer mistreats his soil, and destroys the vegetative covering of hillsides, and burns out the humus by irresponsible methods of farming, he finds winds and rain taking a fearful toll of his ground. How much more fearful must erosion have been in the days and years after the flood, until a strong vegetative covering had once again been established!

Also, while the manner in which the flood receded must have carved a rude drainage system, it must have left the surface of the earth in a sorry condition, with many lakes[1] and swamps, and with rivers which had to adjust their courses, and perhaps new rivers to spring up, until the earth had again built a satisfactory drainage system, a process which may well have required centuries.

All this does not make for a beautiful picture, but it is what, geologically speaking, we need to expect from such a flood as that described Genesis Ch. 7. and 8.

We cannot refrain here from a meteorological observation in connection with Gen. 8, 4-19. This passage teaches that Noah and the creatures that were in the ark with him were on Mt. Ararat for seven months and ten days, during the last fifty-seven days without even a roof on the ark (Gen. 8, 13). We reason from this that the climate on earth must have been vastly different then than now. Today the top of Mt. Ararat is cloaked in everlasting snow and ice. Had the climate been at the time of the flood what it is today, Noah

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[1]Cp. Longwell, Knopf, Flint, Op. Cit. pg. 101 ff. A Chapter on Lakes and Swamps, particularly the section on extinct lakes, and the manner in which lakes become extinct. Pg. 108 ff.

and his charges would have died a miserable death from cold.

Gen. 8, 21. 22.

"And Jehovah smelled the odor of delight, and Jehovah said to His heart, 'I shall not add to curse again the ground because of man, for the imagination of the heart of man is evil from his youth, and not again will I add to smite all life as I have done. All the days that the earth endures seeding and harvest, cold and heat, and summer and winter, and day and night shall not cease."

This is an intriguing passage. The question presses upon the thoughtful reader, whether God here instituted the seasons of summer and winter as we know them, or whether they existed before, so that the words merely indicate that God had interrupted these things by means of the flood and would not do it again.

We are not ready to express a categorical opinion, but we give the following points for consideration. All over the earth we find that the lower rock strata speak in unmistakeable language about a time when the climate even in far northern regions was mild, almost tropical,[1] for so the fossilized vegetation indicates. Coal is found as far north as Spitsbergen,[2] and as far south as Antarctica.[3]

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[1] The Book of Knowledge, Vol. 13, Pg. 4712. "Lamont was the discoverer of coal in Spitsbergen, where mining is now an important Arctic industry.

[2] Spitsbergen, 76° 25' to 80° 50' north latitude, therefore well within the Arctic Circle.

[3] Encyclopedia Britannica, 1947, sub Antarctic Regions: "The continent...is formed for the most part of old rocks, amongst which the most prominent are of Permo-Carboniferous age, and bear coal."

And coal is formed by heavy vegetation sinking in swamps and being carbonized.[1]

The least that one can say is that a vast change in climate must have taken place some time after the flood.

Some Bible students believe that here is the beginning of the Ice Ages,-that they began with the flood itself.[2] We consider this untenable. Case after case has been reported in recent years in which the flesh of mammoth elephants has been found in the ice of Siberia, so well preserved that not only dogs, but men ate it. It is unthinkable that these animals should have been in a flood before they were in the ice. It was not water that killed them, but ice, when, as Dana put it, "The cold descended as of a sudden winter's night, and knew no relenting afterward." We do not pretend to have the final answer in this matter. But it seems to us that, while winter may have had its beginning right after the flood, the so-called ice ages must have been inaugurated somewhat later, after the animals had again bred abundantly and overspread the globe. This whole question deserves far more attention than it has received to date from Biblical scholars in our circles.

THE CHANGE IN THE LIFESPAN OF MAN AFTER THE FLOOD.

We speak of the change in the lifespan of man after the flood

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[1]See Longwell, Knopf, Flint, Op. Cit. Pg. 440.

[2]George McCready Price, The Modern Flood Theory of Geology, Fleming H. Revell Co., New York, 1935, Pg. 63. "This Drift-ice theory is fully in accord with Flood geology; for a period of floating icebergs which were driven by very violent storms undoubtedly prevailed as the last stage of the Flood, this period having been prolonged for nobody knows how long during the time when the continents were emerging from the universal ocean."

because the question stares us in the face when we read Genesis Chapters 1-11. We note that until the time of the flood the age of man is rather constant between 900 and 969 years. After the flood it rapidly sinks to 200 years and even less. Here also the thoughtful student will see geological implications of the flood. Geological science can shed some light on what happened to the length of human life, and why it happened.

Genesis 5 gives us the ages of many of the ante-diluvians, -all of them with an exception or two[1] above 900 years.

Gen. 6, 3 makes the significant statement: "And Jehovah said, My spirit shall not dwell in man forever inasmuch as he also is flesh: and his days shall be one hundred and twenty years."[2]

This passage has puzzled translators and interpreters. Two widely different meanings have been found in it. Luther, in his German Bible, translates: "Ich will ihnen noch hundert und zwanzig Jahre Frist geben," understanding the 120 years as a time for repentance. The fathers in the Missouri Synod faithfully followed this understanding. Dr. Stoeckhardt says: "Die Menschen gaben dem Geist Gottes nicht mehr Raum, verachteten die Geduld Gottes, verscherzten die Gnadenfrist von 120 Jahren, die Gott ihnen noch gegeben."[3] Rupprecht comments: "God granted the apostate race

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[1]See Gen. 5, 17 and 21.

[2]Gesenius, Op. Cit. sub דין : "Most of the ancient versions give to דין the sense of remaining and dwelling... Vulg. non permanebit; Syr. Arab. shall not dwell. This is best adapted to the context."

[3]G. Stoeckhardt, Die Biblische Geschichte das Alten Testaments, Concordia Publishing House, St. Louis, Mo. 1896, Pg. 10.

days, nay, years of grace, ample time to turn to him in true repentance."[1]

This understanding of Gen. 6, 3 involves the interpreter in a difficulty as shown by the following passage from Luther:[2] "Weiter spricht Gott: Ich will ihnen noch Frist geben hundert und zwaenzig Jahr. Das redet er auf die Zeit, die er der Welt noch geben wollt bis auf die Suendfluth, dass sich die Leute indess bekehren und bessern sollten. Nu war Noah daselbs, wie der Text sagt, funfhundert Jahre alt, und wird hernach angezeigt, dass nur hundert Jahre auf die Suendfluth waren, als er den Befehl krieget, die Archen zu bauen, dass es eben zusammen sechshundert Jahr waren, als die Suendfluth kommen ist. Ist nu die Frage, wo denn die zwaenzig Jahr bleiben, die Gott in diesen Worten hinzusetzt. Ich weiss Nichts drauf zu antworten, noch aufzuloesen, ohn dass es wohl sein mag, dass die Bosheit so trefflich ueberhand genommen habe, dass Gott geeilet habe mit der Suendfluth, und die zwaenzig Jahr abbrochen, oder dass es per anticipationem gesagt sei, also, dass diese Worte, zwaenzig Jahr, zuvor geredt sind, ehe Noah die drei Soehne gezeugt hat, oder je ehe er funfhundert Jahr voellig alt worden ist."

It should be noted that there is another understanding of this passage, clearly brought out in the translation of Smith-Goodspeed, "My spirit must not remain in man forever, inasmuch as he is flesh. Accordingly, his life-time shall be one hundred and twenty-years." The difficult יָדוֹן may be rendered, "be made low", according

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[1] Rupprecht, Bible History References, Vol. I, Concordia Publishing House, St. Louis, Mo., Pg. 27.

[2] Luthers Werke, Erlangen Edition, Vol. 33, Pg. 165.

to Gesenius, but the Lexicon adds the remark: "Most of the ancient versions give to דין the sense of remaining and dwelling: Sept. Vulg. Syr. Arab. This is best adapted to the context."

According to this understanding the Lord would be saying in effect: "My spirit, which I breathed into man at his creation, shall not dwell in man so long, because of his wickedness. I am going to cut down his lifetime from nine hundred years and more to a mere hundred and twenty, so that the end of his wickedness may be reached sooner."

If this appears to be a bold stroke to the thoughtful reader, let him read Gen. 9, 28.29 and Gen. 11, 10 ff. and see what actually happened to man's life-span after the flood.

Gen. 9, 29 we read: "And all the days of Noah were nine hundred and fifty years: and he died." Noah had not only been born, but had grown to full manhood, and was in his best years, so to say, before the flood. He reached the full average age of the ante-diluvians.

A remarkable change is seen in his son Shem. Gen. 11, 10: "Shem was an hundred years old, and begat Arphaxad two years after the flood: And Shem lived after he begat Arphaxad five hundred years and begat sons and daughters." Shem, who was a mere youth of slightly less than 100 years at the time the flood began, lived to be a mere six hundred years old. One generation, and that not wholly a post-diluvian one, had lost over three hundred years of life-expectancy.

Gen. 11, 12. "And Arphaxad lived five and thirty years, and begat Salah: And Arphaxad lived after he begat Salah four hundred and thirty years, and begat sons and daughters." It is noteworthy

that Arphaxad married at the age of thirty-five years. Sixty-five is the earliest date at which a marriage is reported of the godly fathers before the flood, Gen. 5, 16. It is more noteworthy that Arphaxad reached an age of only 438 years, almost 200 years less than his father Shem.

Salah, the next in line, son of Arphaxad, maintains right well the record of his father with 430 years, while Eber, with 468 years, surpasses both father and grandfather. Conditions must have been reasonably stable. But Peleg, Eber's son, slumps down to 239 years, and this average is maintained for some generations. In Abraham's time the length of man's life is still slipping noticeably downward. According to Genesis 25, 7 Abraham lived to be 175 years old, his son Isaac, according to Gen. 35, 28.29, 180 years, but Jacob, according to Gen. 47, 28, only 147 years. Joseph's age is given (Gen. 50, 26) as 110 years, that of Moses as 120 years (Deut. 34, 7). And there are students of human life expectancy who maintain that man could still live 120 years, and a few still do, if occasional reports of people living to this age may be trusted.[1]

Now when man's life was changed from 900 and more years to 120 years and less, man himself must have been changed physically. Precisely what these changes were we are unable to say. But it goes without saying that a human being meant to live for 900 years must have had a harder set of teeth than one meant for 120 years or less, or he must have had opportunity to grow a new set. It seems clear

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[1]See article entitled, "The Probability of Death", by Edward S. Deevey, Jr., Scientific American, April 1950, pg. 59. "The maximum length of human life appears to be fixed at about 115 or 120 years."

also that the man who was to live for 900 and more years must have had a stronger heart than one who will drop dead at the age of 120 or before.

What means may God have used to work these vast changes in man, which must have been accompanied by comparable changes in the animal world, for the animals are ever man's companions and fellow-sufferers for his misdeeds?

We believe that God used as means to shorten man's life first of all a ruined earth, which would not yield man the sustenance which would build a body that could last for 900 years or more. Man's heredity might keep the change from being complete instantaneously, but environment would gradually win over heredity. Climate may well have played its part in the transformation. Climate has its effects on life and health. Extremes of climate are detrimental to all life, as we know it here on earth.

Finally it should not be considered out of the question that atomic radiation[1] may have played havoc with the genes of man, beast, and plant at the time of the flood, and that it took generations before life-forms after the flood assumed precisely the forms they have today. We ought not to expect that life-forms before the flood were exactly what they are today, nor should we expect that life-forms after the flood would change much after they had once become stabilized. Much evidence for these statements could be brought from paleontology.

The writer affirms at the end, as he did at the beginning, his firm conviction that God has given to mankind two books to read, both

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[1]Compare thesis pg. 57f.

of them God's books,-the Scripture, given by inspiration of God, and therefore His infallible Word, and the book of Nature, also God's book, to be read and compared with Scripture far more diligently than many of God's children have been willing to do. Between these two books there can be no contradiction, but only the most perfect harmony. It may not always be possible for us to see this harmony because of our ignorance and of pre-conceived notions. Yet the harmony is there. It is with these convictions, and with the purpose of showing, in a measure at least, this harmony, that this thesis was written, and is being presented.

THE END.

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