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Chapter 1 : Plants - Dinosaur Extinction - Prehistoric Life

The accumulation of knowledge has meant that scientists today must practice in finer and finer subspecializations: One is not a paleontologist, one is an invertebrate paleontologist specializing in ammonites; or one is a palynologist, an expert not just in fossil plants, but in fossil pollen spores.

Create New This page talks about prehistoric life by making several examples of extinct creatures, from plants to non-human hominids. Of course dinosaurs receive more details than the other groups, but it would be a really, really incomplete list without non-dinos. This page only talks about non-stock animals: The vast majority of dinosaurs are in this category; and yet, they are as cool as their famous relatives. If you want to see thing about the most popular dinos and non-dinos, there is already some information here and here. Time Scale The geologic and biologic history of the Earth is divided into four eons: Hadean, Archean, Proterozoic, and Phanerozoic. Each eon is divided into eras, which are themselves subdivided into periods, which are in turn sub-sub-divided into epochs. Since we know a heck of a lot more about the recent past than we do about the very very ancient past, the first three eons are sometimes grouped together into a single "supereon" known simply as the Pre-Cambrian. Earth before million years ago. Starting from the formation of the Earth 4. Later, some miraculously surviving rock samples from the Hadean were found in Greenland. Previously it was thought that Earth was super-volcanic during this eon; the current scientific consensus states that no, neither volcanism nor tectonics nor the planetary dynamo had not yet started for most of the Hadean era. The total meltdown of Earth that caused differentiation, formation of core, mantle and crust and the start of volcanism and tectonics marked the transition from Hadean to Archean. Archean eon formerly Archaeozoic: This eon saw the emergence of the first eukaryotic life forms cells with a nucleus 1. The final era of this eon was: Starting 1 billion years ago. Ice ages came and went which were so severe that the ice sheets reached all the way to the equator, resulting in a Snowball Earth. Rodinia eventually broke up, only to re-form as another supercontinent named Pannotia. The final period of this era was: Ediacaran period formerly Vendian: Starting million years ago, which marked the "Dawn of Animal Life. In any case, multicellular life that probably but not certainly belongs to the kingdom Animalia first appears around million years ago; possible fossils are found even earlier, near the beginning of the period, but nothing conclusive. Many possible ancestors of known invertebrate groups show up in the record, including comb-jellies, sponges, corals, anemones, and molluscs, and one fossil might even be a chordate vertebrate ancestor. Fungi also emerge during this period. Earth from million years ago to million years ago. The "Explosion of Life". Most of the main invertebrate groups appeared then, as well as the first vertebrate ancestors. Life was still water-exclusive. Graptolites, cephalopods, and chitons emerge during this period. The first predators appear and cause evolution to speed up drastically, resulting in the Cambrian Explosion. First true fish appeared. Arthropods venture onto land. Ended with a mass extinction. First jawed fish and later ray-finned fish appeared. Plants and scorpions started to colonize dryland. The Fish Golden Age. The first four-limbed vertebrates appeared. Insects, crabs, ferns, and sharks evolve. Forests spread around the world. The Golden Age of Insects and Amphibians. Sharks reach large sizes, and ratfish, amniotes, synapsids, diapsids, and hagfish evolve. This period, which is called the Lower Carboniferous elsewhere in the world, saw a major rebound in diversity from the mass extinction that ended the Devonian. This paved the way for the life forms of the next period, the: This period, which is called the Upper Carboniferous elsewhere in the world, contains the massive coal deposits actually the remains of vast swampy forests that give the Carboniferous its name. The supercontinent of Pangea is formed, and Earth becomes more arid. The Golden Age of the Mammal-Ancestors. Beetles and therapsids evolve. Temnospondyls and pelycosaurs diversify. Ended with the worst mass extinction ever. Earth from million years ago to 65 million years ago. True reptiles replaced mammal-ancestors. Most of the main groups of land-vertebrates still alive today appeared, dinosaurs and mammals are among them. Many groups that did not leave modern descendants, such as pterosaurs and many marine reptile groups, evolved as well. Dinosaurs became the largest and most diversified land-animals, and some became fliers including possible protobirds. New types of pterosaurs and marine reptiles evolved. The three still-living mammalian groups appeared.

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Dinosaurs further diversified, and the first dinosaurs universally recognized as birds appeared. Flowering plants and several groups of insects co-evolved, creating the most common land-ecosystem still present today. Modern groups of fish evolved. Earth from 65 million years ago to the present day. Mammals underwent an explosive evolution, and most still-living lineages appeared, primates included. Birds, crocodilians, turtles, squamates and lissamphibians were among the other land-vertebrates which survived the mass-extinction. At the end, the Earth started to become colder, and polar ices started to form. Continents acquired their modern placement, and new mountain ranges appeared. Grasslands became a widespread environment, partially replacing forests. New mammalian kinds appeared, among them the first hominids. Several Ice Ages alternated with Interglacials. All modern kinds of plants and animals were already present, but also many now-extinct species, many killed off by our own species. True humans evolved and started to develop our modern traits. The age in which we are living today specifically the Holocene Epoch is included in this time period. The only surviving human species, Homo sapiens sapiens, has become a prime environmental factor worldwide. The first written records started to appear some years ago. That moment marked the beginning of recorded history. But also note not all members of each group have their designated suffix; nor these suffixes are necessarily exclusive of these groups think about the whale Basilosaurus. Usually these suffixes are latinized Greek; of note is that there are examples from languages aside from Latin and Greek, such as Yutyrannus "Yu" is Mandarin for "feathered dragon" , Azhdarcho named after a Uzbek myth , and Tawa named for the Hopi sun god. Other names are related with modern geography: Edmontonia cames from Edmonton in Canada; Minmi and Muttaburrasaurus come from Minmi Crossing and Muttaburra, the places in Australia where their fossils were dug out. Allosaurus, Plesiosaurus, Scutosaurus, Edaphosaurus. Often identifies amphibians as well: The whale Basilosaurus is an exception due to Science Marches On it was initially believed a sea-reptile. The suffix can also become prefix: Saurolophus, Sauroctonus, Saurosuchus, the Sauropods, and the Saurischians. Also known is the feminine variant -saura: Greek for "horned face". Most famous dinosaur with this ending is, of course, Triceratops. Also applies to some larger and smaller dinosaurs, in specific theropods seem to get this name a bit, due to their close relation to avian dinosaurs. Latin for "thief", "plunderer" or "robber": Pyroraptor, Bambiraptor , but many other theropod dinosaurs have this as well. Oviraptor, Megaraptor, and Fukuiraptor. Accipitrids and Falconids are commonly called raptors, but there is yet to be a genus in this group that has this ending to its specific name. Also applied some hadrosaurs, like Olorotitan and some theropods, such as Tyrannotitan. Deinosuchus, Titanosuchus and Koolasuchus. Champsosaurus means "crocodile lizard". Greek for "beast", "wild animal"; most prehistoric mammals have this â€”- the famous documentary Walking With Beasts was just named so in reference to the countless -theriums here Ex. But perhaps the most famous example is Megatherium "big beast". Several -saurus have their -therium counterpart, too: Latin for "cat", this is applied to extinct felids quite a bit of the time.

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Fossils of this prehistoric tree showed it was around in the Jurassic era, million years ago, when Stegosaurus and Iguanodon roamed the earth. Scientists thought it was extinct. In , David Noble, adventurous rock climber and forest trekker, spotted an unusual plant in a very remote spot of temperate rainforest in New South Wales, Australia.

Fashion, Costume, and Culture: Prehistoric Life Scientists believe that the earliest stages of human evolution began in Africa about seven million years ago as a population of African apes evolved into three different species: Some three million years later early humans stood nearly upright and had developed larger brains, about half the size of the modern brain. Beginning about one million years ago, early humans began to migrate out of Africa and into other parts of the world. In a process that appears to have been completed around 10, b. As evolution continued man became taller and more intelligent and capable. He evolved from the species Australopithecus into Homo habilus into Homo erectus and finally, about , years ago, into the direct ancestors of modern man, Homo sapiens. Yet human development was not done. Neanderthal man, an early subspecies of Homo sapiens in human evolution , survived from about , years ago to about 30, years ago. Neanderthal man developed in several areas of the world and began to use more tools to hunt, to build shelters, and to develop the first known forms of human clothing. Cro-Magnon man Overlapping somewhat with Neanderthal man was the sub-species from which modern man is directly descended, Homo sapiens sapiens, better known as Cro-Magnon man. Cro-Magnon man first began to appear around forty thousand years ago in various parts of the world, as far apart as Borneo , in Malaysia , and Europe. At first Cro-Magnon man was much like Neanderthal man in his use of tools, his methods of hunting and gathering food, and his creation of rough forms of clothing. But there were important physical differences between the subspecies. Cro-Magnon man stood fully upright, had a larger brain, a thinner nose, a more pronounced chin, and a skeletal structure nearly identical to modern man. Before too long, and for reasons that still puzzle scientists, the capabilities of Cro-Magnon man developed dramatically in what some call the " Great Leap Forward. Cro-Magnon humans were largely hunter-gatherers, which meant their food depended on the animals that they killed and the fruits and plants they gathered from within their local surroundings. Hunter-gatherers were usually nomadic, moving from place to place as they exhausted the local food supply or following herds of deer, bison, or other prey. Over time they developed more sophisticated ways of making stone tools, such as arrow points and axes, and they also developed tools from the bones of animals. Animal skins provided their first forms of clothing and footwear, and Cro-Magnon man used tools such as rock and bone scrapers to strip the flesh and fat from the skins and cut the skins into primitive forms of clothing. In addition to making clothing, Cro-Magnon man began to decorate the human body with body paint and perhaps tattoos. As the climate warmed and the human population grew and spread geographically, humans began to develop the first "civilized" human settlements, starting to grow their own food, to domesticate animals, and to live in permanent settlements. The first such settlements were developed as early as b. Mesopotamians, as those who lived in the area are referred to, developed the ability to create pottery from clay, learned to gather and spin wool from the sheep and goats that they herded, and developed systems of trade that soon expanded throughout the Middle East and into Europe and Asia. It was in Mesopotamia and the other great early civilization, Egypt , where clothing other than animal skins first began to be made and worn. Yet more primitive hunter-gatherer cultures continued to exist in many parts of the world well after the formation of the first civilizations, and indeed up to the modern day. These groups continued to rely on animal skins to provide their clothing. How do we know? The task of understanding the nature of early human life is very difficult. Scientists who study the material remains of past cultures, such as fossils, rocks, and human bones, are known as archeologists. They must use a very limited number of clues to reconstruct the nature of past human life. The older the human remains, the more difficult their work becomes. Years of burial beneath tons of earth and years of erosion and wear help to scatter and destroy evidence. Archeologists must carefully dig the remnants of the human past from out of the earth. They must form a picture of the whole based upon a very small part, guessing what a one-thousand-piece puzzle will look like after just fifty pieces. Much of what archeologists know about past human life is uncertain and partial. For example, archeologists argue about the dates that human life began and changed. New discoveries constantly force scientists to rethink the dating given to major developments in human prehistory. Even the primary method of identifying the age of discoveries, known as radiocarbon dating, is subject to second-guessing. Often different sources have different dates. Another difficulty is that there are simply not many sources of evidence about early human life. Archeologists must form their picture of early life based on small sets of discovered materials separated by both time and distance. The problem of understanding the clothing of early humans is made even more difficult by the fragile and destructible nature of fur. While bones and stones may survive for thousands of years, fur decomposes and disappears. The same is true with human hair and skin. But these difficulties do not mean we know nothing of early clothing and decoration. In some cases, human remains have been embedded in ice or discovered in extremely dry caves, and clothing has been preserved. Another form of evidence comes from early rock paintings and etchings that have depicted human clothes, hair, and body decoration. Though our knowledge of early clothing is minimal, we can get some picture of how our earliest ancestors protected themselves from the cold and, perhaps, made themselves beautiful or scary to their peers. People of the Ice Age. The Atlas of Early Man. Lambert, David, and the Diagram Group. The Field Guide to Early Man. Facts on File, Wilkinson, Phil, and Nick Merriman, eds.

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Prehistoric plants include mosses, horsetails and ferns from the Paleozoic era and bald cypress, ginkgos, cycads, magnolias and palms from the Mesozoic era. Horsetails and ferns are considered to be the first land plants.

Long before humans lived dinosaurs roamed Earth. They ruled the world for million years. During this time, some dinosaurs became the biggest and strongest animals ever to walk on land. Dinosaurs became extinct 65 million years ago. No one is sure why the dinosaurs became extinct. Even though dinosaurs disappeared from earth, they were very successful animals that were able to survive many different changes in their environment. No other group of large animals has managed to live as long as dinosaurs. Many types of ancient reptiles roamed Earth when the dinosaurs lived. Some of these reptiles walked on land. Others lived in the sea or flew in the sky. All budding paleontologists will want to have this series in their school, public or home library. Although there is some overlap, each of the five books in the series focuses on a discrete aspect of prehistoric life forms. Consequently, whether readers are interested in botany, entomology, ichthyology or ornithology, they will be itching to get their hands on each of these beautifully created and extremely informative books. When we think of prehistoric life, there is a tendency to think only about dinosaurs. However important they were, dinosaurs lived, walked and ruled the Earth for only a relatively brief moment in the long history of life on the planet. These volumes correct that misapprehension. The students will see the developmental growth, change and increasing complexity of plant and animal life, which took place over the course of hundreds of millions of years on the ever-changing Earth. In the Precambrian Era 4. All the volumes follow a similar format, and each contains a table of contents, index, research activities, websites, suggested readings and a glossary of terms. The most popular volume will, of course, be Dinosaurs, and it is as exceptional as the other volumes. There were land reptiles, flying reptiles and aquatic reptiles, but they, we learn, were not dinosaurs. Although reptiles, dinosaurs were special because of the way they stood and walked. The era of dinosaurs is divided into three periods: Triassic, Jurassic, and Cretaceous. The Plants volume discuses how plants began to grow on the earth some million years ago, which was million years later than the first animal forms, and evolved into different varieties as environments changed. Some of these plants, mosses for example, still exist in a primitive form whereas others became extinct or evolved into the flowering plants that exist today. However, even though adaptable, plants are a fragile life form, and over the course of millions of years a large percentage died out in the great extinctions of the Permian and Cretaceous Periods. Over the great expanse of time, they evolved into different species as they adapted to their environments, and some of the most primitive aquatic life forms still exist today. We learn about the greatest survivors in Insects. Insects are able to adapt to change quickly, and many of the species that lived hundreds of millions of years ago still survive today. The volumes make clear that there is still much to be learned about prehistoric life. Like all scientists, paleontologists know that they have to continue to explore, research, analyze, debate and, at times, debunk once popular theory. To comment on this title or this review, send mail to cm umanitoba.

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plant had paired stamens (the pollen-producing parts of a plant) and multiseeded fruits, although it may have lacked flowers. Angiosperms quickly became a favorite food of dinosaurs. Flowering plants reproduced much more quickly than gymnosperms; angiosperms constantly replenished a landscape that could become heavily browsed by hungry dinosaurs.

The family with the most species is the Poaceae which includes a huge variety of species, from the tropical bamboo Bambusa arnhemica to the ubiquitous spinifex that thrives in arid Australia from the genera Triodia and Plectrachne. There are more than described species of orchid in Australia. The terrestrial orchids occur across most of Australia, the majority of species being deciduous â€" their aboveground parts die back during the dry season and they re-sprout from a tuber when it rains. Other families with well-known representatives include the alpine Tasmanian button grass , which form tussock-like mounds from the Cyperaceae ; the genus Patersonia of temperate iris-like forbs from the Iridaceae ; and, the kangaroo paws from the family Haemodoraceae. The Xanthorrhoea grass trees, the screw palms of the Pandanaceae and palms are large monocots present in Australia. The Myrtaceae is represented by a variety of woody species; gum trees from the genera Eucalyptus , Corymbia and Angophora , Lillipillies Syzygium , the water-loving Melaleuca and Bottlebrush and the shrubby Darwinia and Leptospermum , commonly known as teatrees, and Geraldton wax. Australia also has representatives of all three legume subfamilies. Caesalpinioideae is notably represented by Cassia trees. Many plant families that occur in Australia are known for their floral displays that follow seasonal rains. The Asteraceae is well represented by its subfamily Gnaphalieae , which included the paper or everlasting daisies; this group has its greatest diversity in Australia. Amongst the most ancient species of flowering hardwood trees are the Casuarinaceae , including beach , swamp and river oaks, and Fagaceae represented in Australia by three species of Nothofagus. Trees of the Rosales are notably represented by the Moraceae whose species include the Moreton Bay Fig and the Port Jackson Fig , and the Urticaceae whose members include several tree sized stinging nettles; Dendrocnide moroides is the most virulent. There are also numerous sandalwood species including the quandongs and native cherry, Exocarpus cupressiformis. The bottle tree of the Sterculiaceae is one of 30 tree species from the Brachychiton. There are about 75 native mistletoes that parasitise Australian tree species, including two terrestrial parasitic trees, one of which is the spectacular Western Australian Christmas tree. Many of these plants have succulent leaves; other native succulents are from the genera Carpobrotus , Calandrinia and Portulaca. Succulent stems are present in many of the Euphorbiaceae in Australia, though the best known members are the non-succulent looking fragrant Wedding bushes of the genus Ricinocarpos. Carnivorous plants which favour damp habitats are represented by four families including the sundews , bladderworts , pitcher-plants from the Cephalotaceae , which are endemic to Western Australia , and the Nepenthaceae. Aquatic moncots and dicots both occur in Australian waters. Australia has about 51, square kilometres of seagrass meadows and the most diverse group seagrass species in the world. There are 22 species found in temperate waters and 15 in tropical waters out of a known 70 species worldwide. Gymnosperms[edit] Gymnosperms present in Australia include the cycads and conifers. There are 69 species of cycad from 4 genera and 3 families of eastern and northern Australia, with a few in south-western Western Australia and central Australia[clarification needed]. Native pines are distributed through 3 families[clarification needed], 14 genera and 43 species, of which 39 are endemic. Most species are present in wetter mountainous areas consistent with their Gondwanan origins, including the genera Athrotaxis , Actinostrobus , Microcachrys , Microstrobos , Diselma and the Tasmanian Huon pine , sole member of the genus Lagarostrobos. Callitris is a notable exception; species from this genus are found mainly in drier open woodlands. Ferns and fern allies[edit] Spore bearing vascular plants include the ferns and fern allies. True ferns are found over most of the country and are most abundant in tropical and subtropical areas with high rainfall. Australia has a native flora of 30 families, genera and species of ferns, with another 10 species being naturalised. The fern allies are represented by 44 native species of psilophytes , horsetails and lycophytes. Non-vascular plants[edit] The algae are a large and diverse group of photosynthetic organisms.

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Many studies of algae include the cyanobacteria , in addition to micro and macro eukaryotic types that inhabit both fresh and saltwater. Currently, about 10, to 12, species of algae are known for Australia. There are slightly fewer that 1, recognised species of moss in Australia. Knowledge of distribution, substrates and habitats is poor for most species, with the exception of common plant pathogens. Later, both were found to be from Western Australia, likely to have been collected near the Swan River, possibly on a visit there of fellow Dutchman Willem de Vlamingh. Indigenous Australians used thousands of species for food, medicine, shelter, tools and weapons. Although commercial cultivation of macadamia started in Australia in the s, it became an established large-scale crop in Hawaii. In the mids restaurants and wholesalers started to market various native food plant products. A few Australian native plants are used by the pharmaceutical industry, such as two scopolamine and hyoscyamine producing Duboisia species and Solanum aviculare and S. Essential oils from Melaleuca , Callitris , Prostanthera , Eucalyptus and Eremophila are also used medicinally. Due to the wide variety of flowers and foliage, Australian plant species are also popular for floriculture internationally.

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Chapter 5 : Prehistoric Life / Useful Notes - TV Tropes

This page talks about prehistoric life by making several examples of extinct creatures, from plants to non-human hominids. Of course dinosaurs receive more details than the other groups, but it would be a really, really incomplete list without non-dinos.

When we think of dinosaurs, we almost all think of a very small subset of these giant creatures from history. But perhaps more interesting are those which are far less familiar to us all. This list is just a small selection of monstrous or weird-looking creatures from ancient times, most of which are little known to the public. Estemmenosuchus is one of the most bizarre-looking prehistoric monsters; it belonged to the group of the dinocephalians, and despite their dinosaur-like appearance, they were actually more closely related to mammalsâ€¦ including us! Estemmenosuchus was the size of a rhinoceros, and it too had a horn on its nose, but it also had antler-like horns on the top of its head, and strange, bony protrusions coming out of its cheeks; no one knows what they were used for. Personally, I believe this thing was big and scary enough to eat anything it wanted. Fossil remains of Estemmenosuchus have been found in Russia; it lived in the Permian period, long before the appearance of dinosaurs. It was a vegetarian, but scary nonetheless; it could grow up to three meters tall and weigh up to kgs! Its strength must have been extraordinary and probably kept it safe from most predators. It finally went extinct Of course, all yeti and bigfoot believers like to think that Gigantopithecus survived somehow in the most remote parts of the Himalayaâ€¦ 12 Epicyon Epicyon could well be described as a giant pitbull on steroids. It was a member of the Canidae or dog family, but whereas modern day canids are built for speed and endurance, Epicyon was built for brute strength, and had jaws so powerful that they could crush bone as if they were crackers! This beast ruled the plains of North America for fifteen million years, before it was replaced by big cats including sabertooths. Edestus was about seven meters long and was one of the top predators of the Carboniferous seas. Regardless of how it did it, it seems obvious that Edestus could possibly cut any other creature in two with ease. Although real life gorgonopsids where a tad smaller than the TV version the largest species, such as Inostrancevia and Leontocephalus, could grow up to six meters long , they were just as terrifying; as a matter of fact, they were the dominant predators during the late Permian, before dinosaurs and their relatives took over. Gorgonopsids had a set of deadly saber-teeth some species had two sets of them which came handy when hunting some of the largest Permian herbivores, often the size of rhinos or bigger. They were quite agile and could probably run quite fast, unlike the predators that came before them. Despite their reptilian appearance, gorgonopsids were actually closely related to mammals, and it is even possible that they were covered in fur! They were unable to fly, but could run very fast as fast as a cheetah, according to some scientists! Their main weapon was their head, which could be up to one meter long, allowing them to swallow prey as large as a dog in one single gulp! However, thanks to the hooked tip of the bill, similar to that of eagles and hawks, the terrors birds could kill and devour prey much larger than a dog, including horses, camels, etc. Although only fragmentary remains are known, it is claimed to have reached the immense length of meters! This creature appeared in the Cretaceous period and possibly dined on dinosaurs. Madtsoia was such a successful predator, that it managed to survive the extinction that wiped out dinosaurs and other animals, but it finally went extinct about 45 million years ago. Other giant snakes are known to have existed, including one that was said to reach 29 meters in length! Purussaurus was the top predator in that sea, and with good reason; at meters long, maybe more, it was one of the largest crocodilians ever to have existed. On the other hand, the Entelodon, a prehistoric pig relative, was a full time carnivore and possibly one of the most monstrous-looking mammals ever. Standing on all fours, this beast was as tall as a man, and had an immense head armed with powerful jaws and sharp teeth. Scientists believe that it was able to hunt live prey, but that it also scared other predators away from their kills which should have been very easy. Its bite marks also suggest that it fought viciously with its own kind, and it is even possible that Entelodonts were cannibalistic. Entelodons were quite successful beasts, existing for about 9 million years. Some of them had wingspans of 12 to 15 meters, making them as large as a small plane although they were obviously not as heavy. But what makes Azhdarchids really strange are their body proportions; they had ridiculously long legs, necks and beaks, and very small bodies, as well as relatively short wings. Scientists believe that they did not hunt on the wing, but rather walked on the ground hunting for any animal they could catch and swallow whole- that included dog-sized, perhaps even man-sized creatures! Standing on all fours, the largest Azhdarchids were as tall as a modern day giraffeâ€¦ and almost as tall as a T-Rex. A predator, Pulmonoscorpius roamed the swampy forests of the Carboniferous in what is today Scotland. Just so you know, during the Carboniferous there were also giant roaches the size of house cats, dragonflies the size of hawks, and centipede-relatives up to three meters long. Enter Xenosmilus, possibly the nastiest feline ever to have existed. The remains of this very large cat the size of a lion or tiger, but more robust were recently found in Florida along with the remains of many unlucky giant peccaries similar to wild pigs that fell prey to it. Instead of strangling prey or breaking their neck as lions do, or stabbing them as the sabertoothed tiger did, Xenosmilus acted more like a shark or a carnivorous dinosaur, biting off a huge chunk of flesh and causing massive blood loss and shock in a matter of seconds. It could grow up to 20 meters long and weigh up to 60 tons, being almost six times larger than Tyrannosaurus rex! In reality, Spinosaurus did existâ€¦ and it was indeed bigger than T-Rex. The remains of this enormous predator where found in Egypt in , and the paleontologist who studied them was already convinced that it was bigger than T-Rex. Recently, however, new fossils have been found, and Spinosaurus was finally declared to be the largest carnivorous dinosaur of all times. This beastie could grow up to 17 or 18 meters long, weigh up to 10 tons and had a sail on its back taller than an adult man. Its long, crocodile-like snout suggests that it spend a long time in the water and possibly ate lots of fishâ€¦ but also crocodiles, giant turtles, and any dinosaur unlucky enough to cross its path. Even though T-Rex will probably always be the most popular prehistoric monster of all times, Spinosaurus is, and remains, the largest predator ever to walk the Earthâ€¦ that we know of.

Chapter 6 : Paleobotany - Wikipedia

An unpolished hand sample of the Lower Devonian Rhynie Chert from Scotland An important early land plant fossil locality is the Rhynie Chert , found outside the village of Rhynie in Scotland. The Rhynie chert is an Early Devonian sinter hot spring deposit composed primarily of silica. It is exceptional due to its preservation of several different clades of plants, from mosses and lycopods to more unusual, problematic forms. Many fossil animals, including arthropods and arachnids , are also found in the Rhynie Chert, and it offers a unique window on the history of early terrestrial life. Plant-derived macrofossils become abundant in the Late Devonian and include tree trunks, fronds , and roots. Angiosperms flowering plants evolved during the Mesozoic , and flowering plant pollen and leaves first appear during the Early Cretaceous , approximately million years ago. Plant fossils[edit] A plant fossil is any preserved part of a plant that has long since died. Such fossils may be prehistoric impressions that are many millions of years old, or bits of charcoal that are only a few hundred years old. Prehistoric plants are various groups of plants that lived before recorded history before about BC. Leaves preserved as compressions. Specimen in Munich Palaeontological Museum, Germany. Plant fossils can be preserved in a variety of ways, each of which can give different types of information about the original parent plant. These modes of preservation are discussed in the general pages on fossils but may be summarised in a palaeobotanical context as follows. Adpressions compressions - impressions. These are the most commonly found type of plant fossil. They provide good morphological detail, especially of dorsiventral flattened plant parts such as leaves. If the cuticle is preserved, they can also yield fine anatomical detail of the epidermis. Little other detail of cellular anatomy is normally preserved. Transverse section through a stem preserved as a silica petrifaction, showing preservation of cellular structure. Petrifactions permineralisations or anatomically preserved fossils. These provide fine detail of the cell anatomy of the plant tissue. Morphological detail can also be determined by serial sectioning, but this is both time consuming and difficult. These only tend to preserve the more robust plant parts such as seeds or woody stems. They can provide information about the three-dimensional form of the plant, and in the case of casts of tree stumps can provide evidence of the density of the original vegetation. However, they rarely preserve any fine morphological detail or cell anatomy. A subset of such fossils are pith casts, where the centre of a stem is either hollow or has delicate pith. After death, sediment enters and forms a cast of the central cavity of the stem. The best known examples of pith casts are in the Carboniferous Sphenophyta Calamites and cordaites Artisia. A lyginopteridalean pollen organ preserved as an authigenic mineralization mineralized in situ. These can provide very fine, three-dimensional morphological detail, and have proved especially important in the study of reproductive structures that can be severely distorted in adpressions. However, as they are formed in mineral nodules, such fossils can rarely be of large size. Fire normally destroys plant tissue but sometimes charcoalified remains can preserve fine morphological detail that is lost in other modes of preservation; some of the best evidence of early flowers has been preserved in fusain. Fusain fossils are delicate and often small, but because of their buoyancy can often drift for long distances and can thus provide evidence of vegetation away from areas of sedimentation. Fossil-taxa[edit] Plant fossils almost always represent disarticulated parts of plants; even small herbaceous plants are rarely preserved whole. Those few examples of plant fossils that appear to be the remains of whole plants in fact are incomplete as the internal cellular tissue and fine micromorphological detail is normally lost during fossilisation. Plant remains can be preserved in a variety of ways, each revealing different features of the original parent plant. Because of these difficulties, palaeobotanists usually assign different taxonomic names to different parts of the plant in different modes of preservation. For instance, in the subarborescent Palaeozoic sphenophytes , an impression of a leaf might be assigned to the genus Annularia, a compression of a cone assigned to Palaeostachya, and the stem assigned to either Calamites or Arthroxylon depending on whether it is preserved as a cast or a petrifaction. All of these fossils may have originated from the same parent plant but they are each given their own taxonomic name.

This approach to naming plant fossils originated with the work of Alexandre Brongniart [4] and has stood the test of time. For many years this approach to naming plant fossils was accepted by palaeobotanists but not formalised within the International Rules of Botanical Nomenclature. In addition, a small subset of organ-genera, to be known as form-genera, were recognised based on the artificial taxa introduced by Brongniart mainly for foliage fossils. The use of organ- and fossil-genera was abandoned with the St Louis Code Greuter et al. The situation in the Vienna Code of [7] was that any plant taxon whose type is a fossil, except Diatoms , can be described as a morphotaxon, a particular part of a plant preserved in a particular way. Although the name is always fixed to the type specimen, the circumscription i. For instance, a fossil-genus originally based on compressions of ovules could be used to include the multi-ovulate cupules within which the ovules were originally borne. A complication can arise if, in this case, there was an already named fossil-genus for these cupules. If palaeobotanists were confident that the type of the ovule fossil-genus and of the cupule fossil-genus could be included in the same genus, then the two names would compete as to being the correct one for the newly emended genus. What would you do if the species-name of a pollen-organ was pre-dated by the species name of the type of pollen produced by that pollen organ. It was argued that palaeobotanists would be unhappy if the pollen organs were named using the taxonomic name whose type specimen is a pollen grain. Palaeobotanists would have to be totally confident that the type specimen of the pollen species, which would normally be a dispersed grain, definitely came from the same plant that produced the pollen organ. We know from modern plants that closely related but distinct species can produce virtually indistinguishable pollen. It would seem that morphotaxa offer no real advantage to palaeobotanists over normal fossil-taxa and the concept was abandoned with the botanical congress and the International Code of Nomenclature for algae, fungi, and plants. Fossil groups of plants[edit] Stigmaria, a common fossil tree root. Upper Carboniferous of northeastern Ohio. Horsetails had evolved by the Late Devonian, [8] early ferns had evolved by the Mississippian , conifers by the Pennsylvanian. Some plants of prehistory are the same ones around today and are thus living fossils , such as Ginkgo biloba and Sciadopitys verticillata. Other plants have changed radically, or became extinct. Examples of prehistoric plants are:

Chapter 7 : 15 Terrifying and Little Known Prehistoric Monsters - Listverse

Prehistoric life refers to all things that lived on Earth between the origin of life billion years ago and B.C. when humans began to keep written records. In this guide, we focus on prehistoric animals that lived between million and.

Edit The geologic and biologic history of the Earth is divided into four eons: Hadean, Archean, Proterozoic, and Phanerozoic. Each eon is divided into eras, which are themselves subdivided into periods, which are in turn sub-sub-divided into epochs. Since we know a heck of a lot more about the recent past than we do about the very very ancient past, the first three eons are sometimes grouped together into a single "supereon" known simply as the Pre-Cambrian. Earth before million years ago. Starting from the formation of the Earth 4. Archean eon formerly Archaeozoic: This eon saw the emergence of the first eukaryotic life forms cells with a nucleus 1. The final final era of this eon was: Starting 1 billion years ago. Ice ages came and went which were so severe that the ice sheets reached all the way to the equator, resulting in a Snowball Earth. Rodinia eventually broke up, only to re-form as another supercontinent named Pannotia. The final period of this era was: Ediacaran period formerly Vendian: Starting million years ago, which marked the "Dawn of Animal Life. In any case, multicellular life that probably but not certainly belongs to the kingdom Animalia first appears around million years ago; possible fossils are found even earlier, near the beginning of the period, but nothing conclusive. Many possible ancestors of known invertebrate groups show up in the record, including comb-jellies, sponges, corals, anemones, and molluscs, and one fossil might even be a chordate vertebrate ancestor. Fungi also emerge during this period. The "Explosion of Life". Most of the main invertebrate groups appeared then, as well as the first vertebrate ancestors. Life was still water-exclusive. Graptolites, cephalopods, and chitons emerge during this period. First true fish appeared. Arthropods venture onto land. Ended with a mass extinction. First jawed fish and later ray-finned fish appeared. Plants and scorpions started to colonize dryland. The Fish Golden Age. The first four-limbed vertebrates appeared. Insects, crabs, ferns, and sharks evolve. Forests spread around the world. The Golden Age of Insects and Amphibians. Sharks reach large sizes, and ratfish, amniotes, synapsids, diapsids, and hagfish evolve. The supercontinent of Pangea comes to light, and Earth becomes more arid. The Golden Age of the Mammal-Ancestors. Beetles and therapsids evolve. Temnospondyls and pelycosaurs diversify. Ended with the worst mass extinction ever. True reptiles replaced mammal-ancestors. Most of the main groups of land-vertebrates still alive today appeared, dinosaurs and mammals are among them. Many groups that did not leave modern descendants, such as pterosaurs and many marine reptile groups, evolved as well. Dinosaurs became the largest and most diversified land-animals, and some became fliers including possible protobirds. New types of pterosaurs and marine reptiles evolved. The three still-living mammalian groups appeared. Dinosaurs further diversified, and the first dinosaurs universally recognized as birds appeared. Flowering plants and several groups of insects co-evolved, creating the most common land-ecosystem still present today. Modern groups of fish evolved. Ended with the last mass extinction since today, known as the K-T Boundary Event [1]. Mammals underwent an explosive evolution, and most still-living lineages appeared, primates included. Birds, crocodilians, turtles, squamates and lissamphibians were among the other land-vertebrates which survived the mass-extinction. At the end, the Earth started to become colder, and polar ices started to form. Continents acquired their modern placement, and new mountain ranges appeared. Grasslands became a widespread environment, partially replacing forests. New mammalian kinds appeared, among them the first hominids. Several Ice Ages alternated with Interglacials. All modern kinds of plants and animals were already present, but also many now-extinct species. True humans evolved and started to develop our modern traits. The age in which we are living today specifically the Holocene Epoch is included in this time period. The only survived human species, Homo sapiens sapiens, has become a prime environmental factor worldwide. The first written records started to appear some years ago. That moment marked the beginning of recorded history. But also note not all members of each group have their designated suffix; nor these suffixes are necessarily exclusive of these groups think about the whale Basilosaurus. Often identifies amphibians as well: Greek for "horned face": Also applies to some larger dinosaurs. Greek for "thief", "robber": Greek for "beast", "wild animal"; identifies mammals - hence the name Walking With Beasts!

Chapter 8 : Prehistoric Life | All The Tropes Wiki | FANDOM powered by Wikia

Paleobotany includes the study of terrestrial plant fossils, as well as the study of prehistoric marine photoautotrophs, such as photosynthetic algae, seaweeds or kelp. A closely related field is palynology, which is the study of fossilized and extant spores and pollen.

Gymnosperms first appeared in the late Paleozoic Era and became dominant during the first half of the Mesozoic Era. They are still represented today by more than known species of conifers evergreen trees , cy-cads, gnetophytes, and Ginkgo, none of which have flowers or fruits. Gymnosperms are typically tough and hearty. Their woody pulp, thick bark, branches, and needles or frondlike leaves are difficult to chew. Herbivorous dinosaurs of the Jurassic Periodâ€"including the sauropods, stegosaurs, and ankylosaursâ€"developed jaws, teeth, and digestive systems capable of extracting nutrition from the likes of evergreens, cycads, and other tough gymnosperms. Gymnosperms were successful at surviving in a Jurassic world with a moderately warm and arid climate. They relied only on wind to carry pollen to their seeds. Pollinated gymnosperm seeds grew slowly, and when fully grown they often took the form of tall trees in species such as ginkgos and conifers. Slow growth and height discouraged consumption by herbivores. Sauropod dinosaurs adapted by growing taller to reach the ever-more-lofty canopies of gymno-sperms and also developed consumption habits that allowed them to eat fairly constantly in order to derive enough sustenance from the nutritionally stingy conifers and cycads. Most kinds of organisms would not survive for long if left to fend for themselves above the Arctic Circle or in Antarctica. The polar regions of the Earth were not always so uninhabitable, however, and there is growing evidence that a wide variety of dinosaurs lived within the polar circles of the Mesozoic. Even though the middle latitudes of the Earth were uniformly warm during the Mesozoic Era, temperatures at the poles would have been somewhat cooler, even without the presence of ice caps. Studies of fossil plants and associated oxygen isotope studies of polar sediments have been carried out to determine the average annual temperatures of the Mesozoic polar regions. Another factor affecting life on the extreme ends of the planet would have been prolonged periods of darkness and cooler temperatures still during winter. The idea that dinosaurs could have lived at the relatively cool poles of the Earth was virtually unthinkable 50 years ago because of the widespread belief that their metabolism was more like that of cold-blooded modern reptiles than that of birds or mammals. The work of paleontologists to collect fossils in these regions during the past 20 years has led to a change of thinking. Not only did dinosaurs colonize the poles by at least million years ago, but fragmentary remains have now been identified there for nearly all major branches of the dinosaur evolutionary tree, with the notable and interesting exception of sauropods. One of the most productive fossil sites for polar dinosaurs is found on the banks of the Colville River in northeast Alaska. Evidence of polar dinosaurs is usually scant. The most complete dinosaur from any polar locality was found at the Matanuska Formation of south-central Alaska in and consisted of about a quarter of the animal. Bones from the foot, limbs, and tail were enough to convince paleontologist Anne Pasch of the University of Alaska that what had been found was a specimen of a hadrosaurâ€"a duck-billed dinosaur. Dating of the fossil sediments was made easier by the presence of sea creatures such as ammonites, the age of which can be fixed at about 90 million years ago. Finding the bones of terrestrial animals in marine deposits is not so unusual, although the specimens are usually spotty and incomplete. Pasch speculated that the hadrosaur died on the shore of an ancient ocean and "floated out to sea, probably as a bloated carcass. It eventually sank to the bottom and was buried in fine black mud along with shells and other sea creatures" found with its bones. Most main groups of dinosaurs are represented by fossil evidence from regions that would have been polar during the Mesozoic. In the Northern Hemisphere, compelling evidence of hadrosaurs, horned dinosaurs, large and small theropods, sauropods, and plated and armored dinosaurs is found in the northern reaches of Alaska, Canada, and Siberia. In the Southern Hemisphere, polar dinosaurs are represented by specimens of armored dinosaurs, small ornithopods, hadrosaurs, prosauropods, sauro-pods, large and small theropods, and possible horned dinosaurs. These remains are not alone and are often found with fossils of other creatures Ccontinues continued from the polar neighborhood such as crocodilians, amphibians, pterosaurs, birds, and small mammals. The presence of polar dinosaurs cannot be denied but raises questions about their lifestyle, metabolism, and thermoregulation. Chief among these questions is whether the presence of dinosaurs in cooler regions of the world is evidence of a more active, energetic thermoregulatory metabolism, or whether there was more to the story. Australian paleontologists Thomas Rich and Patricia Vickers Rich, who have done much to advance knowledge of polar dinosaurs of the Southern Hemisphere, speculate that some small dinosaurs may have actually burrowed into the ground to protect themselves against the chill of the long winter nights. Another plausible idea is that some dinosaur groups migrated to the south toward the poles during seasonally warmer periods and returned toward the Equator when the winter chill set in. That would have been possible given the configuration of connected landmasses during much of the Mesozoic. Another clue to dinosaur survival in colder climates might also be related to the possible use of feathers as a form of body insulationâ€"at least for small theropods for which such body coverings have been found. Angiosperms were characterized by a new reproductive life cycle that quickened their ability to grow, breed, and disperse. Angio-sperms utilize flowers to attract pollinating animals, such as insects, and also encase their seeds in fruits that, when separated from the plant, can aid in dispersal of seeds. The innovations of flowers to aid in pollination and fruits to protect the embryo contributed to the rapid success and spread of flowering plants. The oldest known A fossil of a gymnosperm angiosperm dates from the Early Cretaceous Period, about million years ago. Found in the same Chinese fossil region that contains exciting fossils of early marsupial and placental mammals, feathered dinosaurs, and birds, this primitive early example of a flowering A fossil of an angiosperm plant had paired stamens the pollen-producing parts of a plant and multiseeded fruits, although it may have lacked flowers. Angiosperms quickly became a favorite food of dinosaurs. Flowering plants reproduced much more quickly than gymnosperms; angiosperms constantly replenished a landscape that could become heavily browsed by hungry dinosaurs. The ability of angiosperms to grow rapidly and disperse widely allowed them to diversify into hundreds of species by the end of the Cretaceous Period. The An early magnolia from the Cretaceous Period importance of the angiosperms to the evolution of dinosaurs cannot be understated. The Cretaceous Period is known for an explosion of new lines of ornithischiansâ€"duck-billed, armored, and horned dinosaurs in particularâ€"that developed specialized adaptations for chewing and consuming the wider assortment of vegetation available to them, including the recently evolved flowering plants and gymnosperms. Those special anatomical features will be explored in Section Three of Last of the Dinosaurs, in the discussion of ornithischians of the Cretaceous Period.

Chapter 9 : A guide to prehistoric plants - Eden Project, Cornwall

Understanding why Jurassic period plants play a role in the life of carnivorous dinosaurs isn't too complex; these creatures depended upon many of the herbivorous dinosaur species to feed. Without plant life to sustain herbivores the carnivorous dinosaurs would have been unable to survive.

Plants Last Updated on Sat, 13 Oct Dinosaur Extinction The accumulation of knowledge has meant that scientists today must practice in finer and finer subspecializations: One is not a paleontologist, one is an invertebrate paleontologist specializing in ammonites ; or one is a palynologist, an expert not just in fossil plants, but in fossil pollen spores. One of the most beneficial by-products of the Alvarez theory is the way in which it has brought together scientists from an unprecedented variety of disciplines. Pollen specialists, for example, have found themselves for the first time in the same room with dinosaur experts, chemists, physicists, and astronomers, all discussing supernovae, precious metals, impact explosions, and mass extinctions. Advances have been made that would have been impossible had only one group been involved. In this sense, few theories in the history of science have been as fertile as the Alvarez theory. Two vertebrate paleontologists , William Clemens and David Archibald, along with plant specialist Leo Hickey, were among the first to speak up in opposition to the Alvarez theory, though in much less detail than did Officer and Drake. They closed with this paraphrase of T. This is the way Cretaceous life ended, Not abruptly but extended. The lack of attention is unfortunate, for fossil plants can tell us a great deal about mass extinctions. First, as the base of most food chains, plants determine much of what happens in the entire realm of biology. Second, because they are so different from animals and are sensitive environmental indicators, fossil plants reveal a lot about the nature of extinction events. Third, pollen and leaf fossils can be present in large numbers, reducing sampling errors and allowing the statistical techniques that add confidence to conclusions about extinction rates and timing. The first piece of evidence to suggest that the conclusion might be wrong, or at least not universally applicable, came in the paper by Carl Orth and colleagues in which the first iridium spike was reported in nonmarine rocks from the Raton Basin, proving that the iridium had not been concentrated from seawater. This "fern spike" subsequently turned up at several other K-T localities and in various rock types. Botanists know from studies of modern catastrophesâ€”from the eruptions of El Chichon, Krakatoa, and Mount St. Helens, for exampleâ€”that ferns are opportunistic plants that move in quickly to colonize a devastated area. Flowering plants later replace them, as happened in the early Tertiary. This scenario suggests that for the flowering plants, the Cretaceous ended not with a whimper but with a bang, quite abruptly. At the Snowbird II conference in , Hickey and Kirk Johnson reported the results of a new study of nearly 25, specimens of mainly leaf fossils from more than localities in the Rocky Mountains and the Great Plains. Hickey and Johnson found that 79 percent of the Cretaceous plants had gone extinct at the K-T boundary, at the same point at which the fossil pollen changes and the iridium spike appear. This new and statistically more sound evidence caused Hickey, like Peter Ward, to change his mind and conclude that "The terrestrial plant record [is] compatible with the hypothesis of a biotic crisis caused by extraterrestrial impact. This evidence is incontrovertible; there was a catastrophe. I think maybe [the anticatastrophism] mind set persisted a little too long. Archibald also appears to have been converted, at least on the plant evidence, writing in his book, "Of all the data from the terrestrial realm, the record of plants in the Western Interior seems to me to present the strongest case that extinction was rapid, not gradual, for the species so affected. This means that more Cretaceous species died out than he had measured earlier. Johnson now estimates the percentage extinction at close to 90 percent. As many as 90 percent of Cretaceous plant species disappeared suddenly, right at the K-T boundary; none of them are found above the iridium level.