GEOLOGY

Section 6. Era of early terrestrial life - Mesozoic

Item I. The Triassic Period. Era of Early Survivors

Point 1. Gypsum and red layers in all sedimentary rocks indicate climate influence.
(60:1.1) Erosional deposits in this period are mainly conglomerates, shale and sandstone. Gypsum and red beds in all the sedimentary rocks of both Europe and America indicate the aridity of the climate of these continents. These arid regions were subjected to extensive erosion under the influence of the periodic heavy rains that poured over the surrounding highlands.

Point 2. Fossils from this period have not been found.
(60:1.2) These strata contain few fossil remains, but the sandstone preserves numerous traces of terrestrial reptiles. In many regions, the three hundred meter thick layer of sediments contains no fossils. The life of land animals was not interrupted only in some parts of Africa.

Point 3. The Basalt Pillars of the Hudson River, the New Red Sandstone in England, the Limestone in the Alps, the Carrara Marble - formations of this period.
(60:1.3) These deposits vary in thickness from 1,000 to 3,000 meters, and on the Pacific coast they even reach 5,500 meters. Subsequently, layers of intruded lava formed between many of these layers. The Hudson River Basalt Pillars formed as a result of the extrusion of basaltic lava between these Triassic strata. There was extensive volcanic activity in various parts of the world.
(60:1.4) Deposits of this period occur in Europe, especially in Germany and Russia. In England, the New Red Sandstone refers to this age. Limestone deposits appeared in the southern Alps as a result of the invasion of the seas and currently exist in these places as peculiar dolomitic limestone shafts, toothed ridges and pillars. This layer is found throughout Africa and Australia. Carrara marble is formed from such altered limestone. In the southern regions of South America no traces of this period have been preserved, for that part of the continent remained under water, and therefore contains only aquatic or marine deposits inseparably connected with the preceding and succeeding epochs.

Point B. 150,000,000 years ago

Point 1. The land is significantly above sea level. Huge depressions formed in North America.
(60:1.6) At the beginning of this era, the eastern and central parts of North America, the northern half of South America, much of Europe and Asia were at a considerable height above sea level. For the first time, North America found itself in geographic isolation, but only for a short time, as the reappearing land bridge of the Bering Strait connected that continent to Asia.
(60:1.7) Great depressions were formed in North America which ran parallel to the Atlantic and Pacific coasts. A huge fault appeared in eastern Connecticut, one side of which subsequently dropped two miles. Many of the North American foothills were later filled with erosional deposits, as were many basins-freshwater and saltwater lakes in mountain regions. Later, these filled depressions on land were raised to an enormous height as a result of underground lava flows. Petrified forests in many regions refer to this age.

Point 2. The Pacific coast with rich fossil deposits.
(60:1.8) The Pacific coast, left by the submergence of the continents generally above the level of the sea, subsided, with the exception of the southern part of California and the great island then situated in the limits of the present Pacific Ocean. This ancient California sea contained abundant marine life and extended eastward to join the more ancient midwestern sea basin.

Point C. 140,000,000 years ago
(60:1.9) 140,000,000 years ago there suddenly appeared fully formed reptiles, which had been preceded only by two doreptiloid species which had inhabited Africa during previous ages. They evolved rapidly and soon gave rise to the crocodiles and the scaly-armored reptiles, and later both the sea serpents and the flying reptiles. Their transient predecessors quickly disappeared.

Point D. 130,000,000 years ago
A period of turbulent changes in marine life. Asia and North America joined by a land bridge.
(60:1.13) 130,000,000 years ago the seas hardly changed. Siberia and North America were connected by a land bridge across the Bering Strait. A rich and unique marine life appeared on the California Pacific coast, where from

the higher types of cephalopods arose over a thousand species of ammonites. The changes among living beings were truly revolutionary in nature, notwithstanding that they were transitory and gradual.
(60:1.14) This period lasted over twenty-five million years and is known as the Triassic.

Point II. The Jurassic period. Era of late survivors

Point A. 120,000,000 years ago
(60:2.1) 120,000,000 years ago a new period in reptilian development began. This stage was marked by the evolution and decline of the dinosaurs. In terms of their size, land animals reached the limit of their development and by the end of the period practically disappeared from the face of the earth. There were dinosaurs of all sizes, from species less than 60 centimeters long to gigantic non-carnivorous dinosaurs measuring 23 meters long; no living creature has reached such dimensions since then.

Point B. 110,000,000 years ago
(60:2.14) 100,000,000 years ago the reptilian age ended. For all their enormous mass, dinosaurs were practically mindless animals, lacking the intelligence to provide their huge bodies with the necessary sustenance; that's why these lazy land reptiles were dying out in ever increasing numbers. Beginning at that time, evolution will be determined by brain enlargement, not physical mass, and it is brain development that will characterize each subsequent age of evolutionary animal and planetary progress.
(60:2.15) This period, comprising the apogee and beginning of the reptilian decline, lasted nearly 25,000,000 years and is known as the Jurassic.

Point III. Cretaceous period. Period of flowering plants and birds
(60:3.1) The vast Cretaceous period got its name from the predominance in the seas of the prolific Cretaceous-forming marine fora-minifera. This period brought Urantia near the end of the long reign of the reptiles and witnessed the appearance on land of flowering plants and birds. In this era, the continental drift in the west and south directions was completed, accompanied by colossal deformations of the crust with ubiquitous lava flows and extensive volcanic activity.
(60:3.2) At the end of the previous geological period, much of the continents were high above sea level, although there were still no mountain peaks. But deep at the bottom of the Pacific Ocean, the drifting continents encountered their first major obstacle. This collision of geological forces gave impetus and formation to the entire vast mountain range stretching from north to south, from Alaska through Mexico to Cape Horn.
(60:3.3) Thus this period of geological history became a stage in the formation of the modern mountains. Until that time, there were almost no sharp peaks, and the elevations were the widest mountain ridges. The Pacific coastline now began to rise, but this was taking place a thousand and one hundred kilometers to the west of today's coastline. The Sierra Mountains began to form, and their layers of gold-bearing quartz were the result of the lava flows of this era. In eastern North America, pressure from the Atlantic Ocean also caused land to rise.

Point A. 100,000,000 years ago

Point 1. The distortion of the American continents.
(60:3.4) 100,000,000 years ago the North American continent and part of Europe were high above sea level. The distortion of the American continents continued, resulting in the transformation of the North American Andes, and the western plains of North America gradually began to rise. Much of Mexico went under water, and the South Atlantic invaded the east coast of South America, resulting in the formation of the modern coastline. The Atlantic and Indian oceans then looked roughly as they do now.

Point B. 95,000,000 years ago

Point 1. Land subsidence and volcanic activity.
(60:3.5) 95,000,000 years ago the American and European continents again began to sink. The Southern Seas cut into North America and gradually expanded northward, joining the Arctic Ocean; it was the second largest submersion on this continent. When the sea receded, it left the continent roughly as it is today. By the time this extensive subduction began, the eastern Appalachians had eroded practically to sea level. The many colored layers of pure clay now used to make pottery were deposited in this era in the coastal Atlantic regions with an average thickness of about six hundred meters.
(60:3.6) Powerful volcanic activity was observed south of the Alps and along the coastal mountains of modern California. The most significant deformation of the crust in several million years occurred in Mexico. Huge

changes were also taking place in Europe, Russia, Japan and the southern part of South America. The climate became increasingly diverse.

Point C. 85,000,000 years ago

Point 1. Bering Strait closed, Cretaceous deposits.
(60:3.8) 85,000,000 years ago the Bering Strait closed and isolated the cooling waters of the northern seas. Until then, the marine life of the Atlantic and Gulf of Mexico was significantly different from the marine life of the Pacific Ocean, which was explained by the difference in the temperatures of these two bodies of water; now the temperature has become the same.
(60:3.9) This period was named after the deposits of chalk and glauconitic calcareous clay. The varied deposits of this age consist of chalk, shale, sandstone, and small amounts of limestone, together with low-grade coal or lignite; in many regions they also contain oil. These layers vary in thickness from 60 meters in a few places to 3,000 meters in western parts of North America and in many areas of Europe. Along the eastern borders of the Rocky Mountains, these deposits can be seen among the uplifted strata of the foothills.
(60:3.10) All over the world these strata are mixed with chalk, and such porous semi-rock strata collect water in the excavated upturned outcrops of rock and carry it down, supplying water to many of the now arid regions of the earth.

Point D. 80,000,000 to 75,000,000 years ago

Point 1. 80,000,000 years ago the earth's crust underwent powerful perturbations.
(60:3.11) The westward drift of the continents was ceasing, and the colossal energy of the inertial motion of the rear continental mass smoothed the Pacific coasts of North and South America, setting in motion reciprocal changes along the Pacific coasts of Asia. This uplift of land along the entire perimeter of the Pacific basin, culminating in the appearance of the modern mountain ranges, took place over forty thousand kilometers, and the accompanying cataclysms led to the most powerful deformations of the surface since the time of the appearance of life on Urantia. Both terrestrial and underground lava flows were extensive and ubiquitous.

Point 2. Completed the formation of the Pacific Coast Ranges from Alaska to Cape Horn.
(60:3.12) 75,000,000 years ago continental drift ended. The formation of the coastal Pacific mountain ranges from Alaska to Cape Horn was completed, but the mountain peaks at that time were few.
(60:3.13) The back pressure of the retained drifting continents continued to raise the western plains of North America, while to the east the eroded Appalachians of the Atlantic coast rose straight up with almost no tilting of strata.

Point E. 70,000,000 to 55,000,000 years ago

Point 1. Maximum elevation of the Rocky Mountains.
(60:3.14) 70,000,000 years ago crustal deformation occurred associated with maximum uplift in the Rocky Mountain region. In British Columbia, a large segment of mountain ranges from a depth of more than twenty-four kilometers has been thrown to the surface; here the Cambrian mountain ranges are obliquely overhanging the Cretaceous strata. Another spectacular dump occurred near the Canadian border on the eastern slope of the Rockies; here you can find layers of rocks formed before the appearance of life and pushed over the then recent Cretaceous deposits.

Point 2. Widespread volcanic activity.
(60:3.15) The widespread volcanic activity of this age resulted in the formation of a large number of small isolated craters. Ejections of submarine volcanoes took place in the submerged region of the Himalayas. Much of the rest of Asia, including Siberia, was still under water.

Point 3. Extensive outflows of lava flows.
(60:3.16) 65,000,000 years ago there occurred one of the most extensive outpourings of lava flows in all the world's history. The strata deposited as a result of this and previous flows can be found in the territory of North and South America, in the northern and southern parts of Africa, in Australia and in some parts of Europe.

Point 4. Biological development.
(60:3.18) The climate continued to remain warm and even. The climatic conditions of the arctic latitudes resembled the modern climate of the central and southern regions of North America.

Point F. So let's summarize

Point 1. Dominion of the seas.
(60:4.1) The great Cretaceous period was drawing to a close, and with its close the extensive sea invasions of the continents ceased. This is especially true of North America, where twenty-four major floods occurred during the Cretaceous period. And though less considerable floods occurred later, none of them could compare with the extensive and prolonged invasions of the seas in this and the preceding age. Periods of successive dominance of the seas and continents continued over a million year cycles. The ups and downs of the ocean floor, as well as the changes in the level of the continental land, were characterized by a centuries-old cycle. Beginning at this time, such periodic displacements of the crust will continue throughout Earth's history, but diminishing in frequency and magnitude.

Point 2. Reasons for the formation of the mountains.
(60:4.2) In addition, continental drift and the formation of the modern mountains of Urantia were completed during this period. But the pressure of continental masses and obstacles in the way of their centuries-old drift are not the only factors in mountain formation. The main and fundamental factor in determining the location of mountain ranges is the previously existing plain or depression, which is filled with relatively light deposits, formed as a result of soil erosion and displacement of seas in previous eras. Sometimes these lighter rock layers are 4,500 to 6,000 meters thick; therefore, when for any reason the crust underwent contraction, the lighter strata yielded first, and were wrinkled, folded, and uplifted in compensatory adaptation to the colliding and resisting forces and pressures acting in the crust or beneath the crust. Sometimes such land discharges occur without fold formation. But in connection with the uplift of the Rocky Mountains there was extensive folding and tilting of strata, combined with colossal ejections of various strata both underground and on the surface.

Point 3. Era of the mountains.
(60:4.3) The most ancient mountains of this world are found in Asia and Greenland; it is also those mountains of northern Europe that relate to the oldest east-west systems. The Middle Age Mountains are located on the Pacific Rim and in the second East-West European system that emerged around this time. This vast upland, well over 15,000 kilometers long, stretches from Europe to the highlands of the West Indies. The youngest mountains belong to the Rocky Mountain system, where for centuries the land has been uplifted, only to be hidden under water each time, although the highest places remained as islands. After the formation of the mountains in the Middle Ages, a veritable mountain range arose, from which the elements of nature, uniting their mastery, subsequently sculpted the Rocky Mountains.
(60:4.4) The present Rocky Mountain region of North America is not the original land uplift. The original elevation has since eroded and risen secondarily. The modern mountain range is what remains of the original and resurgent range. Pikes Peak and Longs Peak are typical examples of this mountain activity uniting two or more generations of mountains. Two such peaks emerged from the water during a whole series of preceding floods.

Point 4. Conclusion.
(60:4.6) Thus closes the long era in the history of world evolution which began with the emergence of early terrestrial life and ended with the later appearance of man's immediate ancestors and kindred branches. This period, the Cretaceous, covers more than 50,000,000 years and ends the era of evolution of terrestrial life until the appearance of mammals, which lasted 100,000,000 years and is known as the Mesozoic.