DOWNLOAD PDF THE CHAIN OF LIFE IN GEOLOGICAL TIME

Chapter 1 : The Chain of Life in Geological Time [microform] : Sir John William Dawson :

The Chain of Life in Geological Time A Sketch of the Origin and Succession of Animals and Plants by J. William Dawson A Sketch of the Origin and Succession of Animals and Plants by J. William Dawson.

I think I found it on a field trip with Frank Koucky in the distant mists of my student days at Wooster, but so many outcrops, so many fossils â€¦ Below is a nineteenth century illustration of a typical receptaculitid fossil. They were certainly not corals, though, or probably any other kind of animal. Receptaculitids appeared in the Ordovician and went extinct in the Permian, so they were confined to the Paleozoic Era. Receptaculitids were bag-like in form with the outside made of mineralized pillars meroms with square or diamond-shaped heads. The fossils are usually flattened disks because they were compressed by burial. You may notice now that the fossil at the top of this post is a mold of the original with the dissolved pillars represented by open holes. Paleontologists can argue if this is an external or internal mold. So what were the receptaculitids? When I was a student we called them a kind of sponge, something like a successor of the Cambrian archaeocyathids. In the s a convincing case was made that they were instead a kind of alga of the Dasycladales. I find it deeply comforting that we still have plenty of fossils in the Problematica. We will always have mysteries to puzzle over. Another Wooster receptaculitid specimen, this time seen from the underside showing side-views of the meroms. Diagram of a receptaculitid in roughly life position showing its inflated nature and pillar-like meroms. From Dawson , fig. Finally, this is what a typical receptaculitid looks like in the field Ordovician of Estonia. Note that nice sunflower spiral of the merom ends. The chain of life in geological time: A sketch of the origin and succession of animals and plants. The Religious Tract Society, pages.

Chapter 2 : The Chain of Life in Geological Time

The Chain of Life in Geological Time: A Sketch of the Origin and Succession of Animals and Plants (Classic Reprint) Paperback - July 5,

This period gets its name from a place in Wales where the first examples of this type of ancient life was found. The period lasted for nearly 53 million years, from about million years ago until million years ago. Climate The climate at the beginning of this period was cold, but over time the climate in all parts of the Earth grew warmer. This made the seas a good place for many species to live. The continents were still forming. They were mostly barren rocks. The land had no plant or animal life on it yet. Most of these were in the water. Many animals with no backbones lived in the shallow seas. These animals were invertebrates. The Trilobites One species was so plentiful and had such great numbers and so many species that it is sometimes called the ruling species of the period. This species was the arthropod with a tough outer skin. It got its name from the three lobes in the hard skin. The trilobite was also one of the first animals to have eyesight. During the Cambrian there were more than types of trilobites. Other Invertebrates There were plenty of other species living during the Cambrian Period also. Mollusks, worms, sponges and echinoderms filled the Cambrian seas. No Backbones Yet, But There was even an early type of chordate living during the Cambrian Period. It was the Pikaia. Pikaia looked a bit like a worm with a long fin on each side of its body. The nerve cord was visible as a ridge starting behind the head area and extending almost to the tip of the body. This animal had an exoskeleton like an arthropod, but it did not have the jointed legs that would make it a true arthropod. This large animal fed on trilobites and other arthropods, worms and mollusks. Sponges Sponges grew in Cambrian seas, too. These animals belong to the phylum porifera because of all the tiny pores in their bodies. One species of sponge from this period had many branches that made it look like a tree. Another type of sponge looked like an ice cream cone-without the ice cream, of course! Many of the sponges became extinct when temperatures dropped at the end of the Cambrian period. Hard Parts Many of the creatures living in the Cambrian seas developed hard structures for defense, hard shells, scales, and spikes covering the outside of the body. The Wiwaxia lived on the bottom of the sea. The dorsal side of its body had scales and spikes for protection. The underside of Wiwaxia was soft and unprotected. Trilobites also living on the bottom could burrow under the Wiwaxia and attack the defenseless belly. Hallucigenia stood on seven pairs of tall legs. Its long, tube-shaped body had two rows of tall spikes along its back. This type of protection would have been very important for the animal because it had no eyesight to warn it of dangers. Plants The plants of the Cambrian were mostly simple, one-celled algae. The single cells often grew together to form large colonies. The colonies looked like one large plant. Mass Extinction The Cambrian Period began with an explosion of life forms. It ended in a mass extinction. Advancing glaciers would have lowered the temperature of the shallow seas where so many species lived. Changes in the temperature and the amount of oxygen in the water would have meant the end for any species that could not adapt. Enjoy this short video.

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Read "The Chain of Life in Geological Time: A Sketch of the Origin and Succession of Animals and Plants" by Sir John William Dawson with Rakuten Kobo. Questions as to the origin and history of life are not at the present time answered by mere philosophical speculation an.

The Morrison Formation of the United States and the Solnhofen Limestone of Germany , both famous for their exceptionally well-preserved fossils, are geologic features that were formed during Jurassic times. The Jurassic was a time of significant global change in continental configurations, oceanographic patterns, and biological systems. During this period the supercontinent Pangea split apart, allowing for the eventual development of what are now the central Atlantic Ocean and the Gulf of Mexico. Heightened plate tectonic movement led to significant volcanic activity , mountain-building events, and attachment of islands onto continents. Shallow seaways covered many continents, and marine and marginal marine sediments were deposited, preserving a diverse set of fossils. Rock strata laid down during the Jurassic Period have yielded gold, coal, petroleum, and other natural resources. International Commission on Stratigraphy ICS During the Early Jurassic, animals and plants living both on land and in the seas recovered from one of the largest mass extinctions in Earth history. Many groups of vertebrate and invertebrate organisms important in the modern world made their first appearance during the Jurassic. Life was especially diverse in the oceansâ€"thriving reef ecosystems, shallow-water invertebrate communities , and large swimming predators, including reptiles and squidlike animals. On land, dinosaurs and flying pterosaurs dominated the ecosystems, and birds made their first appearance. Early mammals also were present, though they were still fairly insignificant. The Jurassic Period was named early in the 19th century, by the French geologist and mineralogist Alexandre Brongniart , for the Jura Mountains between France and Switzerland. Much of the initial work by geologists in trying to correlate rocks and develop a relative geologic time scale was conducted on Jurassic strata in western Europe. The Jurassic environment Paleogeography Although the breakup of the supercontinent Pangea had already started in the Triassic Period, the continents were still very close together at the beginning of Jurassic time. The landmasses were grouped into a northern regionâ€"Laurasiaâ€"consisting of North America and Eurasia, and a southern regionâ€" Gondwana â€"consisting of South America , Africa, India, Antarctica, and Australia. These two regions were separated by Tethys , a tropical east-west seaway. During the Jurassic, spreading centres and oceanic rifts formed between North America and Eurasia, between North America and Gondwana, and between the various segments of Gondwana itself see the map. In the steadily opening, though still restricted, ocean basins, there was a continuous accumulation of thick flood basalts and a subsequent deposition of sediments. Some of these deposits, such as salt deposits in the Gulf of Mexico and oil-bearing shales of the North Sea , are economically important today. In addition to ocean basin spreading, continental rifting initiated during the Jurassic, eventually separating Africa and South America from Antarctica, India, and Madagascar. The numerous microplates and blocks making up the complex Caribbean region today can be traced to this time interval. Present-day coastlines and tectonic boundaries of continents are shown in the inset at the lower right. Scotese, The University of Texas at Arlington To accommodate the production of new seafloor along the proto-Atlantic Ocean, significant subduction zones where seafloor is destroyed were active along virtually all the continental margins around Pangea as well as in southern Tibet, southeastern Europe, and other areas. All along the west coast of North, Central, and South America, plate tectonic activity in the subduction zones brought on the initial formation of north-south mountain ranges such as the Rocky Mountains and the Andes. Along western North America, several terranes islands or microcontinents riding on a moving plate were brought east on oceanic crust and collided with the continent, including parts of a microcontinent that collided into the Alaskan and Siberian regions in the northern Pacific. These collisions added to the growth of the North American continent and its mountain chains. One mountain-building event, known as the Nevadan orogeny , resulted in the emplacement of massive igneous and metamorphic rocks from Alaska to Baja California. In the Early Jurassic the western interior of North America was covered by a vast sand sea, or erg â€"one of the largest deposits of dune sands in the geologic record. These deposits including the Navajo Sandstone are prominent in a number of places today, including Zion National Park , Utah. In Middle and early Late Jurassic times, the western regions of North America were covered by shallow seaways that advanced and retreated repeatedly, leaving successive accumulations of marine sandstones, limestones, and shales. By Late Jurassic time the seaway had retreated, and strata bearing dinosaur fossils were deposited in river floodplains and stream channel environments , such as those recorded in the Morrison Formation , Montana. Kresan Records of sea level changes can be found on every continent. However, because of the significant tectonic activity occurring around the world, it is not clear which of these local changes can be correlated to global sea level change. Because there is no evidence of major glaciations in the Jurassic, any global sea level change must have been due to thermal expansion of seawater or plate tectonic activity such as major activity at seafloor ridges. Some geologists have proposed that average sea levels increased from Early to Late Jurassic time. Paleoclimate Jurassic climates can be reconstructed from the analyses of fossil and sediment distribution and from geochemical analyses. In higher paleolatitudes, ferns and other frost-sensitive plants indicate that there was a less severe temperature difference between the Equator and the poles than exists today. Despite this decreased temperature gradient, there was a marked difference in marine invertebrates from northern higher latitudesâ€"the boreal realmâ€"and the tropical Tethyan realm. Decreased latitudinal temperature gradients probably led to decreased zonal winds. Large salt deposits dating from the Jurassic represent areas of high aridity, while extensive coal deposits suggest areas of high precipitation. It has been suggested that an arid belt existed on the western side of Pangea, while more-humid conditions existed in the east. These conditions may have been caused by large landmasses affecting wind and precipitation in a manner similar to that of modern continents. Analyses of oxygen isotopes in marine fossils suggest that Jurassic global temperatures were generally quite warm. Coolest temperatures existed during the Middle Jurassic and warmest temperatures in the Late Jurassic. A drop in temperatures occurred at the Jurassic-Cretaceous boundary. It has been suggested that increased volcanic and seafloor-spreading activity during the Jurassic released large amounts of carbon dioxideâ€"a greenhouse gas â€"and led to higher global temperatures. Warm temperatures and decreased latitudinal gradients also may be related to the Tethys Sea , which distributed warm, tropical waters around the world. Ocean circulation was probably fairly sluggish because of the warm temperatures, lack of ocean density gradients, and decreased winds. As stated above, there is no evidence of glaciation or polar ice caps in the Jurassic. This may have been caused by the lack of a continental landmass in a polar position or by generally warm conditions; however, because of the complex relationships between temperature, geographic configurations, and glaciations, it is difficult to state a definite cause and effect. Jurassic life The Triassic-Jurassic boundary is marked by one of the five largest mass extinctions on Earth. About half of the marine invertebrate genera went extinct at this time; whether land plants or terrestrial vertebrates suffered a similar extinction during this interval is unclear. In addition, at least two other Jurassic intervals show heightened faunal turnover affecting mainly marine invertebratesâ€"one in Early Jurassic time and another at the end of the period. Jurassic rock strata preserve the first appearances of many important modern biological groups. In the oceans, life on the seafloor became more complex and modern, with an abundance of mollusks and coral reef builders by Middle Jurassic time. While modern fishes became common in Jurassic seas, they shared the waters with ammonites and other squidlike organisms as well as large reptiles that are all extinct today. On land a new set of plants and animals was dominant by the Early Jurassic. Similarly, dinosaurs and mammals, as well as amphibians and reptiles resembling those of modern times, replaced the ancestral reptiles and mammal groups common in Late Triassic times. The earliest bird fossils were found in Jurassic rocks. However, although groups now living were present in Jurassic terrestrial ecosystems, Jurassic communities would still have been very different because dinosaurs were the dominant animals. Marine life The earliest Jurassic marine ecosystems show signs of recovery from the major mass extinction that occurred at the Triassic-Jurassic boundary. This extinction eliminated about half of marine invertebrate genera and left some groups with very few surviving species. Diversity increased rapidly for the first four million years the Hettangian Age [Another extinction event occurred among benthic bottom-dwelling invertebrates at the Pliensbachian - Toarcian boundary about million years ago in the Early Jurassic, interrupting the overall recovery and diversification. The last spiriferid brachiopod abundant during the Paleozoic Era went extinct at this time, and in some regions 84 percent of bivalve species went extinct. Although best documented in Europe, biodiversity during this period seems to have decreased around the globe. The extinctions may be related to an onset of low-oxygen conditions in epicontinental seas, as evidenced by the presence today of layers of organic-rich shales , which must have been formed in seas with so little oxygen that no burrowing organisms could survive and efficient breakdown of organic matter could not occur. Full recovery from this extinction did not occur until the Middle Jurassic. It has been proposed that a final interval of heightened extinction took place at the end of the Jurassic, although its magnitude and global extent are disputed. This final turnover may have been limited to Eurasian regions affected by local sea level decreases, or it may be related to a decrease in the quality of fossil preservation through the Late Jurassic. Except for the extinction events outlined above, in general, marine invertebrates increased their diversity and even modernized through the Jurassic. Some previously abundant Paleozoic groups were extinct by the Jurassic, and other groups were present but no longer dominant. Moreover, many important modern groups first appeared in the fossil record during the Jurassic, and many important groups experienced high levels of diversification a process known as evolutionary radiation. A diverse group of vertebrates swam in Jurassic seas. Cartilaginous and bony fishes were abundant. Large fishes and marine reptiles were common; the largest bony fish ever to live existed at this time, and Jurassic pliosaurs see plesiosaur are some of the largest carnivorous reptiles ever discovered. Fossil of the plesiosaur Cryptocleidus, a large marine reptile of the Jurassic Period. Courtesy of the American Museum of Natural History, New York Protists and invertebrates Among the planktonâ€”floating, single-celled, microscopic organismsâ€”two significant new groups originated and radiated rapidly: In addition, diatoms are considered by some scholars to have originated in the Late Jurassic and radiated during the Cretaceous. The skeletons of all three groups are major contributors to deep-sea sediments. Before the explosion of skeletonized planktonic organisms, carbonates were mainly deposited in shallow-water, nearshore environments. Today the tests shells of coccolithophores and foraminifera account for significant volumes of carbonate sediments in the deep sea, while diatom tests create silica-rich sediments. Thus, the advent of these groups has significantly changed the geochemistry of the oceans, the nature of the deep-sea floor, and marine food webs. Nektic cephalopods , such as shelled ammonites and squidlike belemnites with internal skeletons, were very common. Although only one group of ammonites survived the Triassic-Jurassic mass extinction, they radiated rapidly into many different forms. Because their shells have elaborate suture lines, they are easily identifiable; this quality, along with their abundance and rapid evolution , make them useful as index fossils for correlating and sequencing rocks. Thus, ammonites are a major tool for developing relative time scales and dividing the Jurassic into finer time intervals. Other common mollusks include bivalves pelecypods and snails gastropods. These forms diversified into a number of different niches. Among the bivalves, scallops pectinids and oysters show marked radiation. Some bivalves also are used as index fossils. Jurassic crinoids are descendants from the one group that survived the Permian-Triassic mass extinction. Their circular or star-shaped stem ossicles plates can be quite abundant in Jurassic sediments. Under special circumstances, articulated Jurassic crinoids are preserved; some of these fossils suggest that some species may have lived on floating logs and not on the seafloor. One group of regular sea urchins, radially symmetrical and living on the surface of the seafloor, radiated into a number of irregular echinoid groups heart urchins that could burrow into sediment. Some lophophorates brachiopods , or lamp shells and bryozoa moss animals underwent recovery and diversification in the Jurassic but never became as dominant as they were in the Paleozoic Era. Spiriferid brachiopods went extinct during the Early Jurassic extinction event, but rhynchonellid and terebratulid brachiopods can be found throughout the period. Among bryozoans that survived into the Jurassic, cyclostomes are found encrusting hard substrates; cheilostomes the most common modern bryozoan appeared in the Late Jurassic. With the extinction of trilobites, a new set of arthropods developed.

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One result of these changes was the melting of large glacial formations. This contributed to a substantial rise in the levels of the major seas. Coral reefs made their first appearance during this time, and the Silurian was also a remarkable time in the evolution of fishes. Not only does this time period mark the wide and rapid spread of jawless fish, but also the highly significant appearances of both the first known freshwater fish as well as the first fish with jaws. It is also at this time that our first good evidence of life on land is preserved, such as relatives of spiders and centipedes, and also the earliest fossils of vascular plants. Life The Silurian is a time when many biologically significant events occurred. In the oceans, there was a widespread radiation of crinoids, a continued proliferation and expansion of the brachiopods, and the oldest known fossils of coral reefs. As mentioned earlier, this time period also marks the wide and rapid spread of jawless fish, along with the important appearances of both the first known freshwater fish and the appearance of jawed fish. Other marine fossils commonly found throughout the Silurian record include trilobites, graptolites, conodonts, corals, stromatoporoids, and mollusks. On the left, Dalmanites limuluris, a trilobite from the Silurian of New York. To the right, Grammysia cingulata, a bivalve from the Upper Ludlow of England. It is also in the Silurian that we find the first clear evidence of life on land. While it is possible that plants and animals first moved onto the land in the Ordovician , fossils of terrestrial life from that period are fragmentary and difficult to interpret. Silurian strata have provided likely ascomycete fossils a group of fungi , as well as remains of the first arachnids and centipedes. Perhaps most striking of all biological events in the Silurian was the evolution of vascular plants, which have been the basis of terrestrial ecology since their appearance. Most Silurian plant fossils have been assigned to the genus Cooksonia, a collection of branching-stemmed plants which produced sporangia at their tips. None of these plants had leaves, and some appear to have lacked vascular tissue. Also from the Silurian of Australia comes a controversial fossil of Baragwanathia, a lycophyte. If such a complex plant with leaves and a fully-developed vascular system was present by this time, then surely plants must have been around already by the Ordovician. In any event, the Silurian was a time for important events in the history of evolution, including many "firsts," that would prove highly consequential for the future of life on Earth. Cooksonia, on the left, has usually been considered the oldest known land plant. The lycophyte Baragwanathia, on the right, is structurally more complex than Cooksonia, but Silurian fossils of this plant have been found in Australia, significantly earlier than in the Northern Hemisphere. Each epoch is distinguished from the others by the appearance of new species of graptolites. Graptolites are a group of extinct colonial, aquatic animals that put in their first appearance in the Cambrian Period and persisted into the early Carboniferous. The beginning of the Silurian and the Llandovery is marked by the appearance of Parakidograptus acuminatus, a species of graptolite. Its base beginning is marked by the appearance of the graptolites Parakidograptus acuminatus and Akidograptus ascensus. The Llandoverian epoch is subdivided into the Rhuddanian, Aeronian, and Telychian stages. At the close of the Telychian stage, the appearance of Cyrtograptus centrifugus marks the start of the Wenlockian epoch Missing from the fossil record of the Wenlock was the conodont Pterospathodus amorphognathoides, present in earlier strata. This is an epoch with excellent preservations of brachiopod, coral, trilobite, clam, bryozoan, and crinoid fossils. The Wenlock is subdivided into the Sheinwoodian and Homerian stages. There is an abundance of shelly animal fossils. The Gorstian and Ludfordian stages make up the Ludlow epoch. Platy limestone strata rich in cephalopods and bivalves characterize the Pridolian It is marked by the appearance of the index fossil Monograptus parultimus, and also by two new species of chitinozoans marine plankton , Urnochitina urna and Fungochitina kosovensis, which appear at the base or just above the base of the Pridoli. Tectonics and paleoclimate Although there were no major periods of volcanism during the Silurian, the period is marked by major orogenic events in eastern North America and in northwestern Europe the Caledonian Orogeny , resulting in the formation of the mountain chains there. The ocean basins between the regions known as Laurentia North America and

Greenland , Baltica central and northern Europe and Scandinavia and Avalonia western Europe closed substantially, continuing a geologic trend that had begun much earlier. While not characterized by dramatic tectonic activity, the Silurian world experienced gradual continental changes that would be the basis for greater global consequences in the future, such as those that created terrestrial ecosystems. A deglaciation and rise in sea levels created many new marine habitats, providing the framework for significant biological events in the evolution of life. Coral reefs, for example, made their first appearance in the fossil record during this time. The shallow seas ranged from tropical to subtropical in climate. Coral mound reefs with associated carbonate sediments were common in the shallow seas. Due to reduced circulation during the Ludlow and Pridoli times, the process of deposition of evaporites salts was set in motion. Resources and references Behrensmeyer, A. Terrestrial Ecosystems Through Time: Evolutionary Paleoecology of Terrestrial Plants and Animals. University of Chicago Press, Chicago. The Biology and Evolution of Fossil Plants. See the Wikipedia page on the Silurian.

Chapter 5 : The Chain of Life in Geological Time

the chain of life in geological time a sketch of the origin and succession of animals and plants by sir j. william dawson c.m.g., ll.d., f.r.s., f.g.s., etc. author of.

So to remember his famous role as science-officer Spock on board of the USS Enterprise I will share some space-geology-related posts: Darwin and the German Otto Hahn- discussing the possibility of extraterrestrial life. Life from outer space was not a new idea. Already in the German physician Hermann Eberhard Richter argued that life was an intrinsic property of the cosmos , transported in space on smaller rocky fragments, dormant microorganism could act like seed , evolving in short time into complex organisms after the host-rock impacted on a suitable planet. Otto Hahn was a former lawyer turned to amateur naturalist and geologist, with a special interest in the origin of life. However it seemed strange that already the oldest life form would be a highly evolved animal and Hahn himself doubted at first that it was even a fossil. Eozoon specimen, the regular lamination were interpretated as chambers of a shelled organism or growth lines, image from DAWSON The Chain of Life in Geological Time. However in similar rocks were found in material erupted by Mount Vesuvius, proving that this texture formed by inorganic processes due the alteration of limestone by heat from underground magma. After this achievement, Hahn suddenly started to find fossils of primitive organisms in all sorts of rocks, not only in sedimentary rocks, but also ancient, partially melted, metamorphic rocks and even igneous rocks like granite or basalt, completely crystallized from the molten magma. Hahn soon added even some extraterrestrial material to his collection of microorganism-derived rocks. Not surprisingly, also in samples of meteorites he discovered his primordial cells, also what seemed to be sponges and even corals. Hahn argued that the studied meteorites were remains of a cosmic cloud of gas, vapor and dust from which our solar system formed. In this semi-liquid environment life formed, evolving at least to the stadium of invertebrates. After the formation of the planets, agglomerated chunks of matter transported these primitive organism onto earth , where they continued to evolve until the appearance of man. Also this book was send to Darwin, who â€" as was his cautious manner â€" politely thanked for the gift, replying that the proposed scientific hypothesis was sure worth of further investigation but nothing more: What a wonderful discovery! Maybe Hahn, before travelling to Canada for his research on Archaean fossils, did also visit England. His idea of all rocks derived from microorganisms, as strange as it may sounds today, was taken serious at the time, at least by some naturalists. Also it seems improbable that Darwin believed it necessary to relocate the origin of life in outer space. Darwin never addressed in public the mystery of mysteries that is the origin of life. His theory of natural selection deals with the diversification of already reproducing life forms and was never intended as creationists claim to explain the origin of life. In private letters he proposed a chemical evolution in a primordial soup , but he also acknowledged that his contemporary science was yet not able to test this hypothesis. There was â€" so he argued â€" plenty of time for terrestrial life to evolve, even without extraterrestrial intervention. Charles Darwin and the Origin of Life.

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Historical origins[edit] The term "missing link" was influenced by the 18th century Enlightenment thinkers such as Alexander Pope and Jean-Jacques Rousseau who thought of humans as links in the Great Chain of Being. The Great Chain of Being is a hierarchical structure of all matter and life. It was during the 18th century that the set nature of species and their immutable place in the great chain was questioned. The dual nature of the chain, divided yet united, had always allowed for seeing creation as essentially one continuous whole, with the potential for overlap between the links. In his view, lower animals were simply newcomers on the evolutionary scene. While the vertebrates were then seen as forming a sort of evolutionary sequence, the various classes were distinct, the undiscovered intermediate forms being called "missing links. He theorized that the missing link was to be found on the lost continent of Lemuria located in the Indian Ocean. He believed that Lemuria was the home of the first humans and that Asia was the home of many of the earliest primates , he thus supported that Asia was the cradle of hominid evolution. Between and Dubois discovered remains that he later described as "an intermediate species between humans and monkeys". He named the hominin Pithecanthropus erectus erect ape-man , which has now been reclassified as Homo erectus. In the media, the Java Man was hailed as the missing link. Java Man , the original "missing link" found in Java. Java Man Homo erectus: Discovered by Eugene Dubois in in Indonesia. Originally named Pithecanthropus erectus. A set of bones found in thought to be the "missing link" between ape and man. Eventually revealed to be a hoax. Taung Child Australopithecus africanus: Discovered by Raymond Dart in in South Africa. Homo habilis described in has features intermediate between Australopithecus and Homo erectus, and its classification in Homo rather than Australopithecus has been questioned. Discovered in by Donald Johanson in Ethiopia. A series of skeletons discovered in South Africa between Portrayals in media[edit].

Chapter 7 : History of Geology: February

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Contents Preliminary considerations as to the extent and sources of our knowledge -- The beginning of life on the earth -- The age of invertebrates of the sea -- The origin of plant life on the land -- The appearance of vertebrate animals -- The first air-breathers -- The empire of the great.

Chapter 9 : The Silurian Period

The Chain of Life in Geological TimeA Sketch of the Origin and Succession of Animals and Plants This is a git repository of the source files for the book The Chain of Life in Geological TimeA Sketch of the Origin and Succession of Animals and Plants by Dawson, John William, Sir.