RINGS AND CANOPIES

By F. L. Parsons

BIBLICAL GEOLOGY and the VAILIAN THEORY

Rings and Canopies

THE EARTH'S OWN RECORD OF IT'S PAST

Why should the earth have experienced Ice Ages in the past?

Will the earth again become a glaciated world?

Why was there an Ice Age at the equator when at the time there was no glaciation at the north pole?

Why do we still find frozen animals from a previous age?

Why are these frozen animals a logical result of a once molten earth?

Where did the ice come from?

Why were the polar regions sometimes sub-tropical?

What was the source of the energy that raised mountains?

Why are the mountain ranges near present or ancient coast lines?

Why is coal found in polar regions, but not in the tropics?

Is coal a deposit of vegetable matter?

How old can this earth be?

What is the answer to these and other "mysteries"?

With an appendix-"Does all this agree with the Bible".

Don’t keep forever on the public road, going only where others have gone. Leve the beaten track occasionally and dive into the woods. You will be certain to find something you have never seen before. Of course, it will be a little thing, but do not ignore it. Follow it up, explore all around it; one discovery will lead to another, and before you know it you will have something worth thinking about to occupy your mind.

Alexander Graham Bell.

———-

It is true I milked twenty cows to get the milk, but So help me, the butter I churned is all mine.

Charles Lamb.

———-

(I’ve milked over fifty cows for the cream for this one.)

(The Author)

FOREWORD

1. In presenting a new treatise on the method of the formation of the earth, some logical motive should be supplied. A completely new theory, no matter how illogical, might supply such a motive. But we must confess that the theory herein presented is not new; it has merely been overlooked by writers on this interesting and important subject. In fact this theory is as old as man, for the first recorded writings on the subject are in complete harmony with the substance of this volume.

2. About the year 1860, John Taylor, an English mathematician, set forth in some detail the belief that the water and crust material of the earth did not descend at one time, but frequently and over long periods. About 25 years later, Prof. I.N. Vail, arrived at his conclusions independently, presented much the same thoughts in a series of lectures and publications. His work attracted a little more attention than had Taylor's, and his theory became known generally as the "Vailian Theory," while he preferred the term "Annular System."

3. Since that time additional information has become available, all of its giving additional support to their general conception. So here we have tried to present only the facts with such logical deductions as those facts warrant, and allow you to be their judge. In presenting these thoughts to our scientific friends, almost invariably we were warned that such a theory would never meet acceptance "because it agrees with the Bible." But surely in a land such as ours, where the Bible remains "the best seller", it seems that it should add immeasurably to the force of the argument to show that this volume is supported by the Bible. Nevertheless, we have refrained from appealing to any of the ancient writers which might add support, but have adhered strictly to three fundamentals, FACTS, NATURAL LAW, AND LOGIC. Geology cannot be considered as a science separate and apart from all others. Whatever conditions we find upon earth in connection with its structure, they are there because of the operation of immutable natural laws. Natural Laws, including the laws of chemistry, physics, biology, mechanics, electronics, astronomy, even mathematics, have been operative in every past age. And here is one fixed, unchangeable rule to which every logical mind will give assent:? "FOR EVERY RESULT WE FIND UPON THIS EARTH, GREAT OR SMALL, THERE MUST HAVE BEEN A SUFFICIENT, COMPETENT, AND REASON-ABLE CAUSE."

4. As we see about us upheavals and erosion, great canyons and lofty mountains, deserts and oceans, we must conceive of means and forces entirely adequate to produce these conditions, in harmony with natural law and in logical sequence as a result of preceding events. We must be able to see the source of the energy that could raise mountains, sink the sea beds, and spread out the great prairies and deserts. We should be able to understand the solution to such questions as to why our metal and coal reserves are where they are; why ice caps now cover the polar regions although they once were warm; why equatorial regions were glaciated; why three great fresh water ice islands are now floating in the Arctic sea; and how giant boulders weighing up to six thousand tons were moved to new locations, often higher than their own source. These are only a few of the "mysteries" that should become plain.

5. If we have been able to pass on more logical and reasonable solutions to these questions, it was only because we were fortunate enough to learn them from our mentor, and prove them over a period of the last half century, which has been a period of great advance in knowledge, and not because of special erudition on our part. Two thousand years ago a writer whose teachings finally

wrecked the Roman Empire advised his readers, "prove all things, hold fast that which is true." That advice is still good today.

CHAPTER ONE

FACTS ABOUT THE EARTH, AS IT IS AND AS IT WAS

6. In attempting to arrive at the methods by which this world was ordered for an habitation for things living, we are dealing only with circumstantial evidence, and we can offer no personal witnesses to testify on our behalf. It is substantially axiomatic in civil law that if either, or both, sides depend upon circumstantial evidence, the theory that they present to explain that evidence, and the conclusions which they draw, must account for all material facts, and leave no such facts unexplained. There must be no unexplainable mysteries surrounding these material facts. Yet in all geologic theories which have been presented to the jury of public opinion, there is none that does not admit that many mysteries are left unexplained, and unexplainable, by that particular theory. Putting this test to the theory herein presented, we find that the so-called mysteries are not only explained but actually become a necessary corollary to the general plan, and in full accord with natural law.

7. Let us remember that every event of any consequence in the history of earth has left its imprint, but that imprint may be only fragmentary, for other events may have partially or almost completely obliterated the record. But actually there can be no contradictory sets of evidence, although men of science may draw diametrically opposed conclusions from certain facts. Earth's record is correct as to what happened, if we but read it aright.

8. This earth on which we live is a nearly round ball of matter, approximately 8000 miles through, and about 25,000 miles in circumference. The ball is slightly flattened at two places which coincide with the points of slowest rotation, for the earth spinning around in space constantly maintains the same axis, and the terminations or surface points of such axis we call the North and the South Poles. Halfway between them we find the points which move the fastest of all points on the earth's surface, and these points or this line we call the "equator." Since the earth rotates a little less than once in every twenty-four hours, we can say roughly, that points on the equator are moving as a result of that rotation, at the rate of one thousand miles per hour. There is no rotation at the poles, So as we leave the equator and move toward the poles the points where we are will have less and less rotation speed, until at the exact pole it will cease entirely. Because rotation of any object develops centrifugal force within the object rotated, there must be a force tending to push any object away from the earth, and this force would be greatest at the equator and diminish as the poles were approached. Then why does not any loose object at the equator leave the earth and go into the clouds? That brings in another law, -the law of attraction. We know that all matter has an attraction for all other matter, proportionate to mass and distance, an attraction which is not directly related to but seems to have some of the characteristics of magnetic attraction. When the mass or weight of the earth attracts a mass of other matter, say a human body, we call this gravity. And gravity has a greater pull toward the center of the earth than centrifugal force has the push to get us off the earth. However there is a noticeable difference in the weight of a person at the equator, and at the poles. A person's weight is the measure of the pull of earth's gravity less its push of centrifugal force.

9. At the equator any object weighs about 1/200th less than it would at the poles, due in part about 1/300th) to centrifugal force not present at the poles, and partly (approximately (1/600th) to decrease gravity. But it would not be necessary to increase the speed of rotation two hundred times for centrifugal

force to equal the centripetal (gravity) but only 17 times. The build-up of kinetic energy is extremely rapid with the increase of velocity, as every one knows who has driven a car. This accounts for So many auto accidents on curves.

10. The outer surface of the earth is composed of water over 78% of its expanse. The 22% of the surface where the solid parts of earth project above the water, we call land. But the water is merely a surface condition, for the deepest places we know are the Mindanao Depths, off the Philippines, and the Challenger Depths, near Guam. But these are a mere 6 1/2 miles 1 in depth, or less than 1/20th of 1% of earth's diameter. Under the sea we again encounter solid matter. Since the solids of the earth are more than 99% of the bulk, why should one of the minor substances (water) dominate 78% of its surface?

11. On the continents are generally a mile or more in depth, deposits that yield relics of former life. These indicate that all the various levels were at one time the surface of the earth, and that other matter has covered up these surfaces, layer after layer, until we reach the present surface. These deposits prove that life began with very small and humble beginnings, that these beginnings passed away and new life, more complex, appeared only to disappear in its turn, followed by still other forms, until we reach the age of man.

12. But this was not the beginning of the earth, for under the fossiliferous layers we find even more materials, both water-laid and igneous. The water-laid was always deposited on the surface, while the igneous was principally extruded through great cracks in the plastic or solidified coverings, rather than as ash blown out of volcanoes or poured down from their craters as molten lava.

13. These non-fossil-bearing series we term the "Archean" or "Azoic." That is, there was a "no-lie" period, either vegetable or animal. The rocks of this period indicate that most of the material deposited was laid down layer after layer, horizontal to earth's surface. But today we often find it folded as if some giant hand had decided to make an accordion of it. Some of these folds are miles in extent, and erosion may have removed So much, that we often find the top part of the fold gone and the sides many miles apart, as if a giant bull-dozer had scooped out the area miles wide. It appears as if the folding force came from the ocean beds, for the continental deposits found in the interiors show less of the folding, and more rupture from beneath. This folding produced great pressure and heat within the structures, resulting in much of the deposits of this period being crystalline. As this often resulted in new atomic alliances, we term this type of rock "metamorphosed."

14. Thus we find earth's outer crust made up of sedimentary or water-laid rock; igneous, or extruded (and usually molten) material from the core; and metamorphosed. There are shades of gradation between these, such as sand dunes, glacial drift, and those organically formed, such as coral, certain other limestones, and diatomaceous earth. Nor should we overlook deposits by petrification which, though not important in bulk, are important as guideposts.

15. In this outer crust, approximately 22 to 24 miles in depth, limestones and silicones form the major portion. Underlying all the deposits like a great enfolding blanket, is a deep layer of granite, except for a portion of the bed of the Pacific Ocean, where it is absent. (See Para. 39). Above this granite in all the ages are found both calcium (lime) and carbon in some form. Some of the deposits of limestone are as much as three to four miles in thickness. Calcium carbonate of which the lime deposits are principally composed is seldom found in its pure state. However it is So found, for instance, in the Carrara marble of

Italy. It occurs in large beds throughout the world in various strata mixed with other earth materials, principally silica in the form of clay. It underlies practically the whole of the North American continent, in one massive sheet.

16. In the Southwestern part of the United States almost on the surface of the ground, will be found deposits of calcium in the form of gypsum, which is used in making cement plaster. This form is readily soluble in water and the greater the carbonic acid content of the water the faster it will dissolve. This accounts for the great caverns, such as found at Carlsbad, N.M., that have been washed out of these deposits.

17. Within the deposited material we also find silica, sometimes in the form of sandstone, sometimes as clay, slate, or shale. These deposits are often thousands of feet in thickness, although some may be less than an inch.

18. It is surprising to learn how few elements go into the make up of this crust. Prof. F.W. Clarke as reported in "Analysis of Rocks" Bulletin 168, U.S. Geological Survey, gives the following Figures as the probably percentages.

ELEMENTS	SYMBOL	PERCENT
Oxygen	O	47.02
Silicon	Si	28.06
Aluminum	Al	8.16
Iron	Fe	4.64
Calcium	Ca	3.40
Magnesium	Mg	2.62
Sodium	Nahum	2.63
Potassium	K	2.32
All Others		1.05

19. Below the deposited material we find a more orderly arrangement, the beginning of the core of the earth itself. It is not possible for a person to go down to the core but by studying the broken and tilted structures which have permitted us to see layers that were once at a much grater depth, and by various sounding devices, we can reach a fairly accurate conclusion as to what is beneath us. Beneath the granitic layer which was once part of the molten core but of lighter material than the rest, comes a massive layer of basalt, volcanic glass, melted and cooled silica, hardened on its upper but probably becoming plastic in its lower portion. Below the plastic mass is more molten silica, floating on other molten rock, predominately iron ores.

20. Scientists have estimated that the pressure toward the center of the earth must be in the vicinity of twenty million pounds to the square inch. Pressure, in

accordance with natural law, must produce heat, if it cannot produce motion. The heat in the earth's interior, unless the pressure is equalized due to the liquid condition of the material, must be almost beyond conception. At any rate we are assured that the bulk of the interior is all past the melting point of earth materials. We know that after the first inequalities of the immediate surface of the earth are overcome, on the average there is an increase of one degree of temperature (Fahrenheit) for each 50 feet of descent. This must be taken into consideration in all mining operations involving deep structures. At this rate it would require only a depth of (212 x 50) 10,600 feet to reach the boiling point of water, or (2000 x 50) about 20 miles to reach the melting point of some rocks. And remember, the center of the earth is 4000 miles from the surface.

21. It would appear that early in earth's history the continents were raised from the general surface, and the areas that were later to become the beds of the seas were depressed. Following this, although the sea bed might sink more and the continents increase or decrease, their relative location remained fixed.

22. In general we find the mountain ranges near the sea shores, and the mountain systems of today are comparable to a great horse-shoe, one tip being the Cape of Good Hope, and the other Tierra del Fuego. This does not however include Antarctica or Australia, which have mountain systems of their own. On both of these sub-continents, we find the mountain systems around the rim, and the center more level. Australia has a low, arid central plain while Antarctica's central plain is at an altitude of approximately 9000 feet. (See Paragraph 148) For many miles around the North Pole there are no great mountain ranges, or even volcanic peaks to break the flatness of tundras. Immense glaciers have scoured and creased the land for hundreds of miles below the pole itself. Some of these glaciers were miles in thickness, but there were no mountains there upon which they could have been formed, and now there is less snow fall at the poles than in West Virginia.

23. In the Antarctic immense glaciers have cut off the tops of granite mountains, and left them like mesas. Everywhere is evidence of glaciation and yet during the 1946 expedition of the U.S. Navy to the Antarctic (Operation High-jump) when Rear Admiral Cruzen visited Ross Island, where the ill-fated Scott's expedition had years before established a base camp, he found one of Scott's sled dogs standing on all four legs near the cabin. Although he had been standing in the snow, frozen, where he had died thirty-five years before, he was not covered with snow. (See paragraph 148)

24. However, at Little America the same expedition found that snow had been added to the surface there at the rate of three feet of ice a year since the previous expedition. There much of the snow is blown in, and does not "fall" as we are accustomed to see snow fall in the temperate zone.

25. The Antarctic continent has never been fully surveyed and mapped, but from what is known we find that on the Indian and Atlantic Ocean sides, at some points, the land slopes gradually upward to the Polar Plateau, while at other places mountain ranges and sheer bluffs rise up close to the water's edge. On the Pacific side are the more mountainous parts and here the indications are that the surface at least is sedimentary in origin. The other parts are more indicative of volcanic activity. In all directions the ice sheet has sent glaciers gouging out great valleys all the way from the Polar Plateau to the surrounding seas.

26. Fossils indicate that in past periods the Antarctic enjoyed a climate comparable to Southern California of today. The ice sheet has in recent years extended much

further out from the pole than at present. The ice is slowly decreasing and receding which means that it is adding to the waters of the seas, and this is also true in the north, but there more of the ice cap was already in the water.

27. Throughout the world minerals of various kinds are found in the deposits, the Azoic beds being the ones with the greatest mineral wealth with decreasing amounts as we approach the more recent periods. Recent discoveries have proven the existence of one of the greatest iron ore deposits in the world in the Azoic beds of Canada. This discovery convinced our Congress that the St. Lawrence seaway was a necessity. We all know of the great deposits of coal in Alaska, where the veins are often twice as thick as those of the average Pennsylvanian deposit, but did you know that this same condition exists in the Antarctic as well? Shackelton's expedition reported finding within 400 miles of the south Pole, a vein of coal one hundred miles long and as thick as forty feet in places. Rear Admiral Byrd reported that on one of his expeditions he saw in the Queen Maude Range a deposit "with enough coal to supply the whole world." Explorers have brought back evidence that important deposits of gold, silver, copper, iron, molybdenum, oil, and even uranium are there.

Antartica Yields High Grade of Coal

WASHINGTON—[UPI]—Scientists are mining "dirty diamonds" in Antartica.

Dirty diamonds are coal—a hard, high grade coal something like anthracite. Like diamonds, this kind of coal is created out of carbon under pressure.

Conceivably, scientists say, it could lure the first industrial enterprises to the frozen continent.

According to the National Science Foundation, five geologists from Ohio State University have been digging for something never before in the Antarctic—coal that has never been exposed to the severe weathering action of the elements.

The geologists are digging into a coal seam on a ridge of the central Horlick Mountains 350 miles from the South Pole. Hard coal, proof that vegetation once grew luxuriously in the now ice-buried continent, was first discovered in Antarctica 54 years ago.

But all the samples have come from very near the surface and none from the pristine deeper layers. To find out just what grade of coal lies under the continent, scientists must dig up some unweathered samples for analysis.

The five geologists braved zero temperatures and wind gusts up to 70 miles an hour to work what they called their "dirty diamond mine." They already have obtained the deepest coal samples ever found in the Antarctic.—Oakland Tribune, Thurs., Feb. 22, 1962

28. As we go from the poles toward the equator we find the coal deposits have a tendency to lessen thickness, until between the "tropics" there are no coal deposits. But in all geologic ages we find some form of carbon, although in Prof. Clarke's tabulation its total bulk only entitles it to be included in "all others."

29. In the Atlantic Ocean lies a great canyon averaging about 300 feet deep and two miles in width. Its known length is over 900 miles. It lies over 500 miles from our Atlantic Coast, running in a general north and south direction.

30. In the Pacific during the late war intensive soundings were made. A surprising number of flat topped mountains with the tops about one mile under the present surface of the sea, were found. A similar condition was found in the Gulf of Alaska, where one of these under sea mountains was found with a flat top five miles across, and 857 fathoms (almost exactly one mile) under the surface.

31. Now all these apparently unrelated facts are very definitely inter-related, and all the questions which these facts raise should have a reasonable answer. They must all fit into the same general plan, and all must be the logical result of the outworking of natural law. We will find many more related facts of great interest. But now let us reverse the usual order of story telling and give the solution first, and then fit facts into that solution in corroboration.

_____

1See Reader's Digest, page 134, May 1960. Challenger Depth measured at 35,800 feet.

CHAPTER 2

SOLUTION TO THE PROBLEM

32. A good place to begin would be at the beginning, but just where is the beginning? As we look backward into the past we realize that we can know nothing of the beginning, for it is hidden in the infinite time of eternity. Therefore we must select a beginning.

33. Prof. Millikan's theory of the cosmic ray, and the subsequent research by Prof. Picard under the auspices of the National Geographic Society and the Bell System, have given us a fairly firm foundation on which to build. It enables us to reason back to the time when all the matter now composing the earth was in the simple form of power as cosmic rays. We are convinced that there is perhaps as much as 300 times more radiant energy throughout the universe existing in the form of cosmic rays than in all other forms of radiant energy combined. These rays under several conditions will cease traveling and become atoms of hydrogen, the simplest form of matter. It is probable that 90% of all the material in the visible universe?stars, nebulae, etc., ?is still in the form of hydrogen. From hydrogen by the addition of neutrons, we know that all the elements can be formed, and neutrons are present in the cosmic rays. From the elements thousands of variations and combinations can be made.

34. An atom of hydrogen is composed of one proton as a nucleus, and one electron circling about the nucleus. If the nucleus picks up one more proton plus two neutrons with one more circling electron the atom has become helium. The proton is the particle of positive electric charge in the cosmic ray, or in any atom. The neutron, absent in hydrogen, is the negative electric charge and, attracted to the proton, assists in forming the nucleus of every other atom. The electron is a relatively lighter particle of negative charge and circles at varying distances from the nucleus of the atoms which comprise the 92 elements found in the earth, and the four additional ones created by man.

35. Very possibly the cosmic ray energies first were converted to hydrogen, and then this great mass of hydrogen compacted from mass attraction, producing heat both from the pressure of the mass and atomic re-action, would act as an atomic pile. From this re-action would come the product on of all the various elements. Each element would be most strongly attracted by atoms of the same element. Thus titanium attracts titanium, iron attracts iron, silica would seek its mate in other atoms of silica. But not alone like to like, for some atoms are especially prone to see compatible elements. Thus carbon will unite with calcium to make calcium-carbonates (limestone), hydrogen and oxygen form water, and So on through an infinite variety of combinations. And such unions would have taken place in this suggested hydrogen mass.

36. As the elements formed, the denser would begin to seek the center of the great whirling, seething, mass and thus the iron core of the earth would begin to assume its final place, the elements and combinations having the greatest affinity for iron accompanying the iron when they could attach themselves to it. Then the lighter of the elements must find their place toward the outside and the greater velocity of the whirling mass the more this would be true.

37. Since the events leading up to the establishment of earth's core, and the bringing of some order out of the chaotic amorphous mass of earth materials left no record which we can read today, we cannot be too certain as to the means employed, but the suggested method at least serves to bring us up to a beginning

where we do have a fairly detailed record if we can but read it correctly, and interpret what we read in harmony with natural law. So this brings us to the period when the earth had formed its core of matter, a ball with an approximate diameter of 8000 miles.

38. That core is made up of molten iron ores, with molten basalt (silica) on the surface. All the rest of the material which would eventually make up the 22 to 24 miles of deposits which have been made on this base (with the exception of such molten material as has been extruded from the core) was not at that time either on the surface nor in the earth, and therefore must have been above it. As the core cooled and contracted, the lighter elements of the core beneath the basalt came under great pressure, and fractures in the basalt permitted the escape of these lighter elements in the form of granite, which wrapped itself like a great blanket around the earth.

39. It is interesting here to ask why a large area of the Pacific Ocean bed lacks that granitic covering. We are inclined to the view that the covering was once there1, but was torn loose from its bed while there was as yet no water there, and the granite had not cooled. We know what that the earth's satellite?the moon?has a specific gravity approximately commensurate with granite, and it could well be that the great tides produced by the sun on a level molten mass was the agent of causation. Owing to the great attraction of the other materials still around the earth, the moon would not have moved out from the earth as far as it is at present, but would have assumed the position of a secondary moving around its primary at too great a speed to be drawn back to earth but held by that force from moving completely out of its control.

40. As the melting point of rock ranges between 2000 degrees Fahrenheit to twice that much, it must have been in that range of temperature on the surface of the earth with increasing heat toward the center until the maximum was reached. Water not under pressure cannot be heated beyond 212 degrees, but if confined the temperature may increase until the water turns to vapor exerting tremendous pressure in all directions. As steam it will expand if possible 1645 times or roughly one cubic inch becomes one cubic foot. Consequently if there had been any water within the molten mass, it would have expanded and being lighter than the molten rock would have risen to the surface and escaped into the atmosphere. But as we have already seen, the water of the earth would not have been at the surface of the core but among the farthest out of the lighter elements above the core, except where it was holding other elements in solution, increasing its specific gravity, and thus being drawn closer to the surface.

41. Viewing the tremendous heat produced by the molten earth?(some conception of what that heat must have been is given us by the heat radiations of a thermo-nuclear explo-sion)?we can see that all moisture would be converted to vapor as fast as atomic action produced it. This would also be true of other substances. Practically every element or combination of elements can be reduced to vapor (gas) by the application of sufficient heat, and caused to expand, many of them to an even greater degree than water. Therefore we see that the requirement of law is that those elements which eventually made up the crust of the earth, would have been converted to gas, and would later have condensed to solid matter in earth's atmosphere.

42. During the early part of this century, scientists studying earthquake vibrations found that at varying depths in the earth the waves were reflected as if striking a solid substance. One of these points of reflection is approximately 1800 miles below the surface, and gave rise to the theory that the earth had

already reached a state of solidity. However we can account for these points of discontinuity which roughly occur at 290, 620, and 1800 miles in depth, by noticing that the various elements or combination of elements would be arranged with the lightest toward the outside. As the waves reached the surface of a denser layer some of the vibration waves would be deflected regardless of whether the material of which that layer was composed were molten or solid.

43. For example, in telephoning by radio from the Pacific Coast to Hawaii, the radio waves are directed at a point miles above the earth to a layer of ionized particles that cannot even be seen, called the "Heavyside Layer." This layer moves up and down during the day, but technicians can make us of it to accurately "bounce" the waves to their proper destination. Hence science swings back again to the law that points out that pressures which do not produce motion, produce heat, and the heat So produced is proportionate to the pressure?the law of "conservation of energy." Scientific minds seem to have a predilection to forget proven facts which are common-place if some new fact comes up which can be explained by some new and different theory. Sometimes we find those theories to be strangely unscientific.

44. It was while the earth was still in a molten condition, although the surface may have reached a state of plasticity, that the rotation of the earth is positively known to have been operating. A molten earth spinning on fixed axis would tend to bulge outward at the fastest moving portion, the equator, and to flatten the ends of the axis, the poles. The diameter of the equator is 7926.677 miles where the axis is 7899.988 miles, a difference of 26.689 miles. After the earth had solidified its crust, this spinning motion would not have had So much effect, So we are assured that the points of the axis were fixed while the earth was still molten, and since they are still in the center of the flattened areas, we are also assured that they have never been changed. This fact may make some difficulty for the theorist who accounts for the changes in climate at the poles from semi-tropic to frigid and back to semi-tropic, by the simple device of moving the poles down to the equator for a time and then moving them back. But natural law says that once the body of the earth was set in motion, spinning on its own axis, it must continue to do So until opposed by sufficient outside force to halt its motion and start it again with a different axis. One such theory suggests that a planet moving close by exerted the force necessary to this theory, but if such a planet had moved close by and exerted more force or pull on one part of the earth than another, it might have resulted in changing the "pointing" of the axis, as regards points in space, but not the position of the axis in the mass.

45. When the surface of the earth was molten, and that surface now generally lies many miles below the present surface, neither water nor any of the substances later added to earth’s crust were on that surface, and therefore must have been above the earth. The entire mass above the surface must have turned with the earth and at the same rate of rotation, just as the atmosphere of today. There are some scientists that claim that at that period the earth revolved at a much faster rate than at present, probably completing a revolution every four hours. Mathematically there is much weight of evidence to support this though, and it certainly would be of very great assistance in proving the theory we are here advancing, if we were to take this figure for our calculations. But, although we may believe the estimate a sound one, we will not claim any greater speed than the present known rate of one revolution a day, actually 86,164 second.

46. Most geologists are agreed that much of the material of the crust of the earth must have been in suspension in the atmosphere at the time of this igneous period. Some recent writers have ignored this logical conclusion and have all of

earth's materials including water out of the atmosphere at the beginning of this period. They explain that since the surface of the earth was So hot the water could not possibly have been there, it much have been inside the earth, for it certainly was somewhere. But we will accept the more general view since it agrees with natural law. It is true that the water could not have remained on the surface, since had it fallen there it would have immediately been flung back into space as vapor, and taken with it any material soluble in water, it might have assimilated.

47. In canvassing the various estimates and appraisals of the depth of the vaporous canopy we find that a depth approximately 200,000 miles to be a general conception. Our own calculations based on present deposits and their respective gas expansions lead us to believe that it was somewhat under this figure. For our calculations let us take only half that amount. This would give us a diameter of twice 100,000 miles, plus the diameter of the earth, a total of 208,000 miles, or a circumference of 653,553. At the equator then this circumference was traveling at a speed in excess of 27,000 miles per hour. But we have already noted that any mass traveling at 17,000 miles per hour would be free from gravity and over that speed would be thrown away from the earth moving outward until the centrifugal force and gravity were equal.

(Note: If mathematics bore you just skip over to paragraph 53 and go on from there.)

48. For a demonstration of this we will let "g" represent the force of gravity at the equator that is exerted on any matter, expressed as the distance a body will fall in one second. But the entire force of gravity is greater than that since there is the centrifugal force also, So that the entire force of gravity is greater than "g" by the amount of centrifugal force. Then let "c" be the chord of an arc over which the earth's surface moves in one second. In this small space of time the difference between the chord and the arc would be So infinitesimal that we may use the length of the chord and the arc of the same, -as a straight line. Let "D" be the diameter of the orbit of which "c" is the chord; then

$$\frac{c^2}{D}$$

is the centrifugal force, or that part of gravity overcome by the present rotation.

Then the whole force of gravity at the equator is

$$G + \frac{c^2}{D}.$$

But we have noted that if the centrifugal and the centripetal (gravity) force were equal, the body would neither fall nor rise, but would continue to travel in its own orbit; in which case we would have

$$G = \frac{C^2}{D.}$$

It requires 86,164 seconds for one revolution, So that the circumference of the earth (diameter X 3.1416) divided by 86,164 would give us the distance traveled by the earth's surface in one second, or "c." But when gravity equals the centrifugal force we have

$$G = \frac{C^2}{D,}$$

or

$$GD = C^2,$$

or

$$C = \sqrt{GD}$$

Then as many times as "c" will divide the whole circumference, there will be that many seconds in one revolution. Thus we have "D" divided by "c" multiplied by pi, or the equivalent of this, the square root of "gD" and we arrive at the equation

$$X = \frac{D \times 3.1416}{\sqrt{GD}}$$

when "X" equals the time of rotation of the earth's surface to make gravity and centrifugal force equal. The diameter of the earth is 7,925 miles (approximately) and we reduce this figure to feet by multiplying by 5,280, and find the circumference by multiplying that figure by pi (3.1416). The distance that a body falls at the equator in one second is 16.076 feet, at least that seems to be the accepted figure. Now substituting figures in our equation we have

$$X = \frac{7925 \times 5280 \times 3.1416}{\sqrt{16.076 \times 7925 \times 5280}}$$

or X = 5,069 seconds, or about 1/17th of the time of the present rate of rotation, or expressing it in other words, the speed would be 17 times greater than the present rate.

49. But it will be noted that this figure does not take into consideration one factor, namely that attraction lessens by the square of the distance, So that moving out from the earth's surface the pull of gravity would lessen the farther out in space that matter would move. The farther away from earth's surface any matter moved the greater would be the velocity of rotation, the greater the centrifugal force, and the less the pull of gravity.

50. The effect then upon a mass of vapors around a revolving earth would be to throw the outer vapors into rings above the equator and since the equatorial portion was moving out in space the polar portion would flow toward the unoccupied space to be in its turn thrown outward into the revolving belt or rings. This would be true of all the mass down to the point where gravity was equal to centrifugal force. Since centrifugal force lessens as we approach the poles such of the vapors as remained in canopy formation would approach the earth closer in polar regions, resulting in marked oblation, that is a polar flattening of what otherwise would be a globular body. This would be

remembered particularly when we come to study the planets. During the igneous (Azoic) period those vapors coming closer to the earth, and being drawn by gravity, were still held off the surface by great heat, but as the earth cooled, and these vapors were allowed to condense, the masses increased in weight and there would be falls from the upper masses to the cooling surface. Undoubtedly at first the water was changed to steam and returned to the atmosphere. Deluge after deluge would follow from the enshrouding mass, and slowly the earth's surface became plastic, depressing under impact and accumulations here, with resulting rises over there, and liquids flowing into the depressions. Slowly the plastic condition firmed until the surface could support the further deluges from aerial sources, and the water would remain to collect in the lower depressions.

51. But since our first mathematical problem did not take into consideration all factors, perhaps we should use as method, well known to astronomers, to ascertain at what height from the earth the vapor belts would become secondaries revolving in their own orbit with the earth's core as a primary. Kepler's 2 Third Law is stated as "the squares of the periodic times of revolving satellites are proportional to the cubes of their mean distance from the primary around which they revolve." We have a satellite of earth on which we can base our calculations. The mean radius of the moon's orbit is approximately 60 times the equatorial radius of earth, So if we take the cube of 60, and divide it by the square of the time of its revolution, expressed in seconds, that result must be equal to the cube of the orbital radius of a ring of matter revolving about the earth and completing a revolution in the same time period as the earth, divided by the square of the time of revolution, expressed in seconds. The time of one lunation to another as a mean is 2, 360,608 seconds. Since lunation time varies from month to month due to attraction from other planets, this can only be an approximate figure, just as the figure 60 is a close approximation, but sufficiently close as not to distort the final result. We have already noted that the rotation of the earth is completed in 86,164 seconds. Letting "X" equal the distance that a satellite will move in its own orbit, rotating at the present speed of the earth, we have?

Or

$$\frac{X^3}{(86164)^2} = \frac{}{(2360608)^2} = 279.726264$$

Or

$$X^3 = 279.725264$$

Or

$$X = 6.54$$

52. 6 1/2 times the equatorial radius of the earth, which for convenience we will consider as 4,000 miles, gives us 26,000 miles as the radius of the circle of the revolving satellite, or in other words, at a distance of 22,000 miles from the surface of the earth any matter revolving in the same time period as the earth will be a satellite traveling in its own orbit. Anything at a less distance would eventually be drawn to the earth by gravity as soon as the repelling heat from the earth's core would permit.

53. Here we have two mathematical demonstrations that the earth did have revolving belts about its core. Very evidently all of the vaporous mass above the surface was not drawn into the rings or belts, but continued to cover the earth in dense clouds as a canopy. In those clouds we would have found for example iron, calcium, and carbon as some of the principal substances, besides whatever water had been drawn to them and kept captive.

54. Do we find iron scattered evenly through all the rock laid down in the first period? If so, then our theory is disproved. The Ring and Canopy theory demands that in harmony with the law of attraction of similar matter, and the known affinities of some dis-similar substances, that a process of collection must have taken place in the canopy, a surging and rotating mass of aqueous and gaseous vapors, and that in cooling and condensing, they would have been precipitated at such a time and place as the cooling earth would permit. Under the 22,000 mile limit, this could have happened at any time or place, but we should find that these precipitations aside from the water content were largely of one element or one combination of elements. And this is exactly what we do find.

55. We noted previously that one of earth's largest deposits of iron ore is found in Canada, in deposits of the first period, the Azoic. Similar beds, now partially exhausted through mining, were found in the United States, but not of such extent. Iron beds have been found in polar regions and in the tropics, in various combinations, and generally these lie today where they were placed many years ago, as they fell from the vaporous canopy around the earth. During the Azoic, or lifeless period, after the earth cooled (for the Azoic would include the igneous and cooling stages), carbon was deposited in a similar manner, a very pure crystalized form as graphite, and another form, fuel carbon, as anthracite coal. The graphite was deposited in Canada, the anthracite coal in Norway. Great beds of carboniferous limestone, a combination of carbon and calcium, were also laid down in this period. So far as we have been able to determine, all these deposits were laid down with water, the bottom of the layers, conforming to the top of the layers upon which they rested. However, we have only had opportunity to study this period on land, not under sea, and on the continents we find some of the strata of Azoic rocks, folded and distorted.

56. As the water drained off into the lower places, causing them to sink still lower from the additional weight on the plastic surface, So other places were forced to rise, and here we have the beginning of continents.

57. When the earth had cooled sufficiently to permit the deposition of all materials under the 22,000 mile range, we would have had an immense accumulation of heavy elements, and their associated water, on the surface of the earth; while above the 22,000 mile range (or whatever the distance might have been to permit any matter to become a satellite), the great belts of aqueous vapor and associated elements would still be continuing their rotation, and they could not decline to the earth as long as they remained at that height and at that speed. But

with the gradual clearing out of the vapors below, the lower ring would begin to spread out in order to reach toward a point where the rotation was less rapid. With the formation of this canopy, the sun again could not shine directly on earth's surface. As a matter of fact, these canopies may have formed in such succession that the sun may never have been visible from earth until many thousands of years had passed, and we have no proof to the contrary. In any event, the thickness of the rings or belts, circling about the equator would have protected the equatorial regions from the direct rays of the sun, even if the direct rays had reached polar regions. Thus in the tropics and most of the temperate zones of today, the suns rays would always have reached the earth filtered through these rings even when there was no overshadowing canopy.

58. Whenever a ring by declining toward the poles formed a canopy around the earth, the heat from earth's core would be retained under the canopy, and the heat generated by the sun's rays filtered through the canopy, would be spread fairly evenly over the entire earth. The luminous rays would penetrate the canopy until striking either the earth or earthly material they would be converted to heat rays and the moisture in the canopy would absorb about thirty times more heat than would dry air, and thus prevent its escape into stellar cold. From this we would expect to find that the equatorial regions were more temperate than now, while the poles would experience long periods of temperate to sub-tropical climate. However, the canopy would continue to move its masses toward the points of no rotation, until all the mass in the ring had lowered and spread into the canopy. With the ring ceasing to feed the canopy and a continuing movement of the mass toward the poles, the canopy must rupture near the equator. When that happened the heat would no longer be held under the canopy, the poles would become frigid, the vapors of the canopy in polar regions would descend as snow and ice, toward the equatorial regions as rain. The ice masses accumulating to great depth would move across the earth's surface as great plows, to grind down a hill here, leave an enormous terminal moraine of conglomerate material there, or move gigantic boulders hundreds of miles.

59. Since we noted that under natural law the mass of the canopy would be moving toward the poles, we would expect that much of the canopy would be precipitated in polar regions, where the water content would fall as snow and ice, while in the warmer regions it would fall as rain, if such heavy falls of water may be termed "rain." But with this water content would also be present the various other elements contained in the ring. This sediment together with the water would bring an additional load upon the continents and the seas. The continents would drain much of the water and probably some of the sediment into the seas to augment the water accumulating there. The sea bottoms would be forced downward by the increasing load, plastic material under the sea beds would be moved under the continents, and continental shelves, thus up thrusting the margins of the continents, particularly where previous ruptures had occurred, and mountains were raised.

60. This must have happened repeatedly in earth's history, every time that a canopy or segment of a canopy collapsed, until the last ring formed its canopy which in its turn declined and came to earth, and there were no more right, no more canopies, no more masses of water and earth material between the earth and the sun. There are still gaseous canopies surrounding the earth, and without these life as we know it would not be possible. These gases present somewhat the same condition as we would have found in the water and material canopies, that is the heavier are closer to earth's surface, the lighter ones are forced outward.

61. The rocks tell us that water and other elements have been deposited from some other place since the molten surface rock cooled, and the sum of their volume can be measured with fair accuracy today. These elements and their combinations must have been in suspension in the vaporous mass, and that mass much have formed concentric rings, at least above the 22,000 mile height, and those rings must have descended in the only manner possible, by declension as canopies, and falling principally in polar regions as snow and ice, but also in the warmer regions as rain. The presence of the canopies must have been accompanied by temperate or sub-tropic weather in polar regions. The fall of canopies as snow and ice any where in the world would have meant such an accumulation of ice masses that such masses would move as glaciers away from the point of fall, eroding and marking the landscape with the typical marks of glaciation. The rest of the canopy that fell as rain would have sent the great deluges that, washing away the soft deposits, swept out wide valleys, cut great canyons, filled hollows as lakes, and rushed on down to the seas, where the augmented waters once more depressed the sea bed, and raised the land surface. And this hypothesis is based

solely on immutable natural law, and since it is in complete agreement with the story that the earth itself tells us, we find the confirmation all about us, this must be the true solution to earth's development.

62. Now let us briefly examine a part of the voluminous record of evidence to see if the heavens and the earth tell us the same story, for not on earth alone is natural law operative, but throughout the heavens also.

_____

1 This theory has been presented by several writers, and we have not determined who first present it. Visitors on the moon have confirmed this.

2 Johannes Kepler-1571-1630.

CHAPTER 3

RINGS AND CANOPIES IN THE HEAVENS

63. If the foregoing outline is the general plan of development of this planet, and is based on natural law, then we should find some proof in our own universe, in connection with other satellites of Helios (our sun) that these laws are in operation there also. The order of the planets in nearness to the sun is Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto.

64. It is difficult to learn much from Mercury. It lies too near the sun, and as viewed from the earth, is So close to the sun that we do not even know definitely how often it revolves on its axis, if at all. No definite markings are visible, and experiments with heat measuring devices know as thermo-couples, appear to indicate that the same side faces the sun at all times. Apparently it is So small and So close to the sun that it cannot hold an atmosphere, if it ever had one.

65. Venus is in better view, and yet no one, not even with the most powerful telescope, has ever seen the planet. That is because it is "cloud-wrapped," to borrow an expression general among astronomers. The light of the sun shining on the "clouds" is reflected mulch better than from the bare surface on Mercury, or for that matter, from our moon. It is estimated that Venus reflects 60% of the light she receives, or roughly about 10 times greater for a given surface than Mercury. Venus, measured from one side to the other including these clouds, is slightly smaller than the earth and of course weighs less, but its density is considerably less. It is very probably that all of the planets are composed of much the same materials, if not of the same proportions, as we have found nothing on earth that is not also found in the sun, nor have we found anything in the other planets that does not have a corresponding item on earth. Therefore there should be no great discrepancy in the densities of the various planets, unless we are measuring their size, not by the diameter of the core, but including the diameter of a canopy, similar to those which once surrounded our earth. Take this case of Venus, which all astronomers agree is "cloud-wrapped." Let us suppose for a moment that these "clouds," which have never in the life of m an parted So that we might see the core of the planet, were the outside of a canopy such as we have seen was around the earth. There might then be a considerable space, weighing only a very negligible amount, between the canopy and the core. The result would certainly be that its density (its weight divided by its cubic contents), would be considerably less than the solid core of the earth.

66. The rotation of Venus on its axis, at least the rotation of the canopy, is sufficiently slow that there is only a very slight depression, if any, at the poles. However, there is reason to believe that mineral or sediment of some nature is present in the canopy as photographs with ultra-violet light, at Mount Wilson observatory, indicated that dark bands were present somewhat as in the surface of Jupiter. If this is a canopy rather than water clouds (and the presence of water has not been definitely proven) we would expect this condition, consistent with the ring and canopy theory, but if these are pure water clouds as a number of astronomers have assumed, this banding effect has no place.1

67. Mars, our next planet, and the nearest one to us on the far side of the sun, has little or no atmosphere, unless it is a gas akin to our carbon-dioxide, a substance familiar to us as "dry-ice," or when added to our drinks at the soda fountain. Apparently it must have had an atmosphere at some time as oxygen is locked in its crust, just as we have seen was also true of the earth’s crust, but if So it has been absorbed along with its water supply. Since this planet is not

"cloud-wrapped," very naturally its density closely approximates that of earth. But if it has no water supply, what about its canals? That word was taken from an Italian word meaning "lines" or markings, not "canals" in the English sense. Determination of the exact nature of these lines still awaits more definite information for they seem to be more apparent to small telescopes, than to the larger ones. Perhaps the one at Palomar may give us more precise information in the near future, but whatever may develop as to these markings, it will not affect the theory here under discussion.

68. So we pass on to the next planet, the giant Jupiter. It occupies a thousand two hundred times as much space as does the earth. But here again we encounter a planet that is cloud wrapped. However, owing to its size, and position away from the sun, we can make a much better study of Jupiter than of Venus. We know that at its equator the matter on its surface makes a complete revolution in 9.9 hours. Since the diameter from the outside of the clouds to the other side is 86, 728 miles this outside envelope at the equator is traveling at a rate of more than 27,000 miles per hour. But considering the size and the weight of Jupiter we find that if there were not atmosphere, no "firmament," its density would be only one fourth that of earth. If all the weight were in a solid core with the same density as the earth, it would occupy about 300 times more space than the earth, So there must be a very considerable space between the actual core and the canopy we see. Since these vapors are traveling at a rate of more than 7 1/2 miles per second, they must be moving as independent satellites in their own orbit, and could not possibly descend to the core until that speed slackens. But as we have reasoned of the vapors of the earth, their speed must inevitably slacken as the mass moves toward the polar regions of no rotation. Of this we should find some evidence, and we do. The polar regions revolve at a much slower speed, actually taking longer to complete a revolution than the vapors at the equator, although traveling a much shorter course.

69. Now we know that if their speed should be increased by any means whatever, and continue to increase, that these polar vapors would move farther out from their primary, and also move toward the equator. Then since they are now than the equator is it not reasonable to assume they have moved away from the equator toward the poles, and are also mo ving closer to the core, to which in time they must fall, carrying with them their calcium, carbon, and silicates now mixed with the aqueous envelope? And will not these same elements later become part and parcel of the rocky crust of Jupiter, when they have come to rest? Then before these elements declined as a canopy they must have formed a ring at the equator, and what we see now is the declension of that ring, hiding the core from our sight, but eventually to break up and fall to the surface of the core.

70. Does not this give a reasonable and logical solution to the "mystery" of Jupiter, as to how it can be composed of the same elements as the earth, yet only have one fourth its density? How part of the planet can revolve faster than another part? In fact, how could this be if the parts we see were not fluid, and unattached to the core? How account for the bands and spots if they are not the solid elements gathering together in the canopy? The black may well be carbon, the gray calcium and silicas, and the reddish some form of iron or other metal.

71. In 1878 considerable excitement prevailed in astronomical circles with the discovery of "the great red spot." At its maximum it occupied a space of about 7000 miles wide by 30,000 in length, gradually becoming smaller and assuming a more circular shape. It is still visible but greatly diminished. It was in the southern hemisphere, and rotated more slowly than its immediate surroundings,

indicating that inertia, due to greater attraction of gravity (weight) was putting on the brakes. Probably it has for the most part already fallen to the surface of the core, leaving only a remnant of its former amount behind.

72. If the canopy revolves more slowly at the polar regions, then we would expect that the canopy in these localities would move closer to the core, resulting in a marked flattening at the poles. This oblateness of Jupiter is very marked.

73. Some astronomers hold that the "clouds" around Jupiter are composed of ice crystals with methane and ammonia gases, and that such clouds are now over two thousand miles thick, and contain certain "admixtures" throughout

the mass. This is a very acceptable description of a canopy with the outside surface in stellar cold, and the inside receiving heat (if any), from the cooling center core, and the conversion of light rays into heat.

74. But if Jupiter urges us on to an acceptance of the ring and canopy theory, Saturn will practically force us to an acceptance to account for what we find there. Saturn is a little smaller than Jupiter but it still occupies 734 times as much space as the earth, but its gravity is only 1.17 times that of earth, or in other words, its density is approximately 1/8th. Here again we encounter the same type of gaseous or aqueous envelope as we found around Jupiter, with the bands of color more sharply defined. The diameter of its cloud envelope is 72,430 miles and at its equator makes one revolution every 10.2 hours. Hence we have an equatorial speed of 6.2 miles per second. This speed more than insures that the surface we see is the outside of a canopy that is moving in its own orbit around a center core as its primary. Again, then we should expect that the polar regions would be moving slower and closer to the primary. In other words, we should find oblateness here just as we did with Jupiter. And we do, to a very marked degree. The declension of the canopy around Saturn has apparently preceded further then the one around Jupiter and should fall the sooner, as the degree of flattening is So much more marked.

75. But there is still a further item to be noted while examining Saturn, and that is the presence of rings which are moving around the outside of the canopy at the equator, exactly where we should expect them. The width of this ring system is 38,000 miles and its diameter 168,000 miles, and its thickness somewhere around 10 miles. It is very thin as compared to its width. When viewed through a low powered telescope these rings appear as if they are solid, but they are not So in fact. Light can be seen through them, and in various other ways it has been ascertained that they are composed of billions of meteorites, stones, or boulders, undoubtedly mixed with dust and gaseous vapors. Each one of these billions of stones is moving in its own orbit about the planet, much as if each one were a separate moon. This holds true of the inner and the outer rings. The composition of the central ring is in doubt, as it appears to be opaque, and it could be made up of carbon particles.

76. Let us suppose for a moment that earth's moon, at a time when it was a plastic, semi-molten mass, had wandered into such a ring. It would have received a very severe bombardment, and been pitted very thoroughly over its entire surface. Since there is little doubt that such was the condition of our moon at one time, and at that time it was much closer to the surface of the earth and within the limits of earth's belts or rings, is there any reason to believe that our earth would not have had rotating masses similar to Saturn's rings? And if the moon moved at a slightly different rate than the belt, or had moved across the

belt, would it not have been bombarded by those masses great and small? Look at any enlarged photograph of the moon. The so-called "craters" of the moon are not volcanic craters such as we have on earth, but more nearly resemble splashes made in liquid. Even some of the larger "craters" have the return splash right in the center of the smooth area, in the form of a small, steep-sided, mountain in the inside of the crater, as if the splash had cooled and solidified in place. There are rings, and rings on the edge of rings, and rings within rings, resembling a flat of soft mud bombarded by hailstones. Here again the ring and canopy theory offers a reasonable explanation of a so-called "mystery."

77. But some may say that it is not reasonable that these could actually be big boulders or rocks in space, or that there should have been such things in the earth's atmosphere in times past. We can only point such to the moon as an example. It is a big boulder or chunk of rock, and if Nature can make that big a boulder, could it not also make the smaller ones indicated by the markings on the moon? Admiral Robert Peary in 1895 brought from Greenland a boulder that had fallen from the sky, box shaped, about 11 x 5 x 7 feet, and weighing approximately 36 1/2 tons. It is now on exhibition in the American Museum of Natural History. "Sure," says some one, "but that was a meteor." Yes it was a meteor, but it was also a rock, and it came out of space, and it was formed out in space before it fell to the earth. But that is not the largest rock that ever hit the earth. In Arizona there is a pit 570 feet deep, circular, and about one mile across. This means a displacement and removal of approximately six million tons of earth material. For years local inhabitants knew of this hole in the ground, but not until viewed from the air was the cause apparent. Then it was plainly seen to be where a huge boulder (comet, meteor?) Had struck the earth and buried itself. Although considerable effort toward excavation has been made, only fragments of the object have as yet been found. These fragments contained iron, nickel, platinum, and even diamonds. But even this one in Arizona was not the largest. In 1908, a still larger one struck in Siberia, and like the one in Arizona, the site was found, but So far the object itself has not been located So far as is generally known.

78. The inner and outer rings of Saturn revolve at slightly different rates, and as would be expected, the outer ring revolves the slower, as owing to the grater distance from the core, and the extreme thinness of the ring, the rotation of the core and its gravity has less effect on the outer than the inner ring. Both are traveling in their own orbits as satellites and cannot fall to their primary as long as the present speed is maintained. The only apparent way to lose speed is to move toward the poles, and that means to spread out as a canopy, and eventually to fall principally in the polar regions. Here, both in the rings and in the bands visible in the canopy, we find a separation of material has been made, with like grouping with like, before its precipitation to the planet. So here on Saturn we find the formation of the rings, then the canopies with their marked declension in polar regions, these being the very conditions which we noted were required by the ring and canopy theory.

79. Before leaving consideration of Jupiter and Saturn, let us reason as to what it would be like under these canopies. Were you ever in a steam bath with only a single globe of light? The reflection of that light from one particle of moisture to another continually changes the direction of the light beams, and the entire chamber is evenly filled with light, even in places where under normal conditions there would be only shadows. Would not the canopy catching the sun's rays over one half of its surface So refract those rays that on the inner side the light would be transmitted around the surface of the core? Undoubtedly the side away from the sun would not be quite So bright as the side where the sun

was shining, but neither would there be darkness there. This would be doubly true on

Saturn where the rings spread over millions of square miles would catch the sun's rays and reflect a portion back onto the surface of the canopy to intensify the effect of the direct rays.

80. We do not know how much heat there is on the surface of the core of either planet, nor how much heat is radiated to their atmospheres by their cores, but if they are both similar to the earth then we would reason that while the light was spread in this manner, the refracted light would not carry much heat to the planet surface in the shadow, and consequently the portion in the shadow would be cooler than the same portion when it faced the sun. Thus the shadowed portion would have a lessened heat and lessened light, but not dark nor cold. Neither would it experience tropical heat as the equatorial regions of the earth do today under the direct rays of the sun, nor would the polar regions experience much less warmth than the equatorial. But since the sun's rays falling on earth material here on earth produce heat, we would certainly expect the light rays to operate in a similar manner on all the other planets, So that under the canopies which are exposed to stellar cold on their outside surfaces, heat to some degree must be produced which could not escape until the canopy ruptured.

81. We will just briefly note that both Uranus and Neptune must also be surrounded by canopies as their outside surfaces indicate a diameter four times that of earth, their density is about 1/4th and their gravity approximately equal that of earth. The same banding effect that we saw in Saturn and Jupiter's canopies are observed on their surfaces, but less visible owing to their smaller size and greater distance from us. Pluto is too far away for us to have given it much study or observation, but apparently it is a little smaller than the earth.

82. Not alone in our solar system, but throughout all the heavens we can find corroboration of the tendency of gaseous matter, or any other type of matter, to gather around a thickened ball for a center, usually radiant or partially so, and then spread out a ring at the ball's equator, until it looks somewhat like an egg dropped on a skillet. In fact many astronomers hold to the theory that such is the general shape of the whole mass of stars throughout the entire universe.

83. In the fall of B.C. 2, there was a nova (new star) that made its appearance in Coma Berenices, which was recorded in Chinese, Chaldean and Egyptian records as extremely bright, and which fades from view over a period of 30 to 35 years. It still is not visible to the naked eye, but centuries later it was located by astronomers. It has rings of matter around the core, edge on to the earth, blotting out the radiant core from our view. There are literally hundreds of nebulae to be seen in the heavens, some just gaseous clouds, some just beginning to form the core, while others have both core and rings well established. But let us return to our study of the earth itself, and see if the rocks confirm this view.

_____

1 The comments of this paragraph were written prior to the December 14, 1962 view of Venus that was relayed from "Mariner II." It reported no detectable water vapor in the "clouds" surrounding Venus, and their contents "still remain a tantalizing mystery." The data seem to prove that Venus rotates very slowly if at all, and has a core surface temperature of about 800?F., and a temperature of approximately 200?F., within the cloud cover. Since the temperature is

apparently the same on both the side toward the sun, and the side toward the shadow, it is obvious that the core has not yet cooled sufficiently that light and dark make any appreciable difference.

CHAPTER 4

AGES, ERAS, EPOCHS, PERIODS, ETC.

84. Whether or not you have studied geology previously, you may have been somewhat bewildered by the variety of names given to certain time periods of geologic history. Let us remember that practically all the real study given the science of geology is confined to the last two centuries, and as a science it is even yet in its swaddling clothes. No one person could develop all the facts for the entire world, So John Jones (for example), who makes his living in "sanitary engineering," finds some peculiar strata in one of his ditches, and becomes interested in learning as much about it as he is able. This strata we will say contained petrified "geegaws" and with his limited access to geologic material, he finds no record of any one else finding anything like it. So he traces the strata in and around "Jonesboro," and writes an article describing his find, and calling it the "Jonesboro Strata." Later it develops that this same type of strata has been found in at least twenty other places in the world, and in each place it was given a different name. And since there are thousands of separate strata and millions of different kind of fossils, the result can be very confusing to everyone. But progress is being made, and attempts are meeting with some success in standardizing the terms and names, but there is much additional progress in this line needed.

85. Then in dividing geologic time, we have the same differences. One of the early geologists finding that there were rocks which indicated a time when there was no life on earth, while some indicated forms of life radically different from the present, divided the time into the First, Second, and Third periods, the Third period being the present. But of course to be understood in a many languaged world, it was necessary to Latinize the terms as Primary, Secondary, and Tertiary. But it was soon seen that the Tertiary was really at least two period? a period when the highest form of life was a mammal, but before man, and a period after man appeared. This latter period was designated the Fourth or Quaternary.

86. Then there was a school of thought agreeing that time should be divided into four periods, but disagreed with the Latinized division. These decided to ignore the period when there was no life, except that it should be included with the period when life first appeared. These named their divisions in Greek, as Proteozoic (first or primordial life), Paleozoic (old life), Mesozoic (intermediate) and Cenozoic (recent life). The last period made no distinction in time period between the advent of mammals and that of man.

87. But to many the four period division seemed inadequate and to more clearly define the events of certain periods these used a seven period division, in agreement with the oldest writings on geology, and these seven periods were called "ages." In general these "ages" were based on the dominant species of a period of time. But still further division was required to "pin-point" some particular event, So geologists divided the time according to the type of rock, or type of fossil which appeared to dominate in certain strata. But remember that there is no central authority to say what any time period is to be called, or what any particular strata shall be named, and any geologist may call anything by any name he wishes. However, the table given here may be of some assistance in locating a period which a writer may be discussing, but we have not attempted to get all the names or division in this table, only the principal and general ones in current use in the United States. There is a different name system current in English, an another in Germany, etc. But names do not matter as much as the

facts, and it is the facts that we are after. But we must use some names to designate the period which may be under discussion.

Yom or day	Age	Era	Period	Characteristic Life	Characteristic Carbon
1	Azoic (No life)	Proterozioc (First Life)	Archaean	No form of life ever found	Calcium Carbonates, Heaviest Graphites
2	Paleoszoic (Old Life)	Proterozioc (First Life)	Algonkian	Small crustaceans. Brachepods Sea weeds	Calcium Carbonates, Graphite
3	Carboniferous Carboniferous Carboniferous Carboniferous	Paleozoic Paleozoic Paleozoic Paleozoic	Cambrian (Old Life) Ordovician	Trilobites Brachepods Start of insect life	Bituminous and Anthracite Coal, Carbonates
4	Devonian (or Fish Age)		Silurian	Corals, Shell Fish	Coal, Lignites, Carbonates
			Devonian	Shell Fish, Armored Fish	Coal, Lignites, Carbonates
			Carboniferous	Beginning of land verterbrates	Coal, Lignites, Carbonates
			Permian	Beginning of land verterbrates	Coal, Lignites, Carbonates
5	Reptilian	Mesozoic (Middle Life)	Triassic	Dinosaurs or Giant Lizards	Lignites, Carbonates. Some Coal
			Jurassic	Flying Reptiles	Lignites, Carbonates. Some Coal
			Cretaceous	Hardwood Trees, Birds	Lignites, Carbonates. Some Coal
6	Mammalian	Cenozoic (Recent Life)	Tertiary	Mammals	Peat
7	Man	Cenozoic (Recent Life)	Quarternary	Man	Peat, Carbonaceous Earth

But one must not think he can start digging a hole in his backyard, and find all the strata in their order as he digs down, nor even all the ages. Some one has figured that all the diverse strata that had been found up to that time if piled one upon another, would make a pile 90 miles high. Obviously then, many of these are simply records of local conditions, repetitions with possibly very slight differences, and reworkings. For instance, when a glacier cut off a mountain top, and left a valley filled with "till" (a deposit made by glaciers which usually consists of rocks, gravel, rock flour, all mixed with sand and clay or other forms of soil) such till does not represent a new deposit on earth, but a re-worked on.

88. The presence or absence of a certain fossil is also a reason for assigning different names to possibly the same structure in a different locality. The word "fossil" merely means something dug up, but now we usually limit its use to some

indication or remains of life of some previous age, or time. It can apply to simple tracks left in the mud which has turned to stone, or leaf prints between stone layers, or something petrified. Although such fossils are not as plentiful as we might wish, it is by means of these that we read much of the past history of earth and especially of its flora and fauna.

89. In some places, like the Hudson Bay region, the Azoic rocks are found at the surface, and all other deposits have been washed away, or otherwise removed, while on the plains of Iowa we find terminal moraines of the last Ice Age, and the deposits of carboniferous earth that accompanied that period. Every one is familiar with the black soil of the Central States, particularly of Iowa, Minnesota, and Illinois. Further south in Oklahoma we have reddish clay for top soil, and in New Mexico we have hundreds of square miles where we find gypsum on the surface of the ground. But almost all of the periods are represented in some place in North America. But beside the surface of the ground, and walls of canyons but by earth processes, we have a great number of mines that can reveal something of the deeper structures, and even drillings for oil wells can tell us something of that particular location.

90. In Death Valley, California, we have a geologists' paradise. Here the titled structures, which were originally laid in sheets parallel to the earth's surface, stand almost vertical, and in such a manner that some scientists working there claim to have identified separate structures, which if placed back in their original positions, would represent about twelve miles in depth. Here they are of easy access, and practically all periods are represented.

91. The credit for the discovery and development of the facts which have been found are not to be credited to only a few, but to many earnest, patient observers throughout the world, and especially in the last century. Geologists do not differ on the facts, as much as they do on nomenclature, or on the theories which they offer to explain the cause of the facts, although it is true that too many writers have omitted some facts from consideration in order to strengthen the presentation of their philosophy. We are all familiar with the fact that from the same set of data diametrically opposite views may be honestly taken, but only one solution can be correct. If we try to open all the doors in a large hotel, and our key unlocks but half of them, we know that we have not secured the master key. If it does unlock all the doors we may be reasonably sure that the key we are using is the master key. We believe that the ring and canopy theory gives a reasonable and common sense answer, in line with natural law, to the so-called "mysteries" of geology, and provides the key that opens the door to understanding of all geologic phenomena.

92. The difference then, to draw a sharp line, is that the "orthodox" view among geologists holds that all of the material of the earth as it is now, including the water, was all on the surface of the earth at the beginning of geologic time, and not later than the close of the Azoic Age. The "heterodox" view, as presented here, is to the contrary. This view is that both gases and solids were hld in the "atmosphere" of the earth and that due to the heat, and the rapid revolution of the earth, such substances formed belts or rings around the earth's equator. That these belts gradually declined to form canopies, and finally fell, largely in the polar regions throughout geologic time, until the last great fall brought on what is termed "THE ICE AGE" (but which in reality was only the last ice age), and that since that time we have neither rings nor canopies of such substances between us and the sun, we recognize that there is still a gaseous canopy around the which, which we call "atmosphere," including the Troposphere,

Stratosphere, Chemosphere, Ionosphere, etc., which we used to consider as extending from 300 to 500 miles from the surface of the earth, but rocket explorations may prove that the gaseous depth is much more than that.

93. If the generally accepted view of geologists was satisfactory, we should not look for a different explanation. But are the prevalent theories among geologists adequate to explain the facts as we find them, and if not, why not? Before going into further detail of the ring and canopy theory let us first examine the fundamental basis of what we have here termed "orthodoxy," and see if some definite reasons can be assigned for not accepting the view of the great majority of geologists.

CHAPTER 5

THE ORTHODOX VIEW BRIEFLY EXAMINED

94. Lest it be thought that we over-state the orthodox view, we quote from one of their standard authors, who is still one of their best authorities, although this passage was written several decades ago, "The deposits of one period have often been largely denuded to make those of the following; and the chief source of all sediments are Archean."1 This same thought expressed in other words is to be found in most of the more recent writings.

95. Now "Sediments" speak of water deposits, So our problem is, if we are to use the Archean (Azoic) substances for later sediment deposits, to find some way to erode the Archean deposits, and then get that eroded material somewhere So that it can again be placed on the surface of the earth, this time perhaps many mile higher than it was before, and do this with a water deposit. Now all this much be done in a manner consistent with natural law. But while the material is away from the surface of the earth being readied for re-depositing, we must find some way consistent with the laws of chemistry to covert the substances that make up the Archean deposits to entirely different substances which make up the later deposits.

96. Lincoln Barnett, writing in a series of articles which appeared in LIFE magazine, states "throughout geologic time violent periods of mountain building, when the earth's crust readjusted itself to thermal contraction, and the changing stresses of its load, have alternated with longer period of calm, when the implacable rains drilled away at the mountain tops, leaching out their minerals, carving canyons and gorges, sweeping the substance of the mountains down to the insatiable sea."2

97. Back in the days of which he was writing, one can understand that erosion would have bee much more rapid in the soft deposits before they hardened to stone, and the effect of water and gravity would certainly have been exactly as he states, ?"sweep the substance of the mountains (or any other eroded material) down to the insatiable sea." Now we have the eroded substances from the land surface, down in the seas, presumably the most of it deposited on the bottom along the continental shelves. Deposited thus in water any separation of materials would be in accordance with weight, but otherwise it would be a rather conglomerate mass. Just how do we get it off the sea bottom, and up to the land surface, with the various elements separated, So they can be deposited some to thicknesses of several thousand feet, and in chemical arrangements that were non-existent in the Archean Age? The invasion of the continents by shallow seas cannot be the answer. Though such an invasion might ring in certain new plants and animal life, the weightier substances would have remained right where they still are today, -on the bottom of the sea.

98. But orthodoxy might concede that much of the erosion was done by glaciers, moving from polar regions like great plows, but we would still be faced with the same dilemma. The glaciers would turn to water and the water permeating the piles of eroded material would, after filling any hollows or valleys from previous erosions, seek the lower levels of the sea, carrying vast quantities of the debris to be deposited as fans upon the continental shelves, or perhaps carried even further to sea by currents and tides.

99. The force of moving water may be fully appreciated by engineers, but not by the general public. Hopkin's Law, expressed in 1844, has stood the test of

more than a century, and may be stated as, "the transporting power of flowing water increases as the sixth power of its velocity." In other words, if we increase the speed of a moving steam to twice that speed, its power to move or transport has been increased sixty-four times. Where before it could move only one pound rocks, it can now move sixty-four point boulders. The presence of immense glaciers in a warm climate (and such was actually the case) would certainly cause increased rainfall through evaporation, as well as the great addition to the run-off from the melting ice. This, speeding up the flow of normal streams, would serve to increase the certainty of the loss from the land and the gain to the sea, of eroded material.

100. But orthodoxy confronts us with still another almost insurmountable obstacle. According to that theory, all the material, land and water, was on earth at least by the close of the Archean (Azoic) period. If that be true, then there must have been as deep, or even deeper, layer of material over the igneous rock base by the close of that period as there is today, and as we have seen, that layer is many miles in depth. That also means that there was as much water on or in the earth as there is now, and the oceans would have been as full. Yet, today, we find deposits of ages after the Archean that are miles below the present sea-level. There is considerable evidence that the continents were raised from time to time to higher levels, but there is no indication, except incursion of the seas, that they ever lowered again after once being raised. If the incursions of the seas are to be taken as proof of the lowering and raising of the continents, there must have been frequent movements of this nature, and we should find a great amount of cracking or faulting along the shores of the continents, a condition that is non-existent. We find that there is a much more reasonable view as to the cause of the incursions of the seas upon the continents and one which does not require the repeal of natural laws.

101. Some geologists provide a source of material for deposition upon North America during the later geological periods by the creation of another continent which no longer exists, but which was used as the stock pile to provide material for building up the Eastern part of the continent. But recent surveys of the Atlantic floor have failed to reveal even the roots of this mythical continent. And if the eastern part of North America had to have such a stock pile, what about the other continents? But suppose this mythical continent did once exist, would it not raise more questions than it answers? How could such a continent, or even an island, completely erode, leaving no trace, after it was covered by the waters of the Atlantic? If it merely sank with the depressing of the floor of the ocean should it not still be there in its original location?

102. If the sedimentary deposits are principally Archean, just how were the massive salt deposits established? Down in Texas and southern oil bearing states, we frequently find the oil deposits on top of the salt domes. These domes may be quite near the surface of the earth, or one or two miles, or even further down. Nor are they mere puny little deposits. Many of them range from four to five miles across and from one to two miles upward from the great salt beds from which they were pushed. Thus a single dome may represent a salt block of from 15 to 40 cubic miles, and these domes do not represent all of the salt deposits, but only a fraction of the great mass making up the sheet bed. This great mass of salt was undoubtedly water laid, for where it is possible to get through the sheets of salt, we find water laid gypsum underlying the salt. This we should expect as the gypsum would precipitate first, being less soluble and of greater specific gravity. These salt domes and beds of the South are not an isolated example, as similar beds are scattered over the world, and in general all salt beds exhibit the same characteristics. Now it is evident that at some time a

saturated solution was land locked in these locations, and that precipitation of the salt was caused by evaporation and absorption. The question is, where did the salt come from Most geologists ascribe these deposits to impounded ocean water, but they also tell us that the ocean received its salt by rains leached it from the continents, without telling us its original source. Now if these beds did come from ocean water, the waters of the seas must have contained far more salt then now, for the impounded waters must have been practically saturated solutions. But there is no evidence that the seas were ever that salt.(?salty) In fact, biologists point out that the sea life during the period of these salt deposits indicate that "the seas of that period were only slightly saline." Besides the purity of the salt deposits indicate that the period of deposit was very short, as a prolonged period would have meant extraneous material being included in the deposits.

Even if we should agree that the oceans made the salt deposits, that would still not explain as to how the earth received her salt in the first place.

103. Now let us look at the Archean deposits, and we look in vain for any traces of sodium chloride. The oldest salt deposit of which we know is the Salt Mountains in India, where the deposits are thought to be of the Cambrian period (the second period following the Archean) although if they are where they are as the result of a great over-thrust that has as yet not been traced, as many geologists believe, then they could be of a still later period.

104a. Now what is the composition of the rocks that were laid down in the Archean period from which the "bulk of the sedimentary deposits of all later periods" were derived? In this group we must first include the basalts and granitics that make up the basement rocks, and also the various other igneous rocks which have been extruded on to, or intruded into, the sedimentary. These are principally silica. Then we have the sand stones, again principally silica in some of its various forms with some admixtures. For instance, some of the feldspars, a metamorphosed rock, have a small amount of sodium potassium. Among other silicates we have the massive bodies of slate with some graphite (carbon) as an admixture. Then there are the lime deposits, some as calcium carbonates in thick beds, some as magnesiun carbonate mixed with calcium carbonates to form dolomitic structures, and some minor calcium deposits. In Canada, in the province of Ontario, somewhere in the neighborhood of 90,000 feet of Archean deposits have been identified, and more than one half of this amount is calcareous (lime) structures. Then there are the graphitic mica schists, and as has been stated previously, Canada has more carbon in its graphitic Archean deposits than in its coal measures of the Carboniferous period. Nor must we overlook the fact that there are glacial deposits even back there, and tillite (conglomerates left by glaciers), BUT NO SALT. Iron predominates as the metal or mineral deposit of that period. But all this leaves still unanswered our question relative to the formation of salt and how it was confined to certain spots in the earth.

104. Following the Azoic Age, in North America, we find scattered traces of the next three periods, the Algonkian, the Cambrian, and the Ordovician. But when we come to the Silurian we find rather general deposits over all the continents. In North America the lower Silurian is dominated by massive deposits of sandstone generally classified as Potsdam, and covering the Azoic deposits, except around the Hudson Bay region and a few isolated location. Now this sandstone is of "silicon," or as it is more often called "silica." Referring to the table of component parts of earth’s crust (paragraph 18) we note that this is the most common of all elements with the exception of oxygen. It occurs in

practically all the periods as water deposits. Could it be that the greater part of the silica was removed in some mysterious way from the Archean deposits and then a portion of that placed several thousand years later in the Silurian strata, and the balance distributed from time to time over more thousand of years? And in just what manner could it have been stored over these thousands of years unless by some means it was held above the earth? And how could it have been above the earth for such periods of time unless it were moving as a secondary around its primary? But if that were the case, why bring it down to earth in the Archean period, only to remove it and put it back up in the sky? Would it not be more reasonable to presume that the Silurian deposits were made from silica that was not deposited during the Archean period, but remained suspended until the Silurian? And that during the Silurian and subsequent periods there were further depositions of silica from super-aerial sources?

105. If orthodoxy cannot accept that thought, then we are forced to a view that goes still further astray from natural law. Above the Azoic beds, wrapped, blanketed, and sealed in as it were by silica beds, we find more massive deposits in the upper Silurian, but this time of almost pure calcium-carbonate. Now there were calcium-carbonates laid down in the Archean, but mostly with various admixtures including magnesium. How did the agent, whatever it was, that removed them from the Archean deposits take only the calcium-carbonates and leave the magnesium, and then how did it move these up through the silicates of the Potsdam, leaving neither calcium or carbon in the sandstone? Later still we find dolomitic structures above the limestone of the Silurian, and here again we find magnesium. But how did the magnesium get up from the Archean stratas thousands of feet below, and yet leave no trace of magnesium between? Now every geologist and every chemist knows that the evens could not have taken place in this manner, but once they are committed to the premise that all the elements of the crust were out of the heavens by the close of the Azoic Age, they are forced to find some way to rearrange those elements and separate them into the masses and substances that we find deposited in the later periods.

106. We all know that if erosion in a succeeding age removed all the surface except what Azoic is still left intact, the greater part would have been washed into the sea, and the separation would have been according to specific gravity and not according to chemical constituents. But we often find heavier elements lying conformable on lighter ones, and both water-laid. The conclusion is inescapable?the heavier was deposited at a date later than the lighter. Some of the eroded Archean might have been piled like sand dunes by the wind, and left on the land, but this would not account for the fairly even spread of the Potsdam sandstone, which was certainly water-laid, nor does it account for such an immense amount of silica in granulated form.

107. We might enlarge this list of objections, but these few will indicate that we have serious reason to doubt the validity of the orthodox view. It is too full of mysteries that find no reasonable solution, nor any solution without grave distortion of natural law.

0.

108. But before leaving the examination of other theories, there is a more recent one, seeking to explain some of these "mysteries" and contradictions of orthodoxy that has made its appearance, and is known by the name of the writer who presented it as "Velikovsky's Theory." Its principal premise is that the planet Venus was once on the loose and came So close to the earth, that the tides produced the floods and recessions of the past, and finally, about the time the

Israelites crossed the Red Sea, it caused movements of the Sea, earthquakes in many places, and the poles changed places. It may be possible that the proximity of some heavenly visitor, such as a comet or even one of our planets, might have assisted the sun and earth in giving birth to our moon, but as to the events as he lists them, we cannot agree. In Egypt there stands a stone monument, built over a twenty year period, with 2140 BC set as its "construction date." Its downward passage at the time of building was pointed to Alpha Draconis which was the north polar star as of that date. That is, the front entrance faced the north. Today it still faces the north, only five minutes of being exact. Remember the pole star is not always the same star, nor always exactly in the north, due to star movement, and the movement of the north pole itself. But now over 4000 years since its construction, that downward passage still pointing to the north is a very positive proof that the poles have not changed within that period of time. The Great Pyramid had stood undamaged for about 2400 years when a slight local earthquake shook the vicinity. It cracked some of the granite beams in the "construction chambers" over the "King's Chamber," and that is the extent of all the damage that the elements have ever done to the interior. If the earthquake required by the Velikovsky Theory had actually taken place, it certainly would have done more damage than did the slight local one that actually occurred, and surely such a tremendous earthquake as he describes would have toppled pillars and monuments that still stand in Egypt. There are other features of this theory that make its acceptance impossible to us, but the above is sufficient for the present.

_____

1 Dana-1025.

2 LIFE-"The Earth is Born," 12-8-52.

CHAPTER 6

BEFORE THERE WAS LIFE

109. The lifeless period (Archean Period or Azoic Age) began with the earth as a waterless planet So far as the surface was concerned. No seas, no continents, the surface hot, glowing, molten. Every particle of matter that would eventually make up the crust above this basement sheet (with the exception of such molten matter as would later intrude into, or extrude upon, the subsequent deposits) was in suspension above the earth. All that lay beyond the immediate pull of the core's gravity was moving into the rings above the equator. Some of the heavier elements, together with some water, brought together by mutual attraction and forming heavy clouds or canopies, because of their greater gravity could not form a part of the ring system, but were still held off the surface by heat and rotation.

110. As the surface slowly cooled, water vapor above the core could condense, matter in gaseous states could become solids, and no longer repelled by heat could fall to the surface to be incorporated in the accumulating crust. Very early in this period depressions began to form in the surface, which as it cooled, first became plastic before hardening into rock. Undoubtedly some contraction took place while still in this plastic state, forming the first hills and hollows. As depressions formed, receiving any liquid run-off, in weaker spots, the strong places were pushed upward. It was during this cooling process that the earth was permanently flattened at the poles and expanded at the equator. This minor adjustment could be easily made in a plastic, spinning, globe without undue strain on the surface tension.

111. The granitics, being lighter than the basalt, would be on the outer surface, and cooling would contract, forming great blocks floating on the surface, only to sink into the lighter uncooled material. Such detached pieces would be of all sizes and shapes, and set at all angles, but all cemented together by the still molten or plastic rock. Then as this mass cooled and contracted, it put great pressure on the still molten basalt below it. Where the granitics cracked plastic or molten basalt was forced upward through the cracks, to form the immense dykes So prevalent in Archean structures. Also we find some basalt extruded as "sheet" above the granite. Basalt "dykes" are however not confined to Archean structures as faults have been formed in later periods that opened the crust down to the molten basalt, as for instance in the formation of the Grand Canyon of the Colorado, in Northern Arizona. There the dykes are plainly visible from the rim, and are of much later date than the Archean into which they are intruded.

112. Upon the cooled granitic layers came the material which previously had been in suspension above the surface, but now was precipitated in massive quantities. Much of this first precipitation was various combinations of lime, principally calcium carbonate, or common limestone. Water was included for all these deposits show they were water-laid, and the water would have drained off into the lower places. Such depressions filling with water were the beginning of earth's seas. Of the top twenty miles of earth's crust, water represents about 10%, So we would presume that 10% would be a fair relation of the water content to the rest of the earth material in the rings and canopies. Water represents only a fraction of 1% of the entire bulk of the earth, but owing to its inherent nature it was forced in its entirety away from the surface until a waterproof covering was formed, and then when precipitated to the surface it has in general remained above the other elements of the crust, until now it covers 78% of the globe's surface. If this earth had been mixed cold, as some

geologists claim, that 1/10th of 1% which has So great an affinity for So many substances, would have been entirely absorbed and there never would have been an ocean, nor a lake, nor a river, nor a cloud, nor any green grass, and probably no living thing. But although granite will absorb some water, basalt will not, So that only very negligible amounts of water could be beneath the granitic "wrapping."

113. It is well for us to note however, that the land at present is still absorbing water and if it absorb only one barrelful a day more than is taken from the crust it could eventually absorb all the water. How fortunate it is that a great blanket of glass (basalt) is wrapped around the globe! Certainly a neat piece of good engineering! How much we owe in our daily lives to the sea! AT the present time our water supply as a whole is increasing rapidly due to melting of the ice caps, yet in most places in the earth it is more of an immediate problem that there is not enough water than too much, for generally speaking, we have depleted our water supplies and lowered our water tables faster than nature has replaced them. Some day man will really awaken to this problem, and then we can expect that nature will get an assist.

114. We noted that among other deposits of the Azoic Age were large formations of carbon now found in the graphitic mica schists. For instance, in Canada such carbon deposits are equal to, or greater, than the carbon deposits made as coal in the Carboniferous strata. Also in Norway we find anthracite coal, and remember that we are speaking of a "lifeless period," and that practically all geologists today hold to the theory that coal, a carbon deposit, is purely hardened vegetable debris. But further than this is the claim that graphite is metamorphosed (crystalized) coal. Now put these tow assumptions together and we have the astounding claim that at least in some places on earth, there was more vegetation growing in a lifeless period, than there was when the coal measures were laid down. We ill discuss the origin of coal in a separate chapter, bus as to graphite there is not one scintilla of evidence that it was of vegetable origin, nor any evidence that any form of life existed during the Azoic Age, when most of the graphite was laid down.

115. Carbon takes on various forms, and combines in many substances. Diamonds, pure carbon, have been found where there is no possible doubt that they were brought to this earth in a meteor. These could not be vegetable in their origin, nor organic in any sense. The carbon that has gone into the immense deposits of calcium carbonates such as limestone and marble is not organic. True that some limestone has been formed of shells of animals living in water, such as coral, but no one is going to claim that these animals manufactured the lime and carbon out of nothing. They merely used material that was already in solution in the water in which they lived. When the lime and carbon first came into the water they could not have been organic, any more than the water could have been, since they came fro the same source. We are not concerned with what use the animals made of the building material they found in the water, but how did those materials originate, and how did they reach the crust of the earth in the form and the place where they are now.

116. In common with other elements, carbon has its greatest affinity for itself, and it is not surprising that in the great electro-chemical cauldron of the surcharged atmosphere above a glowing (and a smoking?) earth that carbon should be formed in its pure state, find some admixtures for which it had an affinity, such as hydrogen, and be deposited in quantities on the cooled core. Now soot is carbon, and as black and opaque as a diamond is white and clear, and graphite could well be an amorphous carbon distilled in the heat and

radiations of the atmosphere, mixed with materials deposited in some of the many precipitations, and after deposition being exposed to heat of the still cooling earth, and brought under pressure by the folding of crustal strata to produce the crystallized form of carbon we know as graphite.

117. Why should carbon of all the elements by the only one which geologists insist must be organic? This raises a question much discussed among chemists and doctors. Does the presence of a mineral or a chemical substance in a living body prove that the nature of that substance has been changed and that there is a marked difference between the organic and inorganic? The electro-chemist answers "No." For the structure of the atom remains the same. Life permits different combinations than we find in inanimate substances, principally with the amino acids, but let life cease and the elements separate, and we say "the body decays." For many years chemists differentiated carbon between organic and inorganic, and claimed t hat any complex structure of which carbon was one of the predominate components could not be anything but "organic," as such compounds could only be produced in a living organism. This has been proved a fallacy. Many decades ago it was clearly demonstrated that all such compounds found in nature could be produced in the laboratory, and besides these, thousands of carbon compounds that are not known to be in any natural product, have also been made in the same manner. In spite of this, the study of carbon compounds that are not known to be in any natural product, have also been made in the same manner. In spite of this, the study of carbon compounds is still called "Organic Chemistry," and in some schools the students are still being taught the old and false conception, and of course they accept it as being true.

118. It was during the period when practically all chemists accepted the "organic" theory of carbon compounds, that geologist accepted the chemists' views and adjusted geological conceptions to agree. Thus all coal and graphite, being of a complete carbon structure, had to be classed as organic, and the geologist had to avoid as far as possible, making any mention of his view on the origin of graphite since it was largely formed in a lifeless age, and not one single bit of evidence has ever been found of any life, even of the lowest kind, in the age in which most of the graphite was deposited. Is it not about time that we accept the evidence presented by Mother Earth herself that there were no life forms in connection with the formation of graphite, and discard the disproved theory of "organic" origin, which was accepted simply on the basis that it was a complex carbon compound?

119. If the graphite did not have an organic origin, in what manner could the carbon come into existence? Here is a suggestion. We have before us a press bureau dispatch relative to the 100 ton atomic pile at Chicago, and a demonstration that was given for the press. Vials of various substances were passed under the radiation from the pile for a period of fourteen seconds. Transformations were made by the radiation and vials containing nitrogen came out containing carbon. The dispatch does not state the exact nature of the carbon, whether amorphous or crystallized, but we presume it was soft like soot. Mixed with water it could attract hydrogen and thus become a hydro-carbon compound, which in a mass under pressure could crystallize and thus become graphite. In the formation of the earth we are not dealing with a mere 100 ton pile, but a great atomic centrifuge, where hundreds of tons of pure radium were formed, besides other radio-active materials, and this mass weighed six sex-trillion tons (that is a six followed by twenty-one ciphers). There was plenty of nitrogen available for the base. We know very little as yet as to what results can be obtained under all the various conditions of atomic fission and fusion, but at

least we have learned that under certain conditions, carbon can be formed in only fourteen seconds.

120. No account of the Azoic Age would be complete without reference to the metals of that age. In fact almost all the metals such as iron, copper, and lead, and their accompanying ores, were laid down during that period. So much is this true that some geologists have named this the "Metalliferous Period." We have some deposits in later periods that have undoubtedly been converted to "organic" by certain plant life, but in the Azoic Age we find only the "native" or non-organic iron. In that Age we find iron in its purest form, some ores yielding as high as 50 and 60% (See page 20, Reader's Digest, September 1954). Undoubtedly much of the lead deposited then was native or pure lead when deposited, and is not only simply a residuum. However, it is true that certain radio active atoms can use lead as a "foster-mother," and like other mothers it must expect that its "foster-children" will leave it. So after radium and other radio-active atoms have disappeared they leave the lead behind them. But this is not proof that all lead was once incorporated as a part of some highly radio-active substance, any more than since we find carbon associated with calcium, that we must accept this as proof that all carbon at some time must have been incorporated in some form of calcium-carbonate (limestone).

121. With the orthodox view, we must find some means during the Azoic Age to get all the crustal material down onto the earth, and then re-arrange it later. Thus it is necessary to bring in the thought of very extensive erosion, until by the close of the Age, the Azoic beds were worn down to their present amo unts. But just where shall we put this eroded material, which would make up almost one half of the earth's present crust? If it was eroded and moved away, it must inevitably move the greater part to the sea. But there is not room in the seas even if we took out all the water, and remember the seas were not as deep then as they are today.

122. With the Ring and Canopy Theory there is no such difficulty, as such extensive erosion is not required. Only a portion of earth's crust was laid down in the Azoic times and only a small percentage of that was eroded. But what about the "great Laurentian Mountains" that rose in that day in the Hudson Bay area? Today these are found only as the "roots" of a mountain system. While the base of the so-called Laurentian Mountain System is extensive, and drawings can be made of the present folds and these extended as imaginary lines to suit the fancy of each geologist's imagination, these theoretical extensions may or may not be correct. But even if the ancient "mountain system" were as great as the greatest estimate, it still would have been a mere pimple on the face of the earth, and represent less than 1/100th of 1% of the total material incorporated into the crest of the earth during the Azoic Age. In that early age any mo untain would have presented very little resistance to erosion. Freshly laid down with water, and not yet hardened to stone, and raised up by the buckling of the earth structure, it would yield readily to the downfalls of water and other earth materials, even if those downfalls contained no ice, which many of the falls from high altitudes must have brought to earth. In fact huge glaciers were not unknown in this age, and like those that followed could have plowed mountains level before them.

123. Everywhere that the Azoic (or Archean) strata was found covered, such later deposits lie unconformable upon the Azoic, indicating a period of erosion occurred between the first and second (Paleozoic) Ages. In many cases where the Paleozoic is immediately above the Azoic the two deposits are separated by tillite, the deposits of glaciers, indicating that the Azoic closed with a period of

practically universal glaciation. This was one of the wide spread "ice-ages," of which there were three, with a large number of smaller or local ones, involving various areas of glaciation and erosion. The "ice-age" ending the Azoic spread the glaciation from the north pole as far south as 31? north, and in the southern hemisphere from the south polar regions it moved northward to 29? south. Both movements of course presented an irregular front. Thus the only parts of the earth not covered by ice at this period was a band about 30 degrees each side of the equator, and both from north and south the great mass moved from the polar regions, grinding down the elevations, reducing them to the characteristic till, and scattering this till (or tillite) over wide areas, as the changes of summer and winter would temporarily impede or hasten their movement toward the equator.

124. Since there was no life on earth during the period under discussion, there is no way to determine the kind of climate that prevailed during this first Age, but since we commence the Age with the ground surface a molten mass, and the world was cloud-wrapped, then at least at the start it was not merely warm but hot everywhere. Then we know that it cooled sufficiently to permit extensive deposits upon what was once a molten surface. Also the seas had their beginnings, and then we know that the age closed with extensive glaciation which must have had a cooling effect even in the equatorial regions which the ice did not reach. But since this was generally a warm period, from whence came the vast amount of ice, that could have such a tremendous fund at its source that it could force its way as glaciers four thousand miles from the poles?

125. As the heavier materials close to the earth were deposited, and the atmosphere cleared many miles above the earth, oxygen would be drawn down by gravity out of the cleared space (firmament) leaving lessened amounts at the higher altitudes. There would have been more oxygen left at these higher altitudes than we have there today, as the material still above the earth would have an affinity for oxygen also, and thus hold a certain amount in space. Nevertheless the upper portion of the enveloping cloud would find itself in a rarified atmosphere incapable of converting the light rays to heat, and thus could not keep the temperature thousands of miles from the earth's surface above the freezing point. Steam vapor would be changed to snow and ice, move toward the poles to escape the rotation, and eventually reach points above the polar regions where the pull of gravity would be greater than the centrifugal force, and the snow, ice, and associated earth materials would come crashing down to pile up great masses of loose material, whose own weight would provide the melting power for the bottom ice, and the water would act as "roller bearings" to help move the great masses as they sought their own level. With its own earth materials, and some previously deposited, it filled valleys and hollows, plowed out new ones, and generally reshaped the face of the earth. As the ice melted and the water flowed to the sea, the heavier materials sank to rest, forming new irregularities on the earth's rapidly wrinkling face. As we have noted, the Azoic Age closed with just such a glaciation, with just such results as we have discussed.

126. It must not be thought that the ice-falls would occur only at the poles, or only in polar regions. They must have occurred whenever and wherever gravitational force exceeded their rotational energy. We know that falls have occurred all over the earth, and ice ages were experienced even in equatorial regions. One such great ice fall occurred almost directly on the equator and the ice moved north and south.

127. Now if our view is thus far correct, let us see just what would follow such events under the operation of natural law. The force of such a fall must be

tremendous, but not one ounce of that force could have been lost. The law of the conservation of energy requires that we find the reaction to the fall which was produced by the power of gravity. Since the impact would have had greater concentration of effect on land than on sea (depending upon the amount of water in the sea at that time and at the place of fall) some flattening and sinking of the land surface would be the first noticeable result. In the oceans the force of the impact would be spread over a wider area, but would not be lost. It must either have been transmitted to the floor of the sea and converted to either heat or motion, or caused great motion such as tidal waves in the water itself. Any matter, of whatever nature, falling into the sea would have the effect of deepening the sea, and bring it up higher in relation to the land surface. The impact on the land would have at least temporary depressing effect which might result in the seas encroaching on the land, flooding the lower shores.

128. Then the water deposited on the land would drain off into the seas, increasing the load on the sea beds, and lightening the load on the continents. This would result in the further depression of the sea beds. But if the sea beds were depressed then the plastic sub-basement rocks must be moved out from under the area depressed, and the natural place for it to go would be the continental regions where the pressure was lessening, and there it would be tucked under the shoreline and adjacent land. This raised up mountains along the shore line, effecting some elevation of the entire continental mass, and drained the encroaching ocean water back to the seas again, where again a slight adjustment must have been made for this transfer of weight (energy).

129. Logic and natural law require that if there were such falls as we have described, then they must be followed by alternate flooding and draining of the continents, by an increasing depth of the oceans, and by mountain making.

130. As to whether we close the Azoic Age with the ice fall or whether we include the flooding of the land, and its subsequent draining and the mountain making as a part of that period, is immaterial. The work of preparation of the earth was progressing without cessation. Probably if we had been there, we might have thought of some of these processes as calamities, pure and simple. We could not possible have conceived then of the earth in its present condition, any more than we can accurately conceive its condition a few hundred years from now. But our conceptions at that time would have had no effect upon the results. The forces once set in motion must continue to their own logical conclusion. Abut 400 BC Democritus stated as a principle, "Nothing happens by chance. Every occurrence has its cause, from which it follows by necessity." The philosophy of logical inter-related causes and results is not a new one.

131. What then would have been the results in the Azoic Age, from this pressure in from the seas on both sides of a continent? Not only would it result in lifting up mountains along the shoreline but the semi-plastic rocks under the entire continent must have been pushed together, and folded somewhat like an accordion, So far as the strata is concerned, and such pressure and folding would have further resulted in crystallization (metamorphosis).

132. Now we submit that the rocks indicate that this was exactly what happened. If this is not the right key, then how does it happen that this philosophy and logic requires exactly the course of events that did occur? There are no unexplained (or unexplainable) "mysteries," nor suggested course of events that would be contradictions of natural law, but a fulfilling of exactly what natural law would require.

133. After the end of World War Two, the United States Office of Naval Research decided that we needed a better map of the bottom of the Atlantic Ocean. Its expedition located what appears to be a great canyon cut by a river, roughly two miles wide, and 300 feet deep, running north and south for about 900 miles. The floor of the canyon after the covering of normal sea debris, is white sand. The walls are of sand, silt and clay, all water laid soils. Some geologists have endeavored to explain the presence of this "river on the bottom of the ocean," by attributing it to the washing of a deep sea current which was set up at some time by an earthquake shock. But would a force set up by an earthquake start a stream of water with such high velocity that the stream would travel in a nearly straight line, and maintain the pressure to carve a canyon approximately the same width for a distance of 900 miles, requiring the displacement of millions of tons of both earth and water, and yet spread its force as required by the law of hydrostatics? A more reasonable assumption is that there had already been some earth materials laid with water, for the term "silt" indicates there had been previous water deposits. The future bed of the ocean had become depressed or a valley formed by ranges of hills running north and south. A super-aerial deposit of water, or an ice fall in the vicinity of Greenland could have provided the fund of water, which flowing south, cut a bed two miles wide and of sufficient depth to maintain its flow. Simply because the ocean now covers the site of the canyon is no proof that the waters were there when it was made. Nor should we exclude the possibility that after the waters were sufficiently augmented and the Gulf Stream began its northward movement on the surface, that a corresponding replacement of cold water from the north, moving along the bed of the ocean, should find this old river bed a natural channel for its southward movement, with resulting wash of its banks. The more we learn of this canyon in the future, probably the more support that will be given this viewpoint.

CHAPTER SEVEN

ICE MASSES, MOUNTAIN MAKING, AND MYSTERIES.

134. The dictionary defines the word glacier as "an immense mass or river of ice in a high mountain valley, formed by the descent and consolidation of the snow that falls on the higher ground." With this definition we will agree in So far as the present formation of ice masses are concerned. But this definition covers only mountain valley glaciers, and not the great ice masses that in times past have moved over the face of the earth. Nevertheless we can learn something about the greater glaciers by examination and study of the little, rather insignificant, glaciers of the present day.

135. Are these mountain glaciers solid ice, like rock? Yes and no! In one sense, ice being solidified water is rock-like and when frozen into the packed mass of the glacier, solid. But it can still "flow" down a winding crooked valley. How then does this solid adopt itself to the curving bed of a stream? Because the weight of the ice further up the valley becomes pressure on the lower, and thus provides t he necessary energy. When the ice strikes a turn in the valley around which it cannot move as a solid, the upper mass pressing upon that point sets up internal pressure in radial lines from the point of obstruction. If that point can be moved out of the path of the ice, that is if its resistance is less than the power to move the ice around the obstruction, then the corner, the boulder, or whatever it is that is blocking the ice movement, is torn away and moved on with the ice. But if it cannot be moved the stresses caused by the pressure set up heat within the ice along the radial stress lines, the ice turns to water, and now the mass can flow around the obstruction. Most of the water in these stress lines congeals again when the stress is removed. But some of the water escapes and seeks the bed of the stream and will continue to flow down the valley as water if the thickness of the ice and the outside temperatures will permit. Almost all glaciers will be found with a stream flowing from under them at their lower end, summer or winter.

136. These facts have been noted by all students of glacial behavior and they have noted many instances of glaciers moving around bends only a thousand or So feet from the point of formation, but this distance if the pitch is sufficient, is equal to the task of setting up enough pressure to form the radial heat lines.

137. Ice is a peculiar substance. The molecular arrangement in ice is So different from the same molecules in water that as ice it occupies about ten per cent more space than it does as water. It takes power, energy, in some form, to rearrange these molecules So that they fit into less space when ice is again converted to water. Ice can very readily be made colder, it can also be warmed up as readily, until we reach 32?F. Here we find that it takes 142 times as much energy to rearrange the molecules (convert ice at 32° to water at 32°), that it does to raise the temperature of the water from 32° to 33°.

138. and there it will remain for some time, and only very slowly will water form in the pan. How cold is ice-cold? The best answer is that in an atmosphere above the freezing point "ice-cold" is 32°F. If the atmosphere is below freezing then the surface ice partakes of the temperature of the air. In northern Canada and Alaska the natives do not make their houses out of ice, as has been So often stated. They use blocks of snow. If the snow packs and becomes ice another home is constructed. Why? Because the ice would partake of the temperature of the outside air, with that small amount of thickness. But snow with an

approximate content of 90% air acts as an insulator to keep out the cold and retain the heat.

139. Now, how are our present glaciers formed? Let us go back to our definition about the snow falling on the mountain. But before this snow can fall on the mountain, there must first be a sufficiency of the sun's heat, energy, to evaporate water, and the moisture must rise into the air and be borne on the winds to a point where the cold air is sufficient to freeze the moisture quickly enough to form snow flakes. Shortly the snow will fall on the mountain top, accumulating there and the glacier is fed. But all this starts with heat, and without heat there would be no snow and glaciers. And without the winds to carry the moisture from the warmer to the colder spots, there would be no snow on the mountains.

140. Let us see if the ice masses of former days could have been formed in that manner. It is estimated that during the last ice age, in the central parts of Washington and Oregon, that the ice reached a depth of 2 1/2 miles. In Iowa it was probably two miles in depth at the terminal moraine, and about the same in the eastern portion of the United States, and of course it would slope upward to increasing depths as we neared the point from which the glaciers moved. In the last ice age the point of origin for the glaciers of the Eastern and Central portions of the United States and Canada, is found in the Hudson Bay region. From there it moved westward, uphill, and pushed into the Central plains with a two-mile high front to meet an advancing ice sheet moving eastward. This would indicate that at the point of origin the ice must have piled up from ten to twelve miles in depth, to provide the necessary energy to push such enormous masses of ice So far, and even transport great masses of rock, sheared from some no long er existent mountain.

141. How could we ever accumulate an ice pack by snow fall today, even one mile thick? If the glaciers moving down a mountain slope will develop radial heat lines to permit ice to flow around obstructions, how much heat would be developed at the base of an ice pack with the pressure of one mile of ice directly above it? Father Hubbard, the Alaskan "Glacier Priests" reports that glaciers consistently rise in temperature 1F. for every feet in depth, the same as other earth structures. Then 5280 feet of depth would develop 105? above the surface temperature. With the temperature of the air at 50? below zero, the base would still be 23 degrees above the melting point. But in mild weather with temperatures approaching the summer range, the entire mass would be converted quite rapidly, in much less time than many have estimated. If the pressure exerted by a thousand feet of ice on a one to one slope can effect the change as we have seen in the "flow" of glaciers, that is a pressure of only 25,000 pounds per square foot, and we are talking about ten times that much. In other words, it would be physically impossible under the conditions that maintain on earth today, to create by snowfall, an ice pack even one mile deep.

142. But do we hear some one say ," You are wrong. The glaciers of Greenland show depths of a mile or somewhat over." That is true, but the ice fields of Greenland, like those of the antarctic are also relics of the last ice age, with new surface snow being added to them, and the most of the melting being done on the under side. And there are still thousands of cubic miles of ice to melt. Moreover, although Greenland has an extremely cold climate, it does warm up above freezing in the summer, in the southern part. This permits more snow to fall on Greenland than on the Arctic regions further north. According to natural law we should expect to find the ice packs in the Antarctic central plains to be

even deeper than one mile, possibly a mile and a half. Possibly the proof of this will be soon forthcoming from some of the Antarctic expeditions.

143. If an area is too cold over a large expanse, then snow, except as a rare and unusual occurrence, cannot come to that area. Winds blow on the surface of the earth from a colder climate to a warmer, to replace the warm air rising. Unless currents of air can carry moisture, evaporated by heat, well above the surface of the earth, and then convey it over the ground winds to a colder area where it can congeal as snow, there would be no snow. The Arctic and the Antarctic are two places that have comparatively little snowfall, yet these are the two places that store up more than 98% of the world's ice. These great ice packs are not only diminishing around their perimeter, but also in their depth where they are on land and subject to the pressure of their masses. Yet these ice packs are proof that the ice packs of long ago covered as large an area as geologists have stated, and were as deep as they estimated. How then could they possibly have come into existence?

144. Perhaps some of the leading geologists can throw some light on the situation! We quote, "what brought about the refrigeration of these great ice sheets in Pleistocene time? If we can solve this question the last great glaciation in the history of the earth, we shall probably obtain a key to the more remarkable glaciation which occurred in Permian time and earlier in the equatorial regions of the earth; for the conditions that produce one were probably operative in the other as well, though additional causes may have obtained during the older glacial periods."1 We can agree with that statement, and believe that it puts the question fairly before us, but assigns no cause. However another writer gives us some of these possible causes, although not dogmatically insisting on them. Again we quote, "the question of what brought on the Ice Age [the writer is referring to the last one] has not yet been satisfactorily answered. It is likely that the great glaciers owed their origin not to a single cause but a combination of causes. No drastic chilling was required; a comparatively small decrease in present temperatures continued over a long time would suffice to bring the glaciers back to their one time vast extent. Wide spread elevation of continued masses, building of mountain rang es, and shifting of marine currents, combined with some outside cause such as variations in the amounts of energy received from the sun, may have been an adequate cause of the Ice Age climate."2

145. A still later writer states, "We live moreover in a glacial age. Whenever tall mountains stand there is snow and ice; and geology reveals that many epochs of mountain building have been accompanied by one of glaciation. Mountain chains impede the flow of air, and land bridges that arise in times of continental uplift divert the warm currents of the oceans, producing local climatic extremes. During the Appalachian Revolution (Azoic) which affected both northern and southern hemispheres, ice caps covered Africa up to the Tropic of Capricorn, and South America up to 10? of the Equator. Yet the vagaries of glaciers suggest that their recurring presence cannot be explained as an effect of mountain building alone. The causes of earth's periodic ice ages constitute one of the deepest enigmas of geo-history.3\

146. Let us examine some of these suggestions and see just where they would lead. First let us consider the one of mountain making. The rocks do indicate that mountain making and glaciation were close companions, but from the rocks it appears that glaciation came first and the mountain making followed, and then after a lapse of time more glaciation followed by more mountain building. Then the formation of mountains could not have been the cause of glaciation, but glaciation could have been the cause of mountain elevation. If glaciation had

immediately followed the mountain building, just where would we look for the power, the energy, the force that cracked the earlier crusts, forcing the broken parts upward, opening fissures and vents all the way from crust to molten base? Yet as nearly every geologist has noted, there is a very close association between these tow phenomena.

147. For instance in Washington and Oregon the last ice pack was more than two miles high on the Cascades, but the Coast Range in some places not fifty miles from the Cascades, had no glaciation. Why? Because the Coast Range was raised up out of the bed of the Pacific Ocean after the ice came on the Cascades. By the very law of Nature this must be the order. It takes energy to move the crust of the earth upward. The oceans received their quota of ice the same as the continents. The additional water added to the ocean's supply placed pressure (a transfer of energy) on the bed of the ocean, which produced heat, and rendered the basement rocks more plastic. This permitted further depression of the ocean beds, but it meant that some of the plastic material under the bed must be moved to a point of less pressure to make room for the deepening sea bed. In other words, magma was forced under the continental shelves which were being lightened of their load as the ice melted and added to the load on the ocean's bed. We should expect then that the greater movement and the greater mountain making would be at the shorelines of the greater oceans. The wider the ocean and the deeper it was depressed, the more extensive would be the mountain masses that would be raised. Without noting a cause, Dana did notice this effect, and he expressed it as a law. He writes, "The law at the basis of the system (of mountain ranges) depends upon a relation between their continents and their bordering oceans and is as follows:

"First-The continents have in general elevated mountain borders and a low and basin like interior.

"Second-The higher border faces the larger ocean."4

Applying the first law to the Antarctic continent, we must find the interior of that land mass at a low elevation, surrounded by higher mountains. Yet the interior portion is now at an elevation of approximately 9000 feet. Therefore we must find eventually that the land elevation of the interior is between one and two thousand feet and that the rest of the 9000 feet is ice. (See paragraph 143.)5

148. But if the great ice masses were produced by mountain making, then the glaciers would have had their source only on the higher mountains as they do today. So let us suppose that in the last Ice Age, there was a great and high mountain in the Hudson Bay area and that this mountain was the point of origin for all the ice that moved from that area to the west, north and south in such vast quantities. First, we must have an adequate amount of heat to vaporize sufficient moisture for all these cubic miles of ice, and then we must have the winds to transport that vapor to the high mountain where it could fall as ice, and then the ice must move away from the mountain fast enough to keep the ice from melting by its own weight, but still have sufficient weight beyond it to move uphill westward. To cover the area that was covered, even if our theoretic mountain was larger than any on earth today, it would have needed a total amount of ice more than 100 miles thick. But there was no such mountain there and the ice moved out from a considerable area as a point of origin, and it did move uphill, and covered an area many times the extent of the place where the ice movement began.

149. Following the ice ages we have upthrusts of the mountains and their accompanying coasts both along the Atlantic and the Pacific. The Rocky Mountains were once shoreline, to hold back the Pacific waters, then the Cascades (Sierras) and last of all the Coast range. The mountains along the Pacific were always raised more than along the Atlantic, which Dana noted in his "law" must always be the case of the larger ocean. Frequently such upthrusts resulted in "faults" or fissures which provided vents for the molten rock beneath the solidifying crust, and the result was volcanic activity. So we will agree with Mr. Barnett that mountain making was not a cause of glaciation, but we will go further and say that undoubtedly that glaciation (falls and deposits from super-aerial sources) has been the principal cause of mountain making, and provided the energy necessary.

150. What about the "Crollian Theory" which at first was endorsed by many brilliant geologists as a probably cause, and is still meeting with some acceptance? The North Pole of the earth describes a circle in the heavens over a period of thousands of years, and Prof. Croll advanced the theory that the glacial periods were the result of this inclination away from the sun. When the North Pole leaned the furthest away the Northern Hemisphere had a glacial age and at the other side of the swing, the South Pole had its glacial period. This would necessitate a glacial period at one pole or the other, alternately, roughly every 13,000 years. There is no proof that the ice ages were alternately at one pole and then the other. With the exception of the ice age in the Permian times there seems to have been glaciation in both polar regions simultaneously. Nor would this account for the Permian period invasion of ice at the equator. First, it is very doubtful if the inclination will have very much effect on the overall climatic conditions in the years to come, and second, there is no such record of periodicity in the past. No, the Crollian theory is just as unsatisfactory as the others.

151. Then there is the dust theory. This theory contemplates that a sufficient amount of dust would be thrown into the air by volcanoes or wind storms, or both, to exclude some of the heat rays of the sun and thus drop the temperature of the air all over the earth, or at least in the greater part. Now let us suppose this should happen, and the temperature should drop all over the earth to 32?F. In that event there would be little or no evaporation, hence no mo isture in the air, hence no snow, hence no glaciers. Also, if the temperature was equalized all over the earth, there would be no winds to carry the moisture, if there were any moisture. But let us suppose that in some way we could have evaporated enough water to have made the ice for any one of our ice ages, and also have gotten the dust up in the air. With the amount of moisture required for any of our three great ice periods we would have had clouds many miles thick which would have excluded the heat rays of the sun as effectively as any dust clouds, but also we would have the net result of holding heat as under a canopy, which we know resulted to produce semi-tropical conditions at the poles. But in falling such moisture would wash the dust out of the air, but would not be accompanied by boulders, which actually accompanied the ice falls and were present in the glaciers after the falls. That dusts and earth materials of various kinds were precipitated at the time of the great glaciers, is a matter beyond dispute, but the question is whether they came from previous deposits on the earth or were being deposited for the first time. Then again the dust theory requires great volcanic activity just previous to the ice age, whereas, we find that ice ages precede mountain making and subsequent volcanic activity.

152. Let us remember that a frigid earth could never become a glaciated world, as heat is the requirement of the first step in glacier making. And also keep in

mind the law of the conservation of energy. But if we have sufficient heat to form the vapors necessary to formation of snow and ice, we have at that location too much heat for the conversion of moisture to ice, and therefore must call upon the winds for transportation, and such winds must move to a colder portion of the earth, or rise to an altitude which does not have sufficient heat to prevent the formation of snow and ice. For instance, winds en route to a point where warmer air is rising may pass a mountain peak, and there we may have snow fall even in summer, but the moisture did not rise into the air at that altitude, nor at that temperature.

153. With this in mind let us once more consider the theory that extensive mountain making, and the elevation of the continents, was the major cause of the ice ages. Let us suppose that tomorrow morning our continents were suddenly elevated two miles higher than they are today. Then our seacoasts would be over 10,000 feet in height, and the rest of the continent of corresponding altitudes. To do this would require two cubic miles of solid earth material under each square mile of surface, and the only place it could come from would be from under the sea. This would require the movement of more than one hundred million cubic miles of plastic granite and basalt, which would result in a corresponding sinking of the sea beds. Any such movement would require a vast amount of controlled energy, but the only source of such energy that the supporters of this theory even suggest is the crustal shrinkage of the earth. But could the contraction of the earth's crust from cooling have caused this after the crust had sufficiently cooled and hardened as to anchor the continent? The greatest contractions would have occurred with the first coolings in the Archean Age where the buckling and folding have already been noted, but no such elevation was obtained, as has been suggested. There was some pressure and some elevation from crustal shrinkage, but shrinking was insufficient to even explain mountain making, much less extensive elevations of entire continents.

154. If there ever had been such an elevation of the continents with subsequent subsiding, where was the competent source of the requisite energy to move the hundred million cubic miles of material out from under the continents to permit them to resume their former elevation? For it must be that they were not eroded down to their present levels or else we would have nothing left on the continents but basalt and granite, with all the sediments eroded and carried to the seas. And here again we find another fact confronting us. Only recently has any very serious effort been made to determine the make up of the ocean floor. The expeditions engaged in this work were puzzled when they found the sediment deposits were So much thinner than they had anticipated, and as required by the previous theories, especially the Darwinian. The deepest sediment reported by Prof. Pettersson of the Goteburg University, Sweden, was only 7000 feet, roughly approximating the sediment deposits on the continents. Only on the continental shelves is any appreciable amount of eroded material to be found. Hence there has been very much less continental erosion than envisaged by any of the various theories.

155. Then there is the theory that the poles shifted, and ice masses resulted. If that had happened it might explain the location of the glaciers at the equator, but not why the poles shifted in the first place, nor why they shifted back again to their former location. But this theory is offered only because we know that at times the polar regions were blessed with a warm climate and at other times with a glaciated condition, and that this change occurred several times. Also, that great ice masses formed near the equator, and moved north and south, about the close of the Permian Period, So it seemed desirable to some scientists to move at

least one of the poles to the equator, and then move it back So that the ice could melt. But if we moved one pole to the equator would we not of necessity have to move the other one also, to an opposite point? But in the glacial period under consideration, not only were ice masses formed on the equator, but also in the south polar regions, and it is an impossibility that both of these regions can be polar at the same time. Besides we find the poles still just where they were when the earth had a plastic surface, So we must find a more satisfactory answer than moving the poles.

156. One of the other theories to attract support from some geologists was the " increase of carbon dioxide" in the atmosphere. It was reasoned that if the carbon dioxide content of the air could be increased from some unknown cause, it would rob the earth of the heat rays of the sun and cause world wide glaciation. One of the main difficulties of this theory is that it changes the air over the entire earth, to a point below freezing, and the earth could never become glaciated if this were true. We have already noted that the very first step for a glaciated world is heat not cold. There must be enough heat to vaporize all the water that is later to be contained in the ice masses. Present day "orthodox" geologists have this water stored in the ocean, and then when t he earth became frigid, enormous quantities are evaporated (by the cold?) Enough to lower all the oceans hundreds of feet, and then the evaporated moisture is transported over the land surfaces and deposited as snow and ice?no rain because of the intense cold. But we should also consider the fact that the oceans cover much more of the earth's surface than does land, So that the moisture from this evaporation is more liable to fall back into the ocean than to be carried to a land surface. Hence we must increase the amount of evaporated water by more than double the amount needed for the ice masses that were on land. And by what natural law could the chilling of the earth ever produce an ice age? Before the ice ages the world was warm even in polar regions, and the earth was chilled by the ice, for such is the record of the rocks. As far as the effects of increasing the carbonic content of the air is concerned, we will discuss that further in connection with the deposits in the coal measures.

157. These are the principal solutions offered, but not one of them, nor any combination of them, proves satisfactory, because some require impossible conditions, and all ignore the one fundamental fact that it requires a competent source of heat, a sufficiency of moisture above the earth, transportation to the point of deposit, and a sudden deposition, if we are to fulfill the requirements of natural law, and the conditions that the rocks reveal.

158. The ring and canopy theory offers a more reasonable viewpoint. First we have a sufficiency of heat-a molten, glowing, radiating mass that would vaporize all the water of the earth and hold it in suspension around the globe, both by heat and rotation. Certainly all the water of the earth in suspension above the earth gives more than a sufficiency for all our ice ages, without requiring any re-evaporation or re-depositing, and leave enough water over for several hundred floods besides. The decline of the rings and their formation into canopies with movement toward the poles provided the necessary transportation tp every part of the earth, and the rupture and fall of a canopy would certainly provide the sudden deposition of both water and earth material, and remember, the crust of this earth is largely made up of water-laid strata. And all of this is within the scope of natural law!

159. Then note the events that followed. The oceans were deepened, their beds depressed, the continents which had been partially flooded were drained by the land being elevated. Along the sea borders of the continents the elevation was

sufficient to result in mountain making, with usually some volcanic disturbances. This is the order as revealed by the rocks, and this is exactly the order that logical deductions from natural law require. Would it not be strange that a plan So logically the result of a molten earth and that explains, in fact even requires, the so-called "mysteries" in exactly the order that the events occurred, not once but several times, should be found not to be correct?

160. The wide spread glaciation that closed the Azoic Age was evidently from a canopy that had spread as far as possible and very probably had been kept from rupturing sooner by the partially supporting vapors under-neath, which had gradually been deposited throughout the period of that age. When the canopy had completely overspread, and finally broken apart near the equator, the polar portions fell as snow and ice, and the equatorial part as rain, tremendous downpours that have still left their trace in washed material now buried under later deposits. The ice masses were So great that in seeking their own level, they literally moved mountains from their paths, filled old valleys with the debris, and scooped out new valleys, which in their turn became waterways, or lakes. However, they did not change the basic climate of the earth. The polar regions when the earth was not enshrouded with a canopy were cold, the temperate regions as they are now, but the equatorial regions were not "torrid," only sub-tropical." There we have another of our "mysteries," for earth had no torrid zone until after the last ice age. But we did have one immediately afterwards, and have had ever since. How else can we explain this phenomenon except that the rings around the equator always shielded that section from the direct rays of the sun even if there should have been no over-shadowing canopy at any time. But with the last ring forming the last canopy, and that canopy falling to earth, left nothing between us and the sun except transparent gases, and the sun could shine upon equatorial regions with all its direct rays, thus setting up the torrid zone with its consequent effect upon both plant and animal life. And again this is the exact condition which the philosophy of the canopy theory requires!

161. What about the great ice age of the Permian Period? From the equator the ice masses moved north across India, north across what is now the Mediterranean, south across the Sahara; and from the south polar regions across souther South America and Australia in a northward push. Here again we are confronted with another "mystery." If the earth was undergoing such a period of glaciation, why no glaciers at the north pole, and if not in the north polar regions, why of all places at the equator? The answer appears quite simple. Very evidently only the southern half of the canopy developed from that particular ring, or the northern part may not have extended from the equator any where near as far as the southern part, permitting the northern part to fall as water and earth material. But also it is evident that either that canopy or right collapsed at the equator exactly where a collapsing ring would be expected to fall. It will be noted that in the order of sequence, the ring falling at the close of the Permian period was one of the lower ones and weighted with heavier materials than the later ones, and hence without the supporting vapors of the Azoic period, more subject to collapse without the overspreading action. And here again we note the same events following the advent of the ice; the deepening of the seas, raising of shore-line and mountain making.

162. Again and again came the deluges and ice falls, mostly in polar regions, but also in many other places, until there is hardly a place in the world that at some age does not give indications of ice action. These all seem to have been of less volume than the three especially wide spread periods which are denominated as "ice-ages." However, they all played their part in bringing

additional deposits to earth's surface, and the placing of them where they are today.

163. Finally, even after man's appearance upon earth, we have an over-shadowing canopy. The polar regions were temperate to sub-tropic, as was the whole earth. Gradually the canopy thinned, and the brighter stars could be discerned "through the windows of heaven," as the masses moving toward the polar regions grew greater and those in the mid-section lessened. Then, at last, the canopy parted, and the sun's direct rays shown through at the equator. Then there were no refracted rays to warm the polar ends of the earth. The midsection of the canopy fell in great pelting storms of water, while in the polar regions the canopy was deposited as ice and snow mixed with what little earth materials might remain. It fell, miles deep, not all over, but in great masses, and these masses as they piled higher and higher, began their steady march across the continents, floating on the seas, and everywhere seeking their own level. In North America the greatest of the ice masses fell around the Hudson Bay area, moving north, south and west, up hill and down dale. Neither inclines nor depressions mattered, for this ice pack towered over mountains, shearing off their tops, and rounding them as we see them today. Farther to the west was another fall, which moving eastward met the westward movement from Hudson Bay, and moving southward invaded Washington, and Oregon, and eastward from Washington, until the two great falls blend together moving down from Canada into the Central States. There was another fall in Greenland where some of the fall still remains. Parts of Alaska and Siberia were not covered by the ice from this canopy, but snow fell in abundance and to that we must attribute the frozen animals we find in Alaska and Siberia today.

164. Had these animals been frozen under the ice packs, as undoubtedly many were, they would have been ground up as the ice moved over the surface, and possibly this accounts for the small splintered bits of bone found in some of the terminal moraines. This was no ordinary snow storm, but a great fall of super-aerial vapors crystallized as snow-flakes that came down, not with the crushing weight of ice, but softly, thickly, and with the extreme cold of the stratosphere. The animals were wrapped and packed in earth's greatest quick-freeze. Even the great mammoths could not keep above the falling snows. It is reported that some have been standing upright when found, frozen mud under them, some with their trunks upraised as if to brush something from their backs, and So fast fell the snow that they were encased in that position. Others were forced to the ground, or were down when the snow fell, but So packed in the freezing agent that even in death they could not lay over on their side. Some people are of the opinion that only mammoths were thus frozen and preserved to the present time. It is true that the mammoths make the headlines and are accorded places in museums, but deer were frozen in the very act of jumping, and even birds in flight were not fast enough to escape this white terror. All of the animals in the area were victims, and p reserved to present another "mystery" to the scientist. The Saturday Evening Post of December 7, 1946, page 26, carried quite a lengthy article dealing with the frozen animals, especially the mammoth of Siberia. The writer detailed some of the scientific (?) explanations of the past, some ingenious, some ingenuous, and one of them within the scope of natural law, and hence impossible. Even the writer's explanation which he merely suggests, overlooks the fact that only by a quick-freeze process and a continuation of the freezing temperature could it be possible to preserve flesh from that time to this. Any other possible or suggested cause would have permitted putrefaction to have destroyed the flesh in spite of later freezing. Even his later suggestion of crustal slippage, moving the animals from a warm to a cold climate, (see CORONET, September 1960, page 70) would not have caused

an ice age, nor furnished the entombing agent. But the ring and canopy theory explains the cause and even makes it a requisite happening to comply with natural law. So here is another "mystery" that becomes plain, for this must have been repeated many times in earth's history, except that snow and ice were not always the entombing agents. All fossils of animal life are indicative of just such sudden calamities, sometimes encase in silicates, some times in the calciums, but always of a sudden nature, like those that fell into the asphalt pools on Rancho Lamentations Brea (not part of Los Angeles).

165. While speaking of fossils, let us digress just a moment and note how even the fossils force us to accept the fact of the sudden deposition of earth materials, and of such volume that only an annular source would provide. There have been found several fossilized fish of large size with other fish inside of them, and even one in the process of swallowing the other. There is no indication of any digestion, and therefore it is evident that disaster overtook the eater either during the process of getting his dinner or almost immediately thereafter. It seems obvious that in order for one fish to swallow another they both must have been in their natural element pursuing their accustomed habits, then suddenly they were encase either in sand, lime deposits, or clay, So quickly that they were completely shut off from oxygen, and encased many feet from the bottom of the water in which they were swimming, for they were found many feet from the lower seam that indicates the lower limit of that deposit. This could be no slow deposit of lime around a dead fish, for a dead fish would have rotted in a few days of covered slowly, and not eaten before that by the sea scavengers. How else could the imprint of a fish just eating or being eaten be preserved in solid rock?

166. While this is just one kind of fossil, it is typical of all animal remains or fossils, if we make an exception of the limestones formed by coral or shell fish debris. In the Coast Range of Oregon, only a few feet below the surface of the earth, one can frequently find clam beds, with the fluted butter clams in abundance, and all the fossil clams that we have seen have had their shells closed. If they had died in the usual manner, they would have had their shells open, for the muscles that hold the shell closed cannot retain that tension after death. But their feeding habits require that their shells shall be partially opened, and only upon approach of danger does the shell close. Here then we see the clams feeding in the shallow water of the Pacific, and the canopy of the last ice age is rupturing. Probably it was not the fall of the water or snow that disturbed the clams as much as the earth debris brought into their feeding grounds, and instinctively they closed their shells against this foreign matter, and were encased by the sand and clay which engulfed them several feet deep. After they were covered up the coast line responded to the stresses that we have seen were set up by the ice falls, and the continental shelf was lifted upward, part of it forming the new shore line, and part the Coast Range and its short plains. Here again we have that sudden encasement.

167. We will discuss fossilized wood in the chapter on "Time," So we will leave that fossil for later attention.

168. Mr. A. H. Verrill, in his very interesting book "Strange Story of Our Earth," states that there never has been a satisfactory reason put forth for the cause of the ice ages, and gives a number of questions that they pose. Mr. Verrill will find a reasonable and logical answer to every question he has raised, and quite a few that he did not think about, if he will reason along the line of natural law, and not accept as true, the supposition that all of earth's materials including

water, had descended from their positions around the core of the earth by the close of the Archean period.

169. Do you remember the question of the great salt domes forced up from even greater beds? How could these be deposited from a sea that was only "slightly saline"? Now we see that salt (sodium chloride) would have an affinity for itself, and would have gathered in great quantities, with some compatible admixtures for instance some forms of calcium, in the canopies. But being lighter than many other minerals, salt would not have been in the lower rings, but some what lower than the middle. As these masses of salt would decline into canopies, they would be heavier than the water content and sink to the underside, probably becoming detached and falling to earth before the rest of the canopy. Our oldest salt beds were probably Cambrian (see paragraph 104), but all the salt was not laid down in that period. Succeeding rings also carried salt and some of it was deposited in the seas and some on land. Those on the land became principally, land locked lakes, probably a saturated solution to start with, which precipitated the gypsum, which would have had an affinity for the salt, and quickly the lakes turned to solid salt. Considering the contents of some of our salt domes and their respective beds, some of these lacustrine salt deposits must have been not less than a mile in depth.

170. Since apparently all the salt as deposited was already in solution, that which fell into the sea would have spread rapidly throughout all its waters, to render them "slightly saline." Surely as heavy deposits of salt must have been made in the waters as were made on land, and hence the salinity of the sea-water increased ____ until in making incursions over the land surface and draining off, some sale would be left behind, and then rains would leach that salt and restore some of it to the oceans. Since it is true that all sea water contains considerable salt, some geologists have reasoned from that fact, that all salt originated in the oceans and was partly deposited on land during incursions, but other geologists took the opposite view, and noting the great salt deposits on land reasoned that all the salt in the ocean was leached from the land. Again some geologists try to take a middle ground, and try to adopt both views and reconcile them. How much more consistent with natural law is the view that they both received their salt from a common source, with some interchange since, and since the land and the sea embrace all of the surface of the earth, the source must have been above, and not beneath the surface, since the stratas of the Azoic Age have no salt. The great salt beds on land show very little admixture, indicating that their present covering which are usually either calcareous or siliceous matter, followed shortly after to seal them up until the coming of man upon the earth.

171. Then there is the matter of those "mysterious ice islands" in the These Arctic.6 these are somewhere around 1600 feet think, shading down to about 250 feet at the thinnest. They are composed of fresh-water ice, and floating in a salty sea. They are known now by numbers, T-1 having about 300 square miles of surface, T-2 400, and T-3 about 40. It was the smallest of these that was selected for use as a weather outpost by the United States when it had drifted to within two degrees of the North Pole. It was named Fletcher Island after Col. Fletcher who was in the first plane to land on the island. These three islands drift in a somewhat circular path between Greenland and Alaska, and at the time of the landing, T-1 and T-2 were over near Greenland. In the years to come they will be near Alaska, move toward the pole, and then back toward Greenland.

172. The thing that has puzzled some people is the fact that alla the glaciers we see today in civilized parts of the earth are mountain valley glaciers, and hence they have come to assume that all ice packs that ever existed must have been

formed in the same manner. Robert Peary on his dash to the pole did locate glacial deposits on the shores of Ellesmere Island, but that Island is too small to have been the birth place of even T-3. Peary might have seen one of these ice islands in close proximity to Ellesmere, as that island lies in the general path of their movement today, but we have no means of knowing just how long the ice islands have had free movement, but it must have been only in recent years. There are in the Arctic regions neither mountains nor valleys which could prepare a glacier even the size of T-3. The Arctic Ocean is surrounded by the "barrens"?flat waste land. And yet these islands are not from frozen sea water.

173. The only reasonable solution is that they are remnants of the great ice sheet that was formed by the rupturing of the last canopy that surrounded the earth, and which fell in the polar regions as snow and ice?frozen fresh water?for that last canopy, the one which was farthest out from the center core, probably contained little or no salt. We have seen that the movement of this ice across North America further to the south was of such mass that it sheared off mountain peaks, rounded off hills, filled valleys with debris, gouged out other valleys, and left vast lakes of inland waters where there was no ready access to the sea. This same story is written on the land surface of the north, and in the few thousand years since that great ice deposit occurred, we would expect to find remnants of the masses in the Arctic Ocean, just as we do on the land of Antarctica. And we do. Today these ice islands are no longer resting on the bottom of the sea, but have reduced their bulk by melting until now they float free with the currents.

174. When all the ice that is in storage in the polar regions has been added to the seas, unless there is further depression of the sea beds, which is a strong probability, the waters of the oceans will encroach on the land surface due to additional depths of 80 to 160 feet. In such an event, harbors such as New York, New Orleans, San Francisco, San Diego, together with the most of our beach settlements will be flooded. The dykes of Holland will prove insufficient to prevent the flooding of that land. This is not some very remote contingency, which may never happen, and efforts are now being made on an international scale to secure more accurate surveys of the amount that is stored. A press dispatch under date of December 27, 1959, reads: "American scientists have found that there is a great deal more ice than previously calculated in the Antarctic -6,600,000 cubic miles of it, enough to cover the United States from Maine to California more than two miles deep, according to Rear Admiral George J. Dufek." That the depression of the sea beds is a strong possibility is indicated by the rising shoreline of Sweden, and the recent earthquakes along the Pacific Coast of the Americas.7 These quakes were the result of sea bed adjustment causing tension along the larger faults, for instance, the San Andreas of California, and when nature released the tension the quakes made it know. We make expect a continuation of such pheno-mena, and let us hope that depressing sea beds and ele-vating land surfaces take care of the augmentation of the sea waters. And this is the final augmentation of the seas in all the future of the earth. The rate of this increase is much more rapid than we have been led to believe. On this point we have been lulled to sleep by the scientists' siren song of "millions of years."

175. It has been only a little over fifty years (since 1899) that the first ship ever remained for the winter inside the Antarctic Circle. Ross visited the Antarctic Sea and found the Ice Shelf or Barrier that is named after him, in 1840, and the next century saw this barrier retreat thirty miles to the south. The melting of this amount of ice added little water to the oceans, as the barrier was already floating in the water which means that 7/8th of the ice displaced water, and when the ice

was melted it was 1/11th less in bulk than it was as ice. It is the masses on land, on Greenland and the antarctic region, that will in the time to come, seriously augment the waters, not the ice now floating.

176. Let us not forget the truncated islands of the Pacific Ocean and the Gulf of Alaska, which we mentioned previously. The tops of these mountains were sheared off, in general, about one mile below the present level of the ocean. We have heard of no explanation advanced as to how these mountains all came to the same fate at the same time, and at a fairly common level, a mile down in the ocean. It appears obvious that at the time their tops were sheared off, at least the portion removed must have been above the surface of the water. Then if that be true, there are but two ways by which they could be where they are now. One, by sinking of the sea bed, the other by an augmentation of the water. Since it is highly improbable that the sea bed would have sunk at all places over the earth, even along the continental shelves, without disturbing the elevation of the continents, that can not be the correct answer, for if the sea beds were So depressed, the magma under the sea must have been pushed under the continental shelves, resulting in their uplift, but the mouths of the great rivers of that period lie approximately one mile below the present surface, proving that during that period the waters were augmented without a corresponding depression of the sea beds. But if all the water of earth was out of the sky by the end of the Azoic Age, from what source did all this additional water come and where had it been in the meantime? The real explanation seems to be that one of the great ice sheets moved across the sea in that area, pushing off the tops of the volcanic ash mountains and melting, added to the waters of the sea. Without further additions this would leave the water on the tops of the mountains rather shallow, So it could warm up rapidly. It takes warm shallow water to permit coral growth, and coral did grow on the tops of many of these truncated mountains. This would tell us that the additional depth of one mile did not come immediately, but probably in many small increases. It is interesting to note however, that the corals did not grow to reach the surface where it is today, but instead they grew for some little time and then died out. We have noted the two causes of coral extinction. Either the water became chilled below 70?F or the water pressure increases by increasing the depth of the water over the coral. Had there been and additional ice movement into this area some years later, it would have provided both of these causes. But only the storage of water in the "ring and canopy" system of earth, and the gradual decline to the earth's surface of the material making up the rings, can supply any reasonable conception of the source of the water which augmented the oceans.

177. Referring to the ancient rivers mentioned above, many of our rivers whose valleys indicate great age, have been found to have deep estuaries at their mouths where they flow off the continental shelf. The edge of the shelf itself is always cut away like the banks of a river, and the point where these rivers met the old sea level is now about one mile below the surface. Since this is about the same level as the truncated mountains of the Pacific, it would indicate that the submerging occurred after the continents were well established, and that after that there was neither any great amount of continental uplift, nor sea bed depression, except such as resulted in either mountain making or the lifting up of new lands along the shores. Of course the latter would result in new river mouths with consequent lack of the deep estuaries at the continental shelf. As excellent examples of the new rivers, we suggest the Columbia of the Pacific Northwest and the Mississippi of the mid-continent. Both rivers must have their mouths kept open to commerce by jetties. For rivers having the ancient beds we may cite the Hudson of New York, the St. Lawrence draining the Great Lakes, or the Clyde of England.

178. Another of the "mysteries" that appear unanswerable to some is the sudden appearance or disappearance of species of both plan and animal life, particularly the latter. These two facts are to be noted, that in every period after the Azoic, both the fauna and the flora are exactly that which is best adopted to the conditions then obtaining, and that the one always complements the other. Had manmade his appearance on earth along with the first trilobite, man would have perished before he could produce the next generation, but the trilobite would have flourished for many generations. But the trilobite required calcium for its shell and other substances for its food. It could not have survived in clear water, nor in any water not containing calcium. The millepore required not only calcium, but magnesium as well, and would have perished in waters that meant life to the trilobite. Both plan and animal life were fitted for the conditions in which they existed, and when those conditions radically changed, they perished.

179. It is very probable that quite a number of the canopies, especially the earlier ones, did not fall as ice and snow anywhere. If at the time the ring declined into a canopy, and another ring formed a canopy enclosing the lower one, the lower one would have been kept well above the freezing point, and probably even much warmer even toward the poles, So that even in polar regions the downpour would come as warm waters mixed with earth materials. This must have been the case in some of the deposits of the Silurian period, where water washed material was deposited more than a thousand feet deep over almost the entire North American continent. But at the same time similar deposits were being made in Europe and Asia, as well as the southern continents, and here the work of ice is not apparent. So augmentation of the waters of the seas was possible without ice falls, but if it were ice falls that augmented the waters, it would also have chilled them and made the extinction of such life as the coral for example, more certain and more sudden.

180. But what of land animals? They would have been met by sudden catastrophe in the rupture of a canopy whether it came as ice or water. If they should have been entombed in a fall of earth material, which made up the greater part of the canopies, traces of them remain to this day as fossils, in some form of imprint, either between two conformable layers of stone, or within the mass of a single layer. If they were washed away to the seas, or crushed and ground by the ice, probably there is nothing left that man could find today. The sudden changes in temperature which would affect their feeding grounds, the deposit of earth material that would bury existing plants, the destruction that would accompany floods, ice falls, glacier movements or mountain making, all combine to provide an adequate and competent cause for their sudden disappearance.

181. Some have sought to explain these disappearances by ascribing them to biological reasons, or that all of a species decided to be something else than what they were, and So "disappeared." Commenting on such suggestions Dana (page 726) states, "the universality and abruptness cannot therefore be So [biologically] explained. Very much is left for the destructive effects, direct or indirect, that is the exterminations attending the mountain making." But mountain-making alone would have had only a very local effect, but as we have seen, it is a very necessary corollary to the falls of the canopies. There is no doubt that Dana saw that these exterminations were connected with the events that were connected to mountain making, and only his committal to the theory that all earth materials were on the earth's surface by the end of the Azoic Age, kept him from linking these associated events to an adequate cause.

182. As to the sudden appearance of thousands of new and "advanced" species after such an extermination, one of our leading geologists points out that there are but two possible explanations. One is that the periods which we view are "exterminations," are not So in fact, but are actually great missing spans of geological time where all trace of events have been completely eroded over the entire earth, and during these "missing" periods evolution completely changed all the species, and disposed of the previous types. The other explanation is the "unthinkable" (that is the word he uses) possibility that the new species that appear are a direct and new creation. As to his first suggestion, all the theories that require So much erosion are check-mated by the fact that if such erosion had taken place the eroded material would be in the sea, and on the continental shelves, and it simply is not there. Besides, in many instances, the rocks laid down before the extermination, and the ones laid down after are conformable, indicating that little or no erosion took place. But this would indicate that the depositing of that next layer had very much to do with the sudden disappearance of both flora and fauna. Is it more "unthinkable" that whoever, or whatever produced and enforces natural law; that brought the heavenly bodies into existence, could not also by law produce new species of plant and animal life? Is the body of a mouse, or an elephant, So much greater than all the bodies in the Milky Way? Those must have been created by fiat under natural law, why not the mouse? WE do not know what life itself is, nor how it can be produced, So how can we say it is "unthinkable" that there may be natural laws of which we have at present only the faintest glimmerings? But one fact we do know, and that is that thousands of species perished abruptly, suddenly, and almost as suddenly after the catastrophe had cleared, new species of a higher order took the place of those that perished, and that there was no great period of time between them, nor anything more than the normal amount of erosion, due to the collapse of a canopy. We also note that both the animals and the vegetation are compatible one to the other.

183. Another "mystery" that we might solve is why did the moon recede from the earth? When asked that question directly one scientist replied (and we quote), "the moon has receded from the earth because it has converted its rotational momentum into a momentum of revolution around the earth. Its speed has necessarily increased, and it is thus slowly receding from the earth." Now this might do for aw final answer if we did not ask just how and by what law can the rotational momentum of a satellite body be converted to revolutionary? And how and where could it acquire the additional energy to "necessarily increase its speed "? We know that today the moon does not rotate, but "floats" along with the same face always toward the earth. Do we know that it ever did rotate? We have assumed as much because of globular shape, but So far as we have ascertained it has not flattened spots to indicate its poles if it was a spinning mass of molten rock at such time. Simply because we see rotation in the earth, and some of the plants is not proof relative to our moon. Would it be necessary that it was at one time rotating, to have it moving around the earth as it does today? Not at all! If a big blob of molten granite was flung into space by tidal action, while the earth was liquid, and such mass was away from the surface of the rotating earth, the moon-mass would slowly start to move with the rotation of all the other earth material that was suspended above the earth at the same time, until its movement with the earth would approximate the earth’s period, except for a slight lag for inertia. If it never had been given a spinning motion at the time of being thrown off the earth’s body, it would not acquire one. But the more substances there were above the surface in the same location as the moon, the sooner the moon would have overcome its inertia and gained in speed of revolution, and the faster the revolution the farther out from earth’s core it

would move, until there was a balance between centrifugal and centripetal forces and there is would continue as a secondary around its primary.

184. But let us not forget that mass attracts mass in ratio to the square of the distance. Therefore at the time when all the water and all of the earth materials had been deposited on the surface, instead of being close to the moon, there must have been considerable less attraction than previously, and with the removal of that small amount the moon would move outward again, or in others words would recede from the earth until again the balance between forces is restored. Every time that a canopy or ring collapsed, the remaining rings must have also moved outward because of the lessening gravity. As the moon moved outward it would not necessarily have increased its speed. If it kept exactly the same speed, but enlarged the circumference of its pathway, then the period between lunation (one new moon to another) must be lengthened. This has occurred since man observed it. We have data that the moon once was quite accurate in observing lunations every 28 days, now they may be as long as 32.

185. Going back to the thought of the rotational energy being the original power provided to keep the moon going around the earth, let us for a moment think of a car wheel turning on its axle, but with the axle jacked up from the ground So that the wheel may spin freely. A certain amount of energy was imparted to the wheel to make it turn, and the wheel will continue to turn until that same amount of energy has been used in braking. It maybe the friction of the bearings, in which case it may run from some time, or it may be that the brake is applied, with much greater friction, and rotation ceases. But if while the wheel was spinning on its axle it should become dislodged and fall to the ground on its tire, it would start rolling, converting its rotational energy to motion laterally, and it would continue rolling until the lateral movement had used up all its rotational energy, when it would cease motion, but it would have been losing speed as it lost its rotational energy.

186. Now applying this to the moon, just what would we use for the moon to roll on to convert rotational energy to lateral motion (revolutionary energy)> If there ever has been any such conversion, it would have necessitated solid or semi-solid matter in the atmosphere, in order that the moon should of its own power and volition move around the earth instead of staying in one place and spinning on its axis. Since it is evident that if the moon came from material torn from what is now the bed of the Pacific Ocean, that even occurred while the surface of the earth was molten, or very slightly cooling. At that time all the material including water that was eventually to make up the crust above this molten surface, with the exception of certain volcanic matter, was in suspension in the atmosphere. Hence there was at that time substantial matter which would have been affected by the spinning of the moon, and which would have caused a start of revolutionary motion. But the greatest impetus must have been the revolution of all earth materials along with the central core, and where the moon was at that time that motion would have been in excess of 2000 miles per hour. If the earth material in suspension had been the cause for the revolutionary motion, it could also have served to decelerate its speed, as we saw in the case of the wheel. So before this happened, the earth material at the altitude the moon was then traveling must have been precipitated and the atmosphere at the level cleared. So once again we find that the ring and canopy theory can provide an adequate cause to what otherwise might be another "mystery," and also explain why it did not completely decelerate and fall back to the earth. We do not say that theory of conversion is correct but at least it is not impossible.

187. If we do not insist that tall the water and all the earth material that must have been in suspension around a molten earth, was deposited as a continuous process until all material was out of the skies, and that, not later than the end of the Azoic Age, but take the more philosophical view that it would be brought to the surface of the earth over a long period of time, with the heavier materials being deposited first, and the lighter afterwards, then how reasonable the course of events! We see the power, energy, generated by the fusion of atoms into elements, and the fusion and fission of elements to form other compounds. We see power concentrating the heavier materials in a great ball, and the power becoming intense heat which vaporized many elements and compounds and drove them far from the center core. We see power expended to keep the earth in rotation and not the core only but earth materials in suspension. We see that rotational power developing centrifugal force to form suspended materials in great belts of rings, and the power of gravity becoming centripetal force to draw the materials in rings out into canopies, So such material could be deposited on earth's surface. We see energy in the impact of falling masses, energy that deepened the sea beds, that forced the magma under the land surfaces, that raised the land and made mountains. Here we see an adequate source of the great floods that have spread out our strata, washed out our valleys, leveled our plains and deserts, and filled our seas. In short we have a competent and adequate source, not alone for the materials from which to make our earth, but also the power and the methods of employing the power, to build it as we find it today.

_____

1 Grabau, page 885.

2 Longwell, page 155.

3 Lincoln Barnett, LIFE magazine, 12-8-52.

4 Dana, page 80.

5 This is now a proven fact, as established by an American team of scientists.

6 See READERS DIGEST, pg. 90, 1-52. LIFE, pg. 13, 3-31-52.

7 A further proof of the sequence of events as suggested above, due to the melting of the polar ice-caps, is to be found in the results of the 1964 Alaskan earthquake. An AP news dispatch from Anchorage under date of November 30, 1964, states that the U.S. Geological Survey reports that "some 12,000 square miles of southeastern Alaska rose and remained eight feet above old levels." This means the movement of magma from under the sea bed to under the Alaskan coast in amount of 18 cubic miles.

CHAPTER EIGHT

AFTER THERE WAS LIFE

188. After the Azoic Age, or Archean Period, we come immediately upon the fossil remains of life, both vegetable and animal, and the dividing line between flora and fauna sometimes becomes almost impossible to draw. But the beginnings were very modest, and it is very probable that the first real life left no fossil remains. It may have been only a germ, some form of bacteria, a very tender spore, some micro-organism without sufficient body for us to find any trave of it in the rocks. And where did it come from and how? The wisest scientist today knows that he cannot answer that question. He cannot even tell us what life is. So we must be content to take up the story where the rocks have written out the details, and see the beginnings of life commencing upon earth after a period of upheavals and sinkings, a period of molten earth and ice ages, of floods and deepening seas.

189. It would not be strange if every ring and declining canopy was already a seed bed as it were, for the life that would be adaptable to the type of material that would be deposited by that particular canopy. We know that many micro-organisms live in the air we breathe, So why not in the atmosphere when it contains not only air but also water and earth materials? We know that waters strong in silica were promptly made the home of the diatom which used silica to form its framework, and dying, deposited it in great beds for our future use. The diatom would not have been there had there been no silica. On the other hand, all over the earth, wherever siliceous waters were impounded in lakes and ponds, there the diatom flourished, in places as remote from each other as Tripoli, Eastern Canada, and California.

190. In similar manner we find that most of the magnesium-calcium-carbonates forming the dolomitic structures which followed the Azoic, even those as wide-spread as the Swiss Alps, the Isle of Man, and the Ozarks of Missouri, have a common chemical analysis. This analysis shows, we are informed, that the most of this dolomite is made up of 54.35% calcium-carbonates, and that magnesium-carbonates provide 45.65%, but that frequently there is associated with the upper layers, some dolomite that may vary considerably from this percentage. The majority of geologists assign these dolomites whose analysis conforms to the percentage shown, to deposits of the framework of the millepore, which apparently used a very precise amount of these three elements in its bodily structure, but the only place where they could have secured these elements is the water in which they lived, and where the elements were in suspension. One geologist suggests "the millepore contained magnesium, and were responsible for these deposits." But it is self-evident that the millepore could not have created the magnesium, but only used material that was at hand. The deposits in the upper layers that do not carry the usual percentages are, apparently, the deposit of the solutions in the water when the lakes dried up, and not the deposit of dead millepore. What we are interested in, is not where the millepore obtained the material to make their framework, but how did the lakes receive that solution of the needed materials, and how did the millepore find their way to these locations.

191. As we have mentioned before, if it is true that all deposits above the Azoic are mere re-deposits of Azoic material, then how did the magnesium-carbonate get out of Azoic strata, be washed down as eroded material, and then find itself in a water solution above newly laid lime and silicon deposits, So that the

millepore could use the solution to make dolomitic structures super-imposed on limestone and sandstone?

192. The ring and canopy theory has no such difficulty. Both of these carbonates would have been present in the rings, and if present in the same ring, they would have had an affinity for each other. Their specific gravity combined is 2.85, So that a saturated solution (cold water will take about twice as much calcium as hot water) would be about 2.00. Thus it would be drawn to the bottom of a canopy, and probably detach itself long before the rest of the canopy, with a lesser specific gravity, would collapse. Thus we should find such deposits scattered in various parts of the earth, even as we actually do), and if our conjecture is correct that micro-organisms fell with them, we can see why the millepore could commence its work even in widely separated localities.

193. In the water that had filled some of the hollows of the land that later was to become sea-bed, sea weeds grew, and small crustaceans that could feed on them, made their appearance. But perhaps these early forms of animal life demanded some form of protein in their diet and there may also have been some jelly-like organisms present in the water, but if So they left no trace. But it is to be noted again that this life was exactly the life most fitted to survive under the terrestrial conditions then obtaining. Note also how the vegetation and the animal life complement each other.

194. In a number of places, and especially in the northern Adirondacks, massive deposits of silica in the form of sandstone, denominated by American geologists as "Potsdam," lies unconformable on the deformed rocks of the Azoic Age. In fact there are very few places in North America where the "Potsdam" sandstone cannot be encountered at some depth. In northwestern Scotland this deposit is colored red or brown due to some admixture with the sand. Here we find the deposits even more massive than in America, varying from four to eight thousand feet in thickness, mostly upturned at sharp angles from later upheavals (mountain making). There are no fossils found in this deposit of sandstone, either in America or abroad. It appears as if laid by the hand of a giant who was in a hurry to complete his work. Although water-laid, there was no other strata, such as clay or lava to break the solidarity of the deposit. Since silica was rare in the Azoic deposits from whence came this great amount of sand, spread out by water in fairly uniform flows, if this was a "mere re-distribution of Azoic material"? If you ever have the opportunity to examine any of this sandstone, not the fine, compact lines that indicate water laying. Suppose this was all wind blown eroded material as some geologists allege. Would not the lines of deposit resemble waves of greater or less size, rather than the flat level lines? And just where would the winds all over the world find such a vast fund of practically pure crystallized silica to blow about? Certainly not from the Azoic rocks by any known law of chemistry. But turning to the ring and canopy theory we find an adequate source of both silica and water, as well as the indispensable transporting agent, to make the deposits exactly as they were made. Being lighter than most of the materials deposited in the Azoic Age, very little silica would have been included in the earlier down-falls, but it is sufficiently heavy to be included in a very early canopy, So according to natural law, it should follow the Azoic deposits, since we have seen that the material making up the rings would be separated according to specific gravity, the heavier being precipitated first. That must have been the order, for in a general way, that is the order in which we now find the various strata of earth.

195. Let us return to the consideration of the plant and animal life which we left in their very low orders. Millions upon millions of different plants and animals

have been here on earth. Among the first animal life to live on the land surface were varieties of insects. Insects live both on land and at sea, but we are now concerned only with those on land. All told there may have been as many as seven or eight million species of insects, each with their own peculiarities of habits and diets. But it is safe to say that without vegetation no insect could have existed, and no bi-sexual flowering plant could have been fertilized except there had been insects. We are continually confronted with the fact that the vegetable and animal kingdoms progressed into higher forms hand in hand. The old question of which came first, the hen or the egg, has more than a million counterparts.

Note: The original manuscript is misnumbered. Paragraph 197 is skipped.

198. Take the bee for an example. Suppose that a swarm of bees had suddenly made its appearance in a part of the earth where there were no flowers to make honey. The swarm simply starves and disappears, leaving no new generation. Every flower seems designed to produce food for, and be cross-pollinated by, a single or limited number of types of insects. There are flowers that appear to be designed only to accommodate the honey bee. The flowers produce a nectar to attract the bees. The nectar serves no useful purpose to the flower otherwise. No other insect than the bee can or will do the work of cross-pollination that is required to produce the seed for the next crop of plants. An ant crawling down in the blossom accomplishes nothing So far as these plants are concerned. The pollen is So placed in the flower that it will become attached to the body "hairs" of the bee and be carried to a flower of the same kind, where the bee on entering is "wiped off," and that flower fertilized, new pollen is sprinkled on the bee, it takes the nectar as its reward, and goes to another flower of the same kind. This operation is repeated until the bee must return to its hive to deposit the nectar. Suppose the bee did not by instinct confine its attention to only one kind of flower on each trip, and suppose that pollen of one species could fertilize the flowers of another species! Suppose the flowers did not develop the nectar, ?than no fertilization, no seed, and the plant would disappear. Here we find that mutual inter-dependence that made their appearance at the same time a natural necessity.

199. Perhaps an even more striking example is to be found in connection with the yucca. While often mistaken for a cactus, it is actually a lily, and reproduces by seed. These plants which resemble miniature palm trees, produce a spike or cluster of beautiful creamy-white blossoms in the spring, and in a few days the petals drop off, and the ovaries of the flower become the seed-pods, to develop the seed for the following year, or years. During the time of its blossoming the yucca moth emerges and the female moth visits the yucca plant, and only the yucca. Entering the flower she rolls up a ball of the pollen and places it on the stigma of the flower. This work is of no benefit to that particular moth, but of indirect benefit to her family. After she has thus fertilized the flower, she makes a hole in the ovary and lays her eggs through the hole. Now if the developing larvae should use all the seeds for food, then there would be no yucca seeds, but if there were not sufficient seeds the larvae would die and there would be neither moth nor seed in the spring. But Nature has So nicely balanced the matter that there is always enough seed to feed the larvae with enough left over for seed for the yucca. But suppose that the moth should emerge from its cocoon a month earlier or a month later then the blossoms, which only last a few days. Then the moth, which also is short-lived would find no place to lay its eggs, the seeds would not be fertile. Their mutual timing is a matter of just a few days in the spring, and their mutual inter-dependence needs no further elaboration. For

further discussion of this very interesting subject consult "This Green World, by Rutherford Platt.

200. As the seas deepened and the land rose, the land could accommodate animals that lived on plant life, or lived on those that did live on plant life. The seas also could accommodate more life, and since there was an abundance of lime available in the waters, giant clams and oysters, as well as heavily armored fish made their appearance, but as they removed the lime from the water, they either disappeared or diminished in size to accommodate the supplies available. In the warm water, while the earth was covered by a canopy, corals flourished even at the poles, wherever there was shallow water, So he water temperatures must have been above 70F. But with the close of the Permian period there came a catastrophe to the world that practically overwhelmed all living things. Dana1 states that at this time came one of the most wide-spread and sudden disappearances of life experienced in all geologic time. That period closed with great ice masses moving over the face of the earth in the southern hemisphere, and over India and Africa. Most of the life was then in the seas, and their waters must have been thoroughly chilled by the great ice falls, which partially occurring at the equator, either killed the plan and animal life outright, or made its continued growth impossible thus destroying the food supply. The land animals were not equipped to live in a glaciated world and they perished. Then what happened? The beds of the seas were deepened as the waters were increased, continents were moved upward, the water drained off the land, mountain making on a tremendous scale followed the deepening of the seas, and volcanic action along seashores increased.

201. And then we open our book upon an entire new page of history, with new types of animals and of plants, both upon the land and in the seas. But again we find that remarkable inter-dependence of these two types of life. No long series of deposits exist anywhere on earth between the Permian and the Triassic periods, and the earliest Triassic deposits include fossils of entirely new types of animals. This was the reign of the lizards or saurians. They ranged in size from tiny ones you could have carried, to those that had the bulk of ten elephants. Some were herbivorous and some carnivorous. One thing particularly noticeable about the saurians of this period in their remarkable diversity, and that today we would call many of them "freaks," monstrosities. Some were hatched with enormous hind legs and tails, little heads, and tiny, almost useless forelegs. Such would have no means of defending themselves against the meat eaters, especially against "Rex Tyrannus," the lizard with enormous crushing jaws, and with both tearing and grinding teeth.

202. We cannot agree however with many of the scientists who have studied and named thee species, that each type represents an entire race of such a type and that they persisted for millions of years. In many instances only one fossil of a particular type has been found in all the world, but upon finding that one it has been assumed that there must have been thousands upon thousands like it. A little reflection will probably bring us to a more reasonable theory for the diversity of both plant and animal life of this time. Seed plants were making their appearance, and seeds contain the germ of life to reproduce a similar plant with all the parent's characteristics both dominant and sub-dominant, provided the genes in the seed are not disturbed by outside influence. The same may be said of the eggs laid by the saurians, which when laid in a crude nest, or merely in a group, were left to Mother Nature for the hatching of them. We have on earth today an estimated amount of radium of 25 pounds at a minimum and perhaps 100 pounds at a maximum. Radium loses one half its content (and power) every 2000 years, and there is no known way to prevent or curtail this

loss. Then at the period of the giant saurians there must have been many times this amount in the crust of the earth where it was incorporated as an admixture principally in Azoic times.

203. We can today over-expose seeds to the effect of X-rays and find the chromosomes, and consequently the genes, So changed that the result may be anywhere from complete sterilization to the producing of monstrosities, either giants or dwarfs, that bear some resemblance to the parent plant. This same experiment has been tried on pregnant cats, and the results were much what we have seen in the saurians, deformed monsters, deformed dwarfs, and some partially of each. Thus saurian eggs exposed to similar rays from radium, or other radio-active materials, which must have been abundant in many places at that time, would have experienced the same results from disarrangement of the genes. We would then expect to find mutations running all the way from dwarfs to giants, together will all manner of deformations, but not many alike. Of course some eggs never hatched due to overexposure. This corresponds exactly with what we find. Also this could well have been one of the causes for the disappearance of the lizards as they then existed. Many probably could not have reproduced their own species, must less their particular deformities. And doubtless many of their eggs went to feed a new family of animals making their appearance, the mammals.

204. How much the downfalls of ice and earth material also played in their extinction it is some what difficult to say, but since they finally disappear in a glaciated period of mountain making it is probably that such downfalls were the final and deciding factor. The remains we find are usually buried in slate, shale, sandstone, or limestone, all water-laid rock. Unless they were covered in some cataclysm and their bodies sealed away from oxygen, they would have rotted away in the warm climate that

was prevalent in their habitat. But instead they were encased in water-laid rock, and their imprints, sometimes even their bones, petrified, have been preserved for future earth dwellers to find.

205. Probably, in the earlier seas the water had been radio-active, though not as intensely as spots on land, and this may account for some of the diversity among fish life, although the mutations are not So marked as in the saurians, nor would we expect them to be. The water in the seas was frequently being altered in content by the addition of both water and earth materials from the canopies, and the effect of such additions would spread rather quickly throughout the oceans.

206. Why then do we not find these same deformations and mutations prevalent among the mammals? The saurians laid their eggs on the ground, where it may or may not have been reached by radio-activity, while the mammals in general kept their young within their own bodies during gestation, and they themselves often lived in the trees, or in caves of limestone or sandstone, which were not radio-active. Besides, every 2000 years there would be only half as much radium to be effective, which cuts down the activity very rapidly. Between the reign of the saurians and the mammals there were also deposits of non-radio-active earth materials from the canopies, and such deposits would have a smothering effect upon the rays. However, we do find that some mutations occurred that are rather difficult to explain, unless radio-activity was the cause.

207. We have purposely omitted any mention of the coal deposits which occurred following the Azoic, principally in the Carboniferous and Devonian Ages, as these will be treated in a separate chapter. It is enough to note here that

such carbon deposits, like all other deposits, are graded very much by specific gravity. The heaviest graphite occurs in the Azoic, lighter graphite and coal in succeeding ages, and finally lignite and "carbonite." "Carbonite" is the term by which some geologists refer to the light (in weight), but very black carbon that was mixed with the soil in some places on earth during the last ice age. For instance, the black soil of Iowa and other Central Plains states, and the wheat fields of western Russia.

208. There were three particularly severe destructions of existing life, one at the close of the Devonian or Fish age (Paleozoic Era, Permian period); another at the close of the Reptilian Age (Mesozoic Era, Cretaceous Period), and the last since the Age of Man commenced. Dana2 treating of the close of the Paleozoic Era notes that it closed with an ice age, the upthrust of the Appalachians in America, as well as ranges in India and around the Mediterranean, and one of the most sudden disappearances of current life. These as we have noted before, must be linked together as results which must logically ensue from the descent of a canopy, and associated with these phenomena must also be ingress and egress of waters over the continents.

209. The end of the Cretaceous period reveals the same series of events as noted by this same authority. The Cretaceous was a period during which the Arctic and Antarctic regions were warm, and a sub-tropical climate favored life all over the earth. Then some sudden cataclysm brought an end to that paradise. Ice mountains moved over the landscape. The poles became frigid. Plan and animal life died. Few known species of the Cretaceous Period, either marine or land, were carried over to the following period. In the Americas the Rocky Mountain-Andean chains were lifted up along the border of the Pacific, to lofty mountain peaks, after having been raised up a little from time to time previously. The Sierra Nevada and the Cascades were first lifted up at the close of the Jurassic, and were lifted up still further at the close of the cretaceous, and given their final upthrust in the last ice age, at the time the Coast range came up from the sea.

210. In the mountain making at the close of cretaceous times the ruptures of the great limestone and sandstone beds occurred, especially along the shores of the Pacific Ocean. We find in the Rockies up tilts of these deposits with dykes of granite and sometimes basalt, indicating that the rupture extended to the molten core. Here again, the force used for mountain making, both in the east and the west, came from the direction of the oceans, and the greater force came from the larger ocean. This mans there must have been a sinking of the sea bed, a displacement of the plastic and molten material under the sea beds to the extent of the sinking, a corresponding amount pushed under the continents until the pressure became So great that at points of previous stress, the crust gave way and the mountains were thrust upward. When this force had accumulated sufficient energy to break rock beds thousands of feet in thickness, the uplift was not spread over a period of a million years, as certain "authorities" state quite positively. Such is not natural law. While the pressure might be years in accumulating, the end result would come with the shearing of the great rock beds, and frequently this rupture extended to the molten core. In that event, granite or basalt dykes are to be found at the site of the rupture.

211. There are some living today who can recall when the pressure built up along the San Andreas fault in California, in the early part of the century. The accumulation was not sufficient to raise any mountains, or even hills, but it did considerable damage, and minor surface adjustments were made, which in some places meant moving the surface from thirty to forty foot. For instance, highways that had been continuous roads, were completely offset at the fault.

Anyone who recalls that event, which is known in Los Angeles as the San Francisco earthquake, will assure you that not even one year was required to release the pressure, but only a few seconds. Since then, additional pressure has built up and has been released several times, and always in the matter of moments. The oftener these releases come the less severe the earth shock. Consider then how quickly power would act when there must have been many million times more power released in order to raise the Rockies and the Andes. Once the cracking and shearing of the great deposits of granite, limestone, and sandstone had commenced, the total release of that immense store of energy was certain and there was no other power on this earth that could have stopped or delayed it.

212. Following the "catastrophe" at the close of the Cretaceous Period, mammals became the dominate species. The great whales swam the seven seas, which again were warming up after the melting of the great ice packs. Slowly the tide of life moved north and south from the equatorial belt that had not been invaded by the ice, but had been visited with floods and deposits of earth material. Do we have a great hap here, worldwide, wherein all trace of a long period of time has been completely eradicated and of which no record remains? This we cannot believe, for if erosion from any source should have So completely removed the next deposits from the millions of years required for this hypothesis, why should the erosion have stopped at the end of Cretaceous times and spared the soft chalk formation that were laid down in that period? But the "white cliffs of Dover" still stand, and the chalk beds of Iowa remain, and the close of Cretaceous times shows no such tremendous erosion. And the eroded material to be So completely removed from all over the earth could only have been washed down to the seas, and it is not there! While admitting that the Cretaceous period closed with massive ice movements, where is the cause of such extensive erosions in the tropics which the ice did not invade? So the theory that the sudden disappearance of life, and the equally sudden appearance of higher forms represents a gap of several million years, and that during that long period of which we have no record, the animals and plants changed through a process of evolution from one species to another, is merely wishful thinking on the part of these who have embraced a theory that even Mr. Darwin himself did not completely accept.

213. Mr. Darwin saw at least two great obstacles to the acceptance of his theory. One was, of course, the law of the fixity of species, which even Mr. Darwin in his experiments with his pigeons, could not get repealed. The other was?but let Mr. Darwin tell it in his own words. This is to be found in Chapter 15 of his "Origin of Species." "As according to the theory of ?Natural Selection' [evolution theory], an interminable number of intermediate forms must have existed, linking together all of the species in each group by gradations as fine as our existing varieties, it may be asked why do we not see these linking forms around us? Why are not all organic beings blended together in an inextricable chaos? I can answer these questions and objections only on the supposition that the geologic record is far more imperfect than most geologists believe." Here he admits that his theory must rest on the foundation of a supposition, and that supposition has proved to be a false one. He states that if he is correct then only a very small fraction of earth's history has been recorded, and the remainder completely eroded and lost for all time. This would mean that at least 90% of the past geologic deposits have been eroded and swept into the sea, but even in the 1/10 that would remain we look in vain for any of those "interminable number of intermediate forms," which must always have been present if his view is correct, and if not in what remains, why should we expect to find that they were all destroyed by the erosion of 90%? But there has not been any such erosion! In

Darwin's time there was no way of disproving his "supposition." But today we know that the explorations of the "coring crews" have proven the paucity of continental waste matter throughout all oceans, not even t one percent the amount required by the Darwinian theory. And that was the slender thread on which that theory hung.

214. As to the other obstacle mentioned, he hoped to prove that the law of fixity of species did not come into operation until recent years, but natural law operated from the beginning of life on this planet. Certainly we find mutations and adaptations within the species, in line with Mendel's Law, but not one single instance of the change from one species into another. Darwin, in his pigeon experiments only succeeded in proving the Mendelian Law, which does not support the Darwin theory.

215. Do we hear someone saying, "but what about the evolution of the horse? Is not that a proven case?" No, we cannot say that it is. Even if the arrangement, and it is always the same arrangement prepared many years ago, that is presented by So many geologic writers, were a really honest presentation, it still would only be proof of the adaptability of a species to conditions, and response to selective breeding. It is undoubtedly true of animals that the best of the species lived and the others died, leaving the more fleet of foot, or the most cunning, or the most vicious to provide the next generation. But the eohippus (dawn-horse) was said to be a horse, and the blooded Arabian of today is a horse, as is also the Percheron or the Shetland. But some facts not usually included in a discussion of this famous "proof of evolution" rather puts some doubts on the conclusions drawn. These fossil specimens were not found in one locality, in the order shown, but were drawn from various parts of the world and from various strata. Nor are the strata from which they were taken "dated" in the order of their present presentation, but some of the "later" developments actually preceded the "earlier stages of evolution." In fact this horse arrangement is very much like the arrangement of human skulls that you sometimes find in museums, patterned after the display prepared for the San Diego fair of 1915-6. The last we saw it was still on display and labeled "the evolution of man." We are inclined to wonder if they still have in that display the facsimile of the "restoration" of the famous Piltdown skull. When that skull was "discovered" in a gravel pit of glacial till, some scientists and doctors pointed out that no skull could have withstood the grinding it would have received in the till, nor could it have been possible to keep the lower jaw bone even close to the rest of the skull.3 But other scientists, hungry for some proof for the theories they were expounding, swallowed it hook, line and sinker. Read almost any book written between the time of the "finding" of the skull and 1955, dealing with geology or paleontology, and you are most likely to find it endorsed as "one of the greatest steps toward proving evolution and the antiquity of man." But now? O, no! Now they say "we always knew it was a fake and it never was actually accepted by us as authentic." As far as the shape of the skulls are concerned, you probably could duplicate the whole row of them in any city of fair size in the world today. Some skulls are distorted at birth and are never shaped to meet modern medical standards. How much more that would have been the case when there were no doctors, no hospitals, no midwives even!

216. "But is it not true that skulls have been found that indicate an animal half ape and half man lived in the past?" Would that be such a strange thing if it were true? Apes resemble humans more than any other animal, and some are quite tractable. But any cross between a human and an ape could have no offspring, for natural law requires that no hybrid shall have descendants. Again we run into the law of fixity of species. But is it reasonable to believe that such animals

should be a cross? You will agree that no law was ever passed by mankind prohibiting any specific act, until after that act had already occurred and shown the desirability of a law prohibiting its repetition in the future. For instance, there was no law in Rome in the olden days prohibiting a Roman from killing his own mother. It was reasoned that such a law would be useless for no Roman would be guilty of So vile a deed. Yet we find in the earliest written laws the prohibition of man or woman cohabiting with beasts. It would not be strange if we found evidence for the necessity for that law.

217. We have before us a dispatch from Paris, copyrighted by the Chicago Tribune, under date of April 17, 1929, relative to such a hybrid being shipped from the Belgian Congo. We have no other proof of its authenticity. Paul DuChallu, who has been known to color his narratives at times, also reports a similar occurrence. He may have been correct.

218. In California we still hear about a skull that was discovered in the strata of an underground mine, proving that man had lived in California many million years ago. We also heard how that skull was planted by students in the University, who also assisted their professor in making its "discovery." But there are still quite a number who believe in the authenticity of that "find" due to the reporting of the event in the news column.

219. In Carson City, Nevada, on the penitentiary grounds, is one of the finest examples of fossil tracks ever found. The tracks were made near a mineral spring and then covered with sand that came straight down. No washing, no clouding or blurring of the sharp imprints. Even the indentations of the claws of small birds are to be seen. Among other prints there are some of large feet, which were it not for the size and spacing, might be mistaken for a man's foot in a moccasin. These prints have been positively identified as that of the hind feet of a giant sloth. Yet we still hear that at Carson city there are tracks that prove beyond any doubt that a race of giant men lived there perhaps a million years ago. You even may be told that in all seriousness by the guide who will show you the tracks if you wish to see them.

220. What about the Java Ape-Man? A few scattered bones which were parts of a skull or skulls, and supposed and asserted to be parts of the same skull, were found in 1892 in a Java River, and it was immediately decided that they were 750,000 years old. The last published account which we have seen stated that they were that old, without stating that this was some one's estimate. Do you believe that any bones, not fossilized, petrified, could remain in the muck and wet of a warm river in Java for 75 years, without disintegration, let alone 750,000 years? Put some beef bones in the creek or river near your home and then look at them just one year later. Yet out of these broken bones, not even a complete skull, a skull was reconstructed, and then (at least in the opinion of the scientist) a face was made to fit, and then with the face it was possible for him to create in his mind a whole race of Ape-men just like that one whom he envisaged as being twice the size of a gorilla. Of course, all the rest of them died off and left no trace behind them. A similar case of a giant man, only better authenticated, was found in China, and a smaller "giant" in South Africa. But these isolated cases instead of proving whole races of men, similar to them, really prove the very rarity of such men. We have always had unbalanced pituitary gland cases, where men or women grew much larger than normal, often with some deformities. We know that people had bad teeth and suffered from tooth ache in the early period of man's history, So why not disturbed pituitaries?

221. Much of the "fossil" support of the evolution theory has in the past come from mis-application, mis-representation, and outright fraud, and any such theory that needs that kind of support is hardly worth the supporting. We have no esoteric information as to how the various species, including man, came upon earth. But we do know that they were here, at certain periods, and that they must have made their appearance on earth under the operation of natural law, and the law of fixity of species is a part of that law. Also part of that law has been express as "Mendel's Law," which shows how selective breeding can emphasize sub-dominates, or suppress dominates to alter plant or animal life without changing its species. That law is the basis of our horticultural and stock-raising industries today. It explains many of the divergences we find. But it has no relation to, nor does it give any support to, the Evolution Theory sometimes call Darwinism. This theory still remains a theory, but not a fact.

222. Every one that has read history knows that Napoleon Bonaparte was a small man, but did you know that he was responsible for shortening the height of the average Frenchman of today but at least one and one-half inches? He was, by the simple fact that he wanted tall, rugged men for his army, and he got them. Then he took them into Russia, and few of them ever came back, and the succeeding generations of the French nation were sired by shorter men. Does this mean that there are no tall men in France? Not at all. And by selective breeding we could out of the French people develop a group of dwarfs, a group of very tall men, and a group of medium size. Then we could take these groups and develop in each of them blonds and brunettes, or almost any other human characteristic of which you might conceive. For a full discussion on the human race we would recommend "The Proper Study of Mankind," by Stuart Chase.

223. Instead of the usual presentation of a hideous monstrosity as your great———-great grandfather, the facts are that the artifacts of the most ancient origin, covered during the last ice age, show that he was a very skillful artisan, ingenious in adapting to his use the things available, and generally with a greater brain capacity than the modern man. Some were clever artists, some tool makers, others adept in the hunt, etc. Some of the world's finest silver filagree work was antediluvian. He could read and write and he did so. In fact, he contrived a writing that can be read today in any language, for he wrote ideas and not sounds and that method of writing was continued for many years after the ice age, and even appears as late as the Rosetta Stone, along with Egyptian and Greek. You need have no fear that your child or grandchild will throw back to ape forefathers, for they are of an entirely different species, and you need not be ashamed of your family tree.

CHAPTER NINE

THE LAST ICE AGE

224. The last great "catastrophe" that visited this earth, was the last ice age, often referred to by geologists at THE Ice Age, as if there were only one. Since there has not been any subsequent event that So shaped the surface of the earth, the effects that were produced by that last ice age are the ones we see most prominently today. The most of us, as we travel across the continent, fail to see any of the results of that period, because we fail to recognize them. It is much the same thought as the man who visited the great rain forests of the Olympic Peninsula, but could not see the forest for the trees.

225. First let us see according to philosophy what sequence of events we shall anticipate. We have seen that each ring around the equator must decline as a canopy, and with only one known exception, the greater falls of water or ice and earth materials took place away from the equator. So we would expect that the last ring would also decline as a canopy, and the canopy So formed would hold the warmth generated by the sun's rays as well as any warmth still given off by the crust of the earth. Thus the polar regions would be warm, and flourishing with life. There would be no excessive heart, and no rainfall, for there would be no unbalances of temperature nor chilling breezes to make moisture form rain clouds. As we have previously noted there would be condensation from the humid atmosphere in the shape of heavy dews that would permit lush vegetation without rain. These would have been no noticeable change of seasons.

226. Man had already made his appearance on the scene for we find artifacts (manufactured articles) buried beneath the strata which must have been laid down in the last ice age. While these artifacts are largely found in the Middle East, where the breaking of the canopy resulted in downfalls of water, this does not preclude that adventurers of the human family had dared to leave the more settled parts to explore and possibly to settle the unknown. No doubt these adventurers would make use of natural protection where it was afforded. They would have known that animals found protection, warmth and shelter in caves, So would it be surprising if man, adventuring along new paths should imitate the beasts and find temporary shelter in the same manner, and leave behind some proof of his occupancy?

227. In our own life time, Oklahoma was inhabited by people who were troglodytes, that is lived in caves, and since natural caves were scarce, they dug into the earth and made their own caves. Usually, they covered them over with prairie sod, though some used shingles, and there was oftentimes a window above ground in the gable. But suppose we should find one of these with its decaying furniture a thousand years from now, what do you presume the "scientists" of that day would think of such a poorly developed race, that would live in "holes in the ground"? Yet we know that this was only man's ingenuity taking advantages of materials at hand, when desired material was unobtainable. In a very few years, these "dug-out" gave way to big homes and barns, and cities threw up great skyscrapers, So that here in one generation we see a transition from troglodyte to the high concepts of modern civilization. And So it must always have been as man spread over the face of the earth. The crude and the temporary gave way to better and better living conditions, as the economic situation permitted. The fact that people lived in caves is not proof that they were half brutes, nor less capable of learning, nor less wise than modern man. With all our learning and accumulation of knowledge of many generations, can

we today say that we are wiser than past generations? Perhaps wisdom has not kept pace with knowledge!

228. So here we had an Edenic world, warm, comfortable, without excessive heat, or excessive cold, without storms or change of seasons. But man looking upward saw a broadening belt through which as a window, he could see the starts beyond, and the shape of the sun and moon, traveling as he thought, around the earth. Is it not very pertinent that in all places, even including the Mayans of their stelas, we find the "twelve signs of the Zodiac" divided into the same constellations with the names common to all races? On the other hand, the star groups north or south of that belt, are both grouped differently and named differently in many instances. For example, the Persians saw a "great bear" in a northern constellation. In America we take a part of the group and call it the great dipper, while in England it is not a dipper, but a wagon and is known as "Charles' Wain." The Chaldeans took a little different grouping, and the bowl of the dipper was a sheepfold, the handle were the sheep, and the shepherd was Arcturus who was going ahead of the sheep. Although the names of the twelve constellations of the Zodiac are universal, if we were to name them today there is little likelihood that we would use the same names they bear today as the star movements within the constellations have radically changed their arrangements. If there had been no denser canopy, excluding the light of the stars north and south of that narrow band at the equator, how then would we explain the difference in the nomenclature? Here then is another proof that the canopy existed around the earth after man made his appearance, and another "mystery" becomes clear.

229. But perhaps at this point some will ask, "but is it not true that woolly mammoths have been found that were frozen in ice during the last ice age in the north, and would not the fact that they were woolly prove that the Arctic was bitterly cold while the mammoths were still living?" Not necessarily. The saber-toothed tiger lived there, as well as in regions much farther south, and in both habitats he had a good coat of fur. The deer and the seals living in the Arctic had as good coats as their counterparts in California, but not noticeably better. The giant sloth of California had a correspondingly better coat than the woolly mammoth. But it would be true that as the canopy thinned at the equator it would become more dense toward the north and south, hence less radiant sun rays would penetrate and less heat would have been developed from that source in polar regions, but more in equatorial. Hence we must have had some cooling in polar regions and a warming in equatorial regions before the last canopy broke. This would affect the feeding grounds to some extent, and might cause a slow migration or adaptation to the changing conditions. Dana noted this phenomenon, but neither assigned nor suggested a cause for it.

230. Finally there came a day when the canopy completely thinned, or parted, at the equator, and the sun shone down directly on those regions, probably for the first time. The remaining parts of the canopy on each side of the break could now no longer hold in the earth's warmth, and as the cold of space replaced the previous warmth all moisture would condense and freeze. In the tropics, due to the warm ir close to earth, it would fall as rain, and in polar regions as ice and snow. As previously noted, in North America, the great ice masses were piled up in the vicinity of Hudson's Bay, and in Western Canada and Northwestern United States. But the ice piles, or glaciers, moved over the land, towering above mountain ranges, shearing off peaks, rounding the contours, and melting, sending great floods racing over the land. Farther south the canopy descended as rain, drained more quickly into the seas, unless the water was impounded as was often the case, to form great bodies of inland lakes. But since the sea covers So

much more of the earth than does land surface, there was much more water added to the seas than that which drained off the land. This increase of water (weight, energy) as well as the force of the fall itself, forced the sea-beds to sink. This means that magma, plastic or molten material, under the sea-beds had to be displaced to permit the sinking, and that material would have been forced under the continents, especially at the shorelines. This would have built up stresses principally at the shores, So mountains were thrust upward, and the coast raised. The shocks were transmitted inland as well, and the continents raised a little, and the water which had made ingress now drained off into the sea. The lakes that were formed, for the most part, were also drained, although many small lakes lingered on for years.

231. Such are the philosophical requirements of the ring and canopy theory, basing the concept upon natural law. Such also is the record that is written on the face of Mother Earth. We could at this point quote voluminously from standard writings to prove that geologists have seen these effects, but never grasped the cause. Could it be possible that we would find all these effects recorded unless there first had been an adequate, competent cause? And where aside from the canopy theory can we find that adequate cause to answer all these requirements, and still be consistent with natural law? It is not sufficient that we should dismiss the matter lightly with "this is a great mystery and we know no answer." If it happened, it happened along the lines of natural law, and natural law requires natural and logical causes. A glaciated world must be the natural and logical result of a once molten earth.

232. We have some geologists, and even some theologians, who claim that this world has never experienced such a deluge as here described, but since this last one is the one that has left its mark upon the landscape more plainly read than any of the others, let us look about us, and see what we can find here in North America and especially the United States. We all well know that the two polar regions are still ice-sheathed, and that the polar caps are the "fossil" remnants of the last ice age, as most geologists admit, but can we find something close to home to indicate the effects which could have resulted only from a vast amount of water either falling as rain, or placed originally as ice and snow then melted?

233. Shall we start in the Pacific Northwest? We can not take every single item, but touch only on some of the more outstanding ones. In the state of Washington, the Cascades were raised higher and stimulated to greater volcanic activity, in scattered places. The coast Range was raised up from the sea, and numerous submerged mountain tops were elevated along the continental shelf to become islands. But probably the most important item would be Grand Coulee and its chain of lakes and Dry Falls, all a part of one geologic operation. Before the last ice age the drainage of that area was a river that is know as the Columbia, but instead of flowing to the Pacific Ocean, it emptied into a large lake in Eastern Oregon that found its outlet to the south, as it was hemmed in on the west by the Cascade Mountains. At a point where man has built one of his greatest structures, "Grand Coulee Dam," the river bends sharply to the north, and during the last ice age the ice blocked the water flow at this point. With the melting ice, the volume was many times that of today, and being blocked from its regular channel it rose above its banks to flow southward. Not only was there a rapid ice melt due to the weight of the ice, and the warm summers, but a we have seen, one of the accompanying phenomena of any ice age would be the greatly increased rainfall at the outer edges of the ice deposit, just as there is now south of the Arctic mantle. All told, this produced a tremendous fund of water to be drained from the area, in a short period of time. In turning south this water carrying great quantities of ice, flowed over a plateau that had been built

up by some of the most extensive lava flows in all earth's history. The rust of waters came soon after the last flow, and the lava yielded readily to the cutting of the floating ice masses, and the washing of swift flowing waters. At the edge of the lava plateau, near the present town of Soap Lake, the thundering chunks plunged over a precipice, tearing away the lip, breaking it off in great chunks, and distributing the waste far to the south. As the stream ate its way northward through the plateau, it gouged out great holes under the falls which were moving back up stream. The holes averaged about 300 feet deep below the falls which were about 400 feet high, and little of the debris remains, So we are assured that the waters were swift enough to wash out these "pot-holes" and transport the waste many miles to the south.

For twenty miles the falls moved northward, abut half way between where the waters had first plunged over the edge of the plateau and the point where Grand Coulee Dam stands today.

234. That this was a tremendous flow of waters and ice may be determined at the place where the river was pouring over the falls the day that the ice block at the "Bend" gave way, and the waters resumed their old channel. The temporary drain is there for us to see where a mighty stream, forty times that of Niagara of today, plunged over a brink 400 feet high in five great horse-shoes, totaling three and one half miles in width. The pot holes made a chain of lakes twenty miles long, all the way from "Dry Falls" to Soap Lake. North of Dry Falls the channel of the river did not cut So deeply into the plateau, and the government is using this part of the old bed of the drain for a storage basin for irrigating water, syphoned over a hill from the storage behind Grand Coulee Dam. In this part of the old drain is to be seen Steamboat Rock, which was a rocky island that resisted the rush of the waters, as much as Dry Falls. Today, with the impounding of water, the Rock is again becoming an island, and many flood marks above the "Falls" are being buried.

235. Nor is this the only "dry river" that was washed out at that time. Moses Coulee, a few miles to the west, carried almost as much water as Grand Coulee, and still further west on the towering banks of the Columbia River, after it has turned south again, are to be found more dry falls. Incidentally, near these latter falls is to be found a fairly large deposit of petrified trees, dating just prior to the ice age, and the State of Washington maintains a museum there. Among other identified species is the ginkgo tree which was apparently widespread over the Pacific Northwest at that time. It is a semi-tropical plant and indicates that the climate was much warmer than at present, especially during the winters. Here again is evidence that just prior to the ice visitation, the climate, at least in the Pacific Northwest, was semi-tropic all the year, where now cold winters prevail. Something besides the coming of the ice caused the climate to change. There is now no canopy overhead to retain earth's heat. This simple explanation is the only one that can explain the "mystery" of how extensive glaciation could visit a semi-tropical region, and be accompanied by a change in the local climate, that proved to be permanent after the ice melted.

236. We have already mentioned some of Oregon's evidence but in passing let us note at least one more. Look throughout the length of the Willamette Valley, lying between the Cascades and the Coast Range. Before the last ice age, the Pacific had its shores at the foot of the Cascades, but when the Coast Range was raised and the coastal plains, and the Coast range turned the flow of waters from the melting snow and pelting rains, northwest, to seek an outlet. From where the city of Eugene is situated, the waters were stored northward, and spread out as a wide lake. Of course silt was washed into the lake and deposited with the same

leveling process So typical of lacustrine deposits, and the level plains, north to the hills south of Salem (about 75 miles), were the result. Near the site of Salem the lake narrowed and found an outlet in a river that cut its way through the soft earth newly risen from the sea, to pour its waters into the Pacific Ocean near the present town of Astoria. Today the lower portion of this river is called the Columbia. In its original route it continued northward and westward near Wilsonville, where it was shortly blocked by some debris, and turned eastward, leaving a portion of the bed of this new river (which we will call the Willamette) as a dry river. This dry river is to be found between Wilsonville and a point near Clatskanie, where the diverted waters rejoined the old bed. This dry "spillway" with its banks and its islands may be traced today. Locally, some geologists know this as the "Tonquin Spillway," where a tremendous river, two miles wide and 200 feet deep, cut its way to the sea. Later, when the impounded waters of the lake in Eastern Oregon which had been fed by the Columbia, broke through the Cascades at "The Bridge of the Gods" and rushed westward, they brought much of the lake with them, opening up a new channel for the Columbia by which it could reach the Pacific. These waters joined the Willamette just west of Portland, Oregon, and since the Columbia carries the great flow, it is called the Columbia all the way to its mouth.

237. There are also dry rivers in Eastern Oregon, where the ground was not covered by the lake, which indicate a very heavy run-off from the Cascades eastward, and then the waters turned northward.

238. In California we are in a region that was too far south for the ice sheets, though local glaciers formed on the mountain slopes. The effect of moving and melting ice, and the accompanying heavy rainfalls, with the consequent deep erosion of hills and valleys, is still plain to be seen. The raised sea cliffs, the clay and pebble terraces to be found along the coasts of California and Oregon indicate that the coast but recently emerged from the sea. And that fact requires that earth materials (magma), must have been forced under the continental shelf to effect that raising, and the only place where that magma could previously had been was under the sea bed, for there was also continental uplift as well. Then additional weight must have been transferred from some place to the seabed, to provide the energy to move the magma, and such transfer of weight, energy, could only have come from increasing the water in the ocean, and where could be the source of such an amount of water, unless that water was downfall from super-aerial masses? So whether we reason from cause to effect, or backwards from effect to cause, the necessity for the downfall of water and earth material over long periods of geologic time becomes more and more apparent.

239. Among the more spectacular records of the last ice age to be found in California is the famous Yosemite Valley. The Sierra Ranges had been partially raised during previous ice ages, and although too far south for ice falls in the last glaciation, the mountains were high enough to form local glaciers as mentioned previously. One of the great glaciers that formed, possibly with an assist from the mechanical action of mountain raising, plowed down the slopes excavating a valley about one mile wide and 3000 feet deep for a distance of seven miles, and by this time it had So much earth material piled up in front of it that its progress was halted, the west end of the valley sealed by the moraine, and the ice melted to form a lake. However, the waters of the lake seeped through the rubble of the moraine, and the lake became a level meadow, and a most magnificent panorama was left for generations of mankind to enjoy.

240. Not only in California, but also in Nevada, Arizona, New Mexico, and western Texas, a familiar part of the landscape is the "playa," or dried-up lake

bed, usually with mineral substances covering the old lake bed, and usually with scrub trees and brush, most of it now dead, rimming its former bank. These playas are numbered by the hundreds, and come in all sizes, some that you can throw a stone across and some large enough for jet flying fields, and some that will take hours to cross by car. Usually in the center or lowest depression, we find a barren, dry, fairly flat piece of ground, perhaps broken up with cracks due to some recent rainfall that has dried up. Back a little on slightly rising ground, one sees the desert brush growing, or dying, or dead, very small at the edge of the barren ground, and larger as we go back from the center. These are plants that can stand considerable drouth, desert holly, creosote bush better known as greasewood, sage and mesquite brush. Further back and growing on what was the edge of the lake when it was many feet deep, are found the remains of trees, mesquite, palo verde, and other desert trees, some standing gaunt and dead, and others clinging feebly to life. Then, geologically speaking, these lakes must have been filled with water in fairly recent time, and they speak of a time of heavy rainfall in what is now an arid region, practically hemmed in by mountains on all sides. Since these lakes were filled after the mountains were in place, thus making the region potentially arid, such as it is today, why should there have been a period of many years of heavy rainfall to keep these lakes filled, and even support for many years just before becoming arid, a prosperous agricultural economy? Yes, here we have another of these "unexplainable mysteries"! But it is really no mystery. We have seen that following periods of glaciation, there must come abnormal rainfall, and the presence of glacier masses to the north indicates not only downfall of ice masses from a canopy and downfalls of water toward the tropics, but also a succeeding period of excessive rainfall in locations not covered by glaciation.

241. Now do we find anything that indicates a heavy downpour of canopic waters in these localities that would compare with the ice masses of the polar regions? Yes, indeed! Today some of our geologists see the effect of that great flood of water, and ascribe the effects to wind erosion, as they cannot conceive of a stream of water of requisite size flowing in the desert. Take the Grand Canyon of the Colorado as an example. U.S. Government official descriptions of the canyon supplied to visitors by the Department of Interior informs us that "the Canyon was formed by the river cutting down as the land moved upward, owing to the slow transformation of the land's surface. Scientists estimate that it has taken seven to nine million years to cut the Grand Canyon." Now if that were really true it would leave a great many questions to answer. For instance, if the river once ran on the top of the ground, where the rim is, why did it run up a mountain to the west, instead of running downhill to the south? The washes show that all the heavy rains in that region ran to the south, why not the rivers? Perhaps the scientists will argue that at that time the mountain was not there, and instead of being uphill it was downhill. But the strata and the rocks do not support that thought, but tell an entirely different story. The Canyon was formed during a period of violence, land upheaval, and earthquakes. Although the surface of both the north and south rim show the same level deposits, the north rim is now 1200 feet higher than the south. The earth between the two walls was broken by the uplift of the north wall, and a great flood of water was released from an interior sea. Note the general contour of the country to the north and east that comprises the present Colorado River Basin. Block off the canyon with a mountain wall and you have a natural retaining basin, which shows the unmistakable sign of once impounding deep waters. The top layer of stone on each side of the canyon and some of the mesas projecting from the bottom, is of Kaibab limestone, generally ascribed to the Permian period. It was water-laid and before the canyon was formed this sheet was continuous and fairly level. Below it is sandstone of several periods, and on down to the Vishnu schist,

which was once part of the molten crust. Back from the rim on both sides, we find younger deposits of the Kaibab limestone indicating that part of the surface was broken up and washed away when the canyon was formed. In the bottom of the canyon may be seen great black dykes of basalt, running lengthwise of the canyon, which could only have been extruded from the molten core if there was a crack extending through the crust to permit its escape. Where this type of phenomena occurs elsewhere in the world, with the walls fairly close together, geologists do not hesitate to call it a "fault," a rupture, especially when the basaltic dykes are So much in evidence. Is this fault So large that it can not be seen? The lifting up of the north side, and the rupture of the crust, churned up the earth at the top of the break to a width up to twelve miles wide, So that the water from the impounded fund in the Colorado River Basin, could find an outlet and with that tremendous pressure it swept out the rubble as far down as the point where the break had been sealed by the basalt. The churned up waste and broken upper strata were swept down through the rift, finding an outlet at Black Canyon, and deposited where it still lies today mostly in southern California and northern Mexico to make the sand dunes of the Sahara for the movies. Mingled with it, is the wash of the Arizona surface of the northern and western portion of Arizona. Look at any map of Arizona and note the washes, miles wide, and their general direction, and then ask yourself as to when there was ever enough water in Arizona to wash out such wide rivers. Very certainly not in recent years!

242. Look at some of the pictures of the Grand Canyon and one of the striking things you see are the sharp vertical faces of the mesa-like "islands" rising a mile from the bottom of the canyon. Note also that these are mostly of sandstone, interspersed with lava, some capped by lava, some by limestone, and then can you believe that the rain and wind erosion of seven million years would leave them as we see them today? But visualize a heaving mountain, a great crack appearing in the earth, a vast inland sea pouring its water through the disturbed material of the fault, and the picture becomes clear and believable. It would have undermined any crust remaining, and the top of the channel would have fallen in and been swept away. Did you ever pile up some sand on the ocean beach near a creek, and run water under the pile? There you saw the Grand Canyon in miniature. When the top falls in, the upper walls stand vertical, and the lower sand where the water is flowing angles off on about a one to one slant. In further confirmation, when the Hoover Dam was built, the builders must first get down to bed rock, the old bottom of the river when it first washed out the canyon of its debris. They found the old bed several hundred feet below the level of the river as it was at time of commencement of construction. The channel had first been swept clean as far down as the fault permitted, and later when only a normal flow was passing through the channel, the bed slowly rose as debris was deposited. Instead of cutting deeper as the years rolled by, as required by the theory given the public, the bed is filling up and has been for some time. Of course, if we were to start the Colorado River at the top of the canyon today, and figure how fast the present flow of water could cut out the canyon, at its present cutting rate today, since it is not cutting out, but filling up, we could figure that it would certainly take several million years. But that is not the way it happened.

243. It is hard perhaps for men to realize that mountains a mile or more in height can be raised up in a short time, or that immense quantities of sand and soil can be swept away in a few days. But let us remember that the earth is 25,000 miles in circumference, and a mountain a mile high is hardly a pimple on the face of the earth, or the Grand Canyon no more than the crows feet in the corner of an eye. We are not dealing with conditions as they are today, but as

they were at the time these earth-forming events took place. In northeastern Arizona, weird formations, mesas, monuments, pillars, etc., rear themselves from the floor of the washes, or valleys. The strata revealed by these indicate that the ground was water-laid, and of many layers, and considering their height, and noting that all the ground in that vicinity was of equal or greater depth, water must have washed away hundreds of feet (in depth) of earth material. It has not been wind eroded, for then the movement of the soil would be in the direction of the prevailing winds, and somewhat limited in the distance moved. But we find that these Revelation great washes from a vast fund of water, that not only removed the soil from these washes, but carried it downhill in accordance with the contour of the ground, and transported it sometimes hundreds of miles, where it now is, a water-laid deposit again. Could the wind have done that? No, but the downfall of canopic waters could.

244. Such a downfall would not only fill existing hollows to overflowing, but when full they would have been kept replenished for years by the succeeding rains, and only slowly would the climate have changed, and the land become a parched desert. The stored waters, in the lakes and ponds, and like the great lake of the Colorado River Basin before it drained through the Grand Canyon, would continue to supply moisture to the air, and some of it would be returned as rain. Then vegetation began to grow around the rims of the lakes and ponds, and as the water receded the vegetation followed, until the water became too brackish to support life, and the vegetation could not enter further into the lake bed. The waters completely drying up often left valuable minerals on the surface. Some of the playas of today are found with such quantities of trace minerals needed for animal nutrition, that the lake beds are harvested.

245. Such a lake as has been drying up, but is still fed fresh water by rivers, is the Great Salt Lake in Utah, which in its greatest spread is known to geologists as Lake Bonneville. Originally it was a fresh water lake, but must have contained some salt at the time of its filling. That salt had been previously deposited in the western mountain ranges is proved by the presence of a bluff of rock salt on the west side of the Virginia river, near St. Thomas, Nevada. It is probable that the salt now found in the Great Salt Lake was leached from previous deposits, probably Tertiary. As this lake dried up, great salt flats appeared, and as today the water is a saturated solution, it deposits salt very readily. Having the intake from two rivers, and no outlet, it seems to have reached a position of stability, except in unusually dry years. Lake Bonneville reached a maximum depth of more than 1000 feet, and covered between 16,500 and 17,000 square miles. Here was impounded water similar to the condition we noted in the Colorado River Basin, before the fault was formed at the Grand Canyon.

246. Now we come to a group of states that must be treated as a whole to understand what happened there. There is a large basin in the northern half of the United States that extends into southern Canada. The lowest portion of the basin is the Great Lakes region, and it drains both east to the Atlantic and south to the Gulf of Mexico. On its westem border are the Rocky Mountains, partially hemming in the area drained by the Missouri River and its tributaries. The Central Basin is drained southward by the Mississippi which is joined by both the Missouri from the west and the Ohio from the east. After joining, these waters flow through the Ozark Mountains, out of the Basin. The St. Lawrence River, flowing eastward from the Lakes, takes the bulk of their overflow to the Atlantic Ocean. The Ozark Mountains are among the oldest in the world, having been formed in the Archean Age about the same time as the Laurentian group. From the Rockies eastward, the Ozarks are a part of a continuous barrier on the

south and east, that goes on through the Kentucky mountains, the Cumberlands, and the Appalachian system, which united on the north with the Canadian Highlands, the remnants of the older Laurentian. In this barrier, which forms three sides of the Basin, there was but one outlet until after the last ice age, when the Mississippi cut its way southward, and that was the St. Lawrence.

247. There is a very level plain, with deep alluvial soil, that occupies a large part of North Dakota, Minnesota and Manitoba. This was once a glacial lake bed that geologists have named Lake Agassiz. It is now drained to the north into Hudson Bay. With the exception of this Lake Agassiz region, all the Central Basin from the slopes of the Rocky Mountains eastward must have been drained into the Atlantic through the St. Lawrence. Then if anything had blocked the St. Lawrence, and with no break through the Ozarks, the Basin would have filled as an inland sea, limited in size and depth to the waters available, and the height of the blocking of the St. Lawrence. We know that on a number of occasions in the past, this area was inundated, and we can readily see why. Salt was deposited in vast quantities in the Great Lake region and also in Kansas. Ice ages of the past would serve to block the drainage temporarily and provide the water, while precipitation from the canopies of earth material mixed with sodium chloride would provide the salt we find.

248. In the last ice age the glaciers extended well past the Great Lakes, and down toward the southern border of the Basin. In the east, the New England states were sleeping quietly under a shallow blanketing of the Atlantic Ocean. With the vast fall of ice from the breaking canopy, ice moved from the Hudson Bay area north, south and west. Another great fall was on the east slope of the Rocky Mountains in Canada which moving eastward and southward joined the ice movement from Hudson Bay, that was moving westward. There was another great fall west of the Rocky Mountains, that we have already mentioned. As this great weight was added to the center of the continent, the Central Basis around the Great Lakes also sank, and the waters of the Atlantic rushed up the St. Lawrence River, carrying marine debris, fish and even whales with it. Two whale skeletons were uncovered in Michigan, and a part of a skeleton was discovered near Lake Champlain, above the present level of that lake.

249. But the rush of waters was short lived. The on-coming ice pack invaded the St. Lawrence Valley, cutting off both ingress and egress, and moved on further south. The "Lake Agassiz" region, invaded by ice also, could no longer drain to the north, for the Red River Valley was completely blocked, and Lake Agassiz itself was filled with the floe. Here, as the ice melted and pelting rains brought more water, this minor basin filled to overflowing and spilled over the top of its lowest wall to flow south into the Missouri. But that river had also been backed up by the rising waters of the inland sea. Still the waters increased as the ice pack melted, but quietly in a great settling pool, for there was no outlet. This lake and its shore line was first identified and defined by a Mr. Miller, So some have called these waters the "Millerian" sea, in recognition of his work. We will be glad to use that designation.

250. As we have noted, one of the products that accompany glaciers, is the deposits of sand and gravel, intermixed with occasional boulders, and known as glacial till, tillite, or conglomerate. Another of the characteristic products is a finer grind of "rock flour," mixed with fine clay particles, which would hang in suspension in the water much longer than the sand and gravel, and hence for any given glaciation deposit, it is always deposited above the till. This blend is usually laid without any water lines, but as a more or less solid deposit, known as "loess" (pronounced "luss"). Its deposit in this inland sea without markings

either of current, additional deposits, or inter-mixtures of other materials, tells of a quiet settling of the waters, with the loess distributed over a wide area. Many deposits are found scattered through Illinois, Iowa and Nebraska, especially along the terminal moraines. The well known "Council Bluffs" where it is said that Lewis and Clark held a meeting with the Indians near the present site of Omaha, are composed of such loess deposited during the formation of the Millerian Sea. The vertical bluffs were formed when the sea was draining and the resh of the impounded water cut through the deposit like "a hot knife through cheese." A considerable amount of these deposits of loess was washed southward, and re-deposited along the Mississippi's lower reaches.

251. In all the ice falls, in all the various ages, earth materials of all kinds were brought to to the earth from the canopies. Carbon is to be found in every age, sometimes almost pure, more often as a hydro-carbon, sometimes as a gas, carbon dioxide, and sometimes in a very light form like soot. In general it followed the rule that the heavier fell first, So it is not surprising that the two lightest forms accompanied the collapse of the last canopy. Some of the waters carried considerable carbon-dioxide, notably in the southwest, where its work is very apparent, and the other form resembling soot principally in the Central Basis, and also in Russia in the Ukraine. So light was this form that it remained in suspension in the water even after the loess had been deposited. Then we would expect to find this carbon more in the northern part of the Basin than the southern, and more in the central where the waters were deeper, than in the eastern or western portion. And we do find it in just that distribution. Who is not familiar with the "black" soil of the Central States, where this carbon appears on some hilltops, and at the shore-lines of the sea, as a deposit mixing with only a few inches of the soil, where in the valleys the black soil goes down several feet. In Lake Agassiz we find a fairly uniform deposit of such carbon due to the quiet settling of the waters of an almost even depth. This light form of carbon mixes readily with alluvial soils, and has been termed "carbonite." It has never been found as a pure carbon. Today, So much of the Basis has been cultivated that now we must depend on the reports of the observers of about a century ago for our knowledge of the make up of the top soil, and some state that this black ingredient of the soil was due to the burning off of the plains. But others note that moving some boulders, the black substance was under the stone.

252. Boulders often rode the tops of the glaciers, and within the ice pack, while some sank to the bottom and were rolled or shoved along the ground for many miles. Thus we find some of these deposited boulders with no markings, while some ware striated, that is scratched or showing the abrasions while moving under the glacier. In general, the boulders without striation had the carbonite under them, while those showing such marking, especially those near the terminal moraines, have no carbonite under them, although the black soil may be all around them. Some of the rock carried by the glaciers was picked up in their movement, and rock broken off of the Laurentian Range (Canadian Highlands), was moved to Southern Alberta and finally deposited at an elevation of 4500 feet. Some of these rock pieces weigh many, many tons. Ice is the only natural carrier that would be capable of performing such a task. Waters will move boulders downhill but not up.

253. Now let us go back and pick up the chain of events that followed the depression of the Basis with the impact of the ice load. That there was a depression of the area is attested by the rush of marine life up the St. Lawrence Valley. Then, as we have previously noted, if there was a depression there, somewhere there much have been an up-thrust in order to accommodate the rearrangement of sub-structures under the sinking portion. But the seas were

also being augmented with a resulting sinking of the ocean beds. Since the Atlantic was much the larger it put much more pressure on the continental shelf than could the Millerian Sea, which was comparatively shallow. But the seaboard came under pressure from these two sides, the Appalachians were shoved still higher, and the New England States arose from the Atlantic. In the St. Lawrence Valley a barrier 500 feet high was raised, near where the town of Quebec stands today, which for a time kept the drainage effectually closed.

254. As the basin of the Millerian Sea filled, it must in time find the lowest spot on the rim, where it could spill over. Apparently the first place it found was the Mohawk Valley, which had been plugged with ice, but became the Millerian Sea's first spillway, and diverted the water to the Atlantic by way of the Hudson River. But this did not take care of the daily increase of water, nor was this spillway used for any great length of time. Shortly after the water started flowing down the Mohawk, two additional spillways were opened almost simultaneously. The Mississippi, tearing a great gap in the Ozarks, broke through the south barrier and rushed on to the Gulf of Mexico. The Mississippi has presented us with a spectacle of floods in recent y ears, and man has sought to bring such floods under control, but nothing could have controlled this rush of waters. Valleys once swept clear by this new river could not again be filled, So that the effects of this great break through the Ozarks is still recorded in the lower Mississippi Valley. Naturally at the point of breakthrough we must look for the greatest confinement of the waters, and then a spreading out as they rushed southward. Dana states that after the gap was opened then the river had "an average breadth of fifty miles, and along by Tennessee and northern Mississippi of seventy-five miles, So that indeed it was a great stream."

255. With such a discharge of waters to the south, the Millerian Sea would have been sufficiently lowered to reduce the pressure on the Eastern wall, of there had not been practically a simultaneous breakthrough at the barrier raised in the St. Lawrence. By this time the ice barrier had melted in the valley sufficiently to free the old channel except for the earth barrier near Quebec and for such deposits as the receding ice may have left. We, of course, do not know the exact height of the barriers at either point, but there is a close approximation of altitude, but either one or both may have dipped in the portion now washed away. This coincidence accounts four our having two rivers, flowing in different directions, draining the Central Basin. Had the St. Lawrence opened some time previous to the break through the Ozarks, sufficient to lower the entire sea, the Ozark barrier would have remained, but it is questionable if later the St. Lawrence barrier would not have been swept away even if the Mississippi was draining that area. There must have been some additional cause, or event, that resulted in this almost simultaneous breakthrough in the east and south barriers. We can only suggest what might have been that probable factor. At lease it is a reasonable suggestion, but such an event would leave little or no proof. We know that the presence of a glacier in a warm climate, and the summer days were warm despite the ice pack, would result in heavy rainfall and fast melting of the ice. We have seen mountain valley glaciers where lakes would form on the glacier, retained on their lower edge by wind pushed ice. We have seen the result of these lakes being suddenly released and the water catapulting down the slope, tearing out boulders, trees, and even homes, on its downward course, passing any one point in a matter of a few minutes. Central Canada has many valleys where lakes of great capacity did form, with the lower ends choked with ice. The exact time that Lake Agassiz released its waters to the Millerian Sea is not known. The sudden dumping of water from one or a dozen such places may well have brought the waters above the level of both barriers at the same time,

and their distance from each other would have allowed each one to make its own breakthrough.

256. With the two spillways, the Millerian Sea emptied itself rapidly, except for the deeper depressions. In Minnesota and in Northern Iowa many lakes still dot the prairie, and the larger depressions toward the ear we know as "The Great Lakes." Today, these are not as large as they were just after the draining of the inland basin, for that region was still receiving more rainfall than it does at the present time. However, the shoreline of this smaller inland sea, or lake, was marked around its rim, So that it could be traced, though now more or less obliterated by time and man. We know that at that time the shoreline must have marked a water level, but that old shoreline does not do So now. The northern rim, as we would anticipate, is quite a bit higher than the southern. The greater amount of sinking must have been toward the north, and with the removal of the weight of the ice and the transfer of that weight to the oceans, we would expect a raising of the land surface. Whether all of the energy for this uplift came from the oceans or whether part of all of it came from stored energy in the form of compression, we may perhaps never know. But the tilt of the shoreline assures us that an adjustment by an uplift followed the removal of the glacier's weight, just as there had been a sinking when the glacier first came on the land.

257. South of the mid-continent barrier, which includes the Ozarks, except for the wash of the Mississippi there is not So much to see of the results of the last Ice Age. With the augmentation of the waters of the ocean by the collapse of the canopy, the sea again encroached over the land to the south of the barrier, and as the sea beds sank under the weight of the new water, the land again was raised, and the seas returned to their former shores in time for the Mississippi to sweep clear to the Gulf, leaving along its valley deposits of material brought from the northern inland sea.

258. This very briefly presents the picture for the United States. Since this last great "catastrophe" has been the one thing to most shape the surface of the earth, and hence the landscape, it is the one ice age that we know the most about. Volumes have been written about the events as they occurred, but without exception they leave the reader very much in doubt as to the primary cause. We have pointed out enough of the events to show that the ring and canopy theory furnishes a reasonable and competent cause for every effect, in complete harmony with natural law. We will not usurp the place of the field geologist, but refer you to the many excellent books already written describing the effects as found. We can recommend their descriptions, but the reader must be ready to differentiate between facts and speculation, and this necessity will be the more apparent as we take up the subject of the origin of coal.

CHAPTER TEN

THE ORIGIN OF COAL

259. At least one dictionary defines coal as "a mineral substance, consisting of carbonized vegetable matter, which depending upon the degree of carbonization is anthracite, bituminous, cannel, brown, or lignite coal. If mineralization has not gone So far as to carbonize the vegetable matter it is called peat."

260. Do modern geologists agree with this? First, let us hear from a leading authority. "The great interest to the geologist in the subject of peat beds is the essential identity, between their method of origin and that of the great accumulation of vegetable debris out of which the coal bed are made."1 We admit that this writer was speaking quite a few years ago, So perhaps the view point of the more modern writers differs from this. Then let us quote this from one of the latest publications, which was carefully reviewed and approved by a number of leading scientists of the modern school before its release. "Most of the earth's rich beds of coal and oil was created from the rotted vegetation of the marshes and fens that stifled the lowlands from Greenland to Antarctica. The ancient trees that luxuriated there were principally of three kinds: Sigillaria, plumed with old pompons of top foliage; Lepidodendron, which some soared to a height of 130 feet on slender tapered trunks; and Cordaites, precursor of the modern conifers."2

261. Since we have peat beds today, and they contain carbonaceous matter derived from vegetation, and such matter can be made to produce many of the products that can be made by distillation of coal, it sounds very reasonable that coal could be the solidified remains of ancient peat bogs, but not necessarily just from peat moss, but also from the remains of trees, ferns, and other vegetation as suggested by these and other writers. Now add to this that three stumps have been found in coal seams (in only a few isolated case we will admit), and markings of leaves and parts of plants have been found on the tops of coal seams, and that some carbonized seeds have been found in coal, and we have a practically proven case for the vegetable origin of coal. So much So that the scientists of today never even question the accuracy of the conclusion of yesterday.

262. Since the history of mankind points out that progress has been made, not by thinking along the lines of the multitudes, but from thoughts that opposed the thinking of the many, and that were accepted at the first by only the few, perhaps it would be well now for some one to take an iconoclastic view and question the accuracy of the deduction. Certainly no harm can result from asking a few questions! A short time ago, a graduate geologist was conducting some sight-seers through the Chicago Museum of Natural History (Field's Museum). The group was paused before a diorama depicting the forests of the carboniferous age, and the geologist described how such forests accumulated vegetable debris which over immense periods of time became coal. The diorama presented a beautiful scene, with the great trees almost dwarfing the dinosaurs roaming in the forest's shade. Then one of the group asked a question.

"Would not these trees, as tall as they were supposed to be, have very deep, or widespread roots in order for the tree to stand upright?"

"Why certainly, all trees must be held up by their roots."

"And the soil would have to be fairly deep for the support of such trees?"

"Of course. Why do you ask?"

"Oh, I just want to know who took the soil out from under the coal beds, after that forest turned to coal."

The geologist looked startled for a moment. "I see what you mean. I had never thought of it."

263. You see that is a very hard question for a geologist to answer, for rarely, if ever, do we find soil under coal, but we do find clay, slate, shale, limestone, sandstone, even glacial till, all water-laid. Especially in Australia, but also true in almost all coal bearing regions, do we find coal intercalated with boulder bearing glacial till. If the vegetation theory is true, how can we account for "peat bogs" forming on the top of porous gravel and boulder beds, developing the necessary "mass of decaying vegetable matter," sufficient to make up the coal beds, then removing the soil necessary for the growth of vegetation, and then covering the coal bed with more glacial till? And how do we account for this "luxuriant growth" in the midst of a glaciated area, as indicted by the glacial till both under and over the deposit of coal? These are surely legitimate questions and should have a reasonable answer in harmony with natural law! But these are not the only questions that a careful analysis of the vegetation theory raises. Bear with us, and we ill see just how reasonable and well based that theory actually is. You know that before you plant a garden with new seed, you first get rid of the crop already growing, and what school child is there, or what adult, that has not had his or her mind already "planted" with the vegetation theory?

264. But some one will say, "what difference does it make where coal came from, or why should that be important to me?" Perhaps to such a one, it may make very little difference, but if we first reason to a wrong conclusion, and then use that conclusion for a premise to support further reasoning, we can go vary far astray from the truth. All truth is inter-related, and a false view on one subject obscures our seeing the full truth on others. Every fallacy we clear from our minds brings us that much closer to being able to comprehend even greater and more important truths. An error can be a weak and crumbling stone in the foundation.

265. First we will admit that there is a partial chemical similarity between peat bog matter and coal, but will also recognize that they are not chemical equivalents. Peat bog matter could have been covered up by deposited material like glacial till and remained there until this day, but it could not have the appearance of our bituminous coal, and certainly not that of either cannel or anthracite, but possibly somewhat like our brown coal. But let us for the moment assume that all the coal beds in the world are from growths of vegetation, and then go back to their formation and see what would have been required to deposit So much carbon by that method.

266. Since coal is largely carbon, and plants contain carbon, we will start with the carbon atom and trace it through to coal, for every horticulturist will agree that the plant does not create the carbon, but only utilizes it. There are only two sources from which the plant could get the carbon atom to incorporate into its own structure?the soil and the air. If it was taken from the soil, then coal would only be a re-deposit, and the carbon would have had to be present in the soil previously, which would still leave the question of the source of the carbon. But it is much to be doubted if plants can use carbon from the soil.

267. In this connection we quote from personal correspondence with Mr. E.E. Carncross, Managing Director of the Western Peat Company, Ltd., of New Westminster, B.C., a man who has not only made an academic study of plant life, but has had business reasons to continue such research. We quote in part, "Sphagnum moss does have a high carbon content but probably no higher than any other woody or herbaceous matter. The presence of carbon in the soil or bog where it grows is not necessarily related to the fact that there is a carbon content in the moss itself. The carbon content in the moss, as in all other plant growth, is a product of photosynthesis and carbon in plant growth can actually be produced from soil that is wholly void of any carbon content whatsoever. To the best of my knowledge...there is no transfer whatsoever in the plant world of the carbon content of the soil to the carbon content of the plant."

268. This means that all the carbon content that goes to make up the coal beds, as well as the carbon for the oil deposits, not to mention graphite, had to be in gaseous form in the air, before it was deposited in the water of the bogs and fens where it grew as some form of vegetation. Now plants take carbon from only one form of gas, carbonic anhydride. The term "anhydride" means that it is without water content as there would be if hydrogen were present. This gas is also know as "carbonic acid gas," or by its chemical formula CO_2, "carbon dioxide." Carbon monoxide, or one molecule of carbon and one of oxygen, a deadly combination to lung-breaching animals, is never found in nature, but under natural conditions when these two elements unite it is with one of carbon and two of oxygen. It is quite obvious that the carbon atom and the oxygen atom existed independently before they were united, and this requires that we have some source of carbon?fuel carbon, available to the oxygen in the atmosphere, from which to make the prodigious quantities of carbon dioxide needed for the growth of the plants that made the coal. Then we must have had a vast fund of the carbon and an ocean of oxygen.

269. Why would it have to be fuel carbon? The carbon atom is peculiar. It consists of a nucleus with six protons, with two of its electrons circling close to the nucleus. The other four electrons rotate at a greater distance, and these can hook into the field of rotation of another carbon atom, drawing them very close together. In its most compact form, without other interfering atoms, the mass becomes very hard with a crystalline structure, and we call it a diamond. Another form of pure carbon is light and fluffy, and very black, and is known as amorphous carbon, that is, shapeless. This form is familiar to us as soot that collects in our chimneys. Between the diamond and the soot, carbon takes on many forms, aspects and colors. It is found in deadly poisons, and in food for man. It forms combinations in gas, liquids, and solids, and in the latter it takes on various degrees of hardness. It is in our sugar, and in our steel. As a diamond, free oxygen has no affinity for it. In other forms, it will unite with oxygen So readily we may have spontaneous combustion. It is this ability to unite with oxygen that makes it fuel carbon. Carbon must unite freely with oxygen to make carbon dioxide. Some carbons simply are not fuel carbons, as for instance graphite, which is So flame resistant that it is used to handle molten metals. Hence we have the fact that if our coal beds are vegetable deposits, there must, at one time, have been a reserve of fuel carbon, in gaseous form, more than equal to all the carbon in all the coal beds that ever existed, which later united with oxygen to form carbon dioxide, which was absorbed from the air by vegetation, the oxygen thrown off, the carbon united with hydrogen, and built into the plant as hydro-carbon. Then the plants died, were buried in a swamp, and slowly decomposed, sealed away from free oxygen or the plant matter would have been consumed slowly. In this process of decomposition, vegetation would have passed through much the same process as if it had been burned, only

slower. The hydrogen would have been thrown off to unite with oxygen to form water. The carbon would have been deposited as some form of amorphous carbon, and then crystallized later by some process, thus returning to its original state as fuel carbon, although this time not as a gas but as a solid.

270. Those who So glibly assert that coal is of vegetable origin have apparently ignored the fact that the coal, even if it reached the coal beds as a deposit of decaying vegetation, had to have a previous origin, and that origin must provide that carbon as fuel carbon, So the question becomes "did nature go to all the trouble of routing the carbon through vegetation or did it deposit it as a crystallized carbon without processing it through vegetation?" Let us remember that those who accept the vegetation theory also have as a part of their theory that all the materials of earth were deposited by the close of the Azoic Age, So that the carbon in the coal beds, deposited after the Azoic Age, either had to be in the soil and crust of the earth as a solid, or held in the gaseous form of carbon dioxide in the atmosphere. But since we have seen that plants cannot get their carbon from the soil, that source is ruled out and that leaves as the only possible source vast quantities of carbon in gaseous form.

271. How much would be required? We must take into consideration that according to most geologists, all the graphite of the Azoic Ages is only metamorphosed coal, So that amount of carbon, plus all the coal that has ever been mined, or remains in the crust of the earth, both on land and under the sea, must be included in our total carbon requirements. We will omit peat, lignite, and oil as the proof is sufficiently convincing without them. According to the best estimates we can find, these coal measures would provide enough carbon to make a bed roughly 10 feet in thickness around the earth, and in each cubic foot we would obtain 50 pounds of carbon. One pound of mineral fuel carbon when heated and mixed with oxygen to form carbon dioxide, will produce 200 gallons, So our thickness of ten feet, and one foot square would produce 500 times that much, or 100,000 gallons. Using 8 gallons for a cubic foot, we would have a column of carbon dioxide 12,500 feet high. In other words, the atmosphere would have been more than two miles deep with carbon dioxide alone, to provide the carbon necessary to the vegetation theory.

272. Since carbon dioxide is half again heavier than the air, and can even be poured from one vessel to another, it is obvious that if there ever was that amount of carbon dioxide, it would have been at the earth's surface and the lighter air would have been forced upward and above the heavier gas. Today we have about 1/25th of 1 percent of this gas in our air at the earth's surface, and we can breathe comfortably with that amount. But, if by any means, that mixture was increased to three or four percent, we would find that it would act as a narcotic poison to all lung breathing animals, and higher percentages would bring certain death. So instead of a pure carbon dioxide atmosphere, we must dilute it with enough air to insure the lives of animals on land, and even fish in the sea, and the very heaviest mixture where this would be possible (not probably) would bring our column of carbon dioxide mixed with air to a height of fifty miles, but there is no natural law by which such a mixture could be sustained. Carbon dioxide being heavier than air would be drawn to earth, and the pure gas would be at the surface, and if it ever did then all the fish and all the animals died. Hence we are forced to admit that there never was, and never could have been such a quantity of carbon dioxide, for animal life on land and in the sea flourished during the coal making periods. If there never was such a fund of carbon dioxide, then the coal beds could not have been the product of vegetation extracting such vast quantities of carbon from the atmosphere.

273. Now if coal is from vegetation as So emphatically stated by practically all geologists, where would we expect to find it most abundantly? The logical answer to that question seems to be that coal would be most abundant where vegetation grew most abundantly, and that would be between the Tropic of Cancer and the Tropic of Capricorn, the equatorial region, since no glaciation was ever known there except on one occasion. At the present time there is no real winter there except on mountain tops, and along the Congo, the Amazon, and the Orinoco, we have some of the heaviest growths ever known to man, and for at least four thousand years we have a history of uninterrupted growth, and fens and bogs are fed all the year long with rich decaying vegetation. Let us see how fast coal is being made here under such favorable conditions. But we look in vain! In four thousand years not one single crystal of coal has been produced! Not even a trace! Why? As every Future Farmer of American can tell you, these conditions produce humus not coal. Compost?black, cozy, rich fertilizer for the soil. Will it burn? Very probably if the moisture is dried out of it. If used like peat turf, it should have enough fuel in it to produce some heat and enough admixtures to produce lots of ash.

274. No, strange as it seems, there is little or no coal in the tropics, but there are tremendous deposits in Alaska, Siberia, and the Antarctic, and much of the coal mined today was laid down in the ocean or inland lakes, or in connection with glacier movement. There is some coal in India, and it was visited with a glacial period moving up from the equator. The larger beds, and the better quality are in the polar regions, and rapidly lose in quantity as we move toward the equator until seemingly they play out entirely when we reach the tropics. This seems exactly the opposite of what we should expect if the vegetation theory were correct.

275. Still taking the assumption that coal is a deposit from vegetable matter, let us see just what such a philosophy will require beside those things already pointed out. If the coal was a gradual deposit in a bog or fen (and all must agree that most coal was water-laid), the waste matter would first fill the deeper spots and then level off, somewhat like filling a saucer with coffee. But that is not the way that either bituminous or anthracite coal beds lay. With bituminous beds, a single seam may cover many square miles, going up and down grade, thinning out or perhaps even disappearing on the higher elevations. One deposit has been found where there is but a single sheet on the top of an elevation but going down grade it fans out into seven distinct seams, intercalated with sand and clay, now turned to stone. Now if that were bog bottom, and the coal was then decayed vegetable matter, would not that wet, decaying, mass have been So soft that the sand would have mixed with this carbonaceous matter? But not so, the line between the coal and the sand is a sharp cleavage, with even leaf and fern prints clearly outlined on the bottom of a sand cover. Incidentally, these prints indicated that the leaves or pieces of plants were fragmentary, not as growing plants, but rather as if they had been washed in and buried with the sand.

276. Again, it would be necessary that the surface of the bog should have been at sea level or above it, in order that the vegetation should have access to the carbon dioxide laden atmosphere which we saw was essential to plant carbon deposits. But in many places, for instance Pennsylvania and Nova Scotia, we find marine fossils, not only on the surface of the layer above the coal but sometimes even within the coal layers themselves, as well as within the layers of shale, slate, sandstone, or limestone that separate the coal layers. If this coal is a product of a peat bog, or any deposit of decayed vegetation, then after the decayed vegetation had accumulated, that area must have been very gently lowered under the sea, So as not to disturb the deposit, then a layer or layers of

other material were superimposed while the coal material was under the sea, and then the area was raised to the surface again So another bog could grow just above the older one. In South Wales more than 100 such layers of coal separate from each other, all marine laid, have been found. About 75 in Nova Scotia, 27 in Pennsylvania, and probably eight are all that will be found in North Carolina. The deposits in Alaska, Siberia, and the Antarctic have not as yet been sufficiently explored that we can know with certainty as to their make-up. About this raising and lowering of the land, to permit the bogs to grow one above another and then be submerged, we would certainly believe it a very remarkable coincidence if we found one verified case where this had happened. But if we found it repeated three or four times in identically the same place, it would be astounding, but to believe that it happened 100 times in the same place (and without developing a fault), is too much for the average man's credulity. Of course this logical necessity to the vegetation theory is not mentioned by its proponents, but it is what must be accepted if we believe in the "bog and fen" as the coal producer, and accept the evidence of marine deposits in the areas mentioned. Nor should we forget our Australian friends for they have the same condition there, in the interior basin of their continent although it is ringed with mountains. What then in the case of Australia would have caused the basin of the interior to heave up and down? Where did the power come from to move it up and down? To move it up meant more of the plastic or molten rock moved under its surface, and to move it down meant the removing of the equivalent amount. Every geologist knows that it could not and did not happen in that manner.

277. While sand deposits did not sift down into and intermingle with the coal deposits, except in a very slight degree, we do find many instances where boulders are imbedded or even encased in coal seams. Now, boulders within the coal seams indicate that these were not washed there, but dropped there, while the coal beds were being laid down. But to have been dropped there, we must look for a competent transportation agent, and the only possible source of boulders that could still be a transporting agent is floating ice, let us say a remnant of an ice age glacier, a small iceberg, for inland lakes and seas could have floating ice as well as the oceans. But floating ice with boulders must mean glaciers somewhere, and glaciers speak of cold weather, So here again we have at least a semi-frigid location?under water?at a time when the vegetarians should be having their "lush tropical bogs and fens." And again the facts do not tie in with the requirements of the vegetation theory.

278. But what about the stumps of trees that have been found in coal seams? We have seen trees some way up from the ground line, petrified, and standing in volcanic outflow material, but we have never heard of any chemist or geologist that suggested that the volcanic outflow that caused the petrification was of vegetable origin on the basis that a stump was there. A large stump was found within a coal seam, standing upright, with about ten feet of its trunk preserved. The lowest estimation is time for coal to form that we have found, is the rate of one foot in 300 years. Other estimates run as high as a foot in 5000 years. We have already noted that in the most likely spot there has been none formed in 4000 years. But we will take the 300 year figure, and that would mean that it took 3000 years for the coal material to build around that portion of the tree, and that tree was of rather pithy wood as could have been expected of many trees of that period. Now think of that lone tree standing in "a lush fen" for 3000 years while the coal material slowly accumulated around its trunk, and remember, that that coal was the rotting vegetation of all the rest of the trees and other vegetation of that fen! And yet for at least three millenniums that one tree

endured, and then was petrified by the carbon that was present! But this is one of the proofs (?) Of the vegetation theory.

279. There is (at least there was once) in the Chicago Museum of Natural History, a small stump removed from a coal seam, and So well petrified that the annual rings were clearly visible. That stump was offered as "proof" of the vegetable origin of coal, but that wood was petrified, carbonized, and it was not bituminous coal, although it was taken from a seam of bituminous coal. It was purely a product of carbon petrification, and though with sufficient heat, it probably could have been oxidized (converted to carbon dioxide and residue), it would not have burned freely as coal. Such carbonized fossils are not uncommon around coal mines. The same material has been petrified with silica and lime in their various forms, in all parts of the world, and in all ages, but no one has as yet, So far as we know, put forth the thought that this was proof that it was these fossils that made the sand, slate, shale, etc., in which the fossils were found. We do find some limestone composed almost entirely of the shell fish, or of coral, but we know that these took the lime from the water, and did not create the lime themselves. In all these cases of plant or animal conversion or petrification, the basic material has to be on hand first.

280. But what if this vegetation did not grow in a bog, where the falling material could decompose under water, but in a dense forest that provided the organic material and dropped it to the ground? All such organic matter begins a slow decomposition as soon as it dies. Oxygen, that devourer of waste, the scavenger of nature, commences its work. The decaying vegetable matter in the bog was sealed away from free oxygen by the water, but in the forest free oxygen has access to the organic material. Remember that decomposition is a slow way of "burning" or oxidizing, and when oxygen and carbon molecules attract each other, the carbon divorces its hydrogen mate, and unites with two molecules of oxygen instead. The hydrogen released from the carbon finds its affinity in oxygen also, but with two molecules of hydrogen for each one of the oxygen. So that we have once more, carbon dioxide and water just as we did before they were assimilated into the plant. Thus only humus could be made by a forest, for there would be no crystallized carbon for coal. It is estimated that a cubic foot of bituminous coal will oxidize or completely "slack" in about fifty years, So coal left in the forest would deteriorate about six times faster than the least estimate for forming that coal, which would prevent any possible accumulation, even if the forest could make some coal. Chemists many years ago called the attention of geologists to the necessity of keeping fuel carbon away from free oxygen, if they wished to preserve the carbon for their coal beds. That is why Prof. Dana was So emphatic that the peat and coal processes were practically identical, and that the coal measures were laid down at or near sea level.

281. Now again, if coal is vegetable matter, then the bulk of the non-fuel material incorporated in the beds must also be of vegetable origin, and such non-fuel material as was in the plants, must have been preserved the same as the hydro-carbons. On the average, anthracite (So called hard coal) burns with the least ash, then bituminous with its varying ash contents, then cannel coal with more ash, then lignite, and present day peat with the most ash of all. This does not always hold true for some, bituminous coal has much less ash content than some anthracite. We included lignite and peat since in the vegetation theory these are supposed to be coal beds in preparation. We will not here go into the details of the ash content of these coals as anyone may secure official data very readily and exhaustively at any public library. If peat became lignite, and lignite, in its turn, became bituminous (or perhaps cannel?) And bituminous became

anthracite and some anthracite became graphite, just how did it lose its non-fuel material (ash content) in the process? Considering the ash content of today's trees and associated vegetation, we find the vegetation of that day mut have had only about one half as much non-fuel material as their successors, as measured by the average of bituminous coal.

282. Please note that the foregoing has all been predicated on the supposition that all the non-fuel material was of vegetable origin. But would that be a fair supposition? The theory requires that the bog be operative for several thousand years for each layer, and that in a world where the sea coast is doing ups and downs, and would not that have indicated volcanic activity, and would not that mean some smoke and dust which would settle on the bogs? Did you ever burn coal and have some glass-like clinkers to remove from your furnace? Did they look like they had a vegetable origin? Now examine a piece of bituminous coal under as powerful a reading glass as you have. Or if you have the opportunity, see it under a microscope. You will note that the layers all run approximately horizontal, and are of fine black crystals, and then between the layers of crystals there is a grey or rust colored deposit, very thin, almost like a watercolor wash, then another layer of the black crystals, but no layers or pieces running upright between the layers. These thin layers between the coal crystals are frequently ferrous (iron) in content, or mixed with sulphur as iron pyrites. Sometimes, it is silicas in the form of very fine clay particles, that could not possibly come from vegetation. Yet it is these fine layers between the crystals that make up the bulk of the ash content. This mans that even less ash content could have been from vegetation and the disparity between the carboniferous-age plants and today's becomes even greater.

283. Since all the plants suggested as "coal plants" have long fibers running the length, as well as interlocking fibers around the girth, just what process could be used to eliminate completely these fibers and compress them into thin crystallized layers that show no sign of fiber growth? Today we shred wood and bark and compress it under tremendous pressures. Still the fibers interlock and there are no layers, but not So in coal. Although in bituminous coal there are thousands of layers of fuel carbon, separated by layers of non-fuel, and these thin layers may cover many square miles, there is no place where fibers bind the layers above with the layers below. But we do find occasionally a piece of wood, or a stump, with coal layers built up around and even over it, carbonized, retaining its original size and shape, and not compressed in any direction. If fuel carbon was crystallized out of swamp waste by pressure, why did not that same pressure deform the wood?

284. Much to the surprise of the vegetation theorists, uranium has been found mixed in with lignite beds in South Dakota, and the uranium was undoubtedly deposited simultaneously with the lignite. Will it now be claimed that the lignite and uranium had a common origin in vegetation?

285. The claim that anthracite is metamorphosed bituminous coal that has been under greater pressure, hardly appears reasonable when we study the ash content, because all the metamorphosing that pressure or heat could do could never change the non-fuel material into fuel material, and thus change its relative ash content. Further, the claim is also made that a process of metamorphosis changed coal into graphite of the Azoic Age, So altering its nature that it was changed into non-fuel material and all ash content removed. While the mechanics of such an operation seem very vague and unlikely, we are also confronted with the problem of how we could get the necessary decaying vegetable matter for the coal in a world completely lifeless and void of any

vegetation. If we admit that coal and also graphite are not of vegetable origin, then we can understand that both anthracite coal and graphite could have been laid down the same as other minerals in a lifeless age.

286. We will not take longer to indicate that there are very strong reasons for believing that the current conception of the process of coal formation is in reality, a misconception, and certainly subject to grave questioning. Whatever the process was, the conditions we find must be entirely harmonious with the events. Our trouble has been that the deductions made from the facts, were not in harmony with all the facts, and although apparently explaining some, for some facts may point strongly to the orthodox conception, there are other facts that as strongly contradict it.

287. We recall a murder trial where the prosecution presented a whole array of prominent persons to prove the guilt of the prisoner and his identity with the person committing the crime. The defendant had only one witness for his defense, the warden of the State Prison. He testified that the defendant was still serving a sentence within the confines of the prison at the time the crime was committed. One verified fact outweighed what all these prominent people thought, even if they did think it to be the truth. So here we must bring all the facts into harmony, So that all the conditions we have noted would be the logical and natural result of the actual process, and not leave some impossible event in our theory?like having extensive plant life in a lifeless age.

288. Now we turn to the ring and canopy theory which has been able to assign clear and logical causes to some of earth's "mysteries" to see if it can shed any light on this perplexing problem. Again, let us start with the carbon atom and see what pure philosophy would require. We found that very probably carbon was formed from nitrogen during the process of fission and fusion which must have attended the early period of the formation of earth's materials. We find that carbon is one of the common elements in earth's crust and is included in some form in the deposits of every age, although in bulk it comprises a very small percent of the deposited material, being grouped in with all others, that make up 1%. However, in keeping with the law of arrangement of materials according to weight, we would expect the heavier, denser carbons to be deposited first, and the lightest carbon last. We would expect the greater deposits in every age to be toward the polar regions, and that such deposits would indicate that they were water-laid. As the collapse of the canopies brought down earth materials on both sea and land, that which was dropped on water would be separated according to specific gravity, and the heavier carbon crystals would sink before the lighter ones, and the lighter ones would move with the currents and the tides further than the heavier ones, but finally come to rest, water-laid. The heavier carbon crystals sinking faster than particles of clay or other material would have less extraneous matter deposited with them than the lighter carbons. Being laid in water, they might well take down with them small organisms or floating vegetation. Thus, on the Eastern Seaboard we should find the denser coal with less ash content (anthracite) farther east, and the lighter coal, with more ash content (bituminous) further inland, and these beds should diminish in both thickness and quality from their eastern to their western limits. This area was the continental shelf, and under the waters of the Atlantic Ocean during the carboniferous period, and carbon falling into the sea would have been carried by tidal action toward the shores. Note the coal measures still under the sea around the south of the British Isles. East of the Appalachian Range the coal should have been laid down with marine (salt water) fossils, but nearer to the land we would expect refuse from the land vegetation washed down to the sea, and saturated with water, it should have sank to the bottom where the carbon was.

Somewhere we would expect in view of the glacial period following the rupturing of a canopy, to find loess mixed with the carbon, like mud. This condition should be found in the great central basin with its fairly quiet waters rather than in the restless churning waters of the ocean. Along the east side of the Rocky Mountains we would expect to find some anthracite, and west of that bituminous. But whatever anthracite is found, it would not be beyond our expectations to find it where bituminous coal predominates. Since even on the interior of the continents, coal was water-laid during periods of glacial movement, we would expect this period to be of violence and mountain making. These processes involve not only North America, but the whole earth at the same time.

289. Let us visualize a canopy formed overhead, with no blue sky appearing. The underside of the canopy is beyond 20,000 miles above us, and with sunlight filtering through, it reveals many shades of grey as well as colors of brighter hues. This liquid mass forming in the carboniferous age must contain carbon as the base for the coal beds, and it must also have bitumen, and other materials that are attracted to carbon. Otherwise the coal would not have formed but would have been graphite. Coal contains many elements besides carbon. The carbon might be present in various forms beside black crystals, as gas in carbon dioxide probably in water solution, as a white substance in combination with calcium, eventually to become limestone, and other possible combinations. Along with the carbon we would expect to find other earth materials such as silica, sodium, alumina, and of course ample water. As the canopy moves poleward, some of the heavier spots may leave the rest and plunge eastward, but the greater mass awaits the breaking at the equator, and then over a matter of days all of that canopy comes to earth, the liquid parts in polar regions as ice and snow mixed with earth material, in the equatorial regions as rain mixed with other matter. Do you see now why the larger beds of coal are toward the poles? How coal can be water-laid between layers of glacial drift? Why coal seams are intercalated by deposits of water-laid rock? Why on the Atlantic Seaboard we would expect anthracite deposits farther east, and the lighter bituminous farther inland, where the seashore or bays once were?

290. Let us pause here for a moment and see if this is what did happen, for if the facts do not support the ring and canopy theory on this point, then the theory is faulty, but if we find that the actual conditions bear us out, then we know that we are on firm ground. In the region of Narragansett Bay, in Rhode Island, close to the present Atlantic shore, we find a coal So close to graphite that it does not burn readily. Some authorities refer to it as "graphitic anthracite." Farther west, just east of the Allegheny Mountains, we find the anthracite beds, and these are thicker along the eastern part of the strip than the western. These lie as if they were washed in by the tide, and there are not the lines of cleavage So noticeable in bituminous, but the coal appears more as one mass. As we reasoned, marine fossils are found in the beds and also above and below them, but not much trace of land vegetation. This anthracite was laid too far out on the ocean floor, even though it then was part of the continental shelf, to receive as much land material as we find closer in toward what was then the shoreline. Earth material other than carbon was mixed with the flotation and some of it was deposited in the beds with the carbon. For this reason we find a varying ash content from about 2% to 8%, and such variation may be found in the same layer.

291. Bituminous beds make up the greater part of our coal reserves, and going west of the Alleghenies, we find an area of about 7000 square miles where such coal may be encountered. This area is approximately 850 miles north and south, and true to our expectations, we find that the beds are thicker on the eastern side

of the strip and thinner as we move to the west. In this area a single layer may cover a thousand square miles, or it may cover much less than a single square mile. These layers are not necessarily horizontal or parallel, but go uphill and down again, following the contour of the land beneath. Here apparently was a wide area of fairly quiet water, accessible to the tides of the sea, but not unduly agitated by them. The carbon floated in, sank to the bottom, and was gathered in great beds, together with other material, as it too sand to the bottom. This material floated into this "settling pond," not in one great mass, but over a period of time, and the water separated the heavier and lighter materials. Do you see then why bituminous coal is composed of layer upon layer of carbon with its affiliated bitumen, with the slight wash of material between the crystalline layers? Here again we would anticipate a considerable variation in ash content, as some tides must, inevitably, bring in a greater or less admixture of earth material, with varying specific gravities. And we find it so.

292. In Pennsylvania during the coal making period, just as today, the higher grounds must have lain toward the north, as the beds thin out as we go in that direction. For instance, at Pottsville, the known beds total 154 feet, at Wilkes-Barre 85 feet, and at Carbondale 20 feet. A glance at the map will show that these lie in that order in the Susquehanna watershed. If the coal was deposited in water in the manner outlined, there is not only a very valid reason for this difference , but it is demanded by our philosophy to be found that way. But on the other hand, if we pursue the vegetation theory, then we find that these beds are in exactly the reverse order to what that theory requires, for certainly we would not expect much land vegetation to be growing in salt water fifty to a hundred feet deep, but if it grew at all it would be in shallow pools along the shore. But here we find the thicker beds in the deeper waters of the continental shelf, with less ash content and better quality to the east, exactly as required by the ring and canopy theory.

293. The vegetation theory does not give any explanation as to the "why" of the layers above and below coal beds, but here we have a place where their presence cannot only be explained, but is demanded. We have previously noted that downfalls of earth materials would be sorted by the waters according to specific gravity. If you wish to prove this, mix a batch of sand, pebbles, wood ashes, etc., and pour your mixture into a large glass container partially filled with water. Stir it well and allow it to settle. The material you So carefully mixed is now separated with the pebbles on the bottom, then the sand, and then the ashes (if some of the bits of charcoal are not floating on top). This is exactly what would happen with the material deposited with the water, snow and ice of the canopies. At sea, boulders were dropped when no longer supported by the floating ice, and this was also true in inland seas. Strange as it seems to some geologists, there ware boulders resting on the surface of the bed of the ocean, where according to their theories there should only be the decayed "flotsam and jetsam" of the centuries, with all the erosion of the continents, and the soft debris from all bodies that have lived and died in the sea making a soft mass many feet deep. But it just is not that way. And the boulders on the surface of the sea bed are not rarities. The most of them could well be ones placed in the last ice age. The silica present in the water as clay particles would remain in suspension, long after silica present as sand crystals. Thus we find coal layers all of which came from the same canopy separated by layers of sand, slate, shale, or other clays, when the canopy was deposited in open seas, and very much the same thing with varying thicknesses of beds if deposited on land. The various strata deposited between coal layers bulk very much larger than does the coal, and the distance between the layers, even in the carboniferous age vary widely. But that is what we should expect. We certainly would not expect uniformity of distribution of

earth materials by a canopy, especially when we consider that heavy masses may have detached themselves and fallen to earth prior to the collapse of the entire canopy, much as the great salt deposits must have been made.

294. Do you recall about those coal beds, some of which were resting on glacial till, and some were between such deposits? The word "conglomerate" is sometimes used for glacial till, and it very well describes the condition of material left in the moraines of a glacier, or of the material washed out of moraines and re-distributed. Bulletin No. 65 of the United States Geological Survey states, "In the Panther Creek Basin, at Tamaqua the lowest coal bed is the Lykens Valley coal six feet thick within the Pottsville conglomerate." It also reports that in Mercer County, Pennsylvania, there are no less than four distinct and separate beds within this same Pottsville conglomerate. We can readily understand why this could and should have happened if the coal crystals were a direct deposit and brought down to the surface of the earth by the same ice fall that provided the glacier, that transported both the carbon and the till to the location, and deposited the carbon for the first bed, released more till, more carbon, more till until the glacier was melted, and the earth materials that came with it, were incorporated into earth's crust. But to account for four separate bogs, one above another, their aqueous content held for thousands of years by porous gravel, and this nearby glacier remaining to provide the conglomerate when the bog was ready to be cover, ?this is too much for our imagination.

295. In the Inland Basin, where the "Millerian Sea" filled and drained and filled again, we find a slightly different condition. With the advent of an ice pack around Hudson Bay, the eastern outlet might become choked, and all during the period of the depositing of the coal measures there was but the one outlet to the basin. With that outlet closed the basin had no drainage, and was receiving increased amounts of water from the glacial run-off. Thus the Inland Basin would become the Millerian Sea, with much of the water flowing in from the north, just as we have described in connection with the last ice age. Carbon and all other materials either in solution or in flotation would move away toward the south and the east, until it either settled from its own weight, or was deposited by the waves on some elevation or bank of the inland sea. Since the volume of water would vary, So also would the locations of the deposits. Since there were glaciers involved with the most of these deposits, we would expect to find some loess that is a sort of trade-mark of a glacial period. Since carbon also varies in its specific gravity , as well as in the size of crystals formed, we would reasonably expect that in this inland basin we would find some of the bituminous deposits mixed with loess, something like carbonaceous mud. If so, it would be fine grained, without the laminations that mark bituminous coal, and averaging a higher ash content as the loess is not a fuel. As this material, both the loess and the carbon, would be among the lighter earth materials brought down with the glacier, we would find such deposits to the east and south of the basin.

296. The kind of coal that answers our specifications is cannel coal, and we find it right where we would expect it, in Indiana, Ohio, and eastern Kentucky. Apparently the admixture of the loess which floated in with the hydro-carbons helped to preserve some of the original qualities better than in other deposits, for from this cannel coal we produce some of our most volatile hydro-carbons, and these beds should be immensely important to us in the future as a source of high grade gasolines. The ash content in these beds varies from 3% to as high as 20%. If it gets above 20% it is of little value as fuel coal and is referred to as carbonaceous earth. One peculiar thing about these beds is the abundance of fish and crustacean fossils, and these fossils are much more abundant than those of

plant life, which naturally floated in also. Do you suppose then that we should think of these beds as being the product of fish? It seems apparent that the advent of the glaciers sufficiently chilled the waters in the inland basin that much of the fish life perished, and then floated with the loess and the carbon, to the deposit beds, some to petrify but the most merely to leave the imprint of the calcium in their bones within the carbonaceous mass. All of the fossils in this area are indicative of fresh water as are also the layers between the carbon beds.

297. Another thing that seems peculiar in connection with cannel coal is that few if any geologists assign a vegetable source for this coal, except that some believe it to be the eroded waste of other coal beds washed into its present location. But we very frequently find bituminous coal grading into cannel, either underlying or covering it, without any seam or separation, indicating that both types of coal were deposited at the same line. Now we can understand that as water currents varied, So would the deposit from those currents. When some pool of water on the surface of the glacier suddenly swept its floating material into the larger body of water, a change in the content of the deposition would certainly result. But try to apply the vegetation theory to these variations in cannel coal, and we find ourselves with out any sound basis for reasoning, either from cause to effect, or from the effect back to a reasonable cause.

298. There is much bituminous coal to be found throughout the Basin, and here we have a greater parallelism of beds than on the eastern coast, indicating that the depositing was in quieter waters. Since in our philosophical reasoning we reached the conclusion that the contents of a canopy would not be uniform throughout, for the various earth materials would have affinities for other kinds, we would expect that the deposits from the canopies to indicate such lack of uniformity. We should expect then variations in the admixtures in the coal measures of the Inland Basin from those on the Eastern Coat, or in Australia, even if it could be demonstrated that these certain strata all came from the same canopy and were precipitated at the same time. These variations hold true throughout all the coal measures of the earth, as well as their associated strata, but each variation does not indicate a separate downfall of material. For instance, the presence of fire clay at one point and its absence in another is undoubtedly due to such variation. The presence of white china-making clay is very probably due to the waters at that point having a greater quantity of carbon-dioxide, which was absorbed into the clay beds. It is true that carbon dioxide could have been produced by decaying vegetation as some suggest, but then the vegetation would have left impurities behind it, and these impurities do not exist in our finer clays.

299. We look to the southeastern part of the United States, which was alternately flooded by incursions of the seas, and then raised and drained. The state of Alabama will serve as an example. Here we have about 35 different coal layers, and all these beds are thicker to the southeast (nearest the open sea), and thinner as we go to the north and west, away from the ocean. If the carbon did not come as flotation from the ocean, with the miscellaneous associated material accompanying it, why should we find this condition which So exactly meets the requirement of our philosophy?

300. The Rockies rose up out of the Pacific, but at one time were washed by ocean water on both sides. Yes, we find some anthracite in the Rockies, both in the United States and Canada. Professor I.N. Vail, when first giving his lectures, was ridiculed by geologists in general because he stated that there should be, according to this theory, anthracite found in the Rocky Mountains. Did not all

geologist know that the only anthracite in America was on the Atlantic Seaboard? But since then Professor Vail has been proven correct!

301. We will not take the time to detail the mountain making of the Carboniferous Age, but all geologists agree that it was a very active time for earth's crust, just what would be required in a prolonged glacial period of many downfalls, to relieve the stresses set up in the crust. From this we see that there was no need for a continual settling of the land into the sea, and a subsequent emergence, So out of all reason. We see that the 76 layers of coal in what is now Nova Scotia could all have been laid in the sea, together with the additional strata without the slightest elevation or depression being necessary. After all these strata had been laid on the ocean bed, the land was raised, but we do not know how much coal is still covered by sea water. We see now why the coal deposits are greater in the polar regions, with amounts lessening as we approach the tropics.

302. Is there any point where the ring and canopy theory fails to supply a reasonable cause for the facts as we find them? Or is there any point of our philosophy that Nature does not supply the supporting facts? Then let us take one last look at the "vegetation theory." Stumps have been found apparently at the site where they grew and were covered with coal, and the stump itself carbonized. In these cases we find that the trees were growing closer to water, and as the water deepened from glacial melt, and "coal" in the glacial waters was deposited around the base of the trees, the rest of the tree died and rotted away, but the part surrounded by carbonaceous matter was petrified or "carbonized," but did not become bituminous. With the many places on earth where trees were growing it is not at all surprising that coal deposits were sometimes made at the base of some trees.

303. "But is it not true that at Carbondale, Pennsylvania, that the impression of the bark of a Lepidodendron, two feet thick and seventy-five feet long, was found in the coal mines?" So far as we can learn, that report is correct. And the record is that the impression was very plan in the shale forming the roof of that particular seam. Let us remember that Carbondale is in the northern part of the Susquehanna River watershed, and toward the northern limits of the field. During the carboniferous period this location would have been under the sea, fairly close to the shore and the mouth of a river. Why should not a trunk of Lepidodendron wash out to salt water, sink to the top of a carbon deposit, and be buried under a clay deposit that came later? Or is that any reason for saying that the clay, silica, had a vegetable origin, because the tree was in the clay that turned to shale?

304. On the other hand, some trees have been found standing upright, "still rooted in the soil they preferred." The soil in which the roots were petrified was originally clay, then the trunk passed through a coal bed, and into the sand and clay of the stratum above. These trunks were petrified with the substance predominating in the soil at the point of contact, that is with carbon through the coal and silica through the sands and clays. This does not seem to be any proof of the vegetable origin of coal but a direct refutation of that thought. Here Nature tells us that after the tree grew in place, it was covered at the base with several feet of carbonaceous matter, and before the tree could die and decay it was still covered further with a deposit of sand and clay. Now this is certainly most positive proof that all these deposits were made within a short interval of time, less time than it would have taken for the tree to decay, not several thousand years, and hence the material around the base could not have been slowly accumulated vegetable matter.

305. While we have not exhausted the arguments of either theory, this brief summary should prove sufficient to permit reaching a reasonable conclusion as to which is the most logical and most consistent with facts and natural law.

306. But before closing this chapter, what about oil? Is it of vegetable origin, the product of germ life, or from decayed bodies of prehistoric animals? No, it is none of these! It is a composite hydro-carbon, lighter than water, that was formed just as other carbon compounds, above a molten earth, and brought to the surface with other material upon rupture of various canopies. But why is So much of it found around the shores of ancient seas? Did the seas make it? No, but since the seas cover three times more of earth's surface than does land, very naturally much more oil was deposited in water than on land. Tidal action would bring it eventually to shore as the oil was lighter than water, and at the shore line would be absorbed by the sands and sink down in porous rock until it came to rest on an impervious layer. Later the seashore was covered with new strata, and sooner or later, by another impervious layer, usually limestone, sealing the oil between two impervious strata. But why then are some germs found in oil even when first taken from the ground, if they did not make the oil? Simply, because certain germ life can adopt itself to that environment. The fact that germs may be there is no more proof that they had anything to do with the making of the oil, than the fact that there are fish in the sea proves they made the oceans, or that the birds made the air. What about the microscopic sea shells that are often found where oil is located, right at the level of the oil? Where would you expect to find sea shells in abundance except on the shore of the sea wherein the animal that once inhabited those shells had died? Only in this case there must have been an impervious layer close under the beach line. Often a ship at sea dumps oil, and where do we find this oil? Usually on our favorite bathing beach a few days later. Does that ruin the beach? Only a few days, and the warm sun assists it to disappear into the sands, and you would never know that the oil had been there.

CHAPTER ELEVEN

WHAT ABOUT TIME?

307. Shortly before the beginning of the present century, some scientists were putting forth suggestions that the earth perhaps could be a few thousand years older than was generally believed, even as much as a hundred thousand. Some timidly went even further and thought it might be possible that it was a million years. Christendom was solidly secure in the knowledge that Bishop Usher had settled the matter, and that creation had only taken six twenty-four hour days, back in the year 4004 B.C. However, the million year idea began to receive attention and more ready acceptance in scientific circles. To allow sufficient time for the slow accumulation of limestone and sandstone in their massive formation; to grow all the vegetation needed for the coal deposits; to evaporate So much salt out of the ocean for the vast salt beds; and to evolve animals from a protoplasm to a man, would require all the time suggested, perhaps even two million.

308. Since the beginning of man's history, he has always acknowledged some divinity greater than himself. In man's original conception this divinity was an all-wise, all-powerful creative being. Later, man divided up his conceptions of the attributes of divinity into polytheism, endowing each of his gods with certain powers, prerogatives, and duties. Among the Greeks and Romans there was a rather inferior god who was seldom mentioned, but to whom was assigned certain important duties. To the Greeks, he was Chronos, to the Romans, Tempus. When the scientists of the present age rejected the thought of an intelligent creator-god, they bowed down before the altar of Chronos, for here was a god, while not intelligent, was at least mathematical, and since he was the personification of Time, here was a god who could supply all the time necessary to accomplish the seemingly impossible. Having at his disposal infinite time, Chronos could produce beds of material out of older material in which the newly deposited material had never existed. How? Time! Chronos could take primeval carbon and carrying it through the hydro-carbons of plant life, could convert it into fuel carbon in our coal beds. (That is He could in the polar regions, even if He failed to do it in the tropics.) How? Why, Time! As this worship of Chronos became more widespread, the glory of the god must be increased, So a million years stretched into a hundred million, then to one billion, to two billion, and woe betide any scientist that did not at least pay lip service to this god.

309. There is one thing about the Ring and Canopy theory as regards time that seems to be in its favor?it is not predicated upon any length of time. While naturally it rejects the theory of Bishop Usher, it can also reject just as strongly the sacred cows of the cult of Chronos. The older concepts of evolution and vegetable coal among others, saw the inherent weaknesses and their great need for this old-new god with vast periods of time in order to permit Time to perform miracles without being miraculous. But the Ring and Canopy theory requires only such time as will permit the operations of natural law. Since either a short or a long period of time will fit in the frame work of this theory, depending on facts, we can take a very natural view of the controversy, and make our inquiry only with a desire to ascertain the real facts, and not to fit the various guesses offered as theories.

310. One of the first "scientific" efforts to determine the age of the earth required the efforts of many men, and a period of many years, but was designed according to scientists to give a very definite answer to the age of the oceans, and thus arrive at an approximate period for the life of the earth, for the earth

must of necessity be older than its oceans. The theory was advanced that we know the percentage of salinity for the various seas, and their approximate contents, and thus we could determine the amount of salt now in the oceans. Then if we could find out just how much salt each and every river emptying into the sea added each year, we could by the simple process of division find out the exact age of the oceans. This was, we believe, first proposed in 1715 by Edmund Halley, a noted astronomer who has a comet named after him, and with his prestige he was able to secure the interest and co-operation of other men of science. Collection of the necessary data went forward until 1899, a period of nearly two centuries, and then John Joly, a professor of geology in Dublin, collected all that mass of data and came up with the final word on exactly the years the oceans had existed. They were 97,600,000 years old.

311. But as a matter of fact, no matter what answer he had secured, it was not worth the paper that was used to make the mathematical computations, let alone all the effort that had been expended in making the saline analysis of the rivers. Why? Because of the unknown factors and the many "ifs." All saline tests of ocean water was from the surface or near the surface. They did not know what variations were in the depths. They did not consider that it was more probable that salt had been deposited directly in the water than only on land. They considered all salt to have come only from land masses, and made no allowance for either ingress or egress of ocean waters. They considered that the salt leaching from land had always been exactly the same every year, with no variation. And if...., but you can carry on from there. Science can be quite ridiculous at times, but nevertheless, this "exact" method gave impetus to other theories of determining the age of the earth, greatly extending the time.

312. We will not attempt the chronological order of these theories, but about this time the Darwinian theory was engrossing the attention of science, and as we have already noted, Mr. Darwin required still vaster periods of time, in fact unlimited periods, and enormous amounts of erosion. To supply the time required for some of these theories, the vegetable origin of coal came in very conveniently, for here was something that certainly would require about all the time that even Chronos would be able to supply. In all solemn seriousness, one writer details the length of time of the growth for all the Pennsylvania strata, but no reason is assigned as to why Nova Scotia (then under the Atlantic Ocean), had "millions upon millions of years" more growth for her coal beds than did Pennsylvania, nor why the equatorial regions had none. But it’s all very scientific, and while exalting Chronos, it still fails to give any answer to the real cause of the facts as we find them, nor a concept of time that appeals to our reason, but only to our credulity.

313. If one desires to figure as to how long a period of time could be "proved" by assuming that coal is of vegetable origin, take this example. We have four thousand years of positively known heavy equatorial growths, accumulated with little loss. Now take the amount of coal formed in 4000 years as our basis, and we can then determine the length of time it will take for any given coal seam, at the same rate. Multiplying the amount of coal formed in 4000 years, which is nothing whatever, by 1000 will give us the amount that would be formed in 4,000,000 years. The answer is still nothing. Multiplying by another 1000 or a period of 4 billions years, and it is still nothing. But as we view the ring and canopy method which nature employed, we can see that a few thousand years, or even a few centuries, perhaps, would allow sufficient time to lay the beds of fuel carbon, as we have seen they must have been l aid down to conform to natural law, and the facts as we find them. But if it were a million years, that would not have any bearing, nor effect any change in the ring and canopy theory. Did you

ever stop to think that Time as such is non-existent except here on earth? We measure time by the events of the earth, its rotation on its axis, the phases of the moon, the swing of the earth around the sun, and the gradual movement of the sun through the various signs of the zodiac at the time of the spring equinox, all of these very short periods of eternity. As we move out into space such time ceases, and we are literally in a timeless universe.

314. Then there is the support that can be given this worship of Chronos by the long, long periods of time that orogeny (mountain-making) is assigned by geologists. "The Rocky Mountains must have required several million years in their upthrust." Why "must"? Could not the geologist visualize the stored tension and power necessary to break through the crust of the earth, miles deep, as though it had been cut with a knife? Sheer breaks in the crust through miles of depth, could not have been a slow lifting and prolonged effort, but the sudden and overwhelming release of tremendous forces, such as we see on a smaller scale in present day earthquakes. Such breaks through the strata had to be practically instantaneous, or at least in a matter of moments. When the tension had become So intense as to overcome crustal resistance, the fault or rupture of the strata commenced, and the pent-up energy of the subterranean pressure would complete the break, forcing one or both sides of the fault upward, until the energy was expended. Orogeny is mentioned by many geologists as "a greater mystery than even the ice ages," for mathematical computation of the percentage of crust shrinkage will quickly show that the mountains of this earth could not have been raised except in a very small measure by crustal shrinkage. But a recognition that all the water and earth materials did not descend at one time, gives the key to the sources of power that was provided by Nature to perform her work of mountain raising. It is simply the old law of conservation of energy, and once seen, "the long years" of crustal deformation by shrinkage, reduce themselves many times. And recently Paracutin was given a very clear example of how rapidly a volcanic mountain can be raised, "not in thousands upon thousands of years." It has the most of its growth by the end of the first year, and already vegetation is appearing on its slopes.

315. Then we read in some of our school textbooks (much given to the worship of Chronos), how tress and other items "buried for millions of years, gradually turned to stone." As a matter of fact, none of the woody matter whatever is to be found in a piece of "petrified wood." The same textbook informs the pupil that "the details of the process by which wood is replaced with silica and other mineral substances are not well understood." Another mystery! But the only mystery that appears on the surface is how the "professor of science," who teaches this same class in chemistry, harmonizes this with his chemistry where he will have to tell them that the process is well known and understood, and must proceed at the same rate as wood rots, thus the process usually is fairly rapid. First, there must be a supply of water in or on the ground that has the minerals in solution almost to a saturation point. Silica, the most common medium, even has the effect on most woods of hastening the process of decay. The wood becomes saturated with the mineral from the water, and as decay takes place the mineral settles in place, the decayed wood’s molecules are floated out on the water, and the exact reproduction of the wood, even to its knots and annular rings is reproduced.

316. For example, on Mosier Hill, east of Mosier and west of The Dalles, Oregon, on the old trail surveyed by the then Lt. U.S. Grant, the silica is So strong in the ground water that Douglas Fir (Noble Larch) fence posts rot off at the ground line and their butts are petrified in about two years. Untreated cedar telephone poles lasted about five years, with the same results, the rot at the

ground line not petrifying for lack of sufficient silica above ground, So there the decay operated faster than petrification.

317. At Eagle Creek, Oregon, contractor's crews excavating for a short cut of the Columbia River Highway through "Ruckel's Slide" in the year 1939, encountered a petrified trunk standing upright, six feet through at the base and about 35 feet high. A large Douglas Fir had been entrapped and encased in a slide of earth caused by the flooding of Ruckel's Creek, So far as we could learn, about the year 1883. Ruckel's Creek is still very heavy with silica, and the creek kept the mass of the slide soaked with water for years. Just how long it took that tree to petrify that much of its log or trunk, cannot be determined but it could not have been more than 56 years, and it was solidly petrified. Further to the west in this same vicinity, a road building crew pushed their spoil off a hillside and covered one half of a freshly cut hemlock, in the year 1915. In 1938, it was found during a construction job, still half covered. That portion that was covered was petrified, and from the other half a young tree was sprouting. Here again a silicated brook keeps the ground saturate.

318. Can you imagine a piece of wood, or a whole tree, lying in mineralized waters for several centuries, let alone millions of years, just waiting to rot? Just how long redwood or cypress might remain without decay, we are not prepared to say, but we do know that some woods rot very rapidly, and that in all cases petrification must take place at the same rate as decay.

319. Then there is the theory that we can measure the age of the earth by the rate of sedimentation deposits. This theory presupposes that all material above the igneous rock base is the result of deposits of stellar dust, and arranged as we find it by Time. Since the amount of dust that we attract as we go through space, even including all meteors, is So infinitesimal that we grant their basic premise, even 50 billion years would be insufficient, and then we would have no possible answer as to how such accumulations could arrange themselves into limestone, sandstone, slate, shale, coal, etc., no matter how long a time we assign. As we view it, this theory has little or nothing to recommend it.

320. A very earnest endeavor to find out the time required for run-offs from melting glaciers of an ice-age, was made on the basis of the fine laminations found in lacustrine deposits of glacial periods. It was reasoned that each one of these laminations represented one year, similar to the annual rings of trees, the banding effect being the difference between summer and winter deposits. Since the most of these deposits or laminations were less than an inch in thickness, we would seriously doubt if such a small amount could be the total yield of a year's melt from a glacier thousands of feet thick and carrying earth materials in at least as much quantity as ice. Beside, the points tested would have been in a warm and possibly even sub-tropic climate during the melt. From what we have seen of melting mountain glaciers with the run-off carrying volcanic ash, we are strongly of the opinion that these lamination represent a single day's deposit, the "banding" due to the difference of the day and the night melt. The lessened amount of water and material moving at night would permit the lighter materials which would be the slower in settling, to be deposited before the rush of the next day's melt. When we consider the ratio between earth material and water deposited above earth's first surface, it will be seen that the fall of the canopies must have precipitated more earth material than ice, even in the ice ages. If our view is the correct one, this calculation has made the time 365 times too long, and their count becomes consistent with other reasonable computations, or the figure of from 15,000 to 25,000 years for the ice packs to melt, become the figures of 40 to 70 years.

321. One of the more recent theories relative to dating of objects, is the carbon 14 method. As the originator has stated it is not very accurate with objects of recent age. With what limited contact we have had, we feel the same about things of greater age. When Lewis and Clarke came to the Northwest, the natives told about a series of events that had taken place as near as could be determined from the Indians, circa 1650 A.D. The Columbia River broke through the Cascades undermining them and leaving "the Bridge of the Gods," and partially draining a great inland lake. At this time a valley west of the Cascades was inundated and the forests covered by the rising waters. Then came volcanic activity along the Cascades. Mount Mazama (Crater Lake) became the "mountain that swallowed itself." Belnap and Newberry Craters had their final eruptions, and the Bridge of the Gods was destroyed. North of the Columbia River, Mount St. Helens, like Paracutin, was raised from the plains, a beautiful volcanic cone. It is So high it is snow capped the year around. Sandals of willow had been left by some Indian workman apparently to cure, in the Newberry Crater and some were scorched in an outflow of lava. At least one sandal was dated by the Carbon 14 method as 9000 years old. But we can date these events otherwise and not by jut one witness. The trees left standing in the Columbia River died 300 years ago. Dendro-chronology indicates the eruptions at Newberry and Belnap craters as 300 years ago. The same figure is given for Mount Mazama. There is not a tree on Mount St. Helens over 300 years of age. West of the Cascades no trees over 300 years of age are growing in the bottom of the Columbia Gorge, but are on the tops of the hills above. No artifacts have been found on the Pacific Coast that a date prior to the Ninth century at the time of the great migration, can be positively fixed.

322. Then there is another method of arriving at the age of the earth which has come into vouge, and is according to its supporters, absolutely accurate. This method was proposed by electro-chemists. It consists of analyzing rocks for their uranium or thorium content, both of these minerals showing radio-activity, then taking into account all of either of these metals, and free lead that may be present (for lead is a residuum of radium, but all lead may not be a residuum), and then comparing that with the rate of loss by radiation, the result is fitted into what has been predetermined as "the uranium cycle," to determine the age. The difficulty seems to lie in the fact that the entire weight of metal is used as a factor. Uranium is composed of helium, lead and a very minute portion of radium, and it is only the radium that is radio-active. The loss of radio-activity is an excellent measure as to the amount of radium in the sample, and the "cycle" of radium is very accurately known. Why then is not the radium cycle applied, instead of the theoretical "uranium cycle"?

323. This question was asked of a proponent of the "uranium cycle," and his reply was to the effect that an answer based on the radium along would not satisfy any one. For example, see how the scientific world ignored and hoped to forget the findings of Madam Curie, although her findings have been fully corroborated, while the so-called "uranium cycle" please the biologist by giving him time for evolution that he needs for his theories, and the geologist for the many things in his theories that only Time could possibly do, So contrary to the laws of nature. Radium loses one-half its weight every 2000 years, and So far nothing has been found that can prevent that loss, So today we have only one half as much radium as at the beginning of the Christian Era. Madam Curie viewing the probable amount of pure radium left in the world stated quite positively that the radium bearing rocks were laid down not less than 40,000 years nor more than 60,000 years ago, and that answer pleases no one.

324. If we use the radium cycle and double the amount available for each 2000 years that we move back in time, we should be able to say how much radium there was available in the earth at any given time. Today's estimate of available radium is from 25 to 100 pounds. The larger figure is based on the continuing discoveries of uranium deposits hitherto unknown. But we will take the smaller figure, for it is only a mere matter of 4000 years anyway, between the two. If we go back in time to the minimum period mentioned by Madam Curie, 40,000 years, our 25 pounds would have been 26,214,400 pounds or 13,107 tons. That would have had a tremendous effect on forms of life. If we move back to the 60,000 year point of time the figure becomes 6,711,184 tons. Now the earth itself weighs according to the latest figures six sextillion tons, ?the figure six followed by 21 ciphers. Now let us move back another 100,000 years ago, or to about the year 158,000 B.C. and we find our radium mass would have been equal to two and one half times the present weight of the earth, and every 2000 years farther back doubles that amount. If we project this radium cycle back to two billion years ago the figure becomes a figure no one on earth can read, it is 25 followed by 299,975 ciphers, representing how many times greater than the present earth this radium mass must have been. But since matter is not lost, and the earth has never been twice as large (by weight) as at present it merely indicates the impossibility of the earth's age being remotely like some of the scientific (?) guesses of today. We must limit the time to points within the realm assigned by Madam Curie if we are to keep our figures within the bounds of reason. No wonder that those holding theories which require such vast periods of time reject the most accurate clock we have for the ages, the radium cycle! But radium is still in the earth and generally found in Archean rock.

325. The ring and canopy theory has nothing to fear from the acceptance of the radium cycle, as everything we see upon this earth could be accomplished by natural law within the time limits established by that cycle. If it is proved that the radium cycle has been misinterpreted, and actual proofs of vast periods of time should be found, it effects the ring and canopy theory not at all. Rings were formed around the earth, declined into canopies, canopies broke and brought great deluges of water, ice and earth materials. This transfer of energy depressed ocean beds, raised mountains, elevated land surfaces, and even ruptured the crust to permit volcanic outflow. Volcanoes spewed out ashes and lava and quickly built themselves into mountainous cones even as Paracutin has done in our day, and could have been destroyed just as suddenly as Krakatoa in 1883.

326. Down in the Grand Canyon of the Colorado, about fifty miles east of Boulder City, in Rampart Cave, which in times past was used for a home for ground sloths, the "giant sloth," for successive generations. The deposit of sloth excretions is So recent that they have retained their deposited shape to the present day. Excavation has been rather limited, but two small diggings have yielded sloth bones in a very good state of preservation, not petrified. But the ground sloth is supposed to have perished in the last ice age, and many geologists assign that event to a period one million years ago. Some years ago some geologists collaborating on a treatise stated that the last ice age had occurred within the last few thousand years. Revised editions now read that it probably occurred within the last million. That ought to allow a sufficient latitude of time, and the latter statement would certainly include the former.

327. Among the oldest living things we have on earth today are the sequoias, or redwoods of California. Of the trees that have been felled the oldest ones indicated an age of around 3000 years. The oldest ones, now preserved, are estimated not to exceed 3500. Trees 2000 years old, when uprooted, show signs of humus under them, indicating previous vegetation had existed. Those 3000

years or older So far as we can learn, do not show any signs of humus. This would indicate the upheaval of the Pacific Coast ranges and present shore line as a little time prior to 3500 years ago, or roughly the last ice age occurred 4000 years ago. Recently Dr. Edmund Schulman, of the University of Arizona, at Tucson, announced the findings of some Bristlecone Pines which had proved to be 4000 years old. These were found in sufficient quantity as to permit the moving back of the frontiers of dendro-chronology for that region. Dendro-chronology is a well established science, but has not been extended worldwide as yet. At present the dating covers the Pacific Coast and the Southwest quite accurately. This figure fits in very closely with other facts. It is to be noted that these bristlecone trees were found near the summits of the White Mountains in California, points that had already been raised from the Pacific Ocean. It also coincides very closely with the periods of rainfall and the drouth cycles recorded by the trees, by the playas, and the records of settlement and migration. It would be in agreement with the finding of the archeologists that the earliest humans migrating to the southwest found copious rainfall, and lake sin abundance. After many years the lakes dried up, the rains did not bring sufficient moisture for their crops, and migration became a necessity, and this was only a few centuries ago.

328. While we are discussing time features, let us look at the facts about the human family, in which we should be interested. Some geologists have set the appearance of man on earth at about one million years ago. Their reasoning goes this ways, "We have proof that man was here before the last ice age, and since we know the last ice age was at least a million years ago, then we know that man has been here that long." One fallacy leads to another. However, archeologists have no such figure as this. The earliest man could leave a record by drawing, and by painting in earth colors that remain to this day. Writing was a very early accomplishment, even before the ice age which would have been rainfall or a flood where the most of the antediluvians were. And they wrote in a way which can be read in any language today, for they wrote a form of picture writing that expressed ideas, not sounds. This method continued for many years even after Egyptian and Greek were in vogue. Yet it may surprise some to know that we have no dated, authentic chronology (unless it be in the books of Israel), back of the year 606 B.C. We have all probably read or heard about Chinese history going back for ten thousand years, but when we examine the facts, they have a written history without exact continuity, that may extend back as far as 2000 years. The legends of China might possibly cover some events of the previous 2000 years, but back of that nothing is even suggested. Manetho, an Egyptian historian working under the orders of Ptolemy, prepared a history of Egypt that presumably covers about a thousand years more than the Greek histories written at the same time, but for a period of about 21 dynasties he is extremely vague, and apparently these were conjured up in a fertile mind to show the Greeks and the Jews that the Egyptians were much older than any other part of the human race. Ptolemy's Canon based on Manetho's work, is discredited by most scholars. No graves, no stela, no documents have ever been found to support any part of this mythical period. Even the Jews became infected with the desire to extend time backward, and their committee translating their histories, even though they were sacred to them, put in more length of time than is indicated in the Masoretic text. Correcting these apparent errors these closely coincide to present a period of 6100 years, in round figures, of man's history.

329. So time remains a moot question, and every scientist feels that it is his right, if not his duty, to do his own guessing So it will fit his theory, but in the face of all the evidence, we cannot believe that it has been even a million years ago that this planet was being shaped So that eventually it could and did become

the habitation of man, nor can we believe that beginning with its molten center, it was ready for such habitation in just six twenty-four hour days. We have merely tried to give you a fair presentation of the various theories and a few related facts, for your consideration. But we warned you that our view of time would probably satisfy very few.

SUMMARY

330. In the foregoing pages we have attempted to present a theory that appears to meet all the requirements of all the facts that we find in connection with the formation of our wonderful home, our earth. Freely we admit that this is not the concept of the majority of geologists today, and though it will be rejected by the many as being contrary to their cherished theories, we hope that to some it will banish the many "mysteries" with which those theories abound. The Ring and Canopy theory provides a reasonable, logical, and orderly process for the laying down of the various strata, and in the order in which they are now found. It provides an understanding of how mountain ranges came to be formed where they are, and why the larger mountains are by the larger oceans, and indicates the source of the power that brought these ranges into being, one of earth's great "mysteries." It points to the how and the why of the ice ages, and why they were never over the entire earth, but in various places at various times. It gives the reason why there never can be another ice age, now being So freely predicted. And all of this without any conflict with natural law, but all within its framework. Surely, it would be strange if meeting all these conditions and more beside, that the ring and canopy system is not the key to the method of ordering our marvelous and beautiful world.

Here we write

THE END,

but readily we are at another BEGINNING.

APPENDIX

The record of the rocks tells us that this earth once had a ring and canopy system, wherein was contained all the water and all the crust materials, except igneous, now upon the earth. Further, it tells us that these layers, strata upon strata, were laid down over a long period of time. W believe that the brief discussion given in the book, which confined itself to facts, law, and logic, needs no further confirmation other than the multitude of proofs all about us, which Nature has So abundantly provided mankind. Nevertheless, we did state in the foreword that this presentation was in harmony with the Bible account of Creation, and that statement has been questioned by some with whom we have discussed the contents, and not a few have expressed the thought that such a statement should be included. We have therefore prepared that proof as an appendix, in the hope that it may be of assistance to some to find that in the earliest writings of mankind, and on down through the ages, the ring and canopy theory was accepted as truth by at least a few, and that it is the only theory which explains all the details given to us in the tablets of Genesis.

Much of the book of Genesis was written in the cuneiform and was translated from that writing to Hebrew as it was written in the time of Moses. There is much internal evidence that the translations were made between the time of leaving Egypt and the arrival in the land of Palestine, and certainly Moses was about the only person who could have completed the final chapters. But since we have no copies of the original cuneiform, we cannot say that the original writer's or writers' exact shade of meaning was accurately preserved in translating to Hebrew, to Latin, to English. Hence, on doubtful passages we have given the Hebrew-English translation as it is given in the "Margolis." But please remember this is a scientific discussion, not a theological one.

Genesis 1:1 "In the beginning God created the heaven and the earth." We are told that the qualifying "the" does not appear in the Hebrew, and that hence a more accurate translation would be "a beginning." As we noted in paragraph 32, there are many beginnings in the ordering of the vast universe, and the starting of the formation of the earth was one such beginning, not the beginning of all things. The "heaven" mentioned does not refer to any celestial above, nor any point remote from the earth, for as you will note in the eighth verse, it refers to the underside of the canopies which surrounded the earth.

"Now the earth was unformed and void, and darkness was upon the face of the deep." Paragraph 33 points out that at first the earth was a mass of energy, and as an earth it was as yet, unformed, and as far as life was concerned, empty-void. Then we saw that the water and gaseous matters were thrown away from the center core, forming a great cloud, or deep, around that core. Since there would be too much earthly material in this deep for the sun's rays to penetrate to the surface of the core, it would have been true that "darkness was upon the [inside] face of the deep," even though the sun shown upon the outside, even as it now does upon the planets which still have their canopies.

"And the spirit of God hovered over the face of the water." Whatever may be the theological view of this matter, you will note that the outer surface of the canopy and the rings, largely composed of water, would have been in the bright sunshine, while great masses of earth material was suspended for a time because of the heat rather than rotation, in the space between the core and the lowest canopy, a space roughly 22,000 miles in depth. Here the word "spirit" is used in the sense of power, and the sun's rays have had a powerful effect on the events that were to prepare earth for an habitation.

"And God said, ?Let there be light,' and there was light." The first falls of material were the heavy massive deposits of the Azoic Age, and with these materials out of the atmosphere, the light could penetrate through the canopies which had formed far out from the core, and of course the rings shadowed only the equatorial regions.

"And God called the light ?day,' and the darkness He called ?night,' and there was evening and there was morning, one day." In this text, the first use of the word "day" appears, and since Bishop Usher insisted that all "days" mentioned in Genesis were 24-hour days, we note that in its first use, only the light of a period is described as "day," and the "dark" is not included. So we go to the Hebrew to see just what Moses intended in translating this passage. We find that both of the words "day" in the above passage are from the Hebrew "yom" or "yome." This word is translated into English as "age, ever, everlasting, always, continually, evermore, life, as long as, perpetually, day, season, year, space, process of time," etc. (See Strong's Concordance or Scott and Liddel's Lexicon.) In other words, it refers to any period of time, the length of that period to be determined from the context, or simply as an "indefinite period." We use the word day in English much the same way. A "day" of work may be six, eight or ten hours. The "day" (daylight) varies in length with the latitude. Every "calendar day" is on earth 48 hours. Hitler's "day" was not as long as Victoria's "day."

Now why in the text above does it mention "evening" first? Because as was stated in the second verse there was darkness to begin with, and with the fall of the Azoic material during that first "yom," it became lighter and that period was termed morning. The Jews to this day commence their yom of 24 hours as at sunset, So that evening comes first and the morning as the second half, perhaps an unwitting, but nevertheless, a constant commemoration of the ring and canopy system.

This first yom makes no mention of life, and there was none in the Azoic Age, and even in the next yom, the Paleozoic Age, life was So unimportant, that it is not mentioned in the Genesis account. Of this second yom the write stated, "Let there be a firmament [an expanse or separation] in the midst of the water." That is, "Let there be a space with atmosphere between the waters." "And let it [the atmosphere] divide the waters from the waters. And God made the firmament and divided the waters that were under the firmament [the waters already on the surface of the earth, as lakes, ponds, rivers, and oceans] from the waters which are above the firmament [in the canopies and rings], and it was so." And we will agree that it was so. Surely by the close of the Paleozic Age all the atmosphere was cleared of water and earth material, and the residue was held in the rings and canopies, creating a vast space of separation. "And there was evening and there was morning, a second yome." Again, we see that with the additional falls of earth material in the Paleozic Age that the light would be less in the beginning of the age than in the close, especially in view of the fact that that age closed with a heavy downfall of ice, and a glaciated period, which indicates the rupture and fall of one of the heavier canopies.

From the ninth to the thirteenth verse is sketched the work of the Carboniferous Age, during which insects appeared on land, and the trilobites in the seas. The Genesis account assigns the formation of the continents to the third yom, or period, and certainly they must have been formed before life of any kind could be established there. We do not know just where the writer of Genesis begins or ends his "yoms," and even our modern geologists are rather vague about the

exact endings, for from another view it was one continual operation. So it seems sufficient to note that in general the Genesis account agrees with the seven division of time, and the work of each yom coincides closely with the accomplishments of each Age. We note that the grasses and herbs "yielded their seed," So at least one full season would be required, and not a single 24-hour day, nor is there anything to preclude that this "indefinite period of time" was thousands of years. The choice of the word "yom" seems to be very appropriate, it is still an indefinite period of time. We also note that the law of fixity of species is mentioned with the first mention of life, and nothing has ever been found to disprove that statement.

In the 14th to 19th verses it mentions that the sun and moon became visible, as well as some stars. This indicates that the canopies which formed in the fourth or Devonian Age did not carry as much earth material as previous ones. This we saw was a requirement of natural law, and corroborated by the strata of earth. In this age, sometimes termed the age of fishes, no additional life is mentioned in the Genesis account, but the principal event was the increase light from the sun and the moon. Evidently by this time the moon had receded from the earth a sufficient distance to permit the sun to shine at times, upon the face toward the earth, even as it does now. If there had been any person on earth at that time, he could have seen the reflected light of the sun. There term "and God made two great lights," does not imply that they were created at that time, and had not been in existence previously, but that they, their outlines becoming visible through the canopy, "were made, the greater to rule the day, and the lesser to rule the night." Here the Hebrew word "memshalah" is translated "rule," in the sense of having power, or dominion. And certainly we know that the sun dominates the daylight, and the moon, the night. Suppose the writer of Genesis had said that the sun and moon were visible in the first yom or age. We would know at once that he was wrong, but he put the visibility of the sun as in the fourth day. Why did he take the trouble to point that out? Was he not trying to tell us that the canopies, the waters that were above the firmament, were So dense that during those first three periods that the light could not have come through to earth with sufficient brightness that the direct outline of the sun and moon could have been seen, although light filtered through and was diffused. Now by the time man was upon earth and could write the account which appears in Genesis, he had words for both the sun and the moon. But in the account of the fourth day the writer does not make use of those words, but instead uses a word referring to "bearers of diffused light." Yet at the time of writing he knew the sun both as a light bearer and as a heater! But the writer did use the term "stars." We noted that the rings began their spreading out, or declension, at the equatorial regions to form the canopies, and the collapse of the canopy would probably leave the polar skies clear, until another canopy formed. The sun and moon would not have been visible in equatorial regions as they would be obscured by the rings. Is it not strong proof that the ring and canopy theory is at least the most ancient of concepts, when it is the only theory by which the statements of Genesis can be explained? Some translations of this passage use the expression "He made to shine two great light." Either translation is consistent with facts.

Genesis 1:20-23 -And God said, ?Let the waters swarm with swarms of living creatures and let fowl fly above the earth in the open firmament of heaven. And God created the great sea-monsters, and every living thing that creepeth, wherewith the waters swarmed, after its kind; and every winged fowl after its kind, and God saw it was good. And God blessed them saying, ?be fruitful and multiply, and fill the waters of the seas, and let fowl multiply in the earth.' And there was evening and morning, a fifth day." First, we note that here also, there

must have been time within the "day" to permit the arrival of successive generations of the various animals, and while these were practically all egg-laying, it still required time considerably in excess of twenty-four hours to produce even one generation, not to speak of "filling the waters of the seas," and producing merely one generation would hardly be "multiplying in the earth." Hence the context indicated that the writer did not have in mind So far as time was concerned, anything except "an indefinite period of time." This fifth day was the Reptilian Age, and although the ring and canopy theory does not require millions of years, the various strata laid down during this period indicate a lapse of time of several thousand years. In the King James version we read the word "whales" in place of the word "sea-monsters." The Hebrew word used here could imply "land and marine monsters," and what better description could we use for the giant saurians, lizards, of the Reptilian Age? The translators of the King James Version, had never heard of a dinosaur, never knew they had even existed, much less know of their habits and habitats. The largest monster of which they knew was a whale, an hence the translation. But whales are mammals and did not make their appearance on the earthly scene until the next age or "yom." Again, this passage insists upon the operation of the law of the fixity of species.

Beginning with the 24th verse we have recorded the sixth "yom" wherein mammals appeared, and at the close of the yom man was formed of "the dust of the earth." Scientists will agree with this statement, that there is nothing in man but what can be found in the elements of the earth. He is literally of "the earth, earthy." He drinks water, breathes air, and eats that which the earth produces. According to geology, he made his appearance as the last and highest order of the mammals, and the last of any new forms of life here on the earth.

The last age in the geologic series is denominated the "age of man," and is the seventh in that series. In Genesis 2:2 we read, "And on the seventh day God finished all His work which He had made; and He rested on the seventh day from all His work, which He had made." Since there have been no new species in this, the seventh age or yome, we must agree that the words "He rested" are especially fitting. We are still in that seventh day or yom and He is still resting from any creative work So far as this earth is concerned. Looking back upon how rapidly new species sprang up after the exterminations incident to glacial and mountain-making periods, and with what abundance of variety, we must pause to wonder that if they were brought forth purely by evolutionary processes from previous unlike species, and if such evolution is a "law of nature," why should that law cease to operate after the advent of man? Natural laws are unchangeable, immutable! Yet the fact remains that although there were a great number of new species introduced into the world just before man, not one single instance is to be found afterward!

The passage in Genesis 2:4 has puzzled many because the writer here states that creation did not take six days but only one yome. The explanation is that Genesis was translated by Moses from several tablets. The ancients wrote on small clay tablet, and to identify each tablet, a summary of the subject matter was written at the bottom, much as we might put a heading for each chapter. Tablets like these have been found literally by the thousands. The story as narrated in this first tablet stops before the flood, while the earth was yet covered by "the waters that were above the firmament," the last canopy. In writing the summary at the bottom of the tablet what would be more natural than to embrace the whole period of the ordering of the earth from its unformed state until it becomes the home of man as one period or yome? This summary at the bottom of the tablets is now called a "colophon," and they often contain the

name of the writer, the place or time of writing, and other data. The colophon of the first tablet in Genesis give no indication of the writer's name, nor of the time of writing, other than the period when the narrative stops.

The other colophons in Genesis are to be found as follows:

Genesis 5:1-2

Genesis 5:6-9 the first half of the verse

Genesis 10:1

Genesis 11:10 first phrase of the verse

Genesis 11:27

Genesis 25:19

Genesis 37:1 and first sentence of Genesis 37:2

There is no colophon for the remainder as it very evidently was written by Moses to cover that particular period. In these colophons, if we substitute the word "history" for the word "generations," we will get a better understanding of them, for the Hebrew word means "origins," that is, the history of the origin of the family. The line of the families recorded in Genesis are by no means the only family tablets ever kept.

The colophon of the fourth tablet ascribes the preceding narrative to the "sons of Noah," and they are presumed by the narrative to have been eye-witness of the deluge of water accompanying the breaking of the last canopy. Let us see if their eye-witness account agrees with what we have been noting must have been the conditions then obtaining. Genesis 7:11, "In the six-hundredth year of Noah's life, in the second month, on the seventeenth day of the month, on the same day were all the fountains of the great deep broken up, and the windows of heaven were opened." Now a window indicates something to see through, or to permit light to enter. Transparent glass did not come into use till much later in earth's history, So we are of the opinion that any "windows" with which Noah's sons would have been familiar were of animal skis scraped thin, through which light could pass, shadows be seen, but not clear vision. To see out of them they would of necessity have to be open. Applying this thought to the windows of heaven, and remembering that the word "heaven" referred to the underside of the canopy which man could see directly above him, the "windows" would be that part of the canopy over the equator which was slowly thinning out, permitting the light of the sun, moon, and stars to be more clearly discerned, and the twelve constellations, or signs, of the Zodiac to be seen sufficiently clear to permit the assigning some distinctive name to each constellation, according the outline of their brighter stars. We know that when that thinning had progressed to the point where the canopy "opened" and the sun shone directly upon the earth, the heat kept close to the earth by that last canopy would be lost. The rays previously reflected and diverted to polar regions would no longer provide a source of heat for those portions of earth, and cold would take possession. We have seen what the results were; the descent of ice and snow to form the great ice packs of the last ice age, with deluges of water in the tropics. The Genesis record states that the fountains (storage places for water) of the great deep (the canopy) were broken up, and the fall of water at the location of the writer continued for forty days.

"And the waters prevailed exceedingly upon the earth; and all the high mountains that were under the whole heaven were covered. Fifteen cubits upward did the waters prevail, and the mountains were covered." We have no way of knowing just how long the cubit was then, but we presume that it was "a man's arm (forearm) and a handsbreadth," known in history as the "sacred cubit," for one of the eight people spoken of as being in the ark, later was instrumental in building one of the pyramids of Egypt where the 25 inch cubit was used. Fifteen cubits would be thirty one feet, three inches. The height of the ark is stated as thirty cubits, and with water fifteen cubits deep, or about one-half its hull submerged, the ark floated. The narrative does not infer that only thirty feet of water fell. Let us remember that the record of the rocks indicated a depth of several miles for one ice fall, but suppose it only had an average depth of a thousand feet, or even one third of that figure, it still would have flooded the plains of the continents, to cover all but the highest hills, and the word translated "mountains" might not infer the same thought we have today when we use that term. We remember the "mountains" of southern Iowa; to those living in Colorado these would not even be big hills. All the hills in the vicinity of where the ark is presumed to have been built would certainly have been covered on that fairly flat plain, and the expression "under the whole heaven" must apply only to the limit of the horizon as the writer could have observed it, which of course to him would appear to take in the entire compass of the "heaven." Remember that the ocean was also receiving its augmentation of water, backing up the tides So that the land water could not drain off. As mentioned before, this ingress of waters over the land was one of the necessary concomitants of a glacial or flood period. As we have seen, the water on the continents remained until the sea bed sank, the displaced magma was forced under the land, and the continental edges were raised, the water drained off, and "dry land appeared." If some insist that the writer of this tablet really knew and intended to convey the thought that all the high mountains, like the Himalayas, the Rockies, the Andes, the Alps, and others of which that writer could not possibly have know, were covered, then we will agree with them that at least such was the case, for such mountains were covered, on account of their altitude, with a mantle of snow and ice, forming valley glaciers, some of which have persisted to this day. However, nearly everyone is familiar with the fact that these glaciers are rapidly receding, and many have already reached a point where they are static.

"And all flesh perished that moved upon the earth, both fowl and cattle and beast....whatever was on dry land died." And So it must have appeared to them, for in that vast plain of water, they could not have seen anything living, except fish. We have noted that all geologists have mentioned the extermination of various species that always accompanied glaciation, floods, incursion of water over the land, and mountain making, without seeing that these are all necessary correlatives. For instance, seals find their natural habitat in sea water, but with their fat they could endure cold and still have the strength to swim long distances. Seals are found land-locked living in interior Siberian fresh water lakes. Many lakes have land-locked salmon, although primarily the salmon is a salt water fish, during its adulthood. Now these fish can neither leave nor enter these lakes and have been living in fresh water for many generations.

We have read one account by a geologist, of a valley in Mexico where a great number of bones were piled, then covered with dust and debris, preserved for this generation to discover. The remarkable fact that none of these bones had been broken was mentioned, indicating that they had not been killed and eaten by beast of prey. The bones have been identified, among others, as from the saber-tooth tiger, the antelope much like our present species, a form of bison,

and many that have been presumed to have become extinct during the last period of glaciation. The conclusion drawn by the writer was that as the ice moved down from the north, the animals had been driven further and farther away from their regular feeding grounds, and that they all starved to death. Since this valley is at least a thousand miles farther south than the ice masses (not valley glaciers) moved, somehow the thought of that noble tiger that would rather starve than kill a nice toothsome antelope, does not quite seem natural. It could not be possible cit it that they were all drowned in the rising waters, and washed into this valley, and covered with dirt and debris bf ore the waters drained off? At least that would have been a reasonable explanation as to why that tiger had not dined on some of the other animals.

At the end of one hundred and fifty days the waters decreased." The ocean bed began its sinking, and the moving of magma under the land, raising the continental shelves, and So the waters on the land began to decrease in depth. "And the waters returned from off the earth continually." We would expect that once the bed of the ocean, subjected to the increased weight or pressure, began to yield to that pressure and adjust itself, that the process would be continuous until the pressure was again equalized. One waiting for this process to take place would be inclined to think it took too long, and if he was making up the narrative without accurate knowledge, he would certainly assume that as soon as the rain stopped the water would run off into the ocean, and in a short time the land would be dry. The 150 days before a definite sign of drainage was seen appears very reasonable when we consider the fact that millions of tons of magma must be moved to effect the final result. After the water had drained off the ground would have been very soft and mu ddy, for much new silt was washed in, that area being a sort of settling basin. The writer assigns 11 1/2 months as the period the water was on the ground where he was, and even then it was still too soft to walk upon.

Whether the "mountains of Ararat" are the same land masses that we today call Mount Ararat, we have no means of knowing. We can readily see that this vast amount of water over the land, in a tropical climate, with ice masses to the north and south, would have produced "murky weather," and rain clouds as we know the. Thus if the writer intended to tell us that previously he could not see the tops of the high mountains to the north of him, that would be very understandable. He did not say that the tops of the mountains "emerged from the water." If he referred to the lower hills of the Mesopotamian plain, which could well have been "mountains" to him, they would have been uncovered as the ocean beds subsided and the water "returned from off the earth."

Now let us go back to the point in the narrative where the rain ceased to fall from the canopy. Genesis 8:1-2. "God made a wind to pass over the earth and the waters assuaged, the fountains also of the deep and the windows of heaven were stopped, and the rain from heaven was restrained." We have previously seen that under the coverage of a full spread of a canopy around the earth, there would be little change in temperature, except that the side of the earth toward the sun would receive a little more heat than the side in the shadow. On the cooler side ground fog would rise in the humid atmosphere, but there would be no rain. Compare this with Genesis 2:5-6 and Gen. 3:8. But with the rupturing of the canopy (the opening of the windows of heaven), the downfall of ice in polar regions, direct sunshine converted to heat at the equator, and the natural result would be that air over equatorial regions would rise and be replaced by air from other regions. Hence winds are the very thing we should expect, and they still blow today, for the trade winds have not ceased from that day to this. When the canopy had exhausted all its contents, the rain that fell from the "windows," and

the snow and ice that had their origin in the "fountains of the great deep" ceased to fall, So that "the rain from heaven [the canopy] was restrained." But it does not state that rain from clouds forming from the winds, did not fall. In fact an event noted later requires the fall of ran from such a source.

In the ninth chapter Noah was told that the rainbow was a surety that there never would be any such flood again. Just how Noah came to this understanding it is not in our province to say, but the rainbow speaks to us today with unmistakable assurance that there cannot possibly be another such flood, or another ice age, even though "scientists" may freely predict one. The rainbow is formed by the sun shining through falling water, and if the sun's rays pass directly through rainfall in the earth's atmosphere, then there is no shrouding canopy of water between us and the sun, and the clouds we see are purely the result of the action of the sun and the wind upon water that has already fallen to the earth's surface, and that there is no longer any canopy to fall. Previous to the rupturing of this last canopy, man had never seen a rainbow, for the sun's rays had to filter through the canopy, and So could not possibly form a rainbow even if there had been falling water, like mist at a waterfall. Here then we have a clear statement that the conditions which had prevented the formation of a rainbow previously, now no longer existed, and only the ring and canopy theory can possibly explain the scientific cause and reason behind that statement. If anyone can prove that the rainbow was seen by man, previous to the last ice age, then the ring and canopy theory would fail at that point, for the philosophy of this theory demands that there should have been no rainbow previously after man came on earth, but that there should have been one immediately after the fall of the last canopy.

Besides the winds and the rainbow, what else would our philosophy require as to changed conditions after the collapse of the canopy? One of the first things affecting man would be the seasons. No longer would there be a continuous planting and a continuous reaping time. Man would have to choose his time for sowing according to the season, and nature would determine the reaping time. The seasons would not be the same for the two hemispheres, now there would be summer's heat and winter's cold at the same time. Nor would the light of the sun and the moon be reflected around the earth, as we noted would be the case under a canopy. Hence the phases of the moon could bring dark nights, even at the same time that there was s unlit day. Genesis 8:22, "While the earth remaineth, seedtime and harvest, and cold and heat, and summer and winter, and day and night shall not cease." Certainly Noah was told in some manner the changes which he would encounter, and these changes are all in direct agreement with the philosophy of the ring and canopy system, but not of any other theory. Even the changing of fruit juice to an intoxicant, which came to man as a surprise, is also corroboratory. Fermentation requires the action of the sun, which had not been possible while the canopy existed, and when fermentation commenced the life span of man began to lessen.

It is not surprising that the entire narrative of Genesis is in complete agreement with the ring and canopy theory, for if the Bible is true, and the ring and canopy theory presents the correct philosophy of the formation of the earth, they must necessarily be in agreement. The formations of the earth, the very rocks themselves cry out that the ring and canopy system really existed abut this earth, and is the true key to the method of earth's preparation. Whatever is true, is always true, and if we have read the record of the rocks correctly, then the writings of old, or of later years, in order to be true, cannot be contradictory. And the rocks assure us that, properly understood, the narrative of "creation" as told in the Bible is true.

But did anyone down through the ages So understand the matter? The thought of a source of water above the clouds that filled the clouds seems to have prevailed for a time after the flood, until the actual process of evaporation, condensation, and precipitation were understood, but poets could still make allusion to the former thought. Psalms 42:7: "Deep calleth unto deep at the voice of thy waterspouts." Psalms 104:5-9: "Who laid the foundations of the earth [the land, the continents] that it should not be moved forever? Thou coverest it [the earth, the globe] with the deep [the canopy] as with a garment [completely covering or surround it], the waters [of the canopy] stood above the mountains [in fact, thousands of miles above]. At thy rebuke they fled [thinning out at the equator and moving toward the polar regions], at the voice of thy thunder they hastened away [from the canopy by falling to earth]. They go up by the mountain [as shown by all the valley glaciers now rapidly disappearing] and they go down by the valleys [by melting] to the place Thou has founded for them [the bed of the oceans], Thou hast set a bound that they may not pass over, that they turn not again [return to form a canopy] to cover the earth."

In Proverbs 8:27 to 29, speaking of the personification of Wisdom, we read, "when He prepared the heavens [the entire ring and canopy system], I was there; when He set the circles upon the face of the deep [the rings or bands were formed above the outside face of the deep the canopy]; when He established the clouds above [by the decline of a ring into a canopy after the ?firmament' was formed. Notice that these canopies were not fleeting matters of a moment, but were ?established' to remain for sometime]; when He strengthened the fountains of the deep [by lessening the gravitational pull on the rings by the fall of lower rings and canopies, and thus allowed the remaining rings to remain longer as secondaries around their primary]; when He gave to the sea His decree that the waters should not pass His commandment [by raising up mountain barriers along the shore lines back of the continental shelves]; when He appointed the foundations of the earth [the continents]." Here again we see that the ring and canopy system makes clear the allusions of the writer.

These few references should be sufficient to show that as late as David's time, this theory was accepted, at least by some. There is also a reference in the New Testament that is rather ambiguous as it is usually translated, but indicates that such acceptance extended on down to Peter's day. He write, 2nd Peter 3:5-6, as given in a word for word translation by Prof. Wilson, "It escapes notice for them this being willing that heavens were of old and earth out of water and through water having been placed together by the of the God word by means of which things the then world having been deluged was destroyed." Remember there was no punctuation in the old Greek, nor even any spacing between words, So we must rearrange this into modern English to get the full thought of the writer. "This willingly escapes their notice, that the heavens [the canopies] were of old [were in existence long before man], the earth's crust having been put together [laid in strata] by means of water [from the canopies] and it was by the same means [the fall of the canopy, the last one] that the world [cosmos] that then existed [just before the rupture of the canopy] was deluged and destroyed."

If anyone desires to pursue this subject further, he may easily do So with the aid of any exhaustive concordance. We trust this brief review is sufficient to indicate that there is no basic conflict between geology and the Bible, or any other science, when both are properly understood. But as yet we know nothing as we should know it. We are children groping in the dark. Now we see through a glass, darkly."

ACKNOWLEDGMENTS

Much of the information presented herein has been gathered from many reliable sources, and from many authors in the geologic field, but the author desires to express in particular his thanks and appreciation for the co-operation of the following publishing companies in permitting the use of copyrighted material in direct quotations, as follows:

D.C. Heath and Company for quotations from TEXTBOOK OF GEOLOGY, part 2, 1921 edition, written by Prof. A.W. Grabau.

Time, Inc., for quotations from their series of articles entitled THE WORLD WE LIVE IN, published in their magazine, LIFE.

John Wiley and Sons, Inc., for material from Prof. Dana's MANUAL OF GEOLOGY, Fourth Edition. Also from the OUTLINES OF PHYSICAL GEOLOGY, Second Edition, from the pens of Professors Longwell, Knopf, and Flint.

The author also acknowledges that this would never have been written except for the key furnished in the invaluable lectures of Prof. I.N. Vail.